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About TowerXchange

Founded in 2012, TowerXchange is your independent community for operators, towercos, investors and suppliers interested in EMEA, CALA and Asian towers. We're a community of practitioners formed to promote and accelerate infrastructure sharing. TowerXchange don’t built, operate or invest in towers; we’re a neutral community host and commentator on telecoms infrastructure.

TowerXchange produces a bi-weekly newsletter and quarterly journal, both available to subscribers, which cover industry news and provide deep insights into telecoms infrastructure worldwide. We also host annual Meetups on each of four continents to bring together the leading tower industry stakeholders.

TowerXchange was founded by Kieron Osmotherly, a TMT community host and events organiser with 21 years’ experience, and is governed with the support and advice of the TowerXchange “Inner Circle” – an informal network of advisors.

TowerXchange was acquired by Euromoney Institutional Investor PLC on December 1, 2017.

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TowerXchange Meetup calendar

- TowerXchange Meetup Americas 2018, June 20-21
- TowerXchange Meetup China 2018, September 26-29
- TowerXchange Meetup Africa 2018, October 9-10
- TowerXchange Meetup Asia 2018, December 4-5
- TowerXchange Middle East 2019, Week 2, February
- TowerXchange Meetup Europe 2019, April 30 - May 1
Q4 2017 and Q1 2018 offered several news with regards to the wave of consolidation currently hitting the Central and South American telecom tower market. In fact, several transactions among towercos contributed to further streamlining the market in Brazil and across the Andean Region while towercos also entered new markets such as the French Antilles.

SBA Communications acquired portfolios from Highline do Brasil, Torres Andinas as well as Tigo El Salvador. Andean Tower Partners acquired Torres Unidas and its 1,644 assets across Colombia, Peru and Chile and Phoenix Tower International entered the French Antilles and acquired 215 sites from Digicel in a sale and leaseback deal.

In this analysis, TowerXchange takes a close look at each country’s telecom infrastructure market, its characteristics and reports on the latest tower counts from across the region.

**Mexico**

Since the last report, the Mexican BTS market seemed to have picked back up as reported by several towercos active in the country. In fact, American Tower, IIMT and Mexico Tower Partners have added as many as 100 towers to each of their portfolios in just a few months and this trend is mostly related to ALTÁN Redes’ deployment projects across the country. In the meantime, Telesites reported +203 sites to its 15,000+ portfolio.
Our clients depend on SBA to provide the wireless infrastructure that allows them to transmit the signal to their customers. As their first choice provider of wireless infrastructure solutions, we are continuously setting the standard for customer satisfaction by “Building Better Wireless”.
While ALTÁN Redes’ first coverage target (30% of the population) wasn’t due until March 31, 2018, the Red Compartida project made the headlines on 22 March as it reached the 32.2% coverage mark. However, to date ALTÁN Redes hasn’t been able to sign deals with any of the country’s major carriers (Telefónica, AT&T and América Móvil).

In the meantime though, ALTÁN Redes’ progresses are good news for Mexican towercos since build-to-suit activities have been stalling in the country for the past two years.

As previously reported, Telefónica has recently launched an RFQ for approximately 150 rings for new rooftops to be deployed in 2018. However, local sources suggest that some aggressive bidders drove prices down considerably in what has been defined as “another punch to the BTS business model.”

One might argue that this is the perfect scenario for towercos to start a consolidation process. But in reality, some of these new firms have built unsellable towers, on discounted lease rates and in remote areas and unlikely to attract multiple tenants or - even worse - unsuitable for being shared from an engineering standpoint. So larger towercos who might have an appetite to consolidate and rationalise the market are left empty-handed unless willing they are willing to buy “bad towers”...

A no-go especially for public entities such as American Tower and Telesites, especially since Carlos Slim is reportedly considering the divestment of a minority portion of his 61% stake in the towerco.

Central America and the Caribbean

Belize has 379.7K connections and 100% penetration rate as of Q4 2017 according to GSMA Intelligence. With two carriers, DigiCell and Smart, and no active towercos to date, the country is too small to attract much attention from the tower industry, and our estimates suggest there are approximately 70-80 towers in the national territory.

Following the spectrum auction held in Costa Rica last year, Claro and Movistar have finalised the

**Market highlights**
- Towercos report healthy BTS volumes
- ALTÁN Redes reaches its first target

**Mexico quick facts**
- **Towers**: 30,349
- **SIMs per tower**: 3,535
- **Mobile connections**: 107.3mn (Q4 2017)
- **Population**: 130mn (Q4 2017)
- **SIM penetration**: 83% (Q4 2017)
- **MNOs**: Telcel, Movistar, AT&T
- **Towercos**: Telesites, American Tower, Mexico Tower Partners, IIMT, Centennial, Torrecom, Intelli Site Solutions, Conex, MX Towers, Rent-A-Tower, Uniti Towers, Tower One, several other smaller local and new entrant towercos

Source: GSMA Intelligence, TowerXchange
## Major tower transactions in Latin America 2011/2018

* 1,000 urban wireless sites and 2,500km of fibre **American Tower acquisition of 4,630 BR Towers includes 2,530 towers plus 2,100 exclusive rights ***Totals and average exclude the GTP / American Tower deal as it was US-centric

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Seller</th>
<th>Buyer</th>
<th>Tower count</th>
<th>Deal value US$</th>
<th>Cost per tower US$</th>
<th>Deal structure</th>
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## Major tower transactions in Latin America 2011/2018

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<th>Country</th>
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<th>Buyer</th>
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Software Solutions for the Telecommunications Industry

Tower companies and mobile network operators worldwide have been utilizing Accruent’s software solutions to increase operational efficiency, improve colocation processes, and get sites on-air faster. With solutions that support the entire site lifecycle, Accruent is the software partner that helps telecommunications organizations scale their businesses seamlessly.

- Infrastructure Lifecycle Management
- Site Survey & Site Access Management
- Project Management
- Lease Administration & Accounting
- Field Workforce Management

Contact us for a demo at sales@accruent.com
Who sold their towers in Central and South America?

### Central America market highlights
- Tigo El Salvador sold towers to SBA Communications
- Costa Rica finalised spectrum auction
- Digicel sold towers to Phoenix Tower International in the French Antilles
- Altice could sell its Dominican Republic towers

<table>
<thead>
<tr>
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<th>Sold in full/majority</th>
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<td>Peru</td>
<td><strong>Entel</strong></td>
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<td>Chile</td>
<td><strong>Bitel</strong></td>
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<tr>
<td>Brazil</td>
<td><strong>Oi</strong></td>
<td></td>
<td></td>
<td><strong>Nextel</strong></td>
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</tbody>
</table>

**Cuba’s SIM penetration grew from 29% in Q4 2015 to 41% in Q4 2017 but that isn’t enough to get anywhere near the regional average. With only one mobile network operator in the country, ETECSA, who share around 500-700 towers with radio companies and TV stations, it will take some time for international towercos to be able to enter the island. However, TowerXchange is keeping a close eye on Cuba in light of its untapped market and undisputed potential to become a target of international towercos should the telecom market liberalise.**

The only towerco active in the **Dominican Republic** is Phoenix Tower International which

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### Costa Rica quick facts
- **Towers**: 3,352
- **SIMs per tower**: 2,565
- **Mobile connections**: 8.6mn (Q4 2017)
- **Population**: 4.9mn (Q4 2017)
- **SIM penetration**: 175% (Q4 2017)
- **MNOs**: Kölbi, Movistar, Claro
- **Towercos**: SBA Communications, American Tower, Continental Towers, Telesites, Phoenix Tower International, TOCSA

**Source**: GSMA Intelligence, TowerXchange

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### Dominican Republic quick facts
- **Mobile connections**: 8.5mn (Q4 2017)
- **Population**: 10.8mn (Q4 2017)
- **SIM penetration**: 78% (Q4 2017)
- **MNOs**: Claro, Orange, Viva
- **Towercos**: Phoenix Tower International

**Source**: GSMA Intelligence, TowerXchange
Beauty is not just a passing fancy but a true need of mankind. Since 1966, we work to satisfy our customers all over the world. We do it with the pride of those who, as first, managed to give telecommunications structures a new meaning, interpreting them as pieces of urban architecture dedicated to technology and beauty.
Towercos have acquired the majority of towers from carriers. However, the majority remain carrier-owned. Significant BTS towerco activity is present, but there is less SLB activity. There is an early stage market for BTS and/or SLB. Negligible towerco activity is observed.
TAKE CONTROL

Secure your business continuity and revenue flow with remote access management.

- **UP-TIME**: Reduce down time by quick access and make decisions on asset renewal based on the frequency of visits.
- **COST CONTROL**: Verify and control billing with data about actual time against spending.
- **RISK MANAGEMENT**: Reduce risk of stolen or lost keys by assigning access only when needed.
- **NATIONAL INFRASTRUCTURE**: Assign service jobs and access based on monitoring of critical assets at the site.
- **OPEX**: Decrease costs with less travelling and reduced aborted visits, enabling more demanding SLAs.
- **REPORTING**: Make effective decisions based on the data from operations and access control.

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 PTI first acquired local towerco Teletower Dominicana and its 190 towers and lately added 545 sites by closing a deal with Viva, the third carrier of the country, at the time owned by Trilogy International Partners. Along with the transaction, Trilogy sold Viva to local media company Telemicro Group, owned by businessman Juan Ramon Gomez Diaz.

In January, Altice opened bids for its 8,000+ tower portfolio across France and Portugal and TowerXchange believes that the sale would include its Dominican Republic’s assets. Current bidders include American Tower and private equity firm KKR and this could mean that a second towerco might enter the Dominican Republic in the near future.

In February, Tigo El Salvador sealed an agreement to sell up to 800 towers to SBA Communications for US$145mn. SBA Communications owns and operates 242 sites in El Salvador and this deal with exponentially grow the company’s footprint.

Guatemala is a complex country with a very competitive tower industry. SBA Communications, Torrecom, Balesia and Continental all operate in the local market which is characterised by a fairly strong regulatory environment and the huge influence of local communities – Consejos Comunitarios de Desarrollo Urbano y Rural (COCODES) – in the approval of new deployments. In spite of these difficulties, Torrecom and SBA
Smart Gensets for Smart Grids

We provide the best power solutions for intelligent networks.

Generac, more than 55 years providing the world with power.
El Salvador quick facts
Towers 1,683
SIMs per tower 5,704
Mobile connections 9.6mn (Q4 2017)
Population 6.4mn (Q4 2017)
SIM penetration 150% (Q4 2017)
MNOs Claro, Movistar, Digicel, Red, Tigo
Towercos SBA Communications, Phoenix Tower International, Continental Towers

Source: GSMA Intelligence, Phoenix Tower International, TowerXchange

Costa Rica - Estimated tower count 3,352

- SBA Communications
- American Tower
- Telesites
- Phoenix Tower International
- Other independent towercos (Continental Towers, TOCSA)
- ICE
- Claro

Guatemala quick facts
Towers 3,680
SIMs per tower 5,380
Mobile connections 19.8mn (Q4 2017)
Population 17.1mn (Q4 2017)
SIM penetration 116% (Q4 2017)
MNOs Tigo, Claro, Movistar
Towercos SBA Communications, Torrecom, Continental Towers

Source: TowerXchange

Communications have achieved good levels of organic growth in the country and have added a combined 300 towers since Q2 2015.

Local billionaire Mario Lopez owns substantial equity in market leaders Tigo, and also owns most of the land under their towers, which makes the operator reluctant to participate in widespread infrastructure sharing. Could Tigo consider selling

El Salvador - Estimated tower count 1,683

- SBA Communications
- Phoenix Tower International
- Continental Towers
- Tigo
- Claro
- Digicel
- Telefónica

*Being sold to SBA Communications
The Bladon 12Kw microturbine genset (MTG) is a cost effective, reliable and clean alternative to traditional diesel gensets for telecom tower power applications. Bladon’s revolutionary patented microturbine, heat exchanger and air bearing technologies harness the power of a microturbine jet to provide a compact and ultra-reliable alternative to the traditional diesel generator.

**UNIQUE FEATURES**
- LOWER TOTAL COST OF OWNERSHIP

<table>
<thead>
<tr>
<th>Traditional Diesel Genset</th>
<th>Bladon MTG</th>
</tr>
</thead>
<tbody>
<tr>
<td>97% fewer site visits</td>
<td></td>
</tr>
<tr>
<td>60% longer life</td>
<td></td>
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<tr>
<td>30% less fuel costs</td>
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<tr>
<td>20% better part load efficiency</td>
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</tbody>
</table>

**WWW.BLADONJETS.COM**

Bladon Jets (UK) Limited, The Proving Factory, Gielgud Way, Coventry, CV2 2SZ, United Kingdom
Honduras - Estimated tower count: 1,200

- Operator captive towers
- Continental Towers

Paraguay - No significant tower transactions

According to TowerXchange’s research, Honduras is home to two towercos, Balesia and Continental Towers Corp. For now, there’s been little visibility on the local industry and its potential with around 20% towerco penetration and the two carriers – Tigo and Claro – still holding on to their tower portfolios.

In the past quarter, SBA Communications and Torrecom added 40 combined towers to their portfolios in Nicaragua. In spite of being an interesting build-to-suit market, the country is still perceived as high risk from an operational and security perspectives.

Panama earned an entry in the regional tower transaction report through the acquisition by Phoenix Tower International of 60 sites from American Tower. SBA remain market leaders but...
lately the country has seen the entrance of another towerco, Torrecom, who has acquired 25 sites and made its debut on the market. Other portfolios are held by Continental Towers and Torres de Panama.

According to GSMA Intelligence, Panama is a fast grower market in Central America with four active carriers (Cable & Vision, Claro, Digicel and Movistar), 138% penetration rate and 5.7mn mobile connections (Q4 2017). TowerXchange estimates there are around 1,600 towers in Panama.

In February, Phoenix Tower International announced the acquisition of 215 towers from Digicel in the French Antilles. While no further details of the transaction have been shared, this deal solidifies PTT’s position as the first towerco in the Caribbean.

**Brazil**

Brazil has faced three tough years as a result of a deep economic recession and political crisis but to date, the market finally seems in full recovery.

In Q4 2017, SBA Communications has sealed a deal for the acquisition of approximately 900 towers to its Brazilian portfolio from Highline do Brasil as well as solid build-to-suit pipeline. TowerXchange has recently interviewed the Vice President of International for SBA Communications, David Porte, who said about Highline’s portfolio that it “included a set of solid BTS contracts with positive terms that were negotiated before a wave of mediocre
contracts were signed by numerous towercos across the region.”

In the meantime, Phoenix Tower do Brasil secured a US$45.8mn loan from the IFC to be utilised to “finance the acquisition of towers” and built 400 towers in 2017. A great achievement that places the towerco as the number one BTS player in the country.

With several PE-backed firms ready to make an exit from Brazil (including the largest private entity Grupo TorreSur with its 6,500+ towers) the market might undergo a considerable reorganisation over the next few months. And one of the consolidating forces in Brazil could definitely be American Tower, who has finalised the sale and leaseback deal initiated in 2014 with TIM Brasil. As a result, the towerco has acquired 5,873 towers for a total approximate value of US$802.6mn.

In the meantime, Oi’s Board of Directors have approved a debt-for-equity swap proposed by the company’s creditors. The operation requires the issuance of up to 1,756,054,163 new shares (a maximum of US$3.8bn). Under this terms, Oi’s unsecured bondholders can swap portions of their debt for shares in the company.

In recent news, the President of Anatel, Juarez Quadros has announced the Agency’s intention to re-auction the unused 700MHz spectrum licenses in its efforts to introduce 5G technology across Brazil.

**Bolivia**

Still a virgin market in terms of towerco penetration, Bolivia is a complex country to do business in. To date, there are approximately 4,600
sites in the hands of three operators with Entel owning the largest portfolio (2,000-2,300 sites), Tigo running approximately 1,500 sites and Viva 1,000.

Trilogy has made no secret over the years that it would happily divest some of Viva’s tower assets, which could represent an interesting entry card for towercos looking to scale-up. But can the opportunities outweigh the risks?

**Paraguay**

Paraguay is one of the newest markets to open its doors to towercos, following the acquisition by American Tower of 1,400 Tigo’s towers at a value of US$125mn (of which 863 were transferred in Q3 2017). As anticipated, the valuation per tower in the Tigo/AMT deal is lower than the regional average (US$89,285 vs US$199,966). In fact, valuations are affected by the limitations on the length of land leases, currently capped at five years, as well as the rising real estate costs. Along with Millicom’s portfolio, Personal’s 1,100 towers could come to market soon and this would surely increase the interest of towercos in this new market.

In January 2018, the 700MHz spectrum auction took place and generated bids for US$84.5mn. Tigo, Claro and Personal all scooped spectrum allocation while State-backed Vox didn’t enter the bidding process.

**Colombia**

In December 2017, the Colombian Ministry of IT and Communications (MinTIC) increased the spectrum caps to allow operators to increase the capacities of their networks. The move should allow the spectrum auction (of 700MHz and 1900MHz bands) to get back to track following two years of delays. In fact, one of the reasons why the local BTS market has been stagnant is the delay in the spectrum auction and the subsequent absence of strong deployment plans by the local operators.

In 2017, the country has delivered some interesting tower news with various deals having been completed over the past few of months. Tigo has announced the sale and leaseback of 1,200 sites to American Tower for US$147mn while Phoenix Tower sealed several deals with two Colombian firms (and a Peruvian one) for a total of 150 sites. PTI’s deals are under confidentiality agreements and no further details have been disclosed. Lastly, SBA Communications acquired Torres Andinas’ portfolios in Colombia and Peru in yet another private deal.

**Paraguay quick facts**
- **Towers**: 4,250
- **SIMs per tower**: 1,788
- **Mobile connections**: 7.6mn (Q4 2017)
- **Population**: 6.9mn (Q4 2017)
- **SIM penetration**: 111% (Q4 2017)
- **MNOs**: Tigo, Personal, Claro, Vox
- **Towercos**: American Tower

**Colombia quick facts**
- **Towers**: 15,553
- **SIMs per tower**: 3,626
- **Mobile connections**: 56.4mn (Q4 2017)
- **Population**: 49.3mn (Q4 2017)
- **SIM penetration**: 114% (Q4 2017)
- **MNOs**: Claro, Movistar, Tigo, Avantel
- **Towercos**: American Tower, SBA Communications, Andean Tower Partners, Centennial, Golden Comunicaciones, Innovattel, Uniti Towers, PTI, QMC, Telesites, Tower One

With tens of towercos operating in the country and not enough business for everyone, local players report tough pricing and economic conditions which are putting small BTS firms under more pressure they can sometimes handle and TowerXchange expects more consolidation to take place among towercos, especially since some developers might decide to exit the market, exemplified by one of PTI’s counterparts in the latest deals.

On the MNO front, the local government is currently selling its 32.5% stake in Movistar, following the fine imposed to Telefónica and Claro for a breach of their 1994 licensing contract. According to the terms of the original agreement, the operators were supposed to return all wireless network infrastructure to the State after ten years, a term then extended for a further ten years, but failed...
Bolivia - Estimated tower count: 4,600

- Entel: 2,100
- Tigo: 1,500
- Viva: 1,000

Source: TowerXchange

Paraguay - Estimated tower count: 4,250

- American Tower: 1,400*
- Personal: 750
- Claro: 600
- Tigo: 400
- Vox: 1,100

* 1,400 announced of which 863 transferred in Q3 2017

Source: TowerXchange

to. As detailed by Telegeography, the government was one of the co-owners of the operators and therefore “duly obliged to participate in a capital increase of approximately US$1.64bn to pre-pay all commitments in relation to PARAPAT, the consortium that owns the telecoms assets and manages the pension funds of the former companies that resulted in the creation of legacy operator ColTel (now Telefónica Colombia).

Ecuador

Ecuador is the quietest of all Andean States especially since its MNO landscape is less attractive for towercos. Claro enjoys a dominant position in the country, while CNT is the government-owned player holding the third spot after Telefónica's Movistar.

On the towerco front, SBA Communications entered the market in 2015 with the acquisition of 130 sites from Innovattel/Torresec but has not made further announcements since. Local firm Aplicanet reports healthy volumes of BTS, having added over 35 sites to its 63-tower portfolio in the last quarter.

Ecuador quick facts

- Mobile connections: 14.5mn (Q4 2017)
- Population: 16.7mn (Q4 2017)
- SIM penetration: 87% (Q4 2017)
- MNOs: Claro, Movistar, CNT
- Towercos: SBA Communications, Ecuador Tower Company, Innovattel, Balesia, Aplicanet

Source: GSMA Intelligence, TowerXchange
Colombia - Estimated tower count 15,553

- American Tower
- Phoenix Tower International
- SBA Communications
- Uniti Towers
- BTS Towers
- Other independent towercos (Andean Tower Partners, Innovattel, Continental, Balesia, Centennial et cetera)

* Including Torres Andinas' sites to be transferred to SBA Communications
** Further sites to be transferred to American Tower

Source: TowerXchange, Company reports, RBC Capital Markets estimates

Peru

In recent months, Phoenix Tower International sealed a private deal with a Peruvian firm and added 49 sites to its portfolio, SBA Communications snatched Torres Andinas’ 100+ towers and Andean Tower Partners further contributed to consolidating the market by sealing the landmark acquisition of Torres Unidas.

With only a handful of towercos now active in the country, Peru is one of the less penetrated and possibly more sustainable tower markets in CALA.

To date, MNOs haven’t shown much appetite to divest their tower portfolios, resulting in the level of towerco penetration to remain low (approximately 25%). But if their strategy changes, this could easily turn Peru into the most exciting regional market.

Chile

Still affected by the infamous 2012 Antenna Law, Chile isn’t like any other CALA market yet the two main regional towercos both operate in the country in spite of its challenges.

As part of the Women in Towers initiative, TowerXchange talked with Priscila Oliva, Country Manager for Chile at American Tower, who recently described the country’s market as follows: “Most towers in Chile are still in the hands of operators and since 2012, there haven’t been significant divestments […]. Chile is advanced in terms of its densifications and networks so we are working on a lot of alternative site typologies such as light poles and other low coverage solutions.”

In 2017, SBA Communications has entered the market thanks to a deal with CTR, a local cable and internet provider. In a previous interview with
Peru - Estimated tower count 10,646*

TowerXchange, SBA’s CEO Jeffrey Stoops noted that “entering Chile isn’t easy since companies need to be licensed and approved, and SBA has been through that process, which has been a barrier to entry for other tower cos. In Chile, we’ll focus on new deployments and we’ll keep an eye if any portfolios of existing assets become available.”

Argentina

Argentina remains in the spotlight as the fastest adopter of 4G in Latin America, driven by an expanding middle class eager to spend more in mobile services. Since 2010, MNOs have connected 26m Argentines (+65% of the total population) but there are as many as 17mn unconnected people in the country.

On the infrastructure front, the inventory of towers should at least double to offer adequate coverage and capacity across the country’s top cities and towns. But the lack of infrastructure reflects inadequate investments by telecom operators as well as an historical reluctance of subscribers to spend more to improve QoS.

In his recent interview with TowerXchange, David Porte, VP International for SBA Communications, said about Argentina’s possible future tower divestments that “the only portfolio that could be put up for sale in Argentina is Telecom Personal’s. In fact, Telefónica is already transferring sites to Telxius and Claro Argentina is likely to stick to the group’s strategy not to sell its towers (and if anything, divesting them to Telesites).

That said, the major hurdle to any divestment is still the tax regime in Argentina. No one can afford to sell or buy towers in the country and take on 30% of the purchase price in taxes on fully depreciated tower assets! While the government is looking at addressing this as well as other crucial issues

Chile quick facts

- **Towers**: 8,950
- **SIMs per tower**: 2,916
- **Mobile connections**: 26.1mn (Q4 2017)
- **Population**: 18.1mn (Q4 2017)
- **SIM penetration**: 144% (Q4 2017)
- **MNOs**: Movistar, Entel, Claro, WOM
- **Tower cos**: American Tower, Andean Tower Partners, Balesia, SBA Communications, Telxius

*Including approximately 100 sites to be transferred to SBA Communications by Torres Andinas

Source: GSMA Intelligence, TowerXchange

Source: TowerXchange
Argentina quick facts
Towers 16,150
SIMs per tower 3,777
Mobile connections 61mn (Q4 2017)
Population 44.5mn (Q4 2017)
SIM penetration 137% (Q4 2017)
MNOs Claro, Movistar, Personal, Nextel
Towercos American Tower, SBA Communications, Atis Group, Innovattel/Torresec, Plata Tower Company, Teletower Argentina, Tower One, Telxius, CSS, GME Alliance

Source: GSMA Intelligence, TowerXchange

the out-of-control municipal inspection fees, towercos cannot reach scale in Argentina by buying BTS firms because none of them have considerable portfolios yet.

As of Q4 2017, SBA Communications reports a portfolio of 35 sites in the country and American Tower of 8 (on top of the approximately 1,000 urban sites acquired with the CyCSA deal)

While the CALA tower industry continues to develop and reshape, we invite all regional tower experts to the fifth annual TowerXchange Meetup Americas, taking place at the exclusive Boca Raton Resort & Club (Boca Raton, Florida), 20-21 June 2018. For more information, visit our website at: www.towerxchange.com/meetups/meetup-americas

The evolution of the CALA telecom tower industry 2013-2017 (Q4)

<table>
<thead>
<tr>
<th>Year</th>
<th>Est. total towers</th>
<th>Towers owned by towercos</th>
<th>Towerco penetration</th>
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<tr>
<td>2013</td>
<td>140,000</td>
<td>46,011</td>
<td>32%</td>
</tr>
<tr>
<td>2014</td>
<td>148,000</td>
<td>61,729</td>
<td>41%</td>
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<tr>
<td>2015</td>
<td>156,000</td>
<td>69,850</td>
<td>44%</td>
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<tr>
<td>2016</td>
<td>164,207</td>
<td>81,207</td>
<td>49%</td>
</tr>
<tr>
<td>Q4</td>
<td>172,542</td>
<td>89,142</td>
<td>51.6%</td>
</tr>
</tbody>
</table>

Source: TowerXchange
UPDATED: TowerXchange’s who’s who in CALA towers

TowerXchange presents its 2018 edition of the stakeholders in the CALA telecom tower industry

With the first edition now almost two years old, the CALA Who’s Who is the number one guide to finding out who the key stakeholders in the regional tower market are. In this updated edition, TowerXchange offers its readers more insights and details on the top companies leading the Central and South American telecom infrastructure industry.


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**Accel:** One of the leading venture capital firms in the world with over US$8.8bn in capital under management, Accel has funded the likes of Facebook, Dropbox and Spotify. QMC Telecom is among its investments in the tower sector.

**Albright Capital Management (ACM):** A private equity firm specialised in emerging markets. In April 2016, ACM granted a US$45mn five-year term credit facility to Innovattel LLC for the development of build-to-suit projects in Argentina.

**AlfaSite:** AlfaSite is a Brazilian build to suit (BTS) firm part of Grupo Alfa which also owns a tower manufacturer (Metal Alfa), an MSP (Alfa Erb) and an energy equipment company (Alfa Energia).

**Algar Telecom:** Algar Telecom is a Brazilian mobile operator serving approximately 1.5mn subscribers across Rio de Janeiro, São Paulo, Santa Catarina and Paraná among others via 31,000km of fibre. It currently offers 3G services and is working alongside Nokia Networks to launch 4G LTE.

**ALTÁN Redes:** The company was founded in 2016 in Mexico and enjoys a Public-Private Partnership with the Organismo Promotor de Inversiones en Telecomunicaciones (Promtel). ALTÁN Redes is deploying a wholesale shared network utilising the 700MHz spectrum. Red Compartida will significantly improve the footprint coverage of wireless voice and data services in the country; this, through a 4G-LTE & 5G ready network built to reach 92.2% of the population, including regions that

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Read this article to learn:

- Towercos who’s who: a comprehensive guide to the towercos active in the CALA region
- Thirty of the most respected CALA-focused investors, advisors and law firms
- MNOs guide: MNOs footprint and tower strategy at a glance
up until now have been neglected by traditional carriers.

The company has Grupo Multitel as strategic partner and Morgan Stanley, Caisse de dépôt et placement du Québec (CDPQ), FFLATAM-15-2, Hansam, S.A., Isla Guadalupe Investments as investors and the IFC as development institution.

**Altice:** Altice took over Orange Dominicana and Tricom in 2014, respectively the second and fourth MNOs in the Dominican Republic. Orange Dominicana and Tricom both offer 3G and 4G LTE across the Dominican Republic.

To date, Altice’s operations in the Dominican Republic are for sale (both its tower portfolio and carrier services) as part of its global divestment project.

**Altman Vilandrie & Co:** AV&Co. has extensive tower industry experience spanning tens of engagements (including Latin America, Africa, Asia, North America, Europe) over ten years, including tower operator strategies as well as tower transaction due diligences. Their recent work has addressed a number of relevant topics such as the impact of small cells, the future opportunity for DAS and the changing role of rooftops.

**América Móvil (AMX):** AMX is one of the largest mobile network operators in the world and part of the Carlos Slim’s group of companies, serving approximately 284mn mobile subscribers across fourteen markets.

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**América Móvil’s (Telcel + Claro) footprint**

Source: TowerXchange
Back in 2014, AMX faced regulatory pressure to reduce its dominant position in Mexico, which forced it to carve-out over 11,000 of its telecom towers and create Telesites, a separate infrastructure entity (see Telesites for more details). Apart from the Telesites venture, which has already expended into Costa Rica, AMX has not faced regulatory or balance sheet pressure to divest assets elsewhere, and thus has favoured retaining their towers.

América Móvil operates as Claro in most of its CALA markets and it offers both 3G and 4G LTE. In Mexico, where it operates under the Telcel brand, the operator is now offering 3G and 4G LTE.

In 2018, CEO Daniel Hajj announced that América Móvil is seeking a TV license in Mexico.

**American Tower (AMT):** The world’s largest independent commercial towerco, AMT need no introduction within this publication. With its headquarters in the U.S., AMT operates a global portfolio of over 160,000 sites across the U.S., South America, Africa, Europe and Asia.

AMT is the leading towerco in the CALA region in terms of its tower count, with nearly 37,000 sites across eight markets.

AMT latest deals include the acquisition of KIO Networks in Mexico, of Millicom’s tower portfolio in Paraguay and Colombia and of engineering firm CyCSA in Argentina.

**Amzak Capital:** Amzak Capital Management is the private investment firm of the Kazma family. The Kazma’s developed and operated cable systems in Canada and the U.S. until 1992, when they entered the Latin American markets, with operations in Aruba, Venezuela, Trinidad & Tobago and Martinique. In 1997, they built and operated Amnet, Central America’s largest cable television/triple play company, which was sold to Millicom International Cellular S.A. in 2008. Originally from Canada but based in the U.S. since 1979, Amzak counts Altice Dominican Republic and BTS Towers among its current investments.

**Analysys Mason:** a recognised global consulting firm specialized, among others, in tower market analysis and due diligence.

**Andean Tower Partners (ATP):** Part of Digital Bridge Holdings, ATP is the largest private towerco active in the Andean region. In December 2017, ATP acquired Torres Unidas and its 1,644 sites across Colombia, Peru and Chile.

**Aplicanet:** Aplicanet is a BTS firm active in Ecuador, where it runs a portfolio of 98 towers.

**AT&T:** AT&T made its entrance in the Mexican mobile market thanks to the acquisition of Iusacell, Unefon (part of Iusacell) and Nextel back in 2014. AT&T has 9.2mn subscribers as of Q2 2016 and has covered over 51mn Mexicans with 4G LTE since its entrance in the country.

AT&T has inherited networks largely divested to towercos, but has still found sufficient capacity on those inherited sites, such that the anticipated volume of new build from AT&T’s market entrance has been slow to materialise.

**Axtel:** Axtel is a Mexican operator offering internet, telephone and TV services in 45 cities across the country. In 2017, Axtel sold 142 sites to American Tower for US$56mn.

**Avantel:** Avantel is the fourth mobile network operator in Colombia where it offers 3G and 4G LTE services.

**Balesia:** Balesia is a BTS focused towerco operating in CALA and owned by International Tower Corporation (ITC).

**Barclays:** Barclays’ global investment banking division offers a leading Technology, Media and Telecoms (TMT) franchise. The TMT team has significant experience representing leading tower operators as well as telecom service providers around the globe on buy and sell side assignments. In this capacity, Barclays has supported its clients in the valuation and/or marketing of tower portfolios as well as the negotiation of various agreements associated with these transactions.

**Berkshire Partners:** Berkshire Partners is a leading private investment firm acting through nine private equity funds with more than US$16bn in aggregate capital commitments. Berkshire Partners has substantial experience of tower industry investments, having been an early stage investor
in Crown Castle and the investment arm behind Torres Unidas until its acquisition by Andean Tower Partners.

**Bitel**: Bitel is the fourth mobile network operator in Peru, wholly owned by Vietnam’s largest MNO Viettel and mostly focused on serving rural communities across the Andean country. Bitel offers an extensive 4G network across Peru.

**Blackstone**: Blackstone’s Tactical Opportunities (Tac Opps) specialises in time-sensitive and complex ventures and is the investment firm behind Phoenix Tower International’s expansion in the U.S. and CALA. Blackstone has previous experience of the towerco asset class having invested in Global Tower Partners, which they successfully exited through the sale to AMT.

**Brazil Tower Company (BTC)**: BTC is a Brazilian BTS focused towerco with a portfolio of 750 towers, owned by private investors, including the company’s CEO Dr Chahram Zolfaghari, and 1848 Capital. In April 2018, the towerco has closed on US$79mn of a US$104mn long-term senior secured debt financing with three international lenders led by Cordiant Capital of Montreal, Canada. The company expects to close on the remaining US$25mn of financing during Q3 2018.

**BTS Towers**: A build-to-suit firm formed by the same executives behind NMS. Its shareholders include Cartesian Capital Group, Amzak Capital and the International Finance Corporation. BTS presently operates in Mexico, Colombia and Peru.

**Cable & Wireless**: Acquired by Liberty Global in November 2015, it serves 3.7mn subscribers in fifteen markets across the Caribbean and Latin America under the FLOW brand.

**Cartesian Capital Group**: a global private equity firm with proven expertise in assisting closely-held companies to expand internationally. Since its inception in 2006, the firm has managed more than US$2.7bn in committed capital.

Cartesian was the founding investor of NMS and is currently behind BTS Towers. The firm also holds a minority participation into Grupo TorreSur.

**Centennial Towers**: Centennial Towers is a BTS firm active in Colombia, Brazil and Mexico funded by Breslau Capital, a New York based firm with presence in both Panama and Tel Aviv. In addition to its core markets, Centennial has a presence in various CALA countries thanks to its network of partners and a portfolio of several hundred sites across Chile, Costa Rica, El Salvador, Panama, Peru, Argentina and the Dominican Republic.

**CMA Strategy Consulting**: CMA is a boutique consulting firm focused on the telecoms, media and high-tech segments. With offices in Boston and San Francisco, the firm has done extensive due diligence and financial consulting in Central and South America, EMEA and Asia in addition to its work in the United States.

**Continental Towers**: Continental Towers is a BTS firm focused on deploying sites in Central America. Originally a joint venture between Terra Projects and Credit Suisse, it then received a US$120mn loan package from the IFC to further fund its Central American expansion in 2012. Since then, the company has been quite secretive and to date, it operates in Guatemala, Costa Rica, El Salvador, Jamaica, Honduras and Panama with an estimated total tower count of around 700 sites.

**Cell Site Solutions (CSS)**: CSS was created in 2013 as a joint venture between Gávea Investimentos and Goldman Sachs. Focused on BTS projects, co-locations, DAS and full turnkey services in Brazil, it runs a portfolio of over 1,200 sites across the country.

To date, the company is fully owned by Goldman Sachs and it seems to have branched out to Argentina via Cell Site Solutions Argentina, which was founded in 2016.

**Citi**: One of the world’s leading tower transaction advisory groups can be found within the TMT team at Citi.

**CyCSA**: The Argentinian engineering firm was acquired by American Tower in December 2016. With the deal, American Tower secured over 1,000 urban wireless sites, 2,500km of fibre-optic network and exclusive rights to deploy mobile infrastructure in various locations across Argentina.

**Delmec**: The tower experts in consultation and
engineering, providing global solutions to operators, towercos and regulators on standards, guidance and due diligence for portfolio management. Engaging audit, assessment and analysis for structural enhancement, capacity and maintenance as individual activities or by way of managed services.

**Deutsche Bank:** Deutsche Bank provides M&A advisory services as well as financing services in the tower space, including both equity and debt products. Deutsche Bank has been involved in the tower sector on a global basis, successfully executing transactions in North America, South America, Europe, Africa and Asia.

**Digicel:** Digicel is a leading MNO with a presence in over twenty countries across Central America and the Caribbean, including Jamaica, Panama, El Salvador and Haiti.

Since 2017, Digicel has started to divest its assets and has sold towers to Phoenix Tower International in El Salvador and the French Antilles.

**Digital Bridge:** Digital Bridge Holdings, LLC, was formed in 2013 through a partnership between Ben Jenkins of Dering Capital (and formerly of The Blackstone Group) and Marc Ganzi (former founder and CEO of Global Tower Partners).

The firm is involved in the acquisition, funding and management of firms in the infrastructure sector such as Mexico Tower Partners, Vertical Bridge, Andean Tower Partners, ExteNet Systems, DataBank and Vantage Data Centres.

**Ecuador Tower Company (ETC):** ETC is a BTS firm founded by executives behind Brazil Tower Company. To date, it runs a portfolio of approximately 40 towers across Ecuador.

**Entel:** Created back in the sixties by the Chilean government, Entel was privatised in the early nineties. Since then, the company has become the largest mobile network operator in Chile and in 2013 acquired Nextel de Perú for US$400mn. To date, Entel owns approximately 3,000 sites in Chile and 2,400 in Peru and offers 3G and 4G LTE services in both countries. While the company has not sold any towers, Entel have increasingly relied on third party towercos for new sites.

**Entel SA:** Entel SA is the Bolivian State-owned telecom company which was nationalised in 2008. Former shareholders include Telecom Italia which settled a dispute with the Bolivian government over the nationalisation for US$100mn. The operator now offers 3G and 4G LTE services in the country.

**EY:** TMT strategy and corporate finance advisory team with extensive experience of advising on tower transactions.

**First Corporate Finance Advisors:** First is a financial advisory firm based in Argentina.

The company specialises in M&A, valuation, infrastructure advisory and securitisation. Serving clients throughout Latin America, First is now actively involved in the opening of the Argentinian telecom tower market.

**Gávea Investimentos:** Gávea was founded back in 2003 by the former president of the Central Bank of Brazil, Arminio Fraga. The fund invested approximately US$150mn to create CSS back in 2013 in a joint US$300mn investment with Goldman Sachs and sold its shares to the latter in 2016.

**GME Alliance:** GME Alliance is a private towerco active in the Argentinian market.

**Golden Comunicaciones:** Created in April 2016 via a joint venture between Goldman Sachs and Innova Capital Partners, the BTS firm is focused on serving the Colombian telecom market and headed by CEO Herman Torres.

**Goldman Sachs:** Goldman Sachs returned to the Brazilian private-equity market with its 2013 investment in CSS, alongside Gávea Investimentos. In April 2016, Goldman Sachs created a joint venture with Innova Capital Partners for the creation of Golden Comunicaciones, a BTS firm focused on the Colombian market. In the same year, the firm took over Gávea’s participation in CSS.

**GP Investments:** GP Investments is a leading investment firm in Latin America and was the firm behind BR Towers, one of the leading towercos in Brazil with its 4,200 sites that was sold to American Tower in 2014 for US$978mn.

**Grupo TorreSur:** With its 6,500 towers portfolio,
Towercos have acquired the majority of towers from carriers, but the majority remain carrier-owned. Significant BTS towerco activity also present. Less SLB activity, but plenty of BTS towerco activity. Early stage market for BTS and/or SLB. Negligible towerco activity.
GTS is the third largest towerco in Brazil and the largest private towerco in CALA. Headed by Jim Eisenstein, one of the pioneers of the U.S. tower industry and co-founder of AMT, GTS is funded by Providence Equity Partners, one of the leading equity firms in the global TMT industry.

**Hardiman Telecommunications**: A unique consultancy equally capable of advising on engineering and operational issues as they are on commercial strategy and corporate finance. Extensive experience advising on both the buy-side and sell-side in tower transactions.

**Highline do Brasil**: Headed by Alexandre Braga, former executive within AMT in Latin America, Highline was created back in November 2012 to serve the Brazilian market with its BTS and co-location services.

In 2017, Highline's portfolio of over 1,000 sites has been acquired by SBA Communications in a private deal.

**Housatonic Partners**: Housatonic Partners is a U.S. private equity firm with over US$1bn in capital under management. QMC Telecom is among its investments in the telecom infrastructure sector.

**Instituto Costarricense de Electricidad (ICE)**: ICE is the State-owned electricity and telecom provider of Costa Rica. Operating under brand Kölbi, the company is the leading MNO in the country ahead of Movistar and Claro. ICE has to date retained its portfolio of ~1,000 towers, but has used towercos for new build and co-location.

**International Finance Corporation (IFC)**: A member of the World Bank Group, the IFC is the largest financing institution in the world entirely focused on the private sector, with specific attention to developing and underdeveloped countries. In CALA, the IFC is involved in various debt financing projects with the likes of Phoenix Tower do Brasil, ON Telecom, Continental Towers and ALTÁN Redes.

**IIMT**: IIMT is a BTS and co-location firm active in Mexico where it runs approximately 550 sites. In addition to its own portfolio, IIMT enjoys an agreement with the Federal Electricity Commission in Mexico to utilise its infrastructure for telecom purposes.

**Indigo Capital**: Indigo Capital was founded in 1998 in New York and is an investment firm focused on private equity in Latin America. Indigo Capital counts Torrecom and Torres Unidas among its current and past investments.

**ING**: Leading Dutch bank with considerable experience of providing debt finance to the tower industry. In April 2018, ING Bank (Brazil) and QMC Telecom announced the closing of a R$150mn (US$43mn) Delayed Draw Credit Facility and Team Loan.

**Innovattel**: Innovattel is Puerto Rico based BTS firm active in Colombia, Peru, Panama, Ecuador, Puerto Rico and Argentina with a total portfolio of over 800 sites. Torresec sold 130 Ecuadorian towers to SBA in 2015.

The first towerco to enter Argentina, Innovattel sealed a US$45mn five-year term credit facility with Albright Capital Management in April 2016 to finance its deployments in the country.

**Intelli Site Solutions**: Intelli Site Solutions is a Mexican towerco focused on BTS projects as well as indoor and outdoor DAS. To date, the towerco runs a portfolio of over 300 towers across Mexico.

**Iusacell**: Iusacell was a mobile operator active in Mexico that got acquired by AT&T in January 2015 for US$2.5bn.

**JP Morgan**: Leading TMT advisory team with extensive experience in towers, including some of the landmark transactions.

**KPR Consult**: Renowned ‘tower doctors’ – go-to guys for structural and technical due diligence, improvement capex planning, decommissioning and just about anything to do with tower design and maintenance.

**Macquarie Group**: Australian Macquarie is a

Comunicaciones (Colombia), via a joint venture with Goldman Sachs.
leading investment and advisory firm globally active in the telecom tower sector. Among its notable operations: investment in Mexico Tower Partners (via the Macquarie Mexican Infrastructure Fund and in conjunction with Digital Bridge), acquisition of InSite Wireless (Puerto Rico, U.S. and Canada) and participation in a consortium which acquired Crown Castle Australia (now Axicom).

**Madison Dearborn Partners:** MDP is the U.S. based private equity firm behind BTS firm Centennial Towers.

**Message Center Management (MCM, Inc.):** MCM is a U.S. independent developer and owner of telecom towers with a portfolio of around 800 sites. Its management team is among the leading forces behind two CALA towercos, Torrecom and Torres Unidas.

**Mexico Tower Partners (MTP):** MTP is the largest independent towerco in Mexico. MTP was originally formed as a joint venture between Digital Bridge and Macquarie Mexican Infrastructure Fund.

To date, the company owns over 1,850 sites across Mexico and is run by an experienced team led by José Sola, whose background includes successful spells within Global Tower Partners and Telefónica.

**MHC Holdings:** MHC is an investment firm focused on telecoms and emerging markets based in Panama. The firm backed Torres Andinas until the towerco sold its assets to SBA Communications and stopped operating in the region.

**Millicom:** Millicom is an international telecom company active in fourteen markets in Africa and Latin America, mostly trading under the brand Tigo. In the CALA region, Millicom is active in Guatemala, El Salvador, Honduras, Paraguay, Nicaragua, Colombia and Bolivia.

In 2017, Tigo sealed two sale and leaseback deals with American Tower in Paraguay (1,400 sites) and Colombia (1,200 sites). In 2018, Tigo sold around 800 sites to SBA Communications in El Salvador.

**Montezuma & Porto:** Montezuma & Porto is a Peruvian based law firm specialised in telecommunications, IT, Internet, data protection and other digital services. Partners Oscar Montezuma Panez and José Miguel Porto Urrutia have advised towercos and mobile operators on a variety of strategic issues.

**MVP Capital:** Financial brokers and advisors active in the U.S. since 1987. Clayton Funk, one of its Managing Directors, has been personally involved in 125 sale and leaseback transactions and although focused on the U.S., he always keeps an eye South of the border.

**MX Towers:** MX Towers is a towerco created by executives previously involved in the Macquarie Mexican Infrastructure Fund focused on offering DAS and other alternative solutions across Mexico. In 2018, MX Towers announced the acquisition of 72 towers from Maxcom in a sale and leaseback deal.
**NII Holdings:** NII Holdings is the company behind the Nextel brand. To date, NII Holdings owns only Nextel Telecomunicações, the fifth mobile network operator in Brazil currently offering 3G and 4G LTE. In May 2016, Nextel sealed a RANsharing agreement with Telefónica’s Vivo.

Between 2013 and 2015, NII Holdings run the Nextel brand in Chile, Peru and Mexico but then sold them respectively to Novator, Entel Chile and AT&T. Additionally, in 2013 NII Holdings divested 6,396 towers in Brazil and Mexico (to American Tower) and faced bankruptcy in 2015.

In 2016, NII Holdings sold all its remaining shares in Nextel Argentina to media giant Clarín Group. Nextel Argentina is now owned by Clarín’s subsidiary Cablevisión and is the fourth mobile operator of Argentina.

**Norton Rose Fulbright:** Norton Rose Fulbright is a Legal 500 law firm serving clients in a multitude of industries. Among them, the law firm provides services in the infrastructure and TMT arenas and is able to help its CALA clients via its offices in Brazil, Colombia and Venezuela.

**Oi:** Oi is the fourth mobile network operator of Brazil offering 3G and 4G LTE services. Since 2012, Oi has divested the majority of its 11,000+ towers across Brazil to Grupo TorreSur, BR Towers and SBA Communications.

In June 2016, Oi filed for bankruptcy protection for...
a total amount of US$19bn (the largest filing in the history of Brazil). To date, the Oi’s bankruptcy isn’t been solved but the latest movement has been the approval by the Board of Directors of a debt-for-equity swap originally proposed by the company’s creditors. The operation requires the issuance of up to 1,756,054,163 new shares (a maximum of US$3.8bn). Under this terms, Oi’s unsecured bondholders can swap portions of their debt for shares in the company.

**Orange:** Orange is the leading French telecom operator founded in 1988 with operations in Europe, Africa, Asia and the Americas. In the Americas it is active in Guadeloupe, Martinique and French Guiana where it offers 3G services. Its Dominican Republic unit was sold to Altice in 2013.

**P2 - Pátria:** Pátria is a leading private equity firm active in Brazil in a variety of sectors including infrastructure and counting Blackstone among its partners.

In 2012, Pátria invested in Highline do Brasil and in 2015 in Odata, a data centre infrastructure and co-location service company. As of 2017, P2’s latest investment in the sector is ATIS Group, an independent towerco active in Argentina.

**Peppertree Capital:** Peppertree is a private equity fund focused on growth equity, recapitalisation and buyout opportunities in the telecom infrastructure industry. Mostly focused in the U.S. where it has backed companies such as Branch Towers, 4G Towers, Clearview Tower Company and Light Tower Holdings, it keeps an eye on opportunities in Central and South America.

**Personal:** Owned by Telecom Argentina, Telecom Personal is third mobile network operator in the country where it offers 3G and 4G LTE services.

**Peterson Partners:** Peterson Partners is a private equity and venture capital firm primarily active in the U.S., Canada, Europe, Mexico, Brazil and India and counts QMC Telecom among its PE investments.

**Phillips Lytle LLP:** Phillips Lytle is a U.S. based law firm offering a wide range of services. Partner Douglas Dimitroff is an expert in DAS and other het-net solutions and is able to advise U.S. as well as international clients on their business and regulatory dynamics.

**Phoenix Tower do Brasil (PTB):** Phoenix Tower do Brasil is the Brazilian subsidiary of Phoenix Tower International (PTI), created after the acquisition of T4U Holdings by PTI. Run by former BR Towers’ CEO Mauricio Giusti and backed by Blackstone, PTB is the largest independent towerco in Brazil with a portfolio of over 1,500 sites.

**Phoenix Tower International (PTI):** PTI was founded in 2013 by Dagan Kasavana, the M&A mastermind behind the GTP rollup strategy and sale to American Tower. PTI now owns and operates approximately 1,600 towers across the CALA region and 600 in the U.S.

PTI has achieved its current scale via both organic and inorganic growth transactions and is active in Brazil, Colombia, Costa Rica, Dominican Republic, El Salvador, French Antilles, Panama, Peru and the United States.

**Plata Tower Company:** created in 2016 by one of the executives behind Brazil Tower Company and Arqueiro Telecom - Alex Sepehri-Nik - Plata Tower Company is a BTS firm active in Argentina.

**Providence Equity Partners:** One of the largest global private equity firms operating in the TMT industry with US$54bn in assets under management across complementary private equity and credit businesses. Providence is an investment partner of Brazilian towerco Grupo TorreSur.

**QMC Telecom:** QMC Telecom was founded back in 2008 and currently runs a portfolio of approximately 1250 towers as well as rooftops and DAS in Brazil, Colombia, Puerto Rico as well as Mexico, where it operates under the Conex brand.

In April 2018, QMC Telecom announced the closing of a R$150mm Delayed Draw Credit Facility and Term Loan with ING Bank in Brazil to finance new deployments and possible acquisitions across the country.

**RBC Capital Markets:** RBC Capital Markets is a Canadian investment bank part of the Royal Bank
of Canada. Jonathan Atkin and Jonathan Dann, Managing Directors of RBC's Telecom Research, are two of the most respected analysts in the global telecom and tower space and regulars at TowerXchange Meetups.

**Rent-A-Tower:** Rent-A-Tower is a BTS firm active in the Mexican market.

**SBA Communications (SBA):** With almost 28,000 towers across the U.S., Central and South America and Canada, SBA is one of the top ten towercos in the world. SBA runs almost 12,000 sites across Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Nicaragua, Panama and Peru.

In the last twelve months, SBA acquired sites in Chile from CTR, in Brazil from Highline do Brasil, in Colombia and Peru from Torres Andinas and in El Salvador from Tigo, adding almost 2,500 sites to its regional portfolio.

**Scotiabank:** In November 2015, Scotiabank granted to Phoenix Tower Dominicana (Phoenix Tower International subsidiary) a US$45mn five-year credit facility to finance the acquisition of Teletower Dominicana and further develop its portfolio in the country. In April 2017, Phoenix Tower International sealed another loan facility for US$120mn with Scotiabank to finance wireless infrastructure across Latin America.

Among its latest involvements, Scotiabank acted as lead arranger and bookrunner for the financing of the Andean Tower Partner's acquisition of Torres Unidas and acted as the buyer's financial advisor.

**Sercotel:** Sercotel is a local mobile network operator serving the Brazilian region of Paraná.

**Silver Swan Capital:** Silver Swan Capital, a NY-based investment firm, sealed a US$40mn funding deal with Brazil Tower Company in August 2016 to finance the towerco expansion plans across Brazil.

**Skysites:** Skysites is an infrastructure firm active in Brazil focused on BTS, small cells, co-locations and iDAS. The company is led by Roberto Massaru Nishikawa.

**Southern Cross Group:** Southern Cross Group is a private equity firm focused on Latin America with offices in Argentina, Brazil, Chile, Colombia, Mexico, Uruguay and the U.S. Mexican BTS and MSP firm Even Telecom is among its latest investments in the telecom infrastructure industry.

**Telecommunications Partners:** Telecommunications Partners is a BTS firm active in the Peruvian market.

**Telefónica:** Telefónica is a Spanish telecom company active in Europe, Asia, North, Central and South America. In the CALA region, it operates under the Vivo and Movistar brands in Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Panama, Peru, Puerto Rico and Venezuela.

Since 2011, Telefónica has entered into fourteen tower transactions, divesting over 11,000 towers across the region. The last three transactions were sealed with Telxius, the company’s own carve-out infrastructure company created at the beginning of 2016. After a tentative IPO in 2016, Telefónica has finally transferred 40% of its stake in Telxius to private equity firm KKR.

In 2017, Telefónica had reorganised its business units and divided its regional business operations into two segment: Telefónica Hispam Sur covering Argentina, Chile, Peru and Uruguay and Telefónica Hispam Norte which includes Colombia, Mexico, Central America, Ecuador and Venezuela.

Latest news from the operator includes its intention to list its Argentinian branch, valued at US$5.8bn, on the Buenos Aires Stock Exchange. This is part of a larger operation looking at divesting various portions of its Latin American businesses in an attempt to reduce its US$50bn debts. In Colombia, the national government is moving forward with its plan to sell its 32.5% stake in Telefónica’s Movistar. Telefónica Group is not likely to raise its own stake in the Colombian operator and the government is looking for a third-party investor.

The sale process is related to the fine (a combined US$1.6bn) received by Movistar (and Claro) for breaching the terms of their original 1994 licenses.
According to their licenses, the operators should have returned all wireless infrastructure to the Colombian state after ten years, a period which was extended for an additional ten years. However, both Claro and Movistar failed to return them.

Telesites: Telesites is the infrastructure company created by Carlos Slim which debuted on the Mexican stock exchange in December 2015. As of Q1 2018 the company owns and manages 15,066 towers in Mexico as a result of the transfer of assets from América Móvil as well as organic growth. Additionally, Telesites is active in Costa Rica where it has built 268 sites for Claro as of Q1 2018, and has started operations in Colombia.

Telxius: Telxius was created in February 2016 by Telefónica with the goal to manage the operator’s infrastructure including its towers and sub-sea cable. To date, Telxius manages over 13,350 sites in Europe, 1,655 in Brazil, 304 in Argentina, 327 in Chile and 849 in Peru. In addition, the company runs 31,000km of submarine fibre optic cable, including SAM-1, a submarine cable that connects the United States with Central and South America.

After a tentative IPO in 2016, Telefónica has finally transferred 40% of its stake in Telxius to private equity firm KKR.

Tillman Global Holdings (TGH): Multinational tower and infrastructure investment and operations firm led by Sanjiv Ahuja, former Chairman and co-founder of Eaton Towers.
and ex-CEO of Orange. TGH has a joint venture partnership with JC Decaux, giving them the opportunity locate points of service, particularly small cells, on over 1mn prime locations worldwide. TGH is pursuing a couple of key opportunities in CALA.

**TIM Brasil:** Owned by Telecom Italia, TIM Brasil is the second mobile network operator in Brazil, serving more than 70mn subscribers across the country. In 2014, TIM entered into a sale and leaseback transaction with American Tower for the sale of the majority of its sites in various tranches. The deal was finalised in 2017 with a total of 5,873 sites transferred for a total value of US$850mn.

**TOCSA Towers:** TOCSA Towers is a BTS firm active in Central America.

**Torrecom:** Torrecom is a leading BTS firm with a portfolio of over 311 sites in Nicaragua, 215 in Guatemala, 245 in Mexico and 30 in Panama.

Its management team includes experienced executives from U.S. towerco MCM, Inc. such as Maria Scotti who acts as CEO and Eric Zachs, Co-Chairman and Co-Founder of MCM. Indigo Capital is one of the investment firms behind Torrecom.

**Torres Andinas:** Torres Andinas was a BTS firm active in Colombia and Peru. The firm stopped operating in the region following the sale of its assets to SBA Communications in 2017.

**Torres Unidas:** Torres Unidas operated 1,644 sites across Chile, Colombia and Peru before its acquisition by Andean Tower Partners in 2017. Led by Daniel Senier, who is now CEO of Andean Tower Partners, Torres Unidas was backed by Berkshire Partners.

**Tower One:** Tower One was launched in 2015 and is a towerco listed on the Canadian Stock Exchange. The company has operations in Canada, the United States, Germany, Colombia, Argentina and, as of 2018, Mexico.

**Uniti Towers:** a subsidiary of CS&L, a U.S. based REIT, Uniti Towers is formerly known as Summit LatAm and is headed by Lawrence Gleason. In November 2016, CS&L announced the purchase of 359 towers from NMS for a total value of US$65mn which will be run and operated by Uniti Towers. The sites are spread across Mexico, Colombia and Nicaragua.

**WOM:** WOM is the fourth mobile network operator in Chile where it’s been offering 4G LTE since the end of 2015.

**Vinson & Elkins (V&E):** V&E is one of the oldest and largest international law firms, with approximately 700 lawyers located in 15 offices around the world. Their global telecommunications team has extensive experience advising on international telecoms and telecoms infrastructure transactions in numerous countries.

**Viva Bolivia:** Viva is the third mobile network operator in Bolivia and is owned by Trilogy International Partners. Viva launched its 4G LTE services in July 2015.

**Viva Dominicana:** Viva Dominicana is the third mobile network operator in the Dominican Republic where it offers 3G services. In March 2016, the MNO sealed a deal with Phoenix Tower International over the sale of 145 sites and transfer of marketing rights of a further 400 towers.

In November 2015, Trilogy International Partners sold Viva Dominicana to Telemicro Group, owned by local entrepreneur Juan Ramon Gomez Diaz.

Who have we missed?

Have we missed a company active in the CALA telecom tower market? Then please email Arianna Neri, MD - Americas and Asia, at aneri@towerxchange.com and don’t forget to sign up for the fifth TowerXchange Meetup Americas, taking place in **Boca Raton, 20-21 June 2018**. More details can be found on our website: **www.towerxchange.com/meetup/meetup-americas/**
UPATED: Demand forecasts for passive infrastructure equipment and services in Central and South America

TowerXchange checks in on demand across six different categories of equipment and services in the 15 most active CALA tower markets

The Central and South American telecom tower markets are experiencing a new wave of business opportunities thanks to new spectrum auctions, positive economic trends and solid deployment plans by the regional carriers. In this updated market review, TowerXchange focuses its attention on opportunities for equipment and service providers as well as offering an update on who the key players are in terms of towercos and carriers in each CALA market.

Keywords: Access Control, Americas, Argentina, Asset Lifecycle Platform, Batteries, Belize, Bolivia, Brazil, Build-to-Suit, Capex, Central America, Chile, Colombia, Costa Rica, Cuba, DAS, Dominican Republic, Ecuador, El Salvador, Energy, Energy Storage, Guatemala, Honduras, Hybrid Power, IBS, Jamaica, Lawyers & Advisors, MNOs, Managed Services, Market Forecasts, Market Overview, Masts & Towers, Mexico, Monitoring & Management, Nicaragua, O&M, Off-Grid, On-Grid, Panama, Paraguay, Passive Equipment, Peru Procurement, RMS, Sale & Leaseback, Site Management System, Small Cells, South America, Steelwork, Strategic Consultancy, TowerXchange Research, Towercos, Unreliable Grid, Uruguay, Venezuela

Read this article to learn:
- Which markets should be business development priorities for solution providers?
- What is happening in terms of new network deployments across the Americas?
- Which MNOs could still sell their towers and generate new business in terms of tower upgrades and O&M contracts?
- Which countries need towers and which projects are driving growth?
- Which are the hottest markets for small cells and DAS

In the run up to fifth edition of the TowerXchange Meetup Americas, taking place June 20 and 21 in Boca Raton, we offer our readers an exclusive analysis of where opportunities lie for tower manufacturers, turnkey providers, energy solution companies, RMS and site management system suppliers, access control experts as well as consultants.

In this article, we analyse the dynamics of the top fourteen markets in the region as well as provide a snapshots of some of the other countries which are yet to see any towerco activity but might become interesting targets in the future.

Here is a list of the specific categories we are analysing:
- Energy: our focus in this category is on backup and primary power solutions, energy storage and energy efficiency solutions.
- RMS, ILM and access control: is there need for remote monitoring and access control systems on most towers? Are they connecting to a NOC and to a Site Management or Infrastructure Lifecycle Management platform? And if not, should they?
- How many new towers are being built in the region? And who is deploying 4G LTE hence densifying its network? Which portfolios are currently being sold, opening to a wave of upgrades on existing sites?
- Where is there demand for small cells, microcells, DAS and other infill and in-building solutions? And in which markets are the greater volumes of such solutions being deployed?
- Where are deals happening? Which countries are still designing their telecom and infrastructure legal framework? These are the markets where the expertise of consultants and law firms is high on demand!
### Selected estimated CALA tower counts

<table>
<thead>
<tr>
<th>Country</th>
<th>Estimated Tower Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paraguay</td>
<td>4,250</td>
</tr>
<tr>
<td>Bolivia</td>
<td>4,600</td>
</tr>
<tr>
<td>Chile</td>
<td>8,950</td>
</tr>
<tr>
<td>Caribbean</td>
<td>10,525</td>
</tr>
<tr>
<td>Peru</td>
<td>10,646</td>
</tr>
<tr>
<td>Central America</td>
<td>12,805</td>
</tr>
<tr>
<td>Colombia</td>
<td>15,553</td>
</tr>
<tr>
<td>Argentina</td>
<td>16,150</td>
</tr>
<tr>
<td>Mexico</td>
<td>30,349</td>
</tr>
<tr>
<td>Brazil</td>
<td>57,127</td>
</tr>
</tbody>
</table>

**Estimated total towers in rest of South America:** 4,000 (Venezuela, Ecuador, Uruguay, Surinam, French Guiana and Guyana)

*Source: TowerXchange*

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**Meetup Americas 2018**

The fifth annual retreat of the top CALA telecom infrastructure elite

**Wednesday 20 and Thursday 21 June, Boca Raton, Florida**

[www.towerxchange.com/meetup-americas](http://www.towerxchange.com/meetup-americas)

*Image courtesy of the City of Boca Raton Office of Economic Development*
### Vendor opportunity matrix

<table>
<thead>
<tr>
<th>Vendor opportunity matrix</th>
<th>Static assets</th>
<th>Energy</th>
<th>RMS, site management &amp; access control systems</th>
<th>Turnkey infrastructure</th>
<th>Small cells, microcells, DAS and IBS</th>
<th>Advisors</th>
<th>MNOs</th>
<th>Towercos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Claro, Movistar, Personal, Nextel</td>
<td>American Tower, SBA Communications, Atis Group, Innovatel/ Torresec, Plata Tower Company, Teletower Argentina, Tower One, CSS, GME Alliance</td>
</tr>
<tr>
<td>Bolivia</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Unknown</td>
<td>Low</td>
<td>Entel, Tigo, Viva</td>
<td>N/A</td>
</tr>
</tbody>
</table>

While Argentina is now home to 10+ towercos and many steps have been made to update its telecoms regulatory framework, the country is still in need of some critical reforms before the market can truly take off.

Two aspects are of particular concern to carriers and towercos: tax and municipal fees. In fact, if on one hand the tax regime isn’t allowing any transaction to take place, high municipal inspection fees (combined with the complex permitting procedure) don’t allow BTS firms to grow their portfolios as much as they could. In fact, while Argentina lacks infrastructure even in dense municipal areas, BTS firms have grown at a relatively slow pace.

While energy isn’t an issue in major cities, MNOs still need some energy solutions for off-grid sites as they move out of urban areas as well as backup power on connected sites. Once and if a new regulation is approved, we could see the volume of new builds grow exponentially, which could be a great news for tower manufacturers, turnkey infrastructure firms and access control solution providers.

Argentina is home to the third largest power market in LatAm which relies heavily on natural gas-fired thermal generation (>60%), with a growing hydropower component (approx 35%). The country’s ever growing demand for electricity is forcing the government to look at large generation and transmission projects to be developed in the near future. Around 99.8% of the population has access to electricity.

While Bolivia is an untapped tower market, carriers active in the country are committing to several interesting investments to modernise their networks.

Tigo has announced a US$150mn investment to expand its 4G LTE footprint and HFC network. Entel, the State-owned operator, has allocated US$340mn to expand its fibre-optic network and committed to US$1bn investments by 2020.

Electricity is a state-owned business in Bolivia and over 60% of it is currently supplied via thermal generation, with the remaining 40% being produced thanks to hydropower. The Bolivian government is heavily engaged in providing universal access to electricity and over-producing in order to export. However, some energy solutions are likely to be needed when coverage plans extend to rural communities beyond the reach of reliable grid.
<table>
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<th>Advisors</th>
<th>MNOs</th>
<th>Towercos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>TIM Brasil, Vivo, Claro, Oi, Nextel, Algar Telecom, Sercomtel</td>
<td>American Tower, SBA Communications, Grupo TorreSur, Phoenix Tower do Brasil, CSS, Brazil Tower Company, AlfaSite, Centennial, QMC, Skysites</td>
</tr>
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<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td></td>
<td></td>
<td>Brazil is finally out of its recession and several BTS firms have reported great progresses on their pipelines. The next 18-24 months should deliver plenty of opportunities for tower manufacturers serving the local market as well as companies involved in new site typologies. In fact, while the country is still lagging behind in terms of its macro towers inventory, many players are addressing their densification needs by opting for lighter, smaller structures. One of the reasons behind this choice is the permitting process, which isn’t always straightforward when it comes to macro towers. Another interesting trend in Brazil is the much awaited consolidation process hitting the towerco ecosystem. Advisory firms serving the local space should have plenty of opportunities for new business! Additionally, tower companies not interested in exiting the market are seeking new financing options, which could represent an opportunity for financial advisors and investments firms. Brazil is the largest electricity market in LatAm and 82% of it is produced via renewable sources (77% of it is hydroelectric) vs only 17% via fossil fuel. Drought years have caused serious energy crisis in the country such as the 2001-2002 one. Around 99.5% of the population has access to electricity.</td>
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<thead>
<tr>
<th>Chile</th>
<th>High</th>
<th>Medium</th>
<th>Medium</th>
<th>Medium</th>
<th>High</th>
<th>Low</th>
<th>Movistar, Entel, Claro, WOM</th>
<th>American Tower, Balesia, SBA Communications, Telxius, Andean Tower Partners</th>
</tr>
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<tr>
<td>Chile</td>
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<td></td>
<td>Chilean players have become quite creative when it comes to installing new sites, also as a function of the much discussed Tower Law. Since then, plenty of local and international firms have flooded the Chilean market with new options to overcome the limitations imposed by the law and still be able to proceed with densifying the national infrastructure network. New site typologies, concealed towers, DAS and small cells have all come into play in Chile. Currently, Chile is the 5G test bed for América Móvil’s trials in Latin America and this might result in enhanced opportunities for producers of infill sites such as lightpoles, shortpoles and beyond. Chile relies heavily on both thermal (approx 38%) and hydropower (approx 62%) for its electricity supply. The government has been involved in the construction of various new hydropower and coal-fired thermal plants as well as a 500MW solar power generation project. Around 99.6% of the population has access to electricity.</td>
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</table>

|              |              |        |                                             |        |     |    |                                               |                                   |
The Colombian tower market has undergone a positive restructuring phase over the past 12 months which has led to less towercos, with more capabilities and know-how. Unfortunately though, the much awaited 700MHz spectrum auction is yet to take place and until then, the country's BTS activities will remain slow.

The Colombian electricity sector relies mostly on hydropower (65%) and thermal generation (35%). The country is yet to fully explore its renewable potential while a transmission line connecting Colombia with Central America is currently underway. The government has created a system of cross-subsidies between higher income / large consumers and low income / low users of electricity (and water). Around 97% of the population has access to electricity.

Costa Rica is likely to enjoy an active year following the spectrum auction which has awarded both Claro and Movistar with additional spectrum. Both carriers should up their deployment games. In the meantime, State-owned Kölbi is currently deploying fibre across the country's key cities.

As of 2015, 93% of the country's electricity comes from renewable sources and in 2016, achieving 98% of electricity from renewable means, it has run on renewable sources for 110 days non-stop. A move in line with the government's plan to become 100% carbon neutral by 2021. Around 99.5% of the population has access to electricity.
<table>
<thead>
<tr>
<th>Vendor opportunity matrix</th>
<th>Static assets</th>
<th>Energy</th>
<th>RMS, site management &amp; access control systems</th>
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<th>Small cells, microcells, DAS and IBS</th>
<th>Advisors</th>
<th>MNOs</th>
<th>Towercos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominican Republic</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>Unknown</td>
<td>Low</td>
<td>Claro Orange Viva</td>
<td>Phoenix Tower International</td>
</tr>
<tr>
<td>Ecuador</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Unknown</td>
<td>Low</td>
<td>Claro Movistar CNT</td>
<td>SBA Communications, Innovattel, Balesia, Aplicanet, Ecuador Tower Company</td>
</tr>
</tbody>
</table>

Altice is currently looking at divesting its operations in the Dominican Republic (and Europe), which might lead to the entrance of a new player or consolidation among carriers. On the other hand, the divestment of Altice's towers could mean an additional growth opportunity for Phoenix Tower International or for a new entrant.

With the grid neither complete nor reliable, RMS and energy equipment suppliers could find plenty of business in the DR (and elsewhere in the Caribbean).

The Dominican Republic has been going through years of electricity crisis, blackouts and overall inefficiency of the sector. To date, 86% of its electricity is supplied by fossil sources and it’s been noted by the World Bank that the country's overall economic growth depends greatly on the improvement of its electricity sector. Around 98% of the population has access to electricity.

While Ecuador is a quiet market compared to the other Andean countries, it also also enjoyed some movements over the past few months. A few new towercos entered the market, hinting at enhanced levels of demand for BTS firms possibly also as a result of Claro's investment plans (US$450mn by 2020) to enhance its network and capacity.

56% of the country's installed electric capacity comes from thermal power and around 33% from large hydropower with the remainder 11% split between various forms of clean energy. In 2011, the government has launched regulation 004/11, creating its first FiT (Feed-in-Tariff) initially benefiting mainly photovoltaic projects and then open to non-solar FiT. Around 97.2% of the population has access to electricity.
<table>
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<th>Advisors</th>
<th>MNOs</th>
<th>Towercos</th>
</tr>
</thead>
<tbody>
<tr>
<td>El Salvador</td>
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<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>Unknown</td>
<td>Low</td>
<td>Tigo</td>
<td>SBA Communications</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>Claro</td>
<td>Phoenix Tower</td>
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<td></td>
<td></td>
<td></td>
<td>Movistar</td>
<td>International</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Digicel</td>
<td>Continental Towers</td>
</tr>
<tr>
<td></td>
<td>El Salvador is currently undergoing a spectrum auction in the 1900MHz and 1700MHz/2100MHz bands. In the meantime, Tigo has agreed to sell its towers to SBA Communications while announcing a 4-year US$1bn investment plan. In 2017, Claro has renewed its license to operate for an additional 20 years while Digicel committed to a US$450mn investment on 4G LTE. These news should bring plenty of opportunity to solution providers involved in tower manufacturing, turnkey services as well as backup energy solutions.</td>
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</tr>
<tr>
<td>Guatemala</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Unknown</td>
<td>Low</td>
<td>Tigo</td>
<td>SBA Communications</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Claro</td>
<td>Phoenix Tower</td>
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<td></td>
<td></td>
<td>Movistar</td>
<td>International</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Continental Towers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Guatemala has been announcing a 700MHz auction for months now but to date it has not materialised. Until then, not much will change in the market which is home to a few towercos enjoying steady growth thanks to regular BTS projects especially by Telefónica’s Movistar. Now that Tigo has started to divest sites across CALA, TowerXchange wonders if Guatemala could be next.</td>
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</tbody>
</table>

El Salvador is the N. 1 producer of geothermal energy in Central America. Its hydroelectric sector is mostly public while the other sources are in the hands of private companies. To date, 40% of its electricity is supplied via fossil sources and 60% thanks to hydroelectric and geothermal plants. The country is part of SIEPAC, a project aiming at integrating the electricity networks of Central American countries. Around 93.7% of the population has access to electricity.
### Mexico

<table>
<thead>
<tr>
<th>Vendor opportunity matrix</th>
<th>Static assets</th>
<th>Energy</th>
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<th>MNOs</th>
<th>Towercos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>Telcel Movistar AT&amp;T</td>
<td>Telesites, American Tower, Mexico Tower Partners, IIMT, Centennial, Torrecom, Inteli Site Solutions, Conex, MX Towers, Rent-A-Tower, Uniti Towers, Tower One, several other smaller local and new entrant towercos</td>
</tr>
</tbody>
</table>

2018 is a positive year for Mexican towercos. In fact, after almost 24 months of slow BTS activities, various towers are finally reporting interesting growth levels. This is mostly due to ALTÁN Redes’ Red Compartida which has achieved its first deployment target (30% of the population by March 31) and started to utilise BTS firms after a first phase of co-locations. This is a great news not only for active towercos but also for tower manufacturers.

In the meantime, MX Towers has sealed a deal with Maxcom to acquire 72 telecom towers in a sale and leaseback deal. Another sign that the market is picking back up also on the deal front.

The Mexican constitution requires the electricity sector to be federally owned and the Comisión Federal de Electricidad is in charge of its organisation. The electricity sector is mainly focused thermal sources (75%) followed by hydropower (19%) and a small component of geothermal energy (2%) and nuclear energy (2.4%). Around 99.1% of the population has access to electricity.

### Nicaragua

<table>
<thead>
<tr>
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<th>Turnkey infrastructure</th>
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<th>Advisors</th>
<th>MNOs</th>
<th>Towercos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicaragua</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Unknown</td>
<td>Low</td>
<td>Claro Movistar CooTel</td>
<td>SBA Communications Torrecom Uniti Towers Continental Towers</td>
</tr>
</tbody>
</table>

The Nicaraguan regulator Telcor is currently looking at replacing the 1995 telecom law with a new law and this could mean good news for the local telecom sector. In the meantime, towercos active in the country have enjoyed a steady level of BTS activities as carriers keep extending their 4G LTE footprint.

Out of all countries in Central America, Nicaragua is the one with the lower levels of electricity generation and access to electricity. Its supplies rely heavily (75%) on fossil energy (oil) and only 25% on alternative sources such as hydro and geothermal. The country is part of SIEPAC, a project aiming at integrating the electricity networks of Central American countries. Around 77.9% of the population has access to electricity.
<table>
<thead>
<tr>
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<th>Small cells, microcells, DAS and IBS</th>
<th>Advisors</th>
<th>MNOs</th>
<th>Towercos</th>
</tr>
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<tbody>
<tr>
<td>Panama</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
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<td></td>
<td></td>
<td></td>
<td>SBA Communications, Cable &amp; Vision, Claro, Digicel and Movistar, Phoenix Tower International, Torrecom, Continental Towers</td>
</tr>
</tbody>
</table>

Thanks to its solid dollar-based economy, good electrification (over 80% of rural areas connected to the grid) and political stability, the country has become a new hub for towercos with the likes of SBA, Torrecom and PTI all active in the market. The country presents interesting BTS opportunities thanks to its high quality carrier landscape.

Panama City is one of the very first smart cities in the region and this means great business opportunities for small cells, DAS, IoT providers.

Paraguay

<table>
<thead>
<tr>
<th>Paraguay</th>
<th>Medium</th>
<th>Medium</th>
<th>Medium</th>
<th>Medium</th>
<th>Unknown</th>
<th>High</th>
<th></th>
<th>American Tower</th>
</tr>
</thead>
</table>

Paraguay has welcomed its first towerco with the sale and leaseback deal sealed last year between Tigo and American Tower but since then, no other towerco has entered the local market. This might be due to the fact that the country did not present critical deployment needs. However, following the January 2018 spectrum auction, awarded carriers (Tigo, Claro and Personal) might announce strong deployment plans which could lead to new towercos eyeing the market.

The Paraguayan electricity sector is a public monopoly and the country is one of the world’s largest exporters of hydropower, which is being exported to Argentina and Brazil. With less than 0.1% of its electricity being supplied via fossil fuels, the country enjoys some of the lowest tariffs in the region. The sector is still heavily affected by the lack of investment in both transmission and distribution. Around 98.2% of the population has access to electricity.
Since our last update, Phoenix Tower International entered the market via a private deal, SBA Communications acquired Torres Andinas’ sites (with the latter exiting the market) and Torres Unidas merged operations with Andean Tower Partners in a landmark deal for the Andean region. Peru remains one of the most exciting countries in the region and offers plenty of opportunities for solution providers in a variety of sectors. Small cells, DAS and alternative site typologies are one of the top priorities for local carriers involved in cell site densification projects, while towercos remain extremely active on the BTS front.

The Peruvian electricity sector has improved considerably since the 90s. In fact, access to electricity moved from 45% in 1990 to 88.8% in 2011, mostly thanks to the privatisation reform of the 90s. To date, fossil energy accounts for 52% of the overall production with 48% relying on renewable suppliers (hydropower). Around 91.2% of the population has access to electricity.
The current and future state of the US$300bn global telecom tower market

An introduction to the structure of the tower market today – and how the industry is evolving to encompass new infrastructure assets

Who owns the world’s 4.4mn investible telecom towers and rooftops? What is a tower company and how have different business models evolved in different regions? Drawing upon TowerXchange’s exclusive and unique research, this article sizes and forecasts the future of this dynamic new US$300bn infrastructure asset class.

Keywords: Acquisition, Africa, Asia, Best of TowerXchange, Business Model, Central America, Consolidation, Data Centre, Europe, Fibre, IBS, IPO, Infill, Infraco, Infrastructure Sharing, MLA, Market Forecasts, Market Overview, Multi-Region, Research, Small Cells, South America, TFN, Tenancy Ratios, The Future Network, Tower Count, TowerXchange Research, Towercos

Once upon a time, telecom towers were depreciating assets, built to serve the needs of one MNO, occasionally (often reluctantly) shared on a site for site ‘swap’ basis. Even today, the management of over 1.4mn operator-captive towers is not a core, value creating business for those MNOs.

Almost 3mn towers have now been transferred from MNOs to tower companies (towercos), specialist telecommunications real estate sales and engineering firms that have professionalised the management of these assets, and added value by leasing up the space on those towers to multiple MNOs. Towercos have deployed improvement capex to improve efficiency; they’ve brought to bear operational excellence and standardisation programmes; they’ve accelerated rollouts; and in simple terms they’ve put more tenants on the towers, creating value and efficiencies.

TowerXchange estimate the average tenancy ratio (the number of tenants leasing towers divided by the total number of towers) of towerco owned towers to be around 1.75 globally, compared to less than 1.1 on MNO-captive towers.

The creation of the tower industry has inaugurated an era of passive infrastructure sharing. Since American Tower, SBA Communications and Crown Castle led the revolution in the mid-1990s, towercos today own 67.4% of the world’s 4.4mn towers and investible rooftops. In a little over 20 years, towercos have created a US$300bn, highly investible global infrastructure asset class, with valuations outperforming just about every comp.

Read this article to learn:
- How many towers do pureplay independent towercos own compared to operator-led towercos and JV infracos?
- How do towerco business models differ?
- Overviews of the tower markets in the Americas, Europe, Asia and Africa
- The future bifurcation of the tower industry into vertical real estate specialists and towercos diversifying into provision of complementary infrastructure

By Kieron Osmotherly, CEO, TowerXchange
There are currently 21 listed towercos worldwide, but the industry’s valuation index remains dominated by the spectacular performance of the three giant U.S. publics (American Tower, Crown Castle and SBA Communications). With up to another seven towercos potentially coming to the public markets in the coming 12-18 months, including three African towercos and the gigantic China Tower Corporation, the tower asset class is becoming more diverse and more international. The tower industry is a top-heavy ecosystem, with 56.1% of the world’s towers on the balance sheets of the dozen largest towercos, each of which has a portfolio of over 20,000 towers. A fragmented ecosystem of 29 further towercos own between 5,000-20,000 towers, and a “long tail” of several hundred sub-5,000 tower towercos, together own 11.3% of the world’s towers. The tower industry is both fragmented and diverse, with a range of business models, lease rates and contractual terms, particularly in that “long tail” of smaller, mostly privately owned towercos, which creates a challenge for larger towercos seeking to consolidate the smaller players.

<table>
<thead>
<tr>
<th>China Tower Corporation*</th>
<th>Reliance Infratel</th>
<th>American Tower</th>
<th>Indus Towers</th>
<th>29 other towercos with 5,000-20,000 towers</th>
<th>235+** other towercos with &lt;5,000 towers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,900,000</td>
<td>43,000</td>
<td>150,975</td>
<td>122,962</td>
<td>286,590</td>
<td>213,175</td>
</tr>
<tr>
<td>Crown Castle</td>
<td>40,039</td>
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<td></td>
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<tr>
<td>Bharti Infratel</td>
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<td>Deutsche Funkturm</td>
<td>34,700</td>
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<tr>
<td>edotco</td>
<td>29,512</td>
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<tr>
<td>GTL Infrastructure</td>
<td>28,000</td>
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<tr>
<td>SBA Communications</td>
<td>27,879</td>
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<tr>
<td>Cellnex</td>
<td>27,044</td>
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<td></td>
</tr>
<tr>
<td>IHS Towers</td>
<td>22,860</td>
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</tbody>
</table>

* China Tower Corporation area reduced to better illustrate the relative global market share of the other towercos – if illustrated to scale, China Tower Corporation’s area would be almost double the scale of the rest of the industry combined
**<5,000 towers segment includes an estimated 37,500 towers at several hundred unidentified towercos, plus an estimated 2% organic growth rate applied to towercos that have not disclosed updated counts
With the sole exception of North and Eastern Asia (excluding China), towercos are now found worldwide. But not all towercos are based on the same blueprint first conceived in the U.S. in the mid 1990s. The contractual terms, particularly the fixed escalators in a low interest economy, negotiated in the USA by American Tower, Crown Castle, SBA Communications and their peers created a “gold standard” of investible contracts which may never again be replicated. Nonetheless the blueprint has been versioned to meet the needs of different operators, different market dynamics, and different regulatory regimes.

TowerXchange recognises three simplified sub-categories of towercos, as shown in Figure Two. The “pureplay independent towercos” category most closely follows the original US, mid nineties blueprint – they are public or privately owned towercos with little or no residual equity retained by MNOs. 242 pureplay independent towercos identified by TowerXchange, exemplified by American Tower, Cellnex and Protelindo, own 594,835 (13.5%) of the world’s 4.4mn towers, as shown in red in Figure Two. This figure is inclusive of an estimated 37,750 towers owned by several hundred private towercos in China, Indonesia and Vietnam whose existence has been confirmed by local trade associations, but which have not been uniquely identified and tracked by TowerXchange.
The orange segment in Figure Two represents “operator-led towercos”; towercos that are themselves at least 51% owned by their parent MNO or MNOs. 25 operator-led towercos own 2,312,227 (52.6%) of the world’s towers. That statistic is distorted by the sheer scale of China Tower Corporation (1.9mn towers) and Indus Towers (122,962 towers), but the fact remains that the carve-out and retention of operator-led towercos is a trend that is growing momentum.

Operator-led towercos often utilise business models and contract structures calibrated to more equitably share value between towerco landlord and operator tenant, for example some discount the anchor tenant’s lease rate when a second tenant co-locates, others charge a nominal “loading” fee for the overlay of nextgen network equipment on a tower, as opposed to charging an additional tenancy, generating what U.S. pureplay independent towercos would call “amendment revenue”. There are exceptions to this generalisation, such as pureplay independent towercos utilising discounted second tenancies in markets like India where standard practices are defined by operator-led towercos, or indeed towercos that are technically operator-led but who don’t discount anchor tenancies when co-locations are secured, sticking more closely to the original U.S. blueprint.

The differences in business model between pureplay independent towercos and operator-led towercos are reflected in valuations, with healthy pureplay independent towercos often valued at EBITDA multiples between the late teens and mid twenties, whereas operator-led towercos have to date been valued in the low double digit to mid teens. This explains why the pureplay independent towercos can often outbid the operator-led towercos to secure sale and leaseback opportunities. This also explains why the demands of tenants of pureplay independent towercos seeking the kinds of more favorable terms offered by operator-led towercos will fall on deaf ears: if MNOs have been paid a premium for their towers by a pureplay independent towerco, they are going to need to pay a premium to lease them back. It should be noted that MNOs can choose to reduce their total cost of network ownership when selling towers to a pureplay independent towerco – they just won’t release as much cash up front.

Going back to Figure Two, the third category is joint venture infracos, shown in green, which is where two or more MNOs pool their passive (and sometimes active) equipment into a third party company which either manages or indeed owns the assets. 12 joint venture infracos own or manage 58,900 towers, 1.3% of the global total.

Joint venture infracos aren’t strictly towercos, if for no other reason than they seldom proactively market their sites for co-location beyond the joint venture partners, but they are very much part of the TowerXchange community and require their own category in the ecosystem. Until recently joint venture infracos were a phenomenon unique to Europe, specifically the UK, Scandinavia, Poland, Romania and Greece, but MCI, RighTel and Fanasia are in the process of creating the first joint venture infraco in MENA: Iranian Towers.

The origination, replication and consolidation of the tower industry in the Americas

The ‘original’ pureplay independent towerco business model emerged in the mid 1990s in the USA, where towercos now own over 80% of the country’s towers. TowerXchange doesn’t cover the
U.S. market, but we do cover Central And Latin America (CALA), which was the first region to which the U.S. model was exported.

Towercos own 52% of the towers in CALA, led by American Tower, SBA Communications and Grupo TorreSur, more recently joined by America Movil and Teléfonica’s operator-led towercos Telesites and Telxius respectively. TowerXchange are tracking 20 of the dozens of private towercos in CALA, who between them represent just over 9% of the region’s assets.

Organic growth has slowed in recent years in CALA, with just under 10,000 towers built across 2015 and 2016. It seems like a slight acceleration will have been achieved in 2017, but we are finalising our data set so cannot share the analysis yet. What remains clear is that government stakeholders who declared that tower inventories in Brazil and Peru needed to be doubled by 2020 will prove to have been very optimistic.

Inorganic growth has also slowed but is recovering faster in CALA. A little over 25,000 towers changed hands through M&A in 2013-14, the total dropping below 20,000 in 2015 and 2016, before a very quiet 2017 in which less than 5,000 towers traded.

The outlook for M&A in CALA is much rosier in 2018, driven by the continuing divestiture of Tigo towers, and an increasing number of well-built, private tower portfolios being sold to the publics and rollup towercos, exemplified by the sale of Highline do Brasil and Torres Andinas to SBA Communications, and the sale of Torres Unidas to Andean Tower Partners, part of Digital Bridge. TowerXchange increasingly see American Tower and SBA Communications competing for acquisition opportunities with Phoenix Tower International and Digital Bridge.

While a further half dozen or so privately owned tower portfolios are progressing toward a sale in the coming 18 months, there is no shortage of tower entrepreneurs and investors entering the CALA market. Smart capital is drawn toward investible towercos that have an exit strategy predicated on meeting American Tower and SBA Communications’ investment criteria: that means building good towers in good locations with good contracts. Previous market entrants who built sub-optimum structures on sub-optimum terms have struggled in CALA and will likewise struggle to make a good exit. However, not all carriers have recognised the medium term uncertainty of partnering with deep discount towercos that are at risk of being left ‘stranded’ when capital runs out and no exit can be secured.

For a deeper dive into the tower industry in Central and Latin America, check out TowerXchange’s summary overview of the CALA tower market.

**Pureplay independent towercos own just 15.4% of Europe’s towers**

The new tower market emerging in MENA notwithstanding, Europe is perhaps the tower industry’s least mature market. Operator-led towercos such as Telxius, INWIT and First Tower Company are present at some scale, while there is also a unique prevalence of joint venture infracos, both symptomatic that some European carriers are under less pressure to monetise their tower assets, and many remain anxious to retain control of their networks. This makes it incumbent upon Europe’s acquisitive towercos to build a business case to acquire both towers and operator-led towercos, a business case which might be significantly affected by the impending IFRS16 Lease accounting standards change, which will remove the distinction between finance leases and operating leases, requiring conventional tower leases to be brought on to MNO balance sheets.

While there are 18 towercos with more than 1,000 towers in Europe, and 28 smaller towercos, the phenomenon of the build-to-suit-centric towerco is rare as build volumes are low and most MNOs keep their search rings to themselves. As a relatively mature tower market, with considerable overlap in networks, Europe demonstrates how a tower market might evolve when organic growth is almost entirely cancelled out by decommissioning.

Ultimately, Europe is a tower market of lower year on year revenue growth potential, yet Europe’s towers remain pensionable assets – exemplified by the fact that American Tower’s European operation is a joint venture with 49% stakeholder PGGM, a Dutch pension fund.

For more detail on the local tower industry, please...
read TowerXchange's analysis of the European tower industry.

Asia's unique tower industry

India was the birthplace of Asia's tower industry in 2008. While the Indian tower industry was inaugurated by a pureplay independent towerco that became Viom Networks (ultimately acquired by American Tower), India’s relatively uniform and MNO-friendly contractual norms and lease rates have been largely defined by operator-led towerco giants Indus Towers and Bharti Infratel. With relatively low lease rates, and other favorable terms including discounts for anchor tenants when additional tenants are added to a tower, the efficiencies unlocked by India’s towercos accelerated the country’s mobile rollout, and contributed to optimising costs.

The key theme in India’s tower industry today is the impact of MNO consolidation. Whereas Indian towers were once changing hands for over US$120,000 each, since 2015 valuations have been in the US$60-90,000 per tower range. The reason is simple: where once India teemed with over a hundred regional MNOs, and more recently nine MNOs with nationwide aspirations, now MNO consolidation seems likely to result in 4-5 national operators, headlined by the merger of #2 and #3 operators Vodafone and Idea Cellular. Tens of thousands of tenancies are set to not be renewed, while battles continue to recover lease revenue from ailing operators.

The restructuring of the Indian tower market is proof positive that towercos are not immune to the pressure on carrier balance sheets. The stimulus for India’s market restructuring was innovative new entrant MNO Reliance Jio jacking the Indian mobile and tower industries into the 4G era, grabbing huge market share, and making voice free. With Jio heavily dependent on data, fibreisation was critical, yet many of India’s independent towers were not connected to fibre, hence Jio has more than half it’s network on small cells and single tenant proprietary lampposts. Jio is also trying to push through the acquisition of infrastructure assets from its elder sibling RCOM, whose wireless business is winding up. Jio is seeking to acquire spectrum as well as substantial fibre holdings and towerco Reliance Infratel (~43,000 towers, on which Jio is a tenant on approximately 30,000 sites, and which TowerXchange cautiously still counts as a towerco, pending reconfirming whether the assets will still be leased to third parties on a non-discriminate basis). This is the first but perhaps not the last time we’ll see the phenomenon of carriers acquiring independent towers, as Aircel are believed to be bidding to acquire Indian towerco GTL Infrastructure to release themselves from contractual obligations originating from their original sale and leaseback a decade ago.

The restructuring of the Indian tower market is proof positive that towercos are not immune to the pressure on carrier balance sheets. For all the turbulence it has created, that same market restructuring may also make hitherto untouchable operator-led towerco Indus Towers acquirable, demonstrating that operator-led towercos may be acquirable under the right circumstances.

Could this all precipitate the evolution of the Indian tower industry business model from its operator-led bias to a more pureplay independent towerco-led blueprint, with higher lease rates and real amendment revenue? Like most analysts, TowerXchange are sceptical – ARPUs remain low in India, and it would take many years to unwind current contractual norms.

Let’s look at China. In 2014, with the approval of the General Office of the State Council and led by State-owned Assets Supervision and Administration Commission of the State Council (SASAC) and the Ministry of Industry and Information Technology (MIIT), China’s operator-led towerco giant China Tower Corporation (CTC) was formed to promote a culture of infrastructure sharing, also referred to as “co-build, co-share.” After an initial ~1.5mn existing
China Mobile, China Telecom and China Unicom towers were injected in 2015, CTC has built a mind-boggling 400,000+ towers, saving tens of billions of Yuan in the process.

Alongside CTC, China is teaming with independent towercos – there are at least 200 privately owned tower companies in China, perhaps as many as 500, although they own less than 100,000 towers between them. In terms of pricing, the situation is reversed to the norm: instead of competition among independent pureplay towercos putting pressure on lease pricing, it is the market leader CTC which is undercutting – under pressure from their MNO owners.

China Tower Corporation will soon be listed on the Hong Kong stock exchange.

The mature Indonesian tower market stands apart from the rest of Asia as it features several pureplay independent towercos of considerable scale, and they have contributed to a relatively commercial, Americas-like tower industry. The Indonesian market is led by Protelindo, Tower Bersama and STP, who have achieved substantial growth through buy and leaseback deals with the country’s MNOs, by rolling up smaller private towercos, and through steady organic growth, which offsets lease up, keeping tenancy ratios constant at around 1.7. Telkom’s Mitratel is emerging as a strong operator-led towerco, while a long tail of 30+ privately owned local independent towercos remain acquisition targets.

Indonesia is a slightly more mature mobile market than many others in Southeast Asia; ARPUs and higher and 4G rollouts are further progressed, which means IBS, fibre and small cells are land grubs as much as are macro towers. This diversification of the towerco inventory beyond ground based towers and rooftops is exemplified by the acquisition of technical innovators iForte by Protelindo, and Bit by STP, as well as partnerships such as those of smaller towercos BaliTower with Jakarta to operate their CCTV network in return for offering the poles as small cell sites, or Pekape’s partnership with retail giant Alfamart.

Beyond China, India and Indonesia, the rest of Southern and Southeast Asia is primarily populated by single country towercos, with the exceptions of edotco, in six countries, and OCK in three.

For a more detailed guide to the tower market in Asia, visit TowerXchange’s summary overview of the Asian tower market.

**Towercos evolve into powercos in Africa: major liquidity events imminent**

The ‘Big Four’ towercos (IHS Towers, American Tower, Helios Towers and Eaton Towers) own 36% of the towers in Sub-Saharan Africa, representing the majority of the sites in investible markets with investible anchor tenants.

The towerco business model evolved to solve African MNO’s number one challenge: energy. By transferring both tower and power assets to their towerco partners, Africa’s MNOs have been able to refocus on their core business, while the towercos have cultivated centres of power management excellence, improving uptime and efficiency.

Whether they merge with one another, sell to a strategic acquirer, or list on the London, New York (and Johannesburg) stock exchanges, the three privately owned members of the ‘Big Four’ seem poised for major liquidity events in 2018.

For a deeper dive into the tower market of SSA, and the emerging MENA market, read our market overview here.

**The future of the tower industry: a bifurcation between vertical real estate specialists and providers of diverse yet complementary connectivity infrastructure**

Figure three represents the vertical real estate-centric world as most towercos, and their investors, know it today. To use a baseball analogy, this word cloud is full of good pitches to hit: we’re in our comfort zone, and the opportunities and issues illustrated on this slide are in our wheelhouse. The tower industry as we know it today is ultimately a simple business: we build towers, we buy towers, we lease them up, we add value.

But with towercos now owing over two out of three of the world’s towers, and many remaining towers stranded in uninvestible markets, we’re running
out of inorganic growth opportunities. And with an increasing proportion of new sites being infill city poles and small cells, the ground based tower rollout is maturing and plateauing. How do we extend our industry's growth narrative?

Firstly, we must continue to open up virgin territories; from Argentina to Zambia. When towers are 'trapped' in uninvestible markets, for example where Foreign Direct Investment is capped at 49% or less, can our investment criteria be relaxed? Alternatively, do we need a global body to lobby regulatory stakeholders to make more new tower markets investible?

Secondly, can we expand our horizons to provision a broader set of connectivity solutions, and to engage with a broader set of alternate site and asset typologies?

Figure four shows ‘The Future Network’ illustrated through a new word cloud which includes many concepts representing pitches outside our strike zone. But you can still hit a home run on a pitch outside the zone!

This word cloud is almost entirely drawn from a fascinating conversation I had with Mansoor Hanif, who until recently was Director of Converged Network Research at BT. Mansoor knows a thing or two about the infrastructure business having served on the Board of Directors of MBNL, one of the joint venture infracos formed to share the UK’s towers. And like senior
strategists at many carriers, one of Mansoor’s preoccupations was to reduce BT’s reliance on towercos by leveraging network innovations like those shown on this illustration.

We’re moving into an era when a cell site is increasingly not a ground based tower. And we’re moving to an era when network topographies will be redefined by software, not by the exchange of equipment on a tower. Carriers demand that their towercos be genuine partners, not landlords.

From the threat of disruptive new market entrants leveraging MESH networks of small cells to create high quality coverage for high value customers – making minimal use of macro infrastructure; to the opportunity of converting towers at the network EDGE into micro data centres, our industry can no longer afford to just passively sell vertical real estate.

If we’re to transform ourselves from passive real estate agents into strategic partners of carriers, we need both a new mindset and a new toolset. Business intelligence tools like Crowd SiteIntel from M2 Catalyst, which uses analyses of crowd sourced data to transform every subscriber into a human driver tester, can enable towercos to view your sites through the lens of the network planner, enabling the proactive promotion of co-location and build to suit services as solutions to carriers’ problems. Such tools can also help focus your capital deployment into fibre, IBS and small cells, while also providing a reality check for lease-up forecasts in due diligence.

there will be towercos that will diversify beyond the tower industry 1.0 blueprint; leveraging street furniture for urban infill, pushing beyond DAS in landmark buildings to deploy small cells in ‘middle market’ premises, laying and acquiring fiber, and eventually converting selected cell sites into micro data centres

Conclusions – the shape of towercos and wireless networks to come

The future of the tower industry worldwide will be defined by innovation, consolidation and bifurcation.

In terms of bifurcation, towercos will increasingly be grouped into two categories: those who strictly adhere to the blueprint of a REIT towerco, who exhibit steady growth, who (eventually) pay good dividends, and who build and buy good ground based towers, with good paper, in good locations. And there’s nothing wrong with that model – it generates proven returns, and risks are controlled. Then there will be towercos that will diversify beyond the tower industry 1.0 blueprint; leveraging street furniture for urban infill, pushing beyond DAS in landmark buildings to deploy small cells in ‘middle market’ premises, laying and acquiring fiber, and eventually converting selected cell sites into micro data centres. Early adopters like Digital Bridge and Crown Castle have already planted their flags in this second category.

TowerXchange are not advocating one path – adherence to the existing blueprint, or diversification as a ‘Future Network Provider’ – but we do feel towercos should either decide to diversify, or decide to focus primarily on their core business ■
Telecom towers as an investment opportunity

A view through the lens of the Global Listed Infrastructure Organisation

The Global Listed Infrastructure Organisation (GLIO) is a representative industry body for the listed infrastructure sector, valued at US$2-5 trillion (depending on the definition used). Founder Fraser Hughes created the GLIO to attract investors into the asset class by helping them understand what is core and what is opportunistic in an infrastructure allocation, and Fraser has consulted with friends at SBA Communications, American Tower and Crown Castle to author this guest editorial, which appears in TowerXchange and IPE Magazine.

Keywords: American Tower, Bankability, Cellnex, Crown Castle, Decommissioning, Europe, GLIO, INWIT, IPO, Infrastructure Funds, Investment, Investors, Market Overview, Multi-Region, North America, RAIWAY, Research, SBA Communications, Third Party Reports, Towercos, Valuation

Read this article to learn:

- Why telecom towers are fundamental to any infrastructure allocation
- Why towers are being transferred from MNO to independent tower company balance sheets
- How mobile data consumption growth correlates growing demand for tenancies and towers
- Tracking the excellent performance of listed towercos compared with global infrastructure and global equities

Telecom towers are an increasingly important investment opportunity as they are absolutely essential to everyday communications throughout the world. Operators need to develop larger, denser and more efficient networks to better handle the rising demand for mobile services as their customers continue to gain access to advanced handsets and high bandwidth applications. This has led to a growing number of independent companies owning telecom tower infrastructure, as they can offer shared networks that can cut costs for the large mobile operators. The owners of the towers are paid rents by the operators, under long-term, typically non-cancellable contracts with annual escalators. Owning masts has become an increasingly attractive investment for private and public investors keen to put capital to work in infrastructure based assets with consistently compounding cash flows.

So, what are some of the key advantages of independently owned tower companies?

- Shared Infrastructure – Owning towers is not strategic for the carriers as they are non-performing, cost-centre assets with a carrier that can be readily monetised and turned into significant cash generating assets in the hands of an independent tower company with no change in functionality for the carrier selling the towers. In addition, the present value economics of owning versus leasing favours leasing. Plus, zoning laws make it impractical for carriers to each have separate towers for every one of their sites. Shared infrastructure remains as the clear cut most efficient way to deploy today’s networks, from both
a cost and technological perspective.

- Importance of scale:
  - In negotiating with customers, who are large, sophisticated multinationals who have a history of putting pressure on their vendors. Scale enables tower operators to offer nationwide portfolios to facilitate the density requirements of modern wireless networks;
  - Because it is a relatively capital-intensive business initially, having significant financial assets is important as portfolios are constructed and acquired;
  - Basic selling, general and administrative is not insignificant, but scalable with revenue growth given minimal incremental SG&A requirements associated with adding towers to an existing operation.

- In a broader sense, telecom tower companies are mission critical as a high percentage of mobile traffic goes through their masts. Network quality is a major factor driving customer churn for wireless carriers and consequently, it remains a key factor in carrier marketing, and will continue to be extremely important in an environment where delivering bandwidth-intensive content is a necessity to attract and retain customers.

- And finally, ESG & sustainability – Simply put, fewer towers, equals less visual pollution. Tower sharing is inherently green, more efficient and reduces the environmental impact of having redundant infrastructure.

The global market

TowerXchange tracks 264 tower infrastructure companies, who collectively are estimated to own just under 70% of the world’s 4.1 million investible towers and rooftops. Table one shows the top 15 independent companies who account for approximately 2.4 million towers themselves. State-run China Tower is the largest owner with 1.9 million towers in China. Reuters reported in May that the company has invited banks to pitch for a role in a potential IPO later in the year, which could value the company at up to US$50 billion. The Government would still retain a majority shareholding according to the report. Listed companies are heavily represented in the table, with US listed American Tower, Crown Castle and SBA Communications holding ranks 2, 5 and 9 respectively. Other listed companies come from Europe, India and Central America.
The Tower business is very much a global affair, and there are a number of different regions with active independent tower companies.

For example, American Tower, Crown Castle and SBA Communications have been around for 20 years or more in the U.S. These three tower specialists qualify under US REIT legislation, SBA the latest to convert this year. The US market is very well established, with independent tower companies owning close to 85% of collocate-able towers in the country according to EY.

Meanwhile, the UK market has three main independent players, Arqiva, Wireless Infrastructure Group and Cellnex, who own approximately 13,400 towers between them. According to EY only 30% of UK towers are independently owned, which could lead to potential growth in the future. For this to happen, however, industry structure and the regulatory environment would likely need to improve.

In Continental Europe, the sector is slowly forming, with the recent IPOs of Cellnex, INWIT, and Railway as mobile operators look to cut costs and raise cash. EI Towers has been around since 2004. However, independently owned towers still only account for less than 20% of the European total according to EY, including Cellnex’ recent expansion into Switzerland with its purchase of approximately 2,200 towers from Sunrise. Parin Shah, European Telecoms Research at BAML says, “The key question for European tower operators is whether they

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**Table one: Top independent telecom tower companies**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company</th>
<th>Towers</th>
<th>Countries</th>
<th>Listed/Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China Tower Co</td>
<td>1,900,000</td>
<td>China</td>
<td>IPO 2017/18</td>
</tr>
<tr>
<td>2</td>
<td>American Tower</td>
<td>150,222</td>
<td>Argentina, Brazil, Chile, Colombia, Costa Rica, France, Germany, Ghana, India, Mexico, Nigeria, Peru, South Africa, Uganda, USA</td>
<td>Listed</td>
</tr>
<tr>
<td>3</td>
<td>Indus Towers</td>
<td>122,730</td>
<td>India</td>
<td>Private</td>
</tr>
<tr>
<td>4</td>
<td>Towercom</td>
<td>45,000</td>
<td>India</td>
<td>Private</td>
</tr>
<tr>
<td>5</td>
<td>Crown Castle</td>
<td>40,085</td>
<td>USA</td>
<td>Listed</td>
</tr>
<tr>
<td>6</td>
<td>Bharti Infratel</td>
<td>39,099</td>
<td>India</td>
<td>Listed</td>
</tr>
<tr>
<td>7</td>
<td>Deutsche Funkturm</td>
<td>31,636</td>
<td>Germany</td>
<td>Private</td>
</tr>
<tr>
<td>8</td>
<td>GTL Infrastructure</td>
<td>28,000</td>
<td>India</td>
<td>Listed</td>
</tr>
<tr>
<td>9</td>
<td>SBA Communications</td>
<td>26,640</td>
<td>Argentina, Brazil, Canada, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Nicaragua, Panama, Peru, USA</td>
<td>Listed</td>
</tr>
<tr>
<td>10</td>
<td>IHS Towers</td>
<td>23,382</td>
<td>Cameroon, Ivory Coast, Nigeria, Rwanda, Zambia</td>
<td>Private</td>
</tr>
<tr>
<td>11</td>
<td>Cellnex</td>
<td>21,039</td>
<td>France, Italy, Netherlands, Spain, Switzerland, UK</td>
<td>Listed</td>
</tr>
<tr>
<td>12</td>
<td>edotco</td>
<td>18,461</td>
<td>Bangladesh, Cambodia, Malaysia, Myanmar, Pakistan, Sri Lanka</td>
<td>Private</td>
</tr>
<tr>
<td>13</td>
<td>RTRS</td>
<td>16,000</td>
<td>Russia</td>
<td>Private</td>
</tr>
<tr>
<td>14</td>
<td>Telxius</td>
<td>15,907</td>
<td>Brazil, Chile, Germany, Peru, Spain</td>
<td>Private</td>
</tr>
<tr>
<td>15</td>
<td>Telesites</td>
<td>15,142</td>
<td>Costa Rica, Mexico</td>
<td>Listed</td>
</tr>
</tbody>
</table>

Source: TowerXchange, as of Q2 2017
can deliver levels of growth on a par with other territories, while still relying largely on CPI-linked contracts. Can the decommissioning model start to significantly augment growth in markets where the organic growth opportunity may not be as attractive as the U.S. and elsewhere? Can newly liberated operator towers and derived proceeds drive incremental growth for the market? And perhaps delivering this growth leads to international players fundamentally reassessing the attractiveness of European businesses.”

Finally, in Asia, China, India and Indonesia are all well represented in the league table, with multiple independent tower companies operating in the region.

**Global growth and demand for mobile data**

Understanding the strong secular backdrop of growth in global mobile data is the first step to understanding the sector and why it should be seriously considered by global institutional investors. This growth, as highlighted in table two, is huge across all regions in the world. In virtually every industry, mobility is an emerging, and potentially disruptive trend. The number of connected devices per capita, the average connection speed growth, growing video usage and mobile traffic per end user (per month) are all estimated to grow at startling rates. Just looking at global connection speed growth of 24% CAGR and mobile traffic per month from at 977MB to 5.7GB (42% CAGR) will offer vast potential for telecom tower companies going forward. Just scratching the surface on potential next generation mobile network applications: the internet of things, augmented reality, self-driving cars (you don’t want buffering issues!), provides some idea of the potential demands on capacity.

To help address the massive network demand growth, wireless carriers and other customers within the mobile ecosystem are expected to utilize incremental space on telecom towers while also growing the number of sites they have within their respective networks. Part of this entails the deployment of new spectrum and the optimization (re farming) of existing spectrum bands and the associated equipment required to deploy this spectrum. Empirical data shows carriers can most efficiently, both in terms of time and capital, achieve this by layering this on top of their existing locations (masts), leading to incremental revenue and cashflow for the tower companies. Existing sites are designed around these spectrum bands, serve the existing customer base, include fiber/microwave backhaul investments, and have requisite power and security in place. Further, as mobile data usage grows, networks must become denser, so carriers

**Table two: Mobile users estimates 2021**

<table>
<thead>
<tr>
<th>Region</th>
<th>Per Capita connected device</th>
<th>Ave Mobile connect speed growth</th>
<th>Video Mobile Data Traffic</th>
<th>Mobile Traffic per end-user (pm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>2.9</td>
<td>1.8x or 13% CAGR (25.2 Mbps)</td>
<td>64% to 77%</td>
<td>3.4GB to 12.7GB (30% CAGR)</td>
</tr>
<tr>
<td>LATAM</td>
<td>1.4</td>
<td>3.3x or 27% CAGR (12.4 Mbps)</td>
<td>60% to 79%</td>
<td>641MB to 3.7GB (42% CAGR)</td>
</tr>
<tr>
<td>West Europe</td>
<td>2.7</td>
<td>2.5x or 20% CAGR (28.5 Mbps)</td>
<td>61% to 80%</td>
<td>1.3GB to 6.6GB (38% CAGR)</td>
</tr>
<tr>
<td>CEE</td>
<td>1.8</td>
<td>2.9x or 24% (18.4 Mbps)</td>
<td>60% to 79%</td>
<td>1.5GB to 8.1GB (39% CAGR)</td>
</tr>
<tr>
<td>MEA</td>
<td>1.1</td>
<td>2.9x or 23% CAGR (10.8 Mbps)</td>
<td>52% to 76%</td>
<td>472MB to 4.6GB (57% CAGR)</td>
</tr>
<tr>
<td>Asia-Pacific</td>
<td>1.4</td>
<td>2.1x or 16% CAGR (20.4 Mbps)</td>
<td>60% to 78%</td>
<td>810MB to 5.2GB (45% CAGR)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1.5 or 12 billion total people</strong></td>
<td><strong>3x 24% CAGR (6.8 to 20.4 Mbps)</strong></td>
<td><strong>60% to 78%</strong></td>
<td><strong>977MB to 5.7MB (42% CAGR)</strong></td>
</tr>
</tbody>
</table>

Source: CISCO VNI Global Mobile Data Traffic Forecast, 2016 to 2021 (Published Feb 2017)
are also expected to place equipment on additional masts over time where they may not already have equipment installed.

Importantly, the physics of signal propagation underlies the demand case for towers, both today and in the future, given the need for a high point to propagate signal over various spectrum bands in the vast majority of topographies. Unless these properties of physics are fundamentally altered (currently, there are no indications of this), more equipment must be located on towers in the future to meet growing network usage, over and above the available incremental spectrum, and spectral efficiency improvements. The bottom line is that by 2021, industry projections suggest that there will be nearly 12 billion mobile connected devices globally, which is approximately 1.5 device per capita; an immense statistic.

**Listed telecom towers investment case**

Telecom towers (which comprise the majority of the GLIO Telecom & Satellites sector) represent the fifth largest sector in the GLIO infrastructure coverage and are fundamental to any infrastructure allocation. Manoj Patel, Managing Director at Deutsche Asset Management indicates the importance of the sector in his infrastructure strategy; “we believe telecom towers play a primary role in a broader allocation to global infrastructure. Wireless communications have developed into an integral part of the essential framework of the global economy, and this will become even more vital going forward as future technologies emerge and the listed tower companies are ideally placed to take advantage of this.”
The long-term track record of the large US based tower companies has been more than impressive, as seen in chart one and table three. Even ten year annualised total returns, which include the time periods around the global financial crisis, range between 12%-16% pa. The periods around the GFC are truly phenomenal, as tower companies tended to materially outperform most other sectors as seen in chart one. Underpinning the growth of share prices are the underlying performance metrics of Adjusted EBITDA and Adjusted Funds from Operations (AFFO). Charts two and three show a consistent, stable and steady growth across these two metrics for the three major US tower companies.

When building a sensible allocation to the sector, investors will also look for a proven track record in terms of shareholder return performance and management expertise. The access to the size, expertise, diversification and global network

---

**Chart three: Consistent Y-O-Y adjusted EBITDA growth**

AMT, CCI & SBA EBITDA growth - 10 years

**Table three: Annualised total returns of global listed tower companies**

<table>
<thead>
<tr>
<th>Company</th>
<th>Country</th>
<th>No Idx</th>
<th>MC $bn</th>
<th>FF MC $bn</th>
<th>FF Wght</th>
<th>Yeild</th>
<th>Beta</th>
<th>1 Year</th>
<th>3 Yrs</th>
<th>5 Yrs</th>
<th>7.5 Yrs</th>
<th>10 Yrs</th>
<th>12.5 Yrs</th>
<th>15 Yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Tower</td>
<td>USA</td>
<td>4</td>
<td>53,526</td>
<td>50,314</td>
<td>49.6%</td>
<td>2.0%</td>
<td>0.74</td>
<td>26.6%</td>
<td>15.7%</td>
<td>17.1%</td>
<td>18.3%</td>
<td>12.8%</td>
<td>18.0%</td>
<td>27.4%</td>
</tr>
<tr>
<td>Crown Castle Intl</td>
<td>USA</td>
<td>4</td>
<td>34,185</td>
<td>27,348</td>
<td>32.0%</td>
<td>4.0%</td>
<td>0.54</td>
<td>16.6%</td>
<td>14.0%</td>
<td>15.9%</td>
<td>16.3%</td>
<td>12.0%</td>
<td>16.5%</td>
<td>24.1%</td>
</tr>
<tr>
<td>SBA Communications</td>
<td>USA</td>
<td>4</td>
<td>15,335</td>
<td>14,108</td>
<td>49.6%</td>
<td>0.0%</td>
<td>0.81</td>
<td>39.0%</td>
<td>10.8%</td>
<td>21.6%</td>
<td>21.5%</td>
<td>15.7%</td>
<td>23.8%</td>
<td>35.4%</td>
</tr>
<tr>
<td>Uniti Group</td>
<td>USA</td>
<td>2</td>
<td>4,818</td>
<td>3,806</td>
<td>3.8%</td>
<td>8.7%</td>
<td>-</td>
<td>9.2%</td>
<td>-</td>
<td>29.6%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cellnex Telecom</td>
<td>Spain</td>
<td>4</td>
<td>4,093</td>
<td>2,497</td>
<td>2.5%</td>
<td>5.5%</td>
<td>-</td>
<td>7.9%</td>
<td>-</td>
<td>19.4%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>INWIT</td>
<td>Italy</td>
<td>4</td>
<td>3,319</td>
<td>1,328</td>
<td>1.3%</td>
<td>2.9%</td>
<td>-</td>
<td>24.7%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>RAI way</td>
<td>Italy</td>
<td>2</td>
<td>1,428</td>
<td>1,000</td>
<td>1.0%</td>
<td>3.2%</td>
<td>-</td>
<td>10.5%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>El Towers</td>
<td>Italy</td>
<td>3</td>
<td>1,631</td>
<td>979</td>
<td>1.0%</td>
<td>3.4%</td>
<td>0.77</td>
<td>14.2%</td>
<td>13.3%</td>
<td>28.7%</td>
<td>21.2%</td>
<td>-1.7%</td>
<td>9.4%</td>
<td>-</td>
</tr>
<tr>
<td>Grand total &amp; sector total returns (USD)</td>
<td>118,335</td>
<td>101,379</td>
<td>100.0%</td>
<td>2.5%</td>
<td>0.72</td>
<td>24.5%</td>
<td>13.5%</td>
<td>16.8%</td>
<td>17.7%</td>
<td>12.5%</td>
<td>18.1%</td>
<td>26.9%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
exposure offered by the listed telecom companies is unparalleled. In simple terms, it would take decades and US$100s billions to replicate the network that they currently offer investors. Transparency, liquidity, yield and cost efficiency bolster the case.

**Summary**

Telecom Infrastructure is a fundamental part of any global infrastructure allocation. It offers exposure to essential economic assets and services and leverages the exponential secular growth in global wireless usage as a key driver of demand. Looking forward, it seems likely that the percentage of independent tower companies will grow both in the listed and unlisted markets, along similar lines as we've seen in the USA over the past 15-20 years.

Looking at the listed telecom towers performance, telecom infrastructure has provided sustainable, long term growth fundamentals which have subsequently generated impressive total shareholder returns for an extended period. Tom Bartlett Executive Vice President, and Chief Financial Officer of American Tower sums up, “we are excited about the long-term growth prospects for our global tower assets and are focused on continuing to translate the secular growth in wireless communications into compelling, consistent total returns for shareholders. Whether in Delhi, Sao Paulo or Boston, our communications infrastructure is optimally positioned to serve as the backbone of today’s advanced wireless networks”

---

**GLIO sector breakdown**

<table>
<thead>
<tr>
<th>Sector</th>
<th>FF MC $bn</th>
<th>FF Wght</th>
<th>Yield</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Utilities</td>
<td>574,631</td>
<td>34.1%</td>
<td>3.8%</td>
<td>0.53</td>
</tr>
<tr>
<td>Ground Freight</td>
<td>237,816</td>
<td>14.1%</td>
<td>1.9%</td>
<td>1.10</td>
</tr>
<tr>
<td>Oil &amp; Gas Distribution</td>
<td>233,685</td>
<td>13.9%</td>
<td>3.9%</td>
<td>0.95</td>
</tr>
<tr>
<td>Multiutilities</td>
<td>163,821</td>
<td>9.7%</td>
<td>4.5%</td>
<td>0.69</td>
</tr>
<tr>
<td>Telecom &amp; Satellites</td>
<td>119,446</td>
<td>7.1%</td>
<td>2.9%</td>
<td>0.77</td>
</tr>
<tr>
<td>Ground Transportation Services</td>
<td>96,199</td>
<td>5.7%</td>
<td>1.3%</td>
<td>0.81</td>
</tr>
<tr>
<td>Gas Utilities</td>
<td>69,013</td>
<td>4.1%</td>
<td>2.7%</td>
<td>0.74</td>
</tr>
<tr>
<td>Highways &amp; Railways</td>
<td>58,137</td>
<td>3.5%</td>
<td>3.9%</td>
<td>0.83</td>
</tr>
<tr>
<td>Airports</td>
<td>56,922</td>
<td>3.4%</td>
<td>2.7%</td>
<td>0.87</td>
</tr>
<tr>
<td>Water Utilities</td>
<td>49,478</td>
<td>2.9%</td>
<td>2.9%</td>
<td>0.73</td>
</tr>
<tr>
<td>Marine Ports</td>
<td>15,804</td>
<td>0.9%</td>
<td>3.9%</td>
<td>0.84</td>
</tr>
<tr>
<td>Construction &amp; Engineering</td>
<td>4,612</td>
<td>0.3%</td>
<td>1.4%</td>
<td>0.73</td>
</tr>
<tr>
<td>Environmental Services &amp; Equip</td>
<td>4,248</td>
<td>0.3%</td>
<td>4.0%</td>
<td>0.65</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>1,683,810</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>3.3%</strong></td>
<td><strong>0.77</strong></td>
</tr>
</tbody>
</table>

Source: Reuters
Meetup Americas 2018

The fifth annual retreat of the top CALA telecom infrastructure elite

To discuss your participation, contact Annabelle on +44 7423 512588 or email amayhew@towerxchange.com
# TowerXchange Meetup Americas 2018 - Agenda at a glance

**Boca Raton, Florida | 20-21 June 2018**

## Day One | Wednesday 20 June

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>Registration and welcome coffee</td>
</tr>
<tr>
<td>9:00</td>
<td>TowerXchange analysis of the CALA telecom infrastructure industry</td>
</tr>
<tr>
<td></td>
<td>- Kieron Osmotherly, CEO, TowerXchange</td>
</tr>
<tr>
<td></td>
<td>- Arianna Neri, MD - Americas and Asia, TowerXchange</td>
</tr>
<tr>
<td>9:40</td>
<td>Keynote speech: Micro data centres at the base of communication towers to enhance data delivery through edge computing</td>
</tr>
<tr>
<td></td>
<td>- Alex Gellman, CEO, Vertical Bridge</td>
</tr>
<tr>
<td></td>
<td>- Raul Martynek, CEO, DataBank</td>
</tr>
<tr>
<td>10:10</td>
<td>Executive panel: The consolidation forces in CALA</td>
</tr>
<tr>
<td></td>
<td>- Dagan Kasavana, CEO, Phoenix Tower International</td>
</tr>
<tr>
<td></td>
<td>- David Porte, VP – International, SBA Communications</td>
</tr>
<tr>
<td></td>
<td>- Olivier Puech, CEO – LatAm, American Tower</td>
</tr>
<tr>
<td></td>
<td>- Daniel Seiner, CEO, ATP Torres Unidas</td>
</tr>
<tr>
<td>11:00</td>
<td>Live poll</td>
</tr>
<tr>
<td>11:15</td>
<td>Coffee break sponsored by accoren</td>
</tr>
<tr>
<td>11:45</td>
<td>Interactive roundtable session I</td>
</tr>
<tr>
<td>12:00</td>
<td>Networking lunch sponsored by SBA</td>
</tr>
<tr>
<td>14:15</td>
<td>Executive panel: how to find value and grow in the CALA maturing tower industry</td>
</tr>
<tr>
<td></td>
<td>- Kurt Bagwell, President International, SBA Communications</td>
</tr>
<tr>
<td></td>
<td>- Mauricio Giusti, CEO, Phoenix Tower do Brasil</td>
</tr>
<tr>
<td></td>
<td>- Brian Groll, VP – M&amp;A and Strategy, ATP Torres Unidas</td>
</tr>
<tr>
<td></td>
<td>- Beth Michelson, Senior Managing Director, Cartesian Capital</td>
</tr>
<tr>
<td></td>
<td>- Aniko Szigetvari, Global Head - TMT Group, IFC</td>
</tr>
<tr>
<td>15:00</td>
<td>Interactive roundtable session II</td>
</tr>
<tr>
<td>16:15</td>
<td>Coffee break sponsored by Neuyo</td>
</tr>
<tr>
<td>16:45</td>
<td>Executive panel: diversifying into integrated digital companies</td>
</tr>
<tr>
<td></td>
<td>- Juan Cuérria, COO, Innovattel/Torresec</td>
</tr>
<tr>
<td></td>
<td>- Don Van Spluntenen, Global Vice President of Sales, Phoenix Tower International</td>
</tr>
<tr>
<td></td>
<td>- Eduardo Wiñazkry, Jefe de Gestión Municipal e Infraestructura, Empresa Argentina de Soluciones Satelitales Sociedad Anónima (ARSAT)</td>
</tr>
<tr>
<td></td>
<td>- Estrella Zaharia, Chief Marketing Officer, ATP Torres Unidas</td>
</tr>
<tr>
<td>17:00</td>
<td>Live poll</td>
</tr>
<tr>
<td>17:15</td>
<td>Close of day one</td>
</tr>
<tr>
<td>17:30</td>
<td>Networking drink reception sponsored by digitalbridge</td>
</tr>
<tr>
<td>19:30</td>
<td>TowerXchange's networking dinner (separate registration required)</td>
</tr>
</tbody>
</table>
# TowerXchange Meetup Americas 2018 - Agenda at a glance

Boca Raton, Florida | 20-21 June 2018

## Day Two | Thursday 21 June

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30</td>
<td>Morning coffee</td>
</tr>
</tbody>
</table>
| 9:00  | Financial panel: Investing (and exiting) in the CALA infrastructure sector  
  - Peter Bendall, Senior Vice President, Macquarie Infrastructure and Real Assets  
  - Eric Crabtree, Chief Investment Officer, IFC  
  - Eric Ensor, President, Quiet Water Associates  
  - Diego Mahecha, Chief Investment Officer, ATP Torres Unidas  
  - David Porte, VP – International, SBA Communications |
| 10:00 | Interactive roundtable session III                                  |
| 11:15 | Coffee break sponsored by TORREC.COM                                 |
| 11:45 | Executive panel: an updated look at selected CALA markets  
  - Manuel Aviles, President and Founder, Innovatel/Torresec |
| 12:45 | Networking lunch                                                     |
| 14:00 | Interactive roundtable session IV                                   |
| 15:15 | Coffee break                                                         |
| 15:45 | Poll results from Day 1 interactive voting sessions                 |
| 16:15 | Final remarks                                                        |
| 16:30 | End of Meetup                                                        |
TowerXchange Meetup Americas 2018 roundtables

1. Mexico: is the tower sector (finally) at a turning point?
2. Brazil, its recovery process and the impact on BTS, deals and overall performances
3. The new (more sustainable) shape of the Colombian tower sector
4. New routes: Paraguay, Uruguay, Bolivia and beyond
5. Argentina: what still needs to happen for towercos to thrive (and what has been done so far)
6. Consolidation among towercos: lessons learnt from the past twelve months of deals
7. New players in CALA: niche towercos, new products
8. How to (smartly) build towers in markets with strict infrastructure laws
9. New routes in Central America and the Caribbean
10. Smart negotiation tips to maximise returns and valuations
11. What’s next in LatAm towers?
12. Will more MNOs carve out their portfolios? Or what can towercos do to push for more SLB?
13. MNO forum
14. Women in towers forum
15. Country focus: Peru
16. Investing beyond towers: fibre, small cells, data centres as viable investment options
17. Small cells and DAS: who should deploy them?
18. A towercos perspective on In-Building Solutions
19. Towers and fibre: synergies and opportunities for towercos and operators
20. Why should towercos go public?
21. How to operating a solid BTS firm (with an exit in mind)
22. Outsourcing vs in-house: the carrier’s choice between DIY and utilising third-party players
23. Que necesitan, compran y construyen los operadores móviles (para sus redes 4G y mirando a 5G)
24. Towers and fibre: an essential combination for tomorrow’s networks
25. Que significa “eficiencia” – la perspectiva de un operador
26. From macro-towers to infill solutions: what do towercos and operators build in CALA?
27. The shape of the post-consolidation CALA tower industry: what’s in it for towercos?
28. Is build-to-suit still trending in CALA?
29. The pros and cons of outsourcing non-core functions to shared services

More roundtable discussions to be announced shortly

TowerXchange Meetup Americas 2018 roundtable moderators:

- Domingos Almeida, Chief Operating Officer, Phoenix Tower do Brasil
- Gonzalo Arauz, Lead Investment Officer, Inter-American Development Bank (IADB)
- George Atuan Ghneim, Gerente Planificación y Nuevos Negocios, Gerencia de Estrategia e Innovación, Entel Chile
- Chris Carraway, Director of Sales and Leasing – LatAm, Phoenix Tower International
- Santiago Castro, General Manager – Colombia, ATP Torres Unidas
- Eduardo Concha, Gerente Departamento de Gestión Inmobiliaria Integral Sitios Técnicos, Gerencia Divisional Construcción Infraestructura, Entel Chile
- Gonzalo Cornejo, Chief Financial Officer, Mexico Tower Partners
- Eric Crabtree, Chief Investment Officer, IFC
- Juan Cueria, VP and Chief Operating Officer, Innovattel/Torresec
- Jesus Eduardo Diez, Experto Eficiencias, Gerencia de Planificación y Eficiencias CAM, Telefónica Centroamérica
- Eric Ensor, President, Quiet Water Associates
- Cecilia Fantinelli, Chief Financial Officer – Brazil, American Tower
- Fernando García Alvarez, Gerente de Construcción e Infraestructura de Red, Vicepresidencia de Redes, Entel Peru
- Edgar Geidans, Group Chief Technology Officer, Trilogy International Partners
- Mariano Gomez, Vice President, Business Development, BTS Towers
- Rodrigo Jiménez Castellanos, Vice President, Public Affairs – Latin America, American Tower
- Shylesh Moras, Vice President – Operations, Phoenix Tower International
- Carlos Santiago Rodriguez Medina, Subdirector Planificación y Control de Gestión Económica, Eficiencias CAM, Telefónica Centroamérica
- Ricardo Ruiz, Vice President – International Operations, SBA Communications
- Jose Varela, Chief Operating Officer, Grupo TorreSur
- Eduardo Wiñazky, Jefe de Gestión Municipal e Infraestructura, Empresa Argentina de Soluciones Satelitales Sociedad Anónima (ARSAT)
- Senior representative, Torrecom
- Senior representative, SBA Communications

The full list of roundtables and moderators will be announced shortly. Contact Arianna Neri, MD – Americas and Asia, TowerXchange at aneri@towerxchange.com for more information.
How can I join?
Early booking is strongly recommended

All previous Meetups have SOLD OUT

Register today to guarantee your involvement

www.towerxchange.com/meetup/meetup-americas/apply-to-attend/

amayhew@towerxchange.com

+44 (0) 7423 512588

Group bookings now available for towercos
For 2018, operational and technical managers are invited to join our regular C-level attendance and participate in dedicated roundtables and activities. Individual passes are US$2,100 - to register a team of four or more please contact Annabelle Mayhew on amayhew@towerxchange.com

Complimentary passes for MNOs
Whether responsible for M&A, strategy, network operations, procurement and supply chain, energy, site acquisition or operations - a limited number of complimentary passes exist for mobile network operators. Register online or contact Annabelle Mayhew for more information

Vendor participation limited
In order to maintain the ratio of buyers to sellers, vendors (excluding MSPs) are limited to two full access and two expo only access passes and attending representatives must be director level or higher.

TowerXchange Meetup Dinner
Wednesday 20 June, 7:30pm
Boca Raton Resort & Club (outdoor location) – Fee US$120

Join us on the evening of Wednesday 21 June for an exclusive networking dinner and make the most of your Meetup experience!

TowerXchange networking dinners are the perfect occasion to discuss business opportunities and share industry insights in an informal yet elegant setting. A fee is required to cover food and beverages for the evening, please select the dinner option when registering online. Prior registration is essential: please note the dinner will sell out and we are unable to take registrations on the day.
Our sponsors and exhibitors

2018 sponsors and exhibitors
Provisional floorplan subject to change

DIAMOND SPONSOR:

SBA Communications

SBA Communications Corporation is a first choice provider and leading owner and operator of wireless communications infrastructure in North, Central and South America. By “Building Better Wireless,” SBA generates revenue from two primary businesses – site leasing and site development services.

In our site leasing business, SBA leases antenna space on our multi-tenant towers to a variety of wireless service providers under long-term lease contracts. SBA owns and operates over 28,000 towers across North, Central and South America. We build our towers at the request of wireless carriers, leveraging our in-house experience in site acquisition, zoning and construction. Our ability to offer carriers a comprehensive portfolio of communication sites is complementary to our tower ownership business. Currently, SBA manages approximately 5,000 communication site locations on behalf of third-party landlords.

Through our site development services, SBA offers wireless service providers assistance in developing their own networks. Our services include site identification and acquisition as well as obtaining zoning approvals and permitting for networks representing all technologies. SBA also provides a broad range of cell site equipment installation, optimization and integration services. Our extensive site development experience includes participation in the development of more than 120,000 communication sites.

www.sbasite.com or call 800.487.SITE
Our sponsors

**SILVER SPONSOR:**

**Acsys**

Acsys is a specialized towerco security and field service management software provider. Recognizing the telecom industry’s relentless drive to efficiency, we design solutions to accelerate you forward. Our software and mobile applications in combination with military-grade access control hardware form a 4 tiered tool for: Flexibility, Efficiency, Productivity, and Security.

Our solutions are designed to improve your site operations through the near elimination of theft, reduced inefficiencies, vendor and ticket auditing, and real-time remote control of field technicians. In the age of Big Data, Acsys gives you the intel you need to offer your tenants a better experience while reducing your OPEX.

Our expert team of mechatronic security, software development, and telecom professionals represent 14 nationalities and have combined their expertise to deploy the Acsys solutions in nearly 50 countries around the globe. Acsys is ISO 9001 certified and a preferred supplier of many of the biggest names in the telco industry.

Acsys – solutions built to improve your bottom line.

[www.acsys.com](http://www.acsys.com)

**SILVER SPONSOR:**

**Siterra, An Accruent Product**

Siterra, an Accruent Product, addresses the software needs of tower companies to sell co-locations, upgrade capacity, build-to-suit, maintain accurate asset registers, manage maintenance, and collaborate with vendors operationally as well as consolidate and integrate tower-related software technically. Sixteen of the towercos and infracos that TowerXchange tracks are current Siterra customers, spanning 18 countries and five continents. The first version of the Siterra site management platform was released in 2001. 100,000 users later, Siterra has become the industry standard, must-have operating software for tower companies today. Accruent works with its leading towerco customers to jointly develop new features that are deployed regularly through the SaaS platform to constantly improve customer value. Accruent has developed global process standards with local flexibility to pair with best-in-class software functionality.

Accruent’s telecommunications division serves some of the world’s largest mobile network operators and service providers in addition to tower companies, helping link employees from different organizations in the industry to collaborate to projects. Accruent is the largest independent provider of commercial property management software, serving the telecom, retail, education, healthcare, and corporate markets with over 7,000 customers in 149 countries.

[www.accruent.com](http://www.accruent.com)

**BRONZE SPONSOR:**

**Torrecom**

Founded in 2010, Torrecom is a leading developer, owner and operator of wireless communication sites in Latin America having secured over 2,000 sites through Sale Leasebacks (SLB) and Build-to-Suit Agreements (BTS) in the region over the past four years. Torrecom currently has over 800 sites in operation and continues to expand its portfolio through BTS and SLB’s in Mexico, Guatemala and Nicaragua.

Torrecom is your most complete resource for wireless telecommunications sites. Carriers in all countries that Torrecom operates rely on Torrecom to identify and deliver the right site. Including Towers, Building Rooftops, DAS, Indoor Solutions and alternate site locations to help carriers provide full coverage to their customers.

Our background gives us the unmatched ability to determine a sites true potential to serve as a viable and effective wireless telecommunications location. Torrecom is intimately familiar with the technical complexities of today’s modern networks, as well as the maze of regulations that apply to telecommunication sites in each market that we participate. No other company is as qualified to guide you through the complicated process of identifying and activating a wireless telecommunications site.

The time has come to make Torrecom your partner in identifying, developing and deploying wireless telecommunications sites.

[www.torrecom.com](http://www.torrecom.com)
Our sponsors and exhibitors

Phoenix Tower International and Phoenix Tower do Brasil

Phoenix Tower International (“PTI”) and Phoenix Tower do Brasil (“PTB”) own and operate towers and other wireless infrastructure and related sites throughout Costa Rica, Panama, El Salvador, the Dominican Republic, French West Indies, Colombia, Peru, United States, and Brazil.

PTI and PTB are devoted to helping our wireless infrastructure partners—customers, sellers, landlords, and communities—achieve their goals. Focused on the principles of unwavering hard work and integrity, we demonstrate this mission every day through the fair and collaborative manner in which we deal with our business partners and the dedicated operation of the wireless infrastructure sites we own and operate.

http://phoenixintnl.com

Digital Bridge

Digital Bridge, a global leader in the mobile and internet infrastructure, is focused on the ownership, investment, and active management of assets across three core pillars: towers, data centers, and small cells/fiber sectors.

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Digital Bridge is led by an experienced team of operators and investors. Our executives have diverse operational and financial backgrounds with experience across the industry. Digital Bridge’s principals have produced an unmatched track record over the last 20+ years resulting in strong partnerships with leading global carriers, content providers, hyperscale cloud companies and global telecommunications infrastructure investors.

Over the next ten years, the drivers of wireless infrastructure will be the ones that understand what the customer wants from a deployment partner, and Digital Bridge’s vision is focused on delivering the needed physical infrastructure bandwidth the industry will need to meet the convergence of 5G and beyond.

For more information, please visit our website.

www.digitalbridgellc.com

Vinson & Elkins RLLP

Vinson & Elkins RLLP

Vinson & Elkins is one of the oldest and largest international law firms, with approximately 700 lawyers located in 16 offices around the world.

Our global telecommunications team has extensive experience advising on international telecoms and telecoms infrastructure M&A transactions, including in respect of towers, data centres, fibre, wireless and wireline technology.

We have significant industry experience, advising on telecoms transactions in numerous countries, including across Europe, Africa, Asia, the Americas and the Middle East and our team is well recognised for such transactions worldwide. Our telecommunications advice includes acquisitions and disposals, debt and equity financing, infrastructure development, operational arrangements, regulatory matters and dispute resolution.

We also have significant experience in the negotiation and drafting of sale and purchase, debt and equity financing, master lease, build-to-suit, site management, site marketing and service level arrangements, fibre IRUs and other complex commercial contracts.

www.velaw.com

Calzavara S.p.A.

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http://www.calzavara.it/?lang=en
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www.abloy.com

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www.polarpower.com

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www.sera4.com

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www.sabreindustries.com

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www.energicplus.com

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New Street Research is an independent research firm specializing in telecommunications equity and debt research. We apply an in-depth, fundamental approach to research that draws on decades of telecom, technology, and policy expertise. We strive to develop differentiated investment insights that impact institutional investors, company executives, and government policy-makers. Our team of 20 dedicated analysts based in New York, London, and Singapore, giving us a truly global and unique perspective on trends across the telecom landscape.

www.newstreetresearch.com

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- **TowerXchange Meetup Asia 2018**, December 4-5, Marina Bay Sands, Singapore
- **TowerXchange Meetup MENA 2019**, Week 2, February, Dubai
- **TowerXchange Meetup Europe 2019**, 30 April - 1 May, Business Design Centre, London

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Regional analysis

The Central and South American telecom infrastructure industry is experiencing a new phase of deals among towercos and with operators who opt to release their assets for the first time. In the meantime, Brazil is finally out of recession which means good news for both acquisitive towercos looking at consolidating the market and build-to-suit firms. And Mexico, whose tower market has been quiet for almost two years, is reporting good levels of build-to-suit activities mostly thanks to ALTAN Redes’ Red Compartida.

In this section, TowerXchange offers its readers analyses, editorials and roundtable reports on some of the key tower markets in CALA including Peru, Brazil, Argentina and Mexico.

Don’t miss:
78 CALA towerco consolidation accelerates
83 American Tower goes on CALA shopping spree
85 Mexico
90 Peru
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98 Argentina
CALA towerco consolidation accelerates

What assets have been sold so far and what remains to be acquired

The CALA tower industry has been created and established on two contrasting blueprints. On one hand, the participation of towerco that are long term investors, committed to stable growth plans across multiple countries, less inclined to risks and observant of the U.S. steel and grass model which they versioned for their ventures in CALA. And on the other hand, a myriad of private equity backed (PE-backed) towerco operating with a specific exit timeline in mind, high growth expectations and an appetite for greater risk. In this editorial, TowerXchange takes a close look at the consolidation trends in CALA, with the long term investors increasingly acquiring the PE-backed towerco, and suggests who could be next in line in the game.

Keywords: Acquisition, American Tower, Americas, Andean Tower Partners, BR Towers, BTS Towers, Brazil, Brazil Tower Company, Centennial Towers, Central America, Colombia, Consolidation, Digital Bridge, Editorial, Global Tower Partners, Grupo TorreSur, Highline do Brasil, Market Forecast, Mexico, Mexico Tower Partners, NMS, Phoenix Tower International, Phoenix Tower do Brasil, QMC Towers, SBA Communications, Sitesharing, South America, T4U, Teletower, Torres Andinas, Torres Unidas, Z-Sites

Read this article to learn:
- The three phases of the CALA consolidation trend
- Who could be looking for an exit in the near future?
- Who are the acquisitive towerco in the region?
- Valuation comps - past towerco on towerco transactions in CALA in the last five years

The structure of the CALA towerco landscape is defined by the fact that while long term players have less appetite to build towers in tough locations, explore countries with a higher degree of operational complexity and open frontier markets, they would however be open to acquire portfolios built by entrepreneurial towerco that have de-risked such markets, at attractive valuations, should they meet the right conditions.

2011-2014: early examples of consolidation

Back at the turn of the decade, when FX rates and build volumes were more favorable than subsequently, CALA did experience some early examples of towerco on towerco consolidation exemplified by the Sitesharing, GTP and Z-Sites deals between 2011 and 2013. However, the first groundbreaking transaction of scale between towerco took place in 2014, when American Tower snatched BR Towers’ 4,630 sites in Brazil for US$978mn (US$211K per tower, but reportedly at a valuation multiple just into double digits).

BR Towers was created in 2012 and rapidly scaled to over 4,000 sites thanks to two acquisitions from Oi and Telefónica and a small one from Sitesharing. Its swift growth trajectory from start-up to exit proved to the regional towerco community that the aforementioned premise, that tower entrepreneurs could build and buy well - and exit successfully - was indeed correct. And if on one hand it incentivised disciplined PE-
backed towercos further in their expansion plans, the transaction also enticed a pool of relatively inexperienced entities to enter the region and disrupt its competitive dynamics.

The reference is to those towercos willing to build towers at deep discount lease rates, sometimes cutting corners on permitting and standards, and sometimes in suboptimal locations which will make it difficult to attract a second, let alone third, tenant.

To date, questions remain whether acquisitive towercos will be interested in buying such “hard to market” portfolios at all or whether they are destined to remain in the hands of their original owners for longer than they originally planned.

2014 also saw a smaller and yet strategic deal between American Tower and Phoenix Tower International (PTI), with the latter acquiring 60 sites in Panama thus announcing themselves as another buyer in the inorganic growth game.

**2015-2016: a biennium of crisis and deals**

In spite of a pan-regional economic slowdown, 2015 and 2016 demonstrated that the consolidation process wasn’t going to be halted by challenging market conditions. In fact, at least four deals took place in the slowest and toughest biennium ever experienced by the CALA tower sector.

Phoenix Tower International (PTI) sealed a deal for the acquisition of T4U and its 529 sites which led to the creation of PTI’s Brazilian spin-off Phoenix Tower do Brasil and a few months later, PTI’s ventures across CALA continued with the acquisition of 190 sites from Teletower in the Dominican Republic. Lastly, in 2015 SBA acquired 130 sites in Ecuador from Torresec.

2016 was a rather uneventful year for CALA tower transactions, but one company succeeded at divesting its assets. In November 2016, NMS sold 359 Mexican, Colombian and Nicaraguan sites to new entrant Uniti Towers for US$65mn (US$181K per site). NMS management then went on to create a new venture, BTS Towers, with similar ambitions and footprint as the original entity.

What we can guess about 2016 is that in spite of being a very slow year, it did host plenty of negotiations behind the curtains for what would prove to be the most exciting phase of CALA towerco consolidation to date.

**2017-today: the game is on**

The lifecycle of a typical private equity investment ranges between seven and ten years and it might stretch to as long as 15 years in certain sectors. However, in the CALA telecom infrastructure industry towercos are proving that five is the perfect number!

While the regional market is enjoying a second wave of carrier divestments with the likes of Digicel, Tigo and Axtel releasing portfolios across multiple countries, towercos are eyeing each other to further consolidate assets and at least three entities made an exit over the past twelve months.

Torres Andinas, with an estimated portfolio of 400 sites across Colombia and Peru, exited the market and sold its assets to SBA Communications. The company was backed by a consortium of private and public investors who included Directors from SBA Torres in Panamá, Costa Rica, Guatemala, El Salvador and Nicaragua so it’s possible that the two companies had some sort of ‘build to flip’ or right of first refusal agreement from day one. SBA Communications also acquired Highline do Brasil and its 1,200 sites in November 2017.

In December 2017, Andean Tower Partners announced the acquisition of Torres Unidas and its 1,644 across Peru, Colombia and Chile. This move also meant a reshuffle at the management level with Daniel Seiner taking over the position of CEO of Andean Tower Partners and Estrella Zaharia being appointed Chief Marketing Officer.

What do these deals have in common? The three towercos achieved different scale and exits (undisclosed) and operated in a variety of countries but they were all active for approximately the same period of time: five years. And they made an exit at the very beginning of the recovery of CALA...
economies, hinting both at their readiness and at the attractiveness of their portfolios.

In 2017, PTI acquired an additional 150 sites in three undisclosed deals with a Peruvian towerco, a Colombian towerco and a Colombian rooftop business, suggesting that the consolidation game is not only made of companies selling their assets to exit the market but also of divestments of pockets of assets whose proceeds are likely being utilised to refinance those small towercos in their ongoing build-to-suit plans.

Who could exit the CALA market next?

One of the most likely towercos to seek a profitable exit over the next few months is Grupo TorreSur with its 6,500+ tower portfolio across Brazil. The towerco is backed by Providence Equity and was eyed by Macquarie (among others) back in 2015. The deal didn’t take place back then but the towerco could be high on the shopping list of various buyers for 2018.

QMC Telecom runs a portfolio of approximately 1,250 sites in Brazil, Mexico, Colombia and Puerto Rico and is backed by Peterson Partners, Accel Partners, Grupo Santo Domingo and Housatonic Partners. The towerco was founded in 2008 but its latest round of financing is dated 2015. The deal didn’t take place back then but the towerco could be high on the shopping list of various buyers for 2018.

Brazil Tower Company (BTC) has been in operation since 2011 and runs a portfolio of around 800 sites across Brazil. The towerco is backed by 1848 Capital Partners and welcomed Silver Swan as an investor with US$40mn back in 2016 to finance its growth and development. Having been operating for seven years, BTC might be seeking to exit Brazil now that the country is finally recovering from its recession.

Continental Towers was created in 2008 and runs a portfolio of approximately 700-800 sites across Mexico, Dominican Republic, Jamaica, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia and Peru. Originally a joint venture between Terra Projects and Credit Suisse, it then received a US$120mn loan package from the IFC to further fund its Central American expansion in 2012.

The last towerco that could be interested in exiting the market is Centennial Towers, whose operations date back to 2008, when the Bettsak family investor group launched its venture in Panama. The towerco is also backed by Madison Dearborn Partners since 2014 and runs a portfolio of over 1,500 sites in Brazil, Mexico and Colombia (unless they were one of the sellers to PTI!), having sold their Panamanian assets to SBA Communications in 2011 and their Costa Rican tower business to Global Tower Partners in 2014.

What’s left to understand is whether investors that have committed to towerco in Brazil and other countries that were affected by economic crisis can achieve the multiples they forecast at the time of the initial investment, in light of the devaluation of various local currencies across CALA.

Who could consolidate CALA towers?

The pool of acquisitive towercos grew over the years as a function of the entrance of two new forces: Digital Bridge and its CALA ventures Mexico Tower Partners and Andean Tower Partners, and Phoenix Tower International and its Brazilian partner company Phoenix Tower do Brasil.

Digital Bridge, the holding company behind Andean Tower Partners and Mexico Tower Partners, was created in 2013 by Ben Jenkins (Dering Capital) and Marc Ganzi (former CEO of GTP) after the sale of GTP to American Tower for US$4.8bn. Since inception, Digital Bridge has raised over US$6bn of debt and equity capital used to acquire and invest in the development of communications infrastructure businesses, including DataBank, ExteNet Systems, Vertical Bridge, Andean Tower Partners, and Mexico Tower Partners.

Phoenix Tower International founded in 2013 by Dagan Kasavana, the M&A mastermind behind the GTP rollup strategy and sale to American Tower, along with other GTP alumni such as...
## Major towerco-towerco deals in CALA

*Sites resulting from the acquisition of GTP’s portfolio in 2013 across U.S., Panama and Costa Rica*

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Seller</th>
<th>Buyer</th>
<th>Tower count</th>
<th>Deal value (US$)</th>
<th>Cost per tower (US$)</th>
<th>Deal structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>Colombia/Peru/Chile</td>
<td>Torres Unidas</td>
<td>Andean Tower Partners</td>
<td>1644</td>
<td>N/A</td>
<td>N/A</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2017</td>
<td>Colombia/Peru</td>
<td>Torres Andinas</td>
<td>SBA Communications</td>
<td>400</td>
<td>N/A</td>
<td>N/A</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2017</td>
<td>Brazil</td>
<td>Highline do Brasil</td>
<td>SBA Communications</td>
<td>1200</td>
<td>N/A</td>
<td>N/A</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2017</td>
<td>Colombia/Peru</td>
<td>Undisclosed</td>
<td>Phoenix Tower International</td>
<td>150</td>
<td>N/A</td>
<td>N/A</td>
<td>Partial acquisition</td>
</tr>
<tr>
<td>2017</td>
<td>Panama</td>
<td>Undisclosed</td>
<td>Torrecom</td>
<td>25</td>
<td>N/A</td>
<td>N/A</td>
<td>Partial acquisition</td>
</tr>
<tr>
<td>2016</td>
<td>Mexico, Colombia, Nicaragua</td>
<td>NMS</td>
<td>Uniti Towers</td>
<td>359</td>
<td>65mn</td>
<td>181K</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2015</td>
<td>Ecuador</td>
<td>Torresec</td>
<td>SBA Communications</td>
<td>130</td>
<td>N/A</td>
<td>N/A</td>
<td>Partial acquisition</td>
</tr>
<tr>
<td>2015</td>
<td>Dominican Republic</td>
<td>Teletower</td>
<td>Phoenix Tower International</td>
<td>190</td>
<td>N/A</td>
<td>N/A</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2015</td>
<td>Brazil</td>
<td>T4U</td>
<td>Phoenix Tower International</td>
<td>529</td>
<td>N/A</td>
<td>N/A</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2014</td>
<td>Panama</td>
<td>American Tower*</td>
<td>Phoenix Tower International</td>
<td>60</td>
<td>N/A</td>
<td>N/A</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2014</td>
<td>Brazil</td>
<td>BR Towers</td>
<td>American Tower</td>
<td>4630</td>
<td>978mn</td>
<td>211K</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2013</td>
<td>Brazil</td>
<td>Z-Sites</td>
<td>American Tower</td>
<td>236</td>
<td>129mn</td>
<td>546K</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2013</td>
<td>Brazil</td>
<td>Sitesharing</td>
<td>BR Towers</td>
<td>100</td>
<td>N/A</td>
<td>N/A</td>
<td>Partial acquisition</td>
</tr>
<tr>
<td>2011</td>
<td>Brazil</td>
<td>Sitesharing</td>
<td>American Tower</td>
<td>666</td>
<td>585mn</td>
<td>878K</td>
<td>Partial acquisition</td>
</tr>
</tbody>
</table>

Source: TowerXchange
Tim Culver and Natalya Kashirina. PTI now owns and operates over 2,000 towers across Colombia, Perú, Costa Rica, Panamá, El Salvador, the Dominican Republic, the U.S. and Brazil (via Phoenix Tower do Brasil). PTI’s investors include funds managed by Blackstone Tactical Opportunities as well as various members of the management team.

So while up until a couple of years ago PE-backed towercos could only rely on American Tower and SBA Communications (and perhaps we should still count Grupo Torresur as potential buyer or seller) as acquisitive forces, now the CALA region is abundant with options for those towercos who diligently scaled their businesses ensuring high margins and solid contracts and are now looking for a buyer. And even the smaller entities such as the aforementioned Uniti, and Torrecom have proved to be interested in acquisitions from time to time as demonstrated by the latter’s purchase of 25 sites in Panama earlier last year.

TowerXchange expects the next few months to be rather exciting ones for the CALA tower sector, with both niche carrier portfolios and towerco assets coming to market. We forecast the CALA landscape to be quite different twelve months from now and recommend everyone who wants to know more to join us at the fifth annual TowerXchange Meetup Americas, 20-21 June in Boca Raton, for the one and only event of choice of the entire regional tower ecosystem.

See you at our future events!

Meetup Americas 2018
20-21 June, Boca Raton

Meetup Asia 2018
4-5 December, Singapore

Meetup China 2018
26-29 September, Beijing

Meetup MENA 2019
February, Dubai

Meetup Africa 2018
9-10 October, Johannesburg

Meetup Europe 2019
30 April - 1 May, London

www.towerxchange.com
American Tower goes on CALA shopping spree

Since the beginning of the year, American Tower has acquired 2,796 towers in four separate transactions and distinct markets across Central and Latin America. Not to mention the 1,000 urban sites and 2,500km of fibre it added to its portfolio following the acquisition of Argentinian firm CyCSA at the end of 2016. Here is a summary of what the towerco acquired over the past few months and the key characteristics of each deal.

Keywords: American Tower, Americas, Paraguay, Colombia, Mexico, Brazil, TIM Brasil, Tigo, Millicom, Axtel, Sale & Leaseback, News

Paraguay

Millicom changed its tower strategy in 2017 and started divesting selected portfolios across South America. What’s left to be seen is whether the trend could be expanded to other countries or these will remain two isolated cases.

With regards to the Paraguayan deal, Mauricio Ramos, CEO of Millicom, said: “This agreement is consistent with our strategic goal of a two-fold reconfiguration of our business, rapidly growing our mobile data and cable revenue in Latin America, and pushing ahead with major initiatives to enhance our operational and capital efficiency. We are pleased that Tigo Paraguay will be able to rely on the strong operational credentials of American Tower, the largest tower operator in Latin America.”

Seller: Tigo
When: April 2017
What: 1,400 towers
How much: US$125mn - US$89,285 per tower
Type: SLB

Colombia

Just a couple of months later, Millicom sealed another deal with American Tower in Colombia, and Mauricio Ramos was once again quoted saying: “Colombia is our biggest operation in Latin America, where we have a strong focus on remaining competitive by bringing advanced infrastructure and services to our customers. Similar to the Paraguay transaction that we announced in

Keywords: American Tower, Americas, Paraguay, Colombia, Mexico, Brazil, TIM Brasil, Tigo, Millicom, Axtel, Sale & Leaseback, News

Read this article to learn:
- Brief summary of American Tower’s deal to acquire 1,400 towers from Tigo in Paraguay
- Brief summary of American Tower’s deal to acquire 1,200 towers from Tigo in Colombia
- Retrospective of the six phases of American Tower’s deal to acquire 5,873 towers from TIM Brasil
- Brief summary of American Tower’s deal to acquire 142 towers from Axtel in Mexico
April, this new agreement with American Tower Corporation enhances our operational and capital efficiency, while also allowing us to invest in improving the connectivity experience for our customers. The lease obligation is denominated in Colombian pesos, consistent with our objective of increasing our proportion of financing in local currency."

**Brazil**

During the same month, American Tower finalised the last transaction with TIM Brasil, which concluded the transfer of 5,873 towers for US$802.6mn against the 6,480 sites initially suggested and a deal value of US$1.2bn first announced in November 2014. Here is a summary of all the tranches of the TIM Brasil - American Tower deal:

**Mexico**

The most recent deal American Tower sealed in CALA has been with Axtel. This transaction is the second between the two companies after the 2013 deal which saw the sale of 883 towers for US$250mn. Back then, American Tower paid quite a premium for the sites at US$283K per tower. But the 2017 deal is notably one of the most expensive TowerXchange has seen in CALA, with a price per tower around US$394K, possibly linked to the scarcity of tower portfolios remaining for sale in Mexico.

<table>
<thead>
<tr>
<th>Seller</th>
<th>When</th>
<th>What</th>
<th>How much</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Brazil</strong></td>
<td>July 2017</td>
<td>1,200 towers</td>
<td>US$147mn - US$122,500 per tower</td>
<td>SLB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Seller</th>
<th>When</th>
<th>What</th>
<th>How much</th>
<th>Type</th>
</tr>
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<td><strong>Mexico</strong></td>
<td>Nov 2014-Jul 2017</td>
<td>5,873 towers</td>
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The Mexican 700MHz shared network: what’s in it for towercos?

TowerXchange roundtable reveals optimism (tempered by ongoing concerns) about Red Compartida

Wholesale LTE networks have been mooted in many countries, deployed in few, and never before deployed in a country with as many towercos as Mexico. Shared 700MHz network Red Compartida is being rolled out by ALTÁN Redes, and TowerXchange revealed several practical insights into the implications of the rollout for towercos at a roundtable at the TowerXchange Meetup Americas 2017. The following article respects the Chatham House Rule – none of the opinions nor quotes in this article should be attributed to roundtable moderator René Espinosa, VP at Mexico Tower Partners, nor any of the other 14 participants.

Keywords: AT&T, Active Infrasharing, American Tower, Americas, Americas Research, América Móvil, Bankability, Best of TowerXchange, Build-to-Suit, Co-locations, Densification, Infrastructure Sharing, LTE, Market Forecasts, Market Overview, Mexico, Mexico Tower Partners, Network Rollout, North America, Pass-Through, Red Compartida, Research, Telcel, Teléfonica, Telesites, Tenancy Ratios, Torrecom, TowerXchange Research, Uniti Towers, Urban vs Rural

Red Compartida: saviour of the stuttering Mexican tower market?

It’s been a slow couple of years for Mexico’s tower companies. The Mexican Peso was trading around 0.75 to the USD between 2009 and 2014 when most towercos entered Mexico, but declined to 0.50 from 2015, recovering to around 0.55 more recently. In the mobile market tariff wars have driven penetration at the expense of margins, leaving little capex to be invested into Mexico’s overloaded network.

AT&T’s market entry has not heralded the network investment many hoped for. Similarly Telefónica has added few new towers or co-locations, and is considering exiting the Mexican market. Dominant market leader Telcel remains the only company significantly investing in their network, yet most of their new build has been funnelled to América Móvil’s carve out towerco Telesites. TowerXchange estimate that in the last two years less than 1,000 new towers have been built by independent towercos (excluding Telesites) in Mexico. Yet Mexico’s many independent towercos see light at the end of the tunnel in the form of co-locations, and eventually new build, from Mexico’s new wholesale LTE network, Red Compartida.

ALTÁN Redes emerged victorious from the tender to rollout Red Compartida. The first phase of ALTÁN Redes’ rollout targets 30% population coverage by Q118, and is likely to be concentrated on the country’s largest cities including Mexico City.
and Monterrey. This constitutes the main project of the year for towercos such as Mexico Tower Partners, Uniti Towers, Torrecom and American Tower, and roundtable participants suggested the first phase would require co-locations on ~2,500 existing towers, of which Telesites were expected to provide ~1,000. Master lease terms were signed by six towercos in late 2016 and early 2017, and equipment has already been installed on some sites.

“Mexico’s MNOs have slowed their investments and deployments, so Red Compartida represents the best opportunity to reach and exceed our goals on co-location,” said one tower company.

“ALTÁN Redes is working faster than any other operator,” added another towerco.

Mexico’s MNOs have slowed their investments and deployments – so Red Compartida represents the best opportunity to reach and exceed our goals on co-location.

### What is Red Compartida?

Red Compartida a public private partnership (PPP) project to create and share a 700MHz LTE network,

with the objective of bringing high speed mobile broadband to at least 92.2% of Mexico’s population within seven years.

The Mexican government, via the IFT, has made available to the project 90MHz of coveted contiguous 700MHz “digital dividend” spectrum at a discounted price reported to be just US$30mn (for comparison, the auction of similar spectrum bands raised US$2.3bn in Brazil!)

While the focus of Red Compartida will be on broadband, voice will be possible through VoLTE.

While the project is part of President Enrique Peña Nieto’s Reforma de Telecomunicaciones, and is coordinated by the Ministry of Communications and Transportation and the Federal Institute of Telecommunications, the rollout will be led by ALTÁN Redes. ALTÁN Redes will invest US$7bn over the next ten years, drawing upon a multinational consortium led by Spanish cable giant Multitel and a selection of financial investors including funds managed by Morgan Stanley, FFLATAM-15-2, CDPQ, CKD-IM, Hansam, the IFC, and Multitel Chairman Eugenio Galdón’s Isla Guadalupe Investments. Telcos Axtel and Megacable each have non-voting shares.

Red Compartida has an agreement to use the fibre of CFE (the Federal Electricity Commission, the government owned powerco) for fibre backhaul.

The objective of Red Compartida is to improve coverage (currently just over 80%, with significant areas of the country receiving service only from Telcel), to improve QoS, to drive down tariffs by enabling competition and creating efficiencies, and thus to stimulate economic productivity and industrial competitiveness.

Red Compartida will own and deploy the base stations (reportedly using equipment provided by Huawei and Nokia), but will have no direct subscriber relationships, instead using a wholesale model to sell capacity to licensed Communication Service Providers. Red Compartida is expected to accelerate rollout, and leverage efficiencies, by co-locating on third party towerco sites where possible, and may outsource much of the build of new sites to towercos.
Red Compartida might ultimately require as many as 12,000 sites, comprising around 60% co-location on existing towers, 40% new sites

The second phase of ALTÁN Redes' rollout targets 40% population coverage by Q119, extending the footprint of Red Compartida to larger inhabited areas, but remaining focused on relatively high population density areas.

In three to five years, when the rollout extends beyond the 82% existing coverage and ALTÁN Redes starts connecting settlements with populations of 5,000, new sites will be necessary, consisting of less capital intensive 40-60m tall towers, and more smaller, lightweight structures. Will Mexico's towercos want to build what may well remain single tenant towers, given that Red Compartida has an explicit goal to sublease to the companies who would have been towercos' second and third tenants?

“The towers built in the latter phases of the rollout may be beyond the reach of the existing transport and electricity infrastructure, but if ALTÁN Redes agrees to pay a premium we could build those single tenant towers,” said one towerco. “We have already built some single tenant towers in Mexico at a premium. ALTÁN Redes could use electricity towers in some instances, but they're high tension towers and capex would need to be invested to make them low tension.”

To achieve the government's ambitious target of 92.2% population coverage within seven years, one roundtable participant suggested Red Compartida might ultimately require as many as 12,000 sites, comprising around 60% co-location on existing towers, 40% new sites.

**The rural coverage conundrum**

The rural coverage debate is not unique to Mexico. While the economics are challenging for MNOs to extend coverage into areas where population density and ARPU may not be sufficient to generate return on investment within an acceptable timeline, MNO investment in rural coverage can be stimulated by regulatory requirements. Towercos have no such obligations, and have business models and investment criteria attuned to tower cash flow (TCF) generation rather than ARPU – thus rural sites remain unattractive as the first tenant may struggle to afford a premium lease rate and a second tenant may be a distant pipesream, and because opex is often higher. The cost of energy grid extensions, or of distributed generation, is also a concern in Mexico, although there is an electricity distribution network extension plan.

Could Red Compartida solve the rural coverage conundrum? Could multiple operators leverage one shared rural network? And will ALTÁN Redes have to build their own rural sites, or will towercos rise to the challenge? The debate came back to one simple response by towercos: “towercos will build the rural sites, but only if ALTÁN Redes is prepared to pay a premium for rural sites such that the TCF is investible.”

One roundtable participant suggested that one of Mexico's incumbent MNOs had unsuccessfully piloted a revenue share business model to serve rural communities. Another participant called attention to a successful community-led network deployed in Oaxaca by Rhizomatica as illustrative that low cost, open source connectivity could be economically viable in regions with a population under 10,000.

In order to extend population coverage from 82-92%, ALTÁN Redes will have to connect small
communities where ARPU might be US$1 or less; it is in these use cases that Mexico’s incumbent MNOs are perhaps most likely to use the ALTÁN Redes network. Ultimately, ALTÁN Redes must make enough money wholesaling coverage in Mexico’s big cities to subsidise rural coverage.

Who will use Red Compartida?

While Telcel, Telefónica and AT&T all have coverage in Mexico City and Monterrey, given the capacity of Red Compartida’s 700MHz band, with one Red Compartida site the MNOs could achieve 2-3x the capacity as when using their own spectrum bands. So as networks fill with data, the three MNOs could turn to Red Compartida to offload and improve QoS, thus reducing churn. ALTÁN Redes has to meet KPIs on cell throughput on the network edge, and claim they will be able to offer a wholesale service cheaper than Telcel. But one roundtable participant said they had explicitly asked Mexico’s incumbent MNOs if they planned to use Red Compartida in the big cities: “They said no, because they have plenty of spectrum available themselves.”

But Red Compartida is designed to do more than just enable the densification of incumbent MNOs’ networks; the government’s hope is that the network will serve new entrant MVNOs, ISPs and enable mobile money and m-healthcare services. “If MVNOs will rent capacity from Red Compartida and enable Mexicans to get a 3G / 4G phone with a cheaper tariff than with Telcel, I can see this working,” suggested one roundtable participant. “But at present less than 1% of Mexican subscribers use an MVNO,” countered another.

The game-changer would be the entrance of a major new national MNO – particularly if Telefónica does indeed exit Mexico - conversation in the corridors at the TowerXchange Meetup Americas suggested Verizon or Sprint / Softbank could be interested in entering the market.

A network for tomorrow... but not for today?

One of the principal challenges facing ALTÁN Redes and their partners is the lack of compatible devices. “No devices, no customers. Given that Mexico’s existing three MNOs already provide coverage in urban areas, I’m sceptical it will work!” remarked one participant. As more 700MHz spectrum is auctioned across CALA, availability of compatible devices may become less of an inhibitor.

Given the risks inherent in the Red Compartida business model, how comfortable are Mexico’s towercos with the credit risk of their new tenant? ALTÁN Redes has already raised several billion dollars, supplemented by access to vendor credit. It’s already a large operation, with close to 200 employees, although it is not expected to be revenue generating until March 2018. One towerco suggested that Red Compartida would not be allowed to fail because there was too much at stake politically, while another reminded participants that towercos remain insulated from risk by the 10-year term on their co-location agreements. “We can distribute any risk across our large portfolio – and Red Compartida are paying on time to date!” added a third.

How Red Compartida selects and adds sites to its network

Red Compartida’s opco ALTÁN Redes typically chooses the closest existing tower to a required location. Where there are two or three competing locations, they usually go with line of sight. ALTÁN Redes typically prefers to lease space at 30m height, which can mean their ideal elevation on a tower is not available, thus shaking loose a handful of BTS projects in phase one, which could be fulfilled by adding rooftop sites to government buildings, where permitting can be fast-tracked.

ALTÁN Redes reportedly has MSAs with six towercos, so pricing is pre-negotiated and is provided on a tower lease plus rent pass through basis.

ALTÁN Redes undertakes their own civil works, so towerco capex is negligible, with Nokia and Huawei also involved in the Construction Programme.

Conclusions

Red Compartida has provided a welcome influx of new business to the Mexican tower sector. “2017 has been a good year for co-location sales because of ALTÁN Redes,” concluded one towerco “We already have three people implanted with ALTÁN Redes.”
If we make the assumptions that Red Compartida is successful enough to complete its seven year rollout, that it does so on time, and that Mexico's towercos can agree an investible MLA enabling them to build the rural sites, what could the Mexican tower market look like in 2024?

TowerXchange subscribe to the view that Mexico's incumbent MNOs, whoever they are in seven years time, will use Red Compartida at least for rural network extensions, but this in turn will mean much of towerco's organic growth comes from ALTÁN Redes rather than from the MNOs. Mexico is home to more than ten independent towercos – if Red Compartida works, expect this to stimulate consolidation, led by American Tower and Mexico Tower Partners, but don't rule out Torrecom and Uniti Towers as prospective buyers rather than sellers if the market prospers.

In Q117 TowerXchange estimated there were ~2,000 Telesites, 1,531 American Tower, 1,547 Mexico Tower Partners, 1,521 other towercos including IIMT, Centennial, Intelli Site Solutions, Conex and MX Towers, 205 Uniti Towers, 207 Torrecom, and 8,913 Estimated MNO captive towers. This gave an estimated tower count of 14,917.

Taking into account the aforementioned assumptions, by Q124 we forecast there could be 36,500 tenancies on 29,320 towers in Mexico, with a prevailing tenancy ratio around 1.24x. If an MLA cannot be agreed between the towercos and ALTÁN Redes for the rural sites, expect 3-4,000 towers to be moved from towerco balance sheets to ALTÁN Redes themselves in our Q124 forecast.

Source: TowerXchange
MNOs call on towercos to provide power in Peru

Calls for infrastructure sharing and a more diverse offering from towercos to meet rising mobile demand

At the 2015 Peru round table at the TowerXchange Meetup 2015, reference was made to The Ministry of Transport and Communications calling for an increase from 9,000 to 22,000 cell sites by 2018. Two years later, the country’s tower count is still less than half way to the Ministry’s target. Why? This report derives from TowerXchange’s 2017 Peru round table, which featured a diverse group of participants including MNOs, towercos, investors, MSPs and vendors.

Keywords: 4G, Americas, Americas, Americas Insights, Build-to-Suit, Construction, DAS, ESCOs, Energy, Fibre, Infrastructure Sharing, Insights, Leasing & Permitting, MNOs, Managed Services, Market Overview, Network Rollout, Osiptel, Off-Grid, Pass-Through, Peru, Regulation, Small Cells, Tower Count, Towercos

Peru’s tower market

Supervisory agency Organismo Supervisor de Inversion Privada en Telecommunicaciones (Osiptel) recently stated that there were 18,928 base stations deployed in June 2017, but called for the total to be almost doubled to 36,513 by 2021 to satisfy demand.

Osiptel General Manager Sergio Cifuentes commented “Looking ahead at more efficient network deployment, operators could opt for greater sharing of infrastructure... to date, the shared use of passive infrastructure between mobile providers is just 2% of the existing deployments.” (Source: Telegeography)

Around 75% of Peru’s towers remain on MNO balance sheets. Telxius, American Tower and Torres Unidas have the largest towerco portfolios in the country, with smaller portfolios owned by SBA Communications, Torres Andinas, Innovattel, BTS Towers, Continental Towers, Phoenix Tower International and Telecommunications Partners, with Digital Bridge’s Andean Tower Partners entering the market.

“There is no significant pipeline for sale and leaseback in Peru,” said one towerco. “Claro won’t sell, Telefónica has carved out Telxius, and are awarding them most of their build-to-suit, so towercos have to get creative to grow. For example, we are cultivating relationships with municipalities to enable deployment of small cells, Wi-Fi and DAS to enable densification.”

Despite the relatively favourable regulatory
environment for Peruvian towercos (for example Law. 29022 eases filing of permits with municipalities), round table participants reported it still takes around 150-160 days to get a new tower built in Peru, partly as a function of zoning and permitting delays, partly due to the complexity of deciphering land ownership.

“If the chief of a community doesn’t allow you to build a tower, you can’t do anything,” complained one Peru roundtable participant at the TowerXchange Meetup Americas 2017. “Sometimes the Chief doesn’t want rental income, he wants community services instead – paying in blankets instead of cash!”

Once they have the towers, buying out the underlying leases is common practice for many Andean towercos, thereby assuring control of the site and lengthening the client relationship.

With many new sites at significant elevation above sea level, road access can be challenging in the mountains.

**Mobile market**

Telefónica’s Movistar and América Móvil’s Claro lead a mobile market into which both Entel and Bitel have been recent disruptive new entrants. Entel added over a million subscribers in the last year.

ARPU is around US$8 in Peru.

Inaugurated in 2016, Peru’s national fibre optic backbone network, the RDNFO, was commissioned by Mexican consortium Azteca Comunicaciones. The 13,500km network is to connect Lima with 180 of the country’s 196 provincial capitals at an estimated cost of US$333mn.

Claro Peru launched 4G services in May 2014. Movistar launched LTE-A in July 2016. Viettel’s local opco Bitel launched their 4G service in December 2016. In 2016, Entel, Claro and Movistar each secured 30MHz of 700MHz spectrum, ideal for signal propagation in remote rural and low-population areas.

**Do Peruvian MNOs want power as a service?**

In most CALA markets, carriers’ apparent preference to retain ownership of power assets, combined with towercos’ reluctance to provide power and thereby increase their complexity of their business model, means energy remains the carriers’ responsibility. Yet there seems a greater appetite in Peru than anywhere else to unlock efficiencies by sharing energy equipment in multi-tenancy situations, while MNOs are keen to find partners prepared to share the cost of grid extensions.

One round table participant highlighted that a towerco in Colombia had acquired backup power solutions in a tower transaction and, in doing so, had exposed themselves to the risk of becoming liable to pay government’s downtime penalties.

Indeed, while some towercos are diversifying,
A couple of years ago, when a carrier wanted to deploy a co-location or a BTS, the site could be built but the fibre connection to the tower could take 20 days longer,” said the Peru Country Manager of one towerco. “In order that we start billing at the same time the site becomes revenue generating, we are increasingly providing and bundling everything: tower, fibre, fencing and equipment… but we still don’t think we have to provide energy.”

Leading OEMs, such as Ericsson, Huawei, Nokia and ZTE, are happy to step into the breach: “We’d provide managed services as well as product supply. It is does mean we’re taking on some energy risk, but if we’re doing the field services for everything else, we can realise some efficiencies and savings.”

“Towercos always bounce the energy problem back to the client – this happens a lot in Peru,” said a representative of one of the country’s leading MNOs. “Two of Peru’s largest towercos acquired a lot of sites where there are problems with energy, and we are still trying to find solutions.”

“Peru’s MNOs are obligated to provide coverage in 60,000 villages with populations under 1,000 people,” continued the same MNO. “Connecting such villages might need three or four sites with transmission – and almost all of these would be rural, off grid sites.”

“In Latin America the tower business is a real estate business,” added an experienced towerco investor. “In Africa a towerco doesn’t just provide vertical real estate; power solutions can be a source of competitive advantage, and the profitability of African towercos are driven as much as anything else by diesel savings and security improvements.”

One towerco highlighted a deal they had struck with Peru’s electrical utility to market 30,000 sites, many in rural areas. Ironically there is no access to commercial energy at many of these sites, meaning the towerco may need to explore hybrid solutions. Their representative appealed for suppliers to “make the financial model work so we can offer a bundled service.”

“Peruvian MNOs were asking towercos to provide power at last year’s Meetup – it seems like nobody has picked up that challenge,” added a vendor. “Could towercos acquire more towers in Peru if they provided power? Do they have only 25% of the country’s towers because their service proposition isn’t broad enough?”

“Is a towerco willing to expand their role beyond real estate and engage with higher risk operational and energy services? And if not, perhaps Energy

Note: tower counts for Continental Towers remain undisclosed

Source: TowerXchange
Services Companies (ESCOs) could fill that gap,” suggested the vendor.

“Many towercos are closing their doors in Peru. We need to differentiate on service and be disruptive to survive, whether that’s through small cells, or whether we have to provide energy sooner or later,” responded one of Peru’s more innovative towercos.

“And would you want to develop the competencies to provide energy yourselves, or would you partner with a third party?” Asked the vendor.

The towerco responded: “We’ve spoken with some proven vendors of cell site energy solutions to understand what could be offered, and we recognise we have to evolve. Energy is not our core competency, we need your knowledge, and we need a complete service, but share the risk with us, don’t just sell us products.”

“The requirements of the end clients aren’t always clear,” suggested an OEM. “Companies like us can support the evolution with managed services, batteries-as-a-service – sharing risk.”

“If risk sharing comes with revenue sharing, we can make it work!” Added the vendor.

“We have to evolve from a build-to-suit towerco to a provider of bundled services,” said the towerco. “The current focus of our diversification is on DAS and small cells, but we recognise carriers also need energy.”

The discussion progressed to address whether investment in electricity grid extension might bring more prospective off-grid cell sites on-grid.

“There are ten regional government owned power companies, and all plan to extend the grid to more remote communities, but each of these power companies has different needs and issues,” said an investor, who had recently met with Peru’s power regulators. “The regional fragmentation means whether you want grid extensions or co-operation on fibre, you need ten deals not one – it adds complexity.”

It should be noted that the CIA Factbook puts electrification in Peru at 91% population coverage (98% urban, 73% rural).

**Challenger MNO calls for innovative solutions to accelerate rollout**

“We need to rollout fast, which means in some cases our best option is to partner with towercos. But in a lot of scenarios they don’t offer what I need at a price I can pay,” said a senior representative of a recent new market entrant challenger MNO. “We lack partners to do a lot of things. For example, at the moment if I need a grid extension I have to pay for this, not the towerco. We need towercos to be more solution-orientated and to partner with us.”

The ground rent pass through was also highlighted as a disincentive to tower investment: “I have to pay for both the land and the tower, and the addition of a second tenant halves the land cost – so there is no incentive to be the first tenant, better to be second or third!”
Brazilian tower market emerging from a period of uncertainty and irrationality

Long term outlook remains positive for CALA’s largest tower market

Every year over a dozen of the leading stakeholders in the Brazilian tower market convene for their annual roundtable debate at the TowerXchange Meetup Americas. This year’s candid diagnosis acknowledged 2015-16 as slow years for growth, inhibited by uncertainty surrounding the bankruptcy of Oi and an irrational BTS market, while revealing continued optimism about the long term prospects of Brazil closing its growing infrastructure gap.

Keywords: American Tower, Americas, Americas Insights, Bankability, Brazil, Build-to-Suit, Consolidation, Grupo TorreSur, Highline do Brasil, Insights, Investment, Market Overview, Pass-Through, Phoenix Tower do Brasil, Private Equity, QMC Telecom, QoS, SBA Communications, Site Level Profitability, Tower Count, Towercos

Brazilian business climate context

Brazil has been in economic turmoil for the past two to three years, with the country lurching from one political crisis to the next.

“The last three years have been the worst three years for growth since we entered Brazil,” said one of the country’s longest established private towercos. “Yet all the towercos still feel great about the long term growth opportunities in the country.”

The prevailing view among roundtable participants was that 2017 was shaping up to be a better year for growth in the Brazilian tower market than 2016, with 2018 better again.

Bankrupt National carrier Oi remains the source of much uncertainty. The implications of their...
restructuring will be highly significant to the Brazilian tower industry as Oi is both anchor tenant on over ten thousand towers, and co-tenant on thousands more. However, all roundtable participants reported Oi was maintaining timely lease payments.

With four to five leading carriers in Brazil (depending on whether one includes Nextel), consolidation is inevitable but how that will influence the market remains unclear.

One thing that is certain is the continuing relevance of Brazil’s infrastructure gap.

As well as Grupo TorreSur with 6,500 towers, two U.S. publics have positions of scale in Brazil (American Tower had 18,803 and SBA 7,332 Brazilian towers at the time of writing). Both are building and buying more sites every year, both are leasing up healthily, and they remain committed to the market as, in their opinion, the fundamentally positive drivers outweigh short term instability.

“Demand is coming.” concluded one of the publics. “The scale and population of Brazil will support many years of growth – and upon arrival it is immediately evident that QoS is poor – it is evident that the market is underserved.”

Why towercos maintain a positive long term outlook

“While Brazilian towers may be a good investment over a 20 year horizon, insulated against economic turbulence by escalators, will Brazilian towers be a better or worse place to be within a three year horizon as lease rates continue to come under pressure from reduced carrier margins?” Asked one investor.

“We’ve seen anchor tenancies renewed from 16 years ago, even though they were high at the time,” said one towerco.

“Brazil is no different from any other markets – inflation may have exaggerated our employee, office and other costs, and in our case our lease rates weren’t always as high at the outset,” added another towerco. “But over time these contracts escalate, equipment is added, and the carriers will figure out how to make money from the rising middle class.”

“Towercos have faith that there is deferred network investment which has to come, and the recent slow years mean investment is only falling farther behind,” suggested a third towerco. “If Brazil doesn’t catch up in terms of the mobile network it’s going to suffer competitively.”
“With disposable income being slashed, will carriers have to rethink their cost base?” Challenged the investor.

“The last two years have been disastrous economically, yet we’re still building sites, and carriers will continue to invest,” responded one towerco.

“Ultimately the consolidation of carriers will shape Brazil; the Oi bankruptcy and restructuring. Even Nextel just got investment and may continue to be a factor in the long term,” added another towerco.

“Oi’s balance sheet is unsustainable. Once they get through restructuring, that will trigger reconstruction. Nobody knows what will happen, except that consolidation seems inevitable,” concluded a third towerco.

“And if the Brazilian economy recovers, what kind of upside could we see?” Asked an analyst.

“Brazil remains far behind the U.S. Whether it be in terms of subscribers per tower, coverage or QoS, it will take a long time to close the gap,” responded one towerco. “We see potential growth in co-location, and the coverage of our networks, even if the market consolidates to three strong operators.”

“I could see Brazil’s carriers doing 2-3x the co-location and build to suit (BTS) than they’re doing today for five straight years, and they’d still have plenty to do – but it won’t jump to that level,” added another towerco. “For example, Vivo’s network could use as much as double their current investment level. Subscribers are getting picky about QoS, and churn is a great motivator for network investment! And it’s great when we have someone leading marketing messaging with their network as a differentiator.”

“Is network sharing a possible factor?” Asked the analyst.

“Network sharing not on the horizon in Brazil,” was the definitive response.

**Increasing discipline in BTS**

Prior to 2015, new site build volumes in Brazil were strong, fuelled in part by a fiercely competitive, at times irrational, BTS market. In the subsequent two years, according to TowerXchange research, just 3,326 new sites were added to the portfolios of Brazilian towercos (Q115-Q117). Excluding the effect of towerco-on-towerco consolidation, we estimate that represents only around 1,000-1,500
new builds per year. According to roundtable participants, 90% of new cell sites in Brazil are being built by towercos, as opposed to by carriers.

At the 2016 Brazil roundtable concern was expressed that several private Brazilian towercos were behaving with poor discipline in terms of leasing pricing, volume discounting, and granting concessions to critical MLA terms. By 2017, after two slow years for BTS volumes, the land-grab that led to unnatural pricing proved unsustainable, leaving some smaller towercos that had deviated farthest from the established towerco ‘playbook’ stuck with portfolios of 50-100 sites of a quality insufficient to attract a buyer.

“The value is in the Tower Cash Flow (TCF) – if your initial spread over ground rent isn’t high enough, there’s not enough TCF, and sellers may not be able to attract an offer sufficient to recoup their initial capital outlay,” said one prospective consolidator.

“Brazil was a hot market for private equity,” added the CXO of another large Brazilian towerco. “There were not enough towers, so investors felt if they just backed a team, they thought they could make a lot of mistakes and still sell at 18x. That hasn’t proved to be the case.”

“Every couple of months I get an email from a new towerco with a handful of sites they’d like to sell,” said another prospective consolidator. “But we see our multiples come down during acquisition processes of most private towercos. When we dig in we see that contracts are terminable, capacity rights or RANsharing have been given away – and as a result, too often the buyer and seller cannot reach terms.”

“Even the small private towercos with decent sites and decent spreads are often struggling to get co-location,” added another prospective buyer.

However, Brazil also remains host to a number of long term, quality oriented private towercos who are more likely to be on a course to achieve a profitable sale. “We used to see 30 bidders for BTS contracts offering anything the carrier wanted, but bidders have become more sophisticated, and are holding firmer on pricing and terms,” said one of the consolidators.

“The Brazilian BTS market became irrational – price and quality was too low. But carriers are now narrowing to increasingly do business with a pool of proven BTS providers,” added another leading Brazilian towerco. “If we don’t like the terms on offer for BTS, we’re under no pressure to take the work. That said, the carriers have so much demand that there are some sites they simply must build even if they can’t get a discounted lease rates, so we’re still doing BTS for three of Brazil’s four big carriers at prices and under contractual terms we can live with.”

“There are a lot of private Brazilian towercos with decent scale, and there will be M&A eventually, but both we and they have the luxury of a long horizon,” added another of the market leaders.

“A lot of value has been lost in Brazilian towers. This is a long term business which requires a long term view and long term investors. Everyone wants to show growth in Brazil but greater discipline must be applied in future,” concluded another of the consolidators.

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### Ground leases and rooftops

A legacy of the accelerated rollout in Brazil, most ground leases remain a pass-through to the carriers. As the country’s carriers become increasingly aware of the opportunity to lower real estate costs, most of the Brazilian towercos have programmes to buyout ground leases, but the incentive to deploy capital in this manner can be limited in the absence of programmes to share benefits.

The rooftop tower market in Brazil is similarly limited primarily to sites where the towerco has exclusive rights to the rooftop, and can control the site and provide combined pricing with the ground lease.
By now, investment in Argentinian infrastructure should be more reality than hype. But since its exposition to the international business world after the election of President Macri in December 2015, the overall change has been slower than hoped, at least for the telecom infrastructure sector and its many players who are still eagerly hoping for Argentina to deliver higher volume of business.

**A law in the making**

The Argentine government has been open to listen and engage with the international telecom infrastructure investment community and interested stakeholders.

A lot of work has been done in the background and governmental officials have been very active in expanding their understanding of the towerco model and its ecosystem, meeting towercos from across the region to identify the best way to reform the national telecom sector.

In order to solve some of the issues affecting the local market and contribute to the growth of the telecom and infrastructure sectors, the government has been drafting a new telecom law that will be presented for parliamentary discussion after the legislative elections in October. Measures that the law addresses include a shot clock rule, limitations on municipal taxes as well as the promotion of campaigns to educate communities on what it means to install a new site in close proximity and to reassure them regarding their health concerns.
The march of the hopefuls

In the meantime, tens of towercos have colonised Argentina in the hope to gain high volumes of build-to-suit (BTS) projects, driven by an understanding that the country is quite behind in terms of its mobile coverage and capacity, particularly beyond major cities.

American Tower, SBA Communications, Innovattel/Torresec, Plata Tower Company, Tower 3 and Atis Group to name a few established their operations in Argentina to investigate business opportunities and start offering BTS. And as previously reported, American Tower went as far as acquiring a local engineering firm, CyCSA, and its 1,000 urban sites and 70+ staff.

The level of interest in this market is extremely high and as many as thirteen towercos participated in a recent RFP for approximately 200 sites, which was then assigned to four different towercos.

The dynamics between towercos and MNOs

Panellists noted how MNOs are now starting to work with towercos as partners, after some probing and testing, and are more receptive towards their business model. While the government is enabling the entrance of towercos by creating a more conducive regulatory environment and facilitating the deployment of greenfield projects.

Some of the most recent entrants were attracted by the network investments announced by MNOs for the triennium 2016-2019, with Personal leading the way at US$2.5bn followed by Telefónica (US$2.2bn) and Claro (US$1.2bn).

In the case of Innovattel/Torresec, their early entrance into Argentina gave them an edge against the competition and the time to set up the right business in line with the needs of the local market. The management has spent time on the ground to meet potential customers, understand the market and the nuances of jurisdiction.

The pros and cons of doing business in Argentina

Analysing the pros and cons of doing business in the country, the need to enhance coverage, data demand growing at a fast speed as well as high levels of mobile penetration all contribute to making Argentina one of the most interesting tower markets in the CALA region. However, the gap between theory and reality is still quite considerable and high taxes both at a municipal and federal level, a NIMBY mentality, and a business environment very much in the making aren’t allowing the fast developments the tower industry initially hoped for.

Another factor hindering the growth of towercos in Argentina is the fact that MNOs have depreciated their tower portfolios close to or at zero on their balance sheet, but would incur capital gains taxes of 35% if they decided to sell the assets to towercos.

According to towercos, one of the positive aspects of doing business in Argentina is that MNOs were already quite aware of the infrastructure sharing model, thanks to established examples from across the region such as Brazil, Peru and Mexico. When towercos entered Argentina, MNOs were quite ready to embrace the model or at least sit at a table and
negotiate, something that took towercos a long time when entering Brazil, back in the early 2010s.

**Forecasts versus reality**

In terms of growth forecasts, MNOs report that around 1,000 sites have been built over the past twelve months (by both towercos and MNOs), bringing the total national inventory to approximately 16,000 sites. But that would need to at least double over the course of the next three years in order to achieve satisfactory levels of coverage across Argentina, and some commentators believe the number should actually triple by 2020. It goes without saying that these levels of growth aren’t realistic but the volume of BTS in Argentina is not yet where it should be to both meet the growth expectations of many towercos and improve the Quality of Service (QoS).

One of the hopes of towercos is that once (and if) the capital gain taxation is revisited, this will allow a flow of M&A opportunities to open up. However the recent entrance of Telxius in Argentina is likely to significantly limit the chances for towercos to acquire Telefónica’s assets, and this is particularly true since Telxius is already managing around 350 sites transferred by Telefónica in January 2017. This would leave only Telecom Personal’s and Nextel’s portfolios since Claro isn’t likely to engage in any sale and leaseback with towercos, as per its Group strategy.

**The threat of inflation**

When discussing some of the financial macros affecting the local tower industry, panellists highlighted that when it comes to inflation, they anticipate it to revert to normalcy in the long term.

The risks of high inflation still need to be mitigated by managing both revenue and costs very carefully, and the effect on towercos is reduced since the tower industry tends to be a long term investor. At time of writing it seemed that inflation was currently under better control in Argentina; the local currency hasn’t devalued as much as some expected, also as a result of the recent tax amnesty which contributed to US$116.8bn of assets being declared (corresponding to US$9.65bn of taxes and fees).

In conclusion, panellists listed the five top questions/expectations that remain unanswered as of now, which TowerXchange hopes to discuss in tangible detail at the next Meetup Americas, which will be held in Boca Raton, 20-21 June 2018.

1. Can the telecom and tower industries come together and deliver thousands of new sites in Argentina every year for the next few years?

2. What will be the realistic benefits and quick wins of the new telecom law?

3. Financing options are largely available to towercos and other players active in the ecosystem; who needs financial support?

4. Can the regulatory framework for new deployments be streamlined as quick as possible?

5. The government is working to welcome more towercos, enhance competition and accelerate deployment - who wants to offer suggestions and ideas?
Can Argentina pull it off?

Miguel Angel Arrigoni, Chairman and Chief Executive Officer, First Corporate Finance Advisors

TowerXchange: What are the expectations with regards to the approval of the new telecom law? And how effective is the law likely to be in speeding the permitting process for new sites?

Miguel Angel Arrigoni, Chairman and Chief Executive Officer, First Corporate Finance Advisors: The approval process on the new telecom law could be extended into 2018 due to political reasons. Although being discussed, it won’t be easy for the new law to incorporate a nationwide system allowing a fast-track municipal approval (the so-called shot clock rule). In fact, the handling of permits will continue to fall under the individual municipalities, with the government looking to exert indirect pressure via alternative ways such as educational campaigns.

With regards to the details of the new law, we don’t see the government really working to set targets to reduce the ratio of subscribers per tower, which would eventually improve the Quality of Service (QoS) across Argentina. As a result, the telecom infrastructure industry should consider the creation of a chamber to lobby towards a favourable set of norms and regulations.

TowerXchange: Where do you see the level of investment by towercos in the country going? How many towers are being built by independent towercos in 2017?

Miguel Angel Arrigoni, Chairman and Chief Executive Officer, First Corporate Finance Advisors: Out of the many towercos with a presence in Argentina, only a few have active build-to-suit contracts with MNOs. In fact I believe that MNOs are still testing the efficiency and opportunity of working with towercos; my estimate is that towercos will be responsible for around 400-500 new sites by the end of 2017, but this number is likely to increase next year.

The main limitation is not really the availability of capital to deploy, rather it is the volume of new deployments that MNOs commit to, the difficulties in the permitting process and the availability of high quality suppliers.

With regards to this last point, I actually think that there is an opportunity for equipment and service providers from across the region to enter Argentina as the demand for new sites increases.

TowerXchange: What do you think is needed to improve the competition against MNOs and their level of investment?

Miguel Angel Arrigoni, Chairman and Chief Executive Officer, First Corporate Finance Advisors: It's going to be very hard to modify the status quo as MNOs show resistance to invest and the government isn’t really demanding an improvement in the QoS.

To date it’s not clear whether the new telecom law is going to address the most pressing issues in the short term and it seems to me that a long term plan allowing the industry to fully bloom is not really shaping up.

In my opinion, deregulation in the telecom sector, for example allowing MNOs and cable companies to compete, creates a more dynamic and competitive environment. As the economy keeps stabilising, long term financing options should become more easily available and facilitate investments.
The Future Network

In this section, The Future Network highlights some of the latest innovations “beyond towers”, from edge data centres at the tower, as discussed by DataBank’s CEO, to Ranplan’s insights into how to skillfully deploy in-building and outdoor het-nets.

Additionally, The Future Network asked leading professionals involved in het-net solutions at the TowerXchange Meetup Asia their predictions and forecasts on what 5G will mean to mobile network operators worldwide. Lastly, readers can gain insights into Project Loon, a revolutionary connectivity solution developed by X, the moonshot factory of Alphabet (a Google company).

Don’t miss:
103 DataBank: Edge data centres @ the tower?
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110 How to plan and deploy an integrated in-building and urban outdoor heterogeneous network
114 Project Loon as a complementary infrastructure solution of the future
As content must get closer to the end user, so must data centres. From today’s large scale data centres in tier one and tier two cities, could future use cases require thousands of micro data centres dispersed closer to the network edge? And could towercos host those data centres at the foot of cell sites? If so, do towercos want to lease space to data centre companies, or buy/operate their own data centres? DataBank is one of the latest acquisitions of visionary infrastructure investor Digital Bridge – we spoke to DataBank CEO and serial data centre entrepreneur Raul Martynek.

Keywords: Americas Insights, Data Centre, DataBank, Digital Bridge, Insights, Site Level Profitability, TFN, The Future Network, USA, Valuation

Read this article to learn:
- What are the opportunities at the convergence of the towerco and data centre business models?
- Which technology use cases will require content to get closer to the end user?
- Will towercos want to lease space at their sites to third party data centre operators, or will towercos want to own the data centres?
- Commonalities in the investor pool attracted to data centres and towers

The Future Network: Thanks for speaking to us today Raul. Please would you introduce our readers to the data centre market, to its convergence with the tower market, and to the concept of edge data centres.

Raul Martynek, CEO, DataBank: The concept of edge data centres has come out of the evolution of the data centre sector.

The first incarnations of data centres occurred during the bubble era, but when the bubble burst a lot of empty data centres went bankrupt.

From 2001-2004 the data centre sector re-invented itself to house critical IT infrastructure for rising “Web 2.0” companies and corporate enterprises. Many enterprises had built and were struggling to manage their own data centres, but increasingly they realised that it was better to outsource to a multi-tenant data centre operator, lowering the enterprises’ cost base and enabling them to focus on their core business.

In the U.S., the data centre industry was initially concentrated in five big tier one markets: the New York Metropolitan areas, Ashburn for Washington DC, Chicago, Dallas, and San Francisco / Santa Clara, which have all been key internet interconnection points from the outset. The principle being that content has to live on servers and storage, thus data centres should be close to the nodes (“on-ramps”) of the Internet.
So now we have the rise of the concept of the edge. The rise of video has started to break the Internet. Delivery of over the top (OTT) content is increasingly carried via the Internet instead of via coax cable. Consider an Internet user in Ohio, who hits a piece of content that physically resides in Washington and California. It takes time to deliver that content as a function of latency. Now we cannot deliver content only from the five tier one markets – data has to move closer to the end user.

**The Future Network: Where does DataBank fit in this ecosystem?**

Raul Martynek, CEO, DataBank: I joined Digital Bridge in December 2015 after selling my previous data centre business. We wanted to differentiate our entry as an edge data centre play. By early 2016 we had our investment thesis thought through and just needed an expandable asset to invest in. We saw that in DataBank, which we acquired in July 2016. DataBank started in Dallas, a tier one market, but has expanded into several non-tier one cities including Kansas City, Minneapolis, Salt Lake City, Cleveland, Pittsburgh, Atlanta and Baltimore.

At the heart of our vision is this concept of bringing content and computation closer to the end user. Consider the U.S. data centre strategy of a company like Apple with all the information they have to deliver to the iPhone; health, photos and everything else up in the iCloud. Companies like Apple, Uber and Facebook are increasingly deploying infrastructure closer to population centres – instead of serving St Louis from Chicago, serving them locally from St Louis.

**The Future Network: And how do you see the convergence of edge data centres and towers?**

Raul Martynek, CEO, DataBank: Co-locating edge data centres at existing towers is the logical conclusion as the bits and bytes continue to get closer to the end user. The idea may be a little ahead of its time now, but we’re keen to be a first mover!

Let’s consider a city like Minneapolis, with its population of around 2mn. A company like Amazon may want to put local infrastructure within 50 miles of Minneapolis, which was previously served...
from another more distant location. There are hundreds, probably thousands of macro towers in Minneapolis – with a cell tower we could get content from 50 miles to within half a mile of the user. At the speed of light, the difference between content travelling half a mile versus 50 miles is less than half a millisecond – with today’s technology use cases, there isn’t sufficient incremental benefit. But with autonomous vehicles, robots and AI replicating human activity – and requiring close to real time computation – content will need to be half a mile, not 50 miles from the end user.

Like carriers don’t want to just be a dumb pipe, tower industry stakeholders are also starting to recognise they provision more than just vertical real estate. Towercos and their partners provision connectivity, and that presents an opportunity to further monetise our networks and the end users on our network.

We created a cross company team within Digital Bridge to track these converging sectors, to leverage existing customer relationships, and to facilitate end users taking advantage of our unique architecture for delivery of content and bytes.

Digital Bridge are assembling a unique portfolio of companies; Vertical Bridge, Mexico Tower Partners and Andean Tower Partners – our tower plays; DataBank and Vantage for data centres; and ExteNet Systems for small cells. Is small cell a competitor to edge computing? As fibre-fed small cells become even more numerous, converging fibre becomes a good place to put data centres – with links to thousands of small cells.

The Future Network: Am I right in thinking there have been no deployments of edge data centres at towers yet?

Raul Martynek, CEO, DataBank: We’re at ground zero in 2018 – there have been no edge production deployments yet. But companies like ourselves, Vapor IO (which has partnered with Crown Castle), and Edge Micro are getting a lot of press. We’re all positioning ourselves to be perceived as a good partner of whomever the end user of this edge architecture is going to be.

The Future Network: That begs the question, who will be the end user of this architecture?

Raul Martynek, CEO, DataBank: Most cell towers are effectively monopolies in providing connectivity to a given locality of end users. And an edge data centre represents the fastest way to deliver access. So the killer apps will be whatever puts the greatest pressure on latency. Autonomous vehicles, for example, generate 3TB of data per day from hundreds of sensors sampling many thousands of times per second. And that data may have to be stored for six months to investigate accidents – it will be heavily regulated.

Video is another use case: ultra HD, augmented and virtual reality. If that were incorporated into a car to aid the driver in understanding their physical environment, it would create a huge data need in real time (<5 milliseconds).

In order to really kick-start the convergence of towers and edge data centres, there has to be an economic business case to support the 1,000-
1,500 users typically served by each developed market cell tower.

Those business cases may also come from industrial automation: robotics, IoT services over large geographies, or manufacturing IoT localised in a given facility, using drones and robots and RFID tags on mobile vehicles... this all gives rise to significant complexity, requiring ubiquitous coverage.

Consider the example of LinkNYC, now part of Google, which has transformed tens of thousands of dysfunctional payphones on sidewalks into thousands of fibreised monolithic kiosks with armoured flat screen monitors generating advertising revenue, but with dozens of sensors in the base: noise detection that can hear disturbances, even gunshots; chemical analyses, waste management. That kind of approach makes sense to create an IoT in New York; edge data centres are an analogous way of achieving this in a less dense metropolis.

The Future Network: Do you think tower companies will want to lease space at cell sites to third parties to operate these micro data centres at the network edge, or do you think the towercos will want to own the data centres?

Raul Martynek, CEO, DataBank: The towercos haven't decided yet which model to follow. Towercos already effectively operate edge data centres today – they build a cabinet with a controlled environment and lease to carriers to put their network equipment in there. Conceptually speaking, that's exactly what a data centre is.

Existing data centre operators aren't running to towercos to secure a huge volume of edge data centre sites. We're busy continuing to build larger scale buildings, that's what our customers want at the moment.

Hence you're hearing about alliances between data centre and tower companies, but it's like a set from a Western movie: they're just facades with nothing behind them.

Nonetheless, it would be foolish for towercos not to investigate opportunities in edge data centres.

a data centre starts with a negative NOI, typically breaks even at around 25% occupancy, with a contribution margin of 80% or better after breakeven. At 75% occupancy and above, the model becomes extremely attractive, much like the tower model with a tenancy ratio above two.

It all comes down to where content is going, and the changing requirements of subscribers and enterprises.

The Future Network: Talk to us about the commonalities in the business model between data centres and towers.

Raul Martynek, CEO, DataBank: The data centre business model shares a lot of commonality with the tower model.

That said, we must still educate and get investors comfortable with the differences in competitive dynamics and customer dynamics. For example U.S. towercos have four primary customers signing 10-15 year leases, while in the data centre business we have 1,200 customers with an average contract length of 48 months.
Both and data centres are capital intensive up front – data centres costing around US$10mn per megawatt. We might spend half of that up front to get the shell up and running – often with no customers up front – and a data centre burns more maintenance than a tower. So a data centre starts with a negative NOI, typically breaks even at around 25% occupancy, with a contribution margin of 80% or better after breakeven. At 75% occupancy and above, the model becomes extremely attractive, much like the tower model with a tenancy ratio above two. Revenue growth in the data centre business might be characterised as more gradual and less regular. At scale both are very attractive business models.

While the valuation of towers boils down to forecasting the lease up rate, similarly the valuation of data centre assets is a function of historical and forecast future leasing on a projected KW per quarter basis.

Perhaps the biggest difference is that churn is typically higher in data centres, around 8% per annum, versus half that in towers. Most the churn in the data centre market is related to the dynamism of the Digital Economy – consolidations, bankruptcies et cetera.

The Future Network: Talk to us about the commonalities in the investor pool attracted to data centres and towers.

Raul Martynek, CEO, DataBank: Once upon a time towers weren’t considered infrastructure – now the listed towercos are Real Estate Investment Trusts (REITs). The five publicly listed data centre operators in the U.S. are also REITs. It is not a big stretch for an investor in a towerco REIT to get into data centres, and vice versa.

This is my third year at Digital Bridge, and the interest of traditional real estate and infrastructure investors in data centres is at its highest level over those three years.

Crown Castle is now putting a significant percentage of their investment capital into fibre – which is a vehicle for both towers and data centres.

The Future Network: How would you characterise the M&A pipeline in data centres?

Raul Martynek, CEO, DataBank: Extremely active over the last five years.

Compared to towers, the data centre ecosystem is highly fragmented. In the USA alone there are 250-350 data centre operators.

Consolidation will happen – it just started later because the sector is younger. For example there are four companies consolidated into DataBank.

There are lots of data centre entrepreneurs and investors looking to make timely exits, and lots of appetite to consolidate.

The Future Network: How would you summarise the current state of the edge data centre market.

Raul Martynek, CEO, DataBank: We’re not there yet – the current model of data centres is meeting current requirements, and it generates economies of scale. In a future ecosystem of dispersed edge data centres at thousands of locations, we’ll need feet on the street everywhere.

Standing back from the hype, there remain considerable barriers to the adoption of distributed micro data centre architecture, and we have yet to determine whether the continued expansion of traditional cloud computing and colocation could obviate the need for edge data centres at the tower.

Raul Martynek and Alex Gellman, CEO of Vertical Bridge, will be presenting on “Micro data centres at the base of communication towers to enhance data delivery through edge computing” at the 5th TowerXchange Meetup Americas, taking place on 20-21 June at the Boca Raton Resort and Club. For more information and to register, visit: https://www.towerxchange.com/meetup/meetup-americas/.
What does 5G mean for MNOs and infrastructure providers?

20 predictions and forecasts from The Future Network at the TowerXchange Meetup Asia

When it comes to 5G, there are arguably more unknowns than knowns. Speeds will be faster and increased densification of sites will be required but how will this be achieved, how will it be monetised and what will be the implications on stakeholders in today’s market? As stakeholders search for clarification and answers, The Future Network reports back on the top 20 viewpoints and premonitions shared during December’s roundtable discussion.

**Keywords:** 5G, Active Equipment, Asia, Backhaul & FTTT, Business Model, Capacity Enhancements, Capex, Co-location, Core Network, DAS, Densification, Energy, Europe, IBS, Infrastructure Sharing, Installation, Investment, LTE, Leasing & Permitting, Network Rollout, Small Cells, Towercos, Urban vs Rural

Read this article to learn:

- The barriers holding MNOs back from investing in rural networks
- Different infrastructure sharing options being proposed
- Options for sourcing lower cost technologies and why simplification is key
- The potential for alternatives to GSM coverage
- The importance of how projects are financed

Predictions and forecasts surrounding 5G and its impact on telecoms infrastructure

1. **Asia will see the first 5G deployments:** Along with the USA; Japan and South Korea will be two markets where 5G is first to be rolled out with a general consensus that deployments will start in 2019 with the first systems online in 2020

2. **More sites will be required:** Increased densification of sites is universally recognised as being fundamental to the deployment of 5G

3. **MNOs are still trying to work out use cases that make 5G make sense:** It is essential that MNOs find ways to generate incremental revenue in order to offset the cost of 5G deployment. Driverless cars are widely being touted as one of the key use cases, although many feel this was a way off; additionally opportunities for MNOs in the content space exist but it is a tough game

4. **Question marks exist over whether 5G is essential for many IoT applications:** People talk a lot about 5G and IoT but many IoT solutions can actually work across 2G technology thus negating the requirement to upgrade networks

5. **Frequency allocations likely to be 3.5GHz:** Whilst it remained to be seen what the frequency allocations for 5G will be, 3.5GHz was the most commonly cited frequency that is likely to be used.

6. **Rural deployment of 5G will depend on whether 700MHz spectrum is allocated:** Whether 5G will be rolled out in rural areas people thought was dependent on whether lower frequency spectrum would be allocated to the technology. 700MHz
spectrum was seen as being the most useful and without it, it would be difficult to make a case for 5G.

7. **Fibrisation of towers will be of paramount importance:** Provision of backhaul is a must in enabling 5G deployment, and fibrisation of towers will play a big part in this. Some work around fibrisation of towers has already been done during 4G deployment but more is required. There is a strong role for towercos in the fibre space with Crown Castle in the US and towercos in Indonesia already starting to get involved and offer fibre as a value added service. For the time being, it was thought that towercos would only be looking at fibre in urban areas.

8. **Street furniture will be key:** With a requirement to densify, obtaining the rights to street furniture will be a key tactic in rolling out 5G in urban areas.

9. **There will be a lot of trial and error long the way:** The business model for 5G rollout is far from defined and participants felt that there would be a lot of trial and error and water under the bridge as stakeholders strive towards a model that works.

10. **New types of companies will emerge as competitors to traditional players:** Participants from outside of the existing industry are likely to start to play a role in the deployment of 5G, with entities which are working on land banking sites likely to be one such key stakeholder in the future.

11. **Further MNO consolidation is likely:** With the investment required for 5G, it is likely that we will see further MNO consolidation in developed markets leading to no more than three of four players present in any given market.

12. **As new companies delve into fibre and small cells, regulatory issues will arise:** Having solely operated passive equipment in the past, in many markets towercos have been outside of regulation. As infracos look towards fibre and small cells some regulators stipulate that new licenses will be required.

13. **The right balance of integration testing needs to be struck for open protocol base stations:** Under open protocol, whilst different equipment can be put together in a base station it is important to ensure that this works efficiently as a unit. Whilst such testing is important, putting too much expenditure into testing pushes up the cost of the unit which hampers the economics that open protocol is trying to achieve.

14. **Antenna will have higher power requirements:** Due to the high frequencies likely to be allocated to 5G, there will be higher energy consumption by the antenna which could create challenges, not least due to increased opex.

15. **MNOs could look at sharing antenna to reduce costs:** Whilst regulatory issues need to be overcome, MNOs may look toward shared antenna in a bid to control the capex surrounding 5G deployment.

16. **The step between 4G and 5G is less obvious than 2G-3G or 3G-4G:** The difference in capability moving from 2G to 3G was obvious. Whist the step from 3G to 4G was less clear, the difference was in the devices: as the iPhone came to market suddenly 3G data speeds weren’t enough. With 5G there is a feeling that people are already happy enough with the 4G speeds that they are receiving.

17. **In markets where 4G enhanced exists it is likely to delay 5G rollout:** With 4G enhanced delivering an improved offering on top of 4G, markets where the technology exists would be likely to see a delay in the adoption of 5G.

18. **Once the first movers move, 5G deployment will be an arms race:** Deployment of 5G by one MNO is likely to spur its competitors into deployment, even if the economics do not yet fully stack up.

19. **Margins will be squeezed across the value chain:** Due to the high cost of deployment, it is inevitable that MNOs will continue to squeeze their suppliers and partners for price reductions from everything from the price of hardware from vendors to rents paid to towercos.

20. **Small cells aren’t yet a tried and tested solution:** There have been announcements in the US in the past couple of weeks that small cells haven’t been working for MNOs in the country, further technological enhancements are required.
How to plan and deploy an integrated in-building and urban outdoor heterogeneous network

Wireless propagation gurus Ranplan enable seamless connectivity

Given that we have to use the same spectrum indoors and outdoors, a heterogeneous, indoor and outdoor network must be planned in a holistic integrated manner. Ranplan offers the only tool on the market able to support MNOs, OEMs, systems integrators and neutral hosts in the planning of an integrated in-building and urban outdoor network. Their 3D wireless modelling and simulation software helps to save time and money in network deployment, with use cases from enterprise IBS and industrial IoT, to smart cities, transportation and public safety.

Keywords: 4G, 5G, Active Equipment, Densification, IBS, IoT, LTE, Multi-Region, Ranplan, Small Cells, Smart Cities, TFN, The Future Network

The Future Network: Please introduce yourself and your company.

Alastair Williamson, CEO, Ranplan Wireless: Ranplan Wireless is a research centric business focusing on wireless propagation, with a unique tool for planning an integrated in-building and urban outdoor wireless network. Our first suite of products was launched in 2012 and we secured our first key customers in Ericsson and Huawei. We’re now a team of around 50 people, 35 of whom remain focused on product development, with our HQ in the UK and subsidiaries in China and the USA. I’ve been with Ranplan Wireless since 2012, having previously worked at Cambridge Broadband, Alcatel-Lucent, Lucent, and AT&T.

The Future Network: What is Ranplan’s value proposition?

Alastair Williamson, CEO, Ranplan Wireless: We’ve developed a joint in-building and outdoor wireless planning tool. This give operators, OEMs, systems integrators and neutral hosts the opportunity to plan, simulate and predict their indoor and outdoor coverage, capacity and quality of service prior to deployment. With Ranplan’s enhanced level of accuracy, we can reduce the time taken to plan the network ahead of deployment. Our key differentiator is our joint in-building and outdoor planning capabilities – no-one else can offer this combined functionality in a single tool. So when you’re planning a heterogeneous network, you can plan your in-building coverage in co-ordination with the outdoor environment.

Read this article to learn:
- The criticality of planning an integrated in-building and urban outdoor network
- How to mitigate interference between in-building and outdoor networks using the same spectrum
- The progress of towercos and other neutral hosts in addressing the indoor market
- The unique requirements of planning public safety networks
- Improving workers’ efficiency through IoT and enhancing Digital Lifestyles through smart cities
So we enable the densification of a single, integrated network both indoor and outdoors—critical when planning dense urban networks, such as those putting small cells in urban “canyons” or leveraging street furniture.

**The Future Network: How does it work?**

**Alastair Williamson, CEO, Ranplan Wireless:**

The way it works is that the software simultaneously models both the indoor and outdoor environments, including the complex propagation interaction between them, to provide to provide a true picture of the Heterogeneous network performance.

One of key intellectual properties is around our proprietary ray-tracing algorithm. It’s 3D based and supports multi-path rays. It supports MIMO and can accurately simulate coverage and capacity both indoors and outdoors.

**The Future Network: What are the pain points that bring customers to you, and how have their requirements, and the product, evolved since 2012?**

**Alastair Williamson, CEO, Ranplan Wireless:**

Our product suite has evolved substantially since 2012. Our proprietary 3D ray-tracing algorithm supports all frequencies from 100MHz to 60GHz, so we can can support 2G to 5G, millimeter wave spectrum, TETRA, P25, emerging IoT standards—all the technologies that fit in that spectrum range.

We follow the latest standards, and as new wireless technologies come along, we incorporate these standards into our software.

As for the pain points we’ve solved, spectrum is of course incredibly expensive. Operators use the same spectrum in both the indoors and the outdoor macro environment, so how do you plan heterogeneous networks to mitigate interference between different network layers? Ranplan’s unique tools allow the planning of in-building and urban outdoor networks and the mitigation of interference.

Operators use the same spectrum in both the indoors and the outdoor macro environment, so how do you plan heterogeneous networks to mitigate interference between different network layers?”
Spectrum management is a key focus for MNOs, hence densification and the requirement to plan and co-ordinate different layers of the heterogeneous network – macro, outdoor small cells, indoor DAS and indoor small cells – to deliver the best quality of service to the end user.

Traditionally the outdoor and indoor networks were planned in isolation, using separate tools, but now Ranplan has introduced one tool for in-building and urban outdoor environments.

The Future Network: Are Ranplan helping towercos, new market entrants focusing on IBS and small cells, and other neutral hosts increase their comfort levels with the transition from outdoor to indoor network planning and management?

Alastair Williamson, CEO, Ranplan Wireless:
The opportunity to work with towercos and other neutral hosts varies geographically.

Towercos in the U.S. have grasped the concept of urban densification and in building wireless, and are aggressively pursuing opportunities to act as neutral hosts. The business model is proven and allows a greater proliferation of in building solutions (IBS) in use cases where ROI is greater when the network is shared.

In other regions the neutral hosts or towercos have been more focused on the macro layer – towers – but I see quite a few starting to look at the in-building market and generating a profit from it. We've had discussions with towercos in APAC, where they're starting to aggressively pursue that market, for example edotco is one of our customers.

The Future Network: I know Ranplan has a subsidiary and is very active in China – do you see China Tower Corporation (CTC) getting involved in IBS and small cells?

Alastair Williamson, CEO, Ranplan Wireless:
Small cells and IBS remain the province of the MNOs in China at the moment, but I can see CTC getting involved in the future. Right now our focus in China is on supporting the MNOs and OEMs such as Huawei.

The Future Network: Who do you sell your solutions to?

Alastair Williamson, CEO, Ranplan Wireless:
Our customers can be split into four brackets.

First, MNOs wanting to do their own design work, who then handover to a systems integrator to do the installation. Secondly, systems integrators using the tool to do their own designs to submit to the MNOs for approval. Thirdly, large telecom OEMs offering an end to end planning, design and installation service.

And the newest customer segment for us are neutral hosts, particularly towercos that are expanding their business model to branch out into design work and installation either for their own site planning or their clients. Within that neutral host category, we also include disruptive new market entrants focusing entirely on in-building solutions.

With 80% of mobile traffic originating or terminating in buildings, yet only 2% of commercial buildings having a dedicated wireless network, there is a huge opportunity for growth in this space.

The Future Network: Are there any recent projects that you are particularly proud of and that you are able to talk us through?

Alastair Williamson, CEO, Ranplan Wireless:
People are not just using our tool to plan in-building wireless networks. We’re also seeing applications in planning wireless networks for transportation – underground transit networks, motorway tunnels, underground and overground railway stations.

The public safety market is moving from TETRA (and P25 in US) to LTE, which offers us another dynamic for planning networks. In a public safety context, people need to plan indoor coverage in untraditional areas such as stairwells, lifts,
garages, or underground parking. The criticality of public safety networks adds complexity and strict regulatory requirements to report on when doing simulation prediction – we have an absolute appreciation of the need for critical services, not best effort services, which makes a joint indoor-outdoor planning tool like ours essential.

The Future Network: You are doing a lot of work in providing smart city solutions at the moment, and recently announced that APAC governments, operators and integrators need to take a fresh look at how they can provide ubiquitous wireless connectivity. Could you please talk us through why you see the greatest need in the APAC region?

Alastair Williamson, CEO, Ranplan Wireless:
The proliferation of smart cities across Europe and the U.S. and their emergence in Asia is another great opportunity for us.

In Europe and the U.S. in particular, the concept of municipalities wanting to rollout a smart city by providing the underlying infrastructure within a city environment on which to add applications such as smart lighting, smart metering and traffic control, while also increasing the operational efficiency of workers, and enhancing citizens’ Digital Lifestyle will be critical to attracting more corporates into that city and generating income.

Our dense urban / indoor network design enables the design of the infrastructure of a smart city before it has been physically deployed, saving time and money.

We see a great need for this in Asia. Cities like Singapore are already well advanced, other countries have a big opportunity for MNOs and municipalities to put infrastructure in. And of course there is a role for a neutral host and other new entrants in smart cities – the shared network business model may be more attractive to municipal stakeholders than for a single carrier to deploy the network.

The Future Network: And finally, how do you see the future of cellular networks evolving?

Alastair Williamson, CEO, Ranplan Wireless:
Cellular network evolution is driven by the explosion in mobile data traffic – not just from human consumers but ubiquitous networks carrying voice and data, providing connectivity to humans, machines, and enabling automation.

From this has arisen the concept of delivering open standard cellular networks that carry traffic across these ubiquitous markets. While the evolution of standards continues to drive new technologies, we must strive to move from disparate to totally integrated networks.
Project Loon is the revolutionary connectivity solution being developed by X, the R&D subsidiary or “moonshot factory” of Google’s parent company, Alphabet. A network of balloons, travelling on the edge of space, Project Loon seeks to connect people in rural and remote areas, fill coverage gaps and bring people back online after disasters. TowerXchange were delighted to speak to Project Loon’s Strategy and Operations Director, Mauro Goncalves de Oliveira Filho to understand Project Loon’s vision and progress and learn how it aims to complement other infrastructure solutions.

Keywords: Best of TowerXchange, Google, Insights, LTE, MNOs, Multi-Region, Peru, Project Loon, Telefónica, The Future Network, Universal Access, Urban vs Rural, X

Project Loon as a complementary infrastructure solution of the future

How X’s revolutionary solution is set to tackle coverage gaps where conventional infrastructure models don’t work

TowerXchange: What is Project Loon about?

Mauro Goncalves de Oliveira Filho, Strategy and Operations Director, Project Loon, X: Project Loon is a network of stratospheric balloons designed to provide a cost-effective way for mobile network operators to extend their LTE network connectivity to millions more people in rural and remote areas across the world.

We believe that high altitude balloons are uniquely positioned to help mobile network operators bring connectivity to these areas. Floating roughly 20kms up in the stratosphere, Loon balloons are far enough away from the ground to provide a significantly larger coverage footprint per unit, at roughly 5,000km² per balloon. This helps overcome some of the economic challenges of building infrastructure in areas where communities are far more geographically dispersed. But Loon balloons are also close enough to the earth that they are able to deliver that connectivity direct to the standard LTE phones of our partner’s customers.

TowerXchange: What stage is it at, what trials have been conducted, what developments are being focused on?

Mauro Goncalves de Oliveira Filho, Strategy and Operations Director, Project Loon, X: Over the last few years we have been focused on research and development, conducting a series of small technical trials with multiple network operators around the world to co-develop an infrastructure solution that can seamlessly integrate into a partner’s network.
Earlier this year, we worked with Telefónica in Peru to respond to widespread flooding by starting to deliver balloon-powered connectivity to thousands of users across 40,000km² of affected areas in the country. Operating at this scale in the real world is allowing us to quickly refine the technology, and this is where our focus is at the moment.

**TowerXchange: What is Project Loon’s niche and how big is the addressable market that it is looking to target? What work still needs to be done to map this out?**

**Mauro Goncalves de Oliveira Filho, Strategy and Operations Director, Project Loon, X:** Even by the most conservative estimates there are over a billion people who live completely outside the reach of mobile broadband connectivity. Additionally, many hundreds of millions more are covered only intermittently - whether due to frequent movement between disparate areas of coverage, or by residing along the fringes of current coverage areas where they experience severely intermittent service, particularly during periods of high demand. Due to the relative proximity to areas where there is coverage, these areas already have significant device penetration and demand for connectivity, but these customers are currently severely underserved.

In terms of mapping out this opportunity, data for network planning is of course less comprehensive and well-documented in many of these areas. We’ve been working to understand this more, by using new data solutions to analyse population distribution, income levels and other metrics useful for network planning - but also by getting boots on the ground, conducting research in exactly the type of areas we want to help network operators extend coverage to.

Additionally, like many other infrastructure companies focused on rural and last mile connectivity, we are discussing a number of different potential business models with network operators that aim to minimise some of the commercial risk in bringing connectivity to areas where there are more unknowns in terms of the overall market opportunity.

**TowerXchange: How has the initiative been received by MNO partners and governments to date; what appetite do you see amongst the broader community?**
Mauro Goncalves de Oliveira Filho, Strategy and Operations Director, Project Loon, X: We are incredibly grateful for the supportive and encouraging response we have received to date. We share a common goal with many governments and partners worldwide, which is to provide more connectivity to more people in more places. Loon’s potential to deliver coverage instantly to vast swathes of land in a given country can help reach universal service targets set by governments. Additionally, because our balloons drift across many different countries around the world, we require the support of multiple intergovernmental organisations to enable us to operate effectively at scale. Last year ICAO, the United Nation’s civil aviation body, acknowledged that Loon is consistent with the United Nations’ sustainable development goals, and encouraged countries to enable flight in their airspace.

Of course, MNOs have goals that are directly aligned with Project Loon’s offering - expanding the coverage area of their network and maximising the utilization of their spectrum investments, and do so in a way that makes sense economically. This has meant we’ve been able to find innovative partners that have been willing to test the technology and work with Project Loon. Since recently demonstrating the ability of Project Loon to deliver connectivity at scale, we’re seeing this support now turn into a real appetite to begin rolling out the solution in more countries around the world.

**TowerXchange: How do you see Loon complementing other forms of coverage? Will there be requirements for other forms of rural coverage once Loon is up and running? Do you envision that it has the potential to support urban coverage?**

Mauro Goncalves de Oliveira Filho, Strategy and Operations Director, Project Loon, X: We think that the fact that so many people globally are still outside of mobile broadband coverage areas shows that this is not an easy problem to solve, and most certainly won’t be solved by any one company or technology alone. Indeed, much of our work with MNOs has involved demonstrating that Loon connectivity can seamlessly co-exist with their current and planned cell-tower coverage - and in
many instances even help guide their planned cell-tower rollout.

With regards to urban coverage specifically, we think there is a huge opportunity for Loon to be useful on the fringes of urban networks. From our user research in multiple markets we’ve seen just how intermittent and unpredictable coverage can become the further you move from the centre of cell-site coverage, and just how far customers are forced to go - and in fact do go - just to get a usable connection. This is currently a huge missed opportunity for operators, where they have an active customer base, but limited availability currently caps usage way below the actual level of demand in these areas.

**TowerXchange:** What appetite do you have to work with other MNOs and what attitude do the companies need to have to get involved in Loon at this stage in its development?

Mauro Goncalves de Oliveira Filho, Strategy and Operations Director, Project Loon, X: We are always open to discussing implementation with any network operator globally. Of course, we are a new technology, and a unique one at that! Add this to the fact that the market in unserved areas is much less familiar to operators, and it is probably unsurprising that we’ve had the most success with MNOs and teams within those MNOs who have a much more innovative attitude. That little bit more flexibility and a willingness to work with us as a technology partner as we continue to improve our offering over time has been critical in getting our technology to the point it’s at today.
Executive perspectives

In this section of the TowerXchange Americas Dossier 2018, we offer our readers insights from some of the leading experts in the CALA tower industry. Exclusive interviews and reports from the panels held at the 2017 edition of the TowerXchange Meetup Americas provide unique perspectives on the regional industry, its future and opportunities.

Articles feature insights from top organisations such as American Tower, SBA Communications, Digital Bridge, Entel Peru, Macquarie, Andean Tower Partners, Torrecom, Berkshire Partners, Mexico Tower Partners, Phoenix Tower International and more.

Don’t miss:
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www.towerxchange.com
AMT, SBA and GTS:
CALA tower market still attractive and growing

Business leaders from region’s leading towercos on stage at the fourth TowerXchange Meetup Americas

The opening panel of the fourth TowerXchange Meetup Americas offered a strategic overview of the dynamics of the Central and South American tower market thanks to insights from Olivier Puech, CEO - LatAm at American Tower, Jim Eisenstein, Chairman of Grupo TorreSur and Kurt Bagwell, President - International at SBA Communications. Here is a summary of findings from the executive panel moderated by TowerXchange’s long standing contributor Enda Hardiman, Managing Partner at Hardiman Telecommunications.

Key drivers of doing business in CALA

There are 20+ countries in CALA and each market is at different stages of network deployment with some moving into 4G spectrum auctions and therefore requiring high capex investments by the carriers, and others adjusting to lower levels of spending following years of network deployment. And while 4G is becoming a reality across the region, there are still markets shifting from 2G to 3G and it will take more time for next generation networks to be deployed as regional carriers aren’t as wealthy as in the U.S.

In spite of the challenges of doing business in CALA, panelists agreed that the region still presents considerable growth opportunities. However, they also commented that discipline is needed when assessing new markets and that the criteria taken into consideration must include stable economics and political environment - which is particularly crucial for listed towercos and other entities that seek to make long term commitments to markets. A
healthy level of competition in the telecom market as well as a positive regulatory environment were also mentioned as priorities. And when it comes to the carriers landscape, markets with three players tend to be preferred, but exceptions like Nicaragua, essentially a two-player market, could work too.

Another critical consideration is the potential of the market to deliver scale to towercos. Large entities like American Tower and SBA prefer to enter a new market via an acquisition in order to start with a sizable base. However, SBA’s Bagwell noted that there are always exceptions, for example SBA entered Costa Rica via pure build-to-suit.

**Will CALA towercos consolidate?**

CALA is home to 30+ towercos and the assumption has always been that large entities like SBA and American Tower (but also Phoenix Tower International and Digital Bridge’s ATP and MTP) would end up acquiring most of the independent developers and drive consolidation.

Touching upon the topic, panelists agreed that the high quantity of towercos in the region suggest that we could see some M&A in the future. The entry of private equity-backed towercos was made possible in CALA due to its proximity with the United States and the subsequent interest of U.S. capital in this adjacent and yet underserved region. And some LatAm markets more than others - namely Mexico, Colombia and Brazil - were able to attract 10+ towercos due to their size, carriers landscape and growth prospects.

While the immaturity of CALA markets has played a great role in enabling the entrance of several towercos in the region, the real size of each market is likely to define whether they will ultimately host a towercos ‘natural monopoly’ or not. So while Brazil with its size and needs can welcome more than one towercos in the long run, smaller markets might eventually see towercos consolidating and one or two entities taking the lead.

On the other hand, panelists discussed the potential for consolidation among MNOs which could well be on the cards in Brazil, but not before Oi’s bankruptcy is solved. Oi could end up being restructured or sold in its entirety, or broken up into portions, and any of these options could lead to what was defined a virtuous circle thanks to which MNOs enjoy a less competitive environment which enables them to increase their network capex, resulting in more sites being deployed and more capacity for data consumption and, eventually, in more revenue in the hands of carriers.

**CALA still needs tens of thousands of towers!**

...And more sites being deployed is just what CALA countries need! In fact, most regional markets need several thousand sites each to achieve optimal levels of coverage. And the number of subscribers per site is expected to come down overtime from 3-4,000+ to 1,500-2,000 but low ARPPUs are slowing the process. What might help is the expanding middle class across the region which could enable the change. And some carriers are already serving those pockets of relatively wealthy population by increasing capacity in highly congested areas via short macro-towers, rooftops and other infill solutions.

Cell site densification is made easier in markets with a favourable regulatory environment and panelists...
noted how certain key CALA markets aren’t there yet in their efforts to define a positive legal, regulatory and permitting regime for the telecom sector. This is the case in Chile for example, whose stringent new build requirements and zoning rules have inhibited the entrance of towercos and slowed build-to-suit plans. Or Colombia, whose 700MHz spectrum auction hasn’t been completed yet after two years of announcements and preparation.

Permitting for new sites is particularly challenging in urban areas. And it’s specifically to serve urban areas that carriers are increasingly demanding new site typologies to towercos. Shorter and lighter structures are being requested in high quantities and towercos need to safeguard their returns while meeting the demand for new solutions such as small cells, short macros and rooftops.

What drives growth in CALA?

In spite of the changes and innovation in site typology and the challenges of permitting and deploying greenfield sites, organic growth is the number one growth driver in today’s telecom infrastructure industry.

As AMT’s Puech noted, American Tower is present in eight markets with an overall CALA portfolio of over 36,000 sites and is now looking at scaling up in those markets first while keeping an eye on new opportunities for inorganic growth such as the recent acquisition in Paraguay.

Grupo TorreSur’s Eisenstein agreed that organic growth from existing tenants is their main source of revenue growth and the company is now focused on overlays and amendments to its portfolio of 6,500 sites. GTS is also focused on increasing its co-locations and is carefully adding selected new sites via BTS only when there’s a quick opportunity to add a second tenant.

SBA’s Bagwell drew the attention on the importance of working on the ground leases under the towers. In fact, while in the United States the ground lease is sometimes included, it is often a pass-through in CALA. SBA has a dedicated team that works on extending or buying out ground leases at accretive multiples.

After a high level overview of the governing dynamics of the CALA tower industry as a whole, panelists shifted to comment on selected markets including Mexico, Brazil and Central America.

Exciting times ahead of Mexico?

There are high expectations with regards to the impact of the ‘Red Compartida’ 700MHz shared network in terms of co-locations, although there are less indicators of future build-to-suit needs. The government has taken a bold stance by incentivising competition and addressing preponderant players in Mexico via both the opening of the 700MHz spectrum and the entrance of AT&T. As a result Mexico’s tower companies have renewed hopes for improved growth and opportunities.

Is Brazil finally emerging from uncertainty?

Improvements in the overall economy as well as
in various industrial sectors are more perceived than real. Citizens do feel better about the state of the economy in the country but the tangled political situation isn’t really getting solved. However, Brazil achieved GDP growth for the first quarter since Q1 2015, inflation is coming down and industrial production is going up. These are the early stages of what everyone hopes could be a firm recovery but there are still many uncertainties and high levels of unemployment. From an investment standpoint, FX risk remains high and this is particularly true for private equity investors with US dollar-denominated investments in the country as well as towercos with debt in US dollars. Overall, Brazil is in a better place to do business than a year ago but there’s still a long way to go.

With regards to Oi, it was noted that the Brazilian carrier - now dealing with its 2016 bankruptcy - has been fulfilling its financial obligations towards towercos in a timely manner over the past year. Oi is reportedly investing in co-locations as well as amendments which is definitely good news for towercos active in Brazil! And while the final solution for Oi isn’t clear yet and the whole situation remains complicated, from a towerco standpoint it hasn’t had all the expected negative effects.

A few good words on Central America...

According to SBA, Central America as a pack is an exciting place where to do business. The towerco has added over 2,500 sites to its regional portfolio with more than half of it coming from build-to-suit programme. With solid economics, a capable local workforce, US dollar-denominated contracts and consistent growth, Central America has delivered fabulous opportunities over the past few years. And remains a great source of growth for active towercos!

In conclusion, panelists noted that the wireless industry has proven very resilient during challenging times and hasn’t been as affected as other sectors by the global economic slowdown. While key CALA countries such as Mexico, Brazil, Colombia, Peru, Chile and Argentina all progress towards economic recovery, data consumption is expected to keep growing and this can only mean more business opportunities opening up for smart infrastructure companies able to select the right markets and partners, while being disciplined about their models and return.
(Re)defining towercos

Digital Bridge: an evolutionary tale of the convergence of towers, small cells, data centres and fibre

What is a tower? What is its mission in the telecom infrastructure ecosystem? Are towercos in the real estate business? Or should they take their game one (or three) steps further into the worlds of small cells, data centres and fibre?

According to Marc Ganzi, CEO of infrastructure enterprise Digital Bridge, and his inspirational speech at the fourth TowerXchange Meetup Americas, towercos are much more than their real estate. Here is a summary of his progressive vision for the industry.

Keywords: 3G, 4G, 5G, Americas, Americas Insights, Andean Tower Partners, Business Model, Capex, DAS, Data Bank, Data Centre, Digital Bridge, ExteNet Systems, Fibre, IBS, Infraco, Insights, Investment, IoT, LTE, Market Overview, Meetup Preview, Mexico Tower Partners, North America, Small Cells, South America, Vantage

Read this article to learn:
- Whether towers are a unique asset class or can they provide a replicable model for success
- How the core fundamentals of towers, small cells, data centres and fibre compare
- The impact of data growth on the industry
- What convergence means in the context of 5G

Marc Ganzi, CEO, Digital Bridge

If the traditional towerco model is one of steel and grass, then Digital Bridge, Marc Ganzi’s infrastructure enterprise, has evolved far beyond the definition. Now a global communications infrastructure company, Digital Bridge has committed capital of US$6.7bn and six businesses spanning all core pillars of the mobile and wireless industries: towers, small cells/fibre and data centres.

Expanding beyond towercos

We all know what’s great about towers. They are a “unique asset class delivering both stable yields and capital appreciation.” But, as the mobile industry swiftly changes while shifting to the cloud, the issue becomes what the role of towercos should be, and whether they should open up to new products and move upstream to different - yet complementary - segments of the industry.

Digital Bridge shaped its own response to this question and in 2013, began branching out to the tower industry through Vertical Bridge, Mexico Tower Partners and Andean Tower Partners in the United States, Mexico, Colombia and Peru, respectively; as well as in the small cells and fibre world through ExteNet Systems; and, lastly, data centres via Data Bank and Vantage.

What do towers, small cells, data centres and fibre have in common? While pure-play towercos may argue that the underlying financials differ, the entire wireless ecosystem is actually based on a relatively similar leasing model.
The telecom infrastructure industry in figures

<table>
<thead>
<tr>
<th>US$350bn</th>
<th>10%</th>
<th>6.4%</th>
<th>4.9%</th>
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<tbody>
<tr>
<td>Total market cap of 61 listed companies in the sector</td>
<td>Data centres 5Y revenue CAGR</td>
<td>Towers 5Y revenue CAGR</td>
<td>Fibre 5Y revenue CAGR</td>
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Ganzi stressed that, while “we all understand macro-towers,” not everyone really grasps the similarities and crucial differences across the other components of the ecosystem.

- Small cells and DAS are fibre-fed antenna systems used for indoor and outdoor deployments. The majority of costs come from building the fibre infrastructure for the initial tenant, and revenue comes from the lease of actual network infrastructure to mobile network and cable operators.

- Data centres are powered and cooled buildings that house computer servers and offer co-location, fibre connectivity and managed services to both hyper-scale, large IT loads as well as enterprise. Their highest operational expenses, which are either passed on or marked up to consumers, are the utilities to provide power and cooling. Customers come from the technology world, governments and healthcare.

- Fibre optic cables consist of bundled glass strands that transmit data, offering high bandwidth network capacity through individual fibre strands (dark fibre) or lit services, which they lease to telecom providers, governments, healthcare businesses and other enterprises. The fibre business model is less predictable than those of towers and small cells, mainly due to shorter contracts which lack escalators.

Recreate the “Tower Magic”

While everyone loves towers for their high barriers to entry and the perfect union between telecoms and real estate, many have yet to realise that data centres, fibre and small cells have similar characteristics, and that they are part of a premium asset class that drives attractive returns for investors. In fact, the total market cap of the 60+ public companies operating in the mobile and infrastructure industries reaches US$350bn.

Data centres, small cells and fibre can recreate the “tower magic,” Ganzi highlighted, by allowing the addition of incremental customers, without the cost of new capabilities. The magic is reinforced by increased outsourcing that pushes mobile network operators to divest their non-core assets – not only towers, but also enterprise data centres and small cells.

High growth expectations

The growth pattern of the sector is compelling, with an estimated five-year CAGR at 10% for data centres, 6.4% for towers and 4.9% for fibre. Additionally, the number of enterprise buildings with 20+ employees connected to fibre in the United States increased from 36% in 2012 to 46% in 2015 (source: Vertical Systems Group).

In the data centre industry, there are 401.7MW of data centre capacity under construction, the equivalent of over 400,000 homes (Ganzi clarified that 1MW equates to powering approximately 1,000

Source: Bloomberg consensus estimates and Cowen Research
homes). However, 47% of it is already pre-leased, against the historical trend of pre-leases remaining consistently under 30%.

The main driver behind the high level of growth in these sectors is the surge in mobile data traffic — ranging from 44% in North America and 52% in Western Europe, to over 60% in Eastern Europe and Latin America, 71% in Asia Pacific and 96% in the Middle East.

So, the core of this “transformative moment” is the increasing need to store data. In fact, around 90% of the world’s digital data in existence today has been created over the past two years, and the expected CAGR for global multi-tenant data centres between 2015 and 2020 is 12.4%.

**The power of convergence and 5G**

Ganzi noted that the step function of 5G “may be the most relevant since the transformation from analogue to digital in the mid-nineties, when we thought that 200 new build towers was the biggest thing ever!”

- **Trends** – Ganzi mentioned Multiple-Input Multiple-Output (MiMo), which will drive 5G and push towercos to rethink their current tower model. Ganzi also anticipates Software Defined Networking (SDN) and the virtualisation of the network will push the industry to create fibre-fed access points and light base stations.

- **Implications** – Ganzi went on to stress that towercos must evolve to understand and embrace fibre as the connectivity tissue of the industry, while also grasping the principles of network virtualisation and working to create macro-towers serving as hubs and RAR - Radio Access Rooms - not RAN. The future of the infrastructure industry depends on it.

> “The convergence of all aspects of communications infrastructure is happening now,” Ganzi added and, with that, all segments of the ecosystem – from towercos to fibre companies – are entering the “bandwidth delivery business.”

Some companies have begun to understand and act on the power of convergence by entering other fields. Examples include Crown Castle, whose business encompasses towers, small cells and fibre, and Zayo, who has expanded its traditional fibre business to include small cells.

While the passive infrastructure business has been relatively stable and safe for most companies in the TowerXchange community, Ganzi claims it’s time for companies to realise towers aren’t the only “arrows in the quiver.”

**The customer is always right**

Towercos should listen to the needs of the carriers and focus on customer-centric offerings. Mobile network operators don’t necessarily like the high-rent tower model offered by towercos, and will happily embrace effective and cheaper solutions for their 5G deployments. So, in today’s converged world, towercos should offer diverse types of site solutions and understand how the different pieces of infrastructure and network interact with each other.

As technology evolves, the language of today’s industry is changing and towercos must balance their macro-towers while becoming acquainted with MiMo, C-RAN, SDN and beyond.

**Change is happening – Fast**

Marc Ganzi offered a new take on the evolution of the tower model in the context of convergence and the imminence of 5G deployment. Not all towercos will embrace this vision, given the complex and interdependent segments, each governed by distinct business models and financials. But for those that look at this with curiosity and wonder what is in it for them, one thing should be clear: change is happening, and it’s happening fast.
Why CALA is still an attractive investment platform

Growth and consolidation in the cards for regional towercos

Moderated by Marco Cordoni, Senior Partner within Analysys Mason, the investor panel at the fourth annual TowerXchange Meetup Americas featured Ariana Batori, Investment Officer at the IFC, Beth Michelson, Senior Managing Director, Cartesian Capital, Sachit Ahuja, VP Business Development at Tillman Global Holdings, Peter Bendall, Senior Vice President, Macquarie Infrastructure and Real Assets (MIRA) and Nick Del Deo, Analyst, MoffettNathanson. Here is a summary of their reflections on the investibility of the Central and South American telecom tower markets.

**Keywords:** Americas, Analysys Mason, Argentina, Brazil, Cartesian Capital, Carve Out, Central America, Colombia, Consolidation, Editorial, Exit Strategy, Fibre, IFC, International Finance Corporation, Investment, Investors, MIRA, Macquarie Infrastructure and Real Assets, Market Overview, Mexico, MoffettNathanson, Nicaragua, Operator-Led JV, Private Equity, Small Cells, South America, Tillman Global Holdings, Valuation

Read this article to learn:

- The effects of macroeconomics on the tower sector
- Central America: the attractiveness of U.S. standards, albeit with less scalable potential
- Thoughts on Brazil, Mexico and other maturing markets
- How to build toward a successful exit
- The opportunity of diversifying beyond towers and investing in operator-led towercos

Investors on stage offered an overview of the pros and cons of doing business in CALA and looked at the specific dynamics of Central America, established markets such as Mexico and Brazil, diversification trends beyond macro towers and the critical factors to achieve successful exits.

**Macroeconomics and towers**

The tower model is demand-driven. Towercos need MNOs to believe in the model and release search rings. Therefore any macroeconomic turbulence affecting the level of network investment by MNOs will directly impact the tower build and leasing demand. And forex weakness will directly impact the amount of equipment they are able to buy in U.S. dollars (or in any other strong currency).

Since the tower industry is governed by long term planning and 10-15 year contracts, towercos tend to have some level of protection against forex exposure thanks to contractual escalators, although this doesn’t really help in the short term.

Strong MLAs should include inflation-related clauses that can go as far as including pass-through costs for inflation.

For U.S. equity investors depreciation is an issue, while on the debt side the key factor is the ability of the towerco to actually serve that debt. If a towerco loses 20% of its ability to serve its debt as a result of forex depreciation, and if economic turmoil puts a halt to carriers’ build to suit (BTS) programmes, then investors (and the towerco) could...
be in a perfect storm. And while this might seem a catastrophic scenario, some towercos in CALA have survived despite being greatly affected by forex over the past couple of years.

**Central America**

When it comes to Central America, the region is often seen as having a business model closest to the U.S. golden standard. And the investments made into local towercos have proven to be very positive.

Central America is a U.S. dollar based market, which is one of the greatest advantages of doing business in the region as opposed to South American countries. In fact, investors stressed that making a successful exit in markets where transactions are denominated in local currencies isn’t easy under the current financial climate.

On the other hand Central America presents limitations to growth due to the size of the markets, the presence of less carriers, and lengthy processes to build scale. Patience is the essence in the less dynamic but investment-proofed Central American region, and the payback is relatively assured given the absence of forex risks.

Some investors noted that up until a few years ago, towercos could build a tower in Central America for half the price than in the United States and generate three quarters of the cash flow. And this explains why Central America has been a target for towercos since the early stages of the expansion of the model beyond the United States.

Cartesian’s Michelson discussed their experience in Nicaragua with NMS, which has enjoyed tremendous growth in the country. In fact, in spite of the country’s notorious instability in other sectors, the telecom infrastructure industry is a very stable and safe one due to the fact that local communities tend to understand the importance of mobile connectivity.

**Considerations on mature CALA markets**

In spite of the many expectations regarding AT&T’s entrance in Mexico, so far the carrier’s entry into the market hasn’t yielded many positive results for towercos. However, ÁLTAN Redes is likely to improve the flow of activity for towercos, and this is particularly true at this stage for entities with sizeable portfolios such as American Tower and Telesites.

Colombia is generally seen as a crowded market and one where most investors don’t feel comfortable at the moment. Panellists noted how there’s a “race to the bottom” in lease rates and construction costs at the moment which isn’t healthy for the tower sector. And since Colombia is still working on its much awaited 700MHz spectrum auction, deployment plans have been stalling and the market hasn’t grown as much as towercos expected upon entering.

Brazil is still seen as a very interesting market in spite of its recent financial crisis - which is just now improving. With three large players (AMT, SBA and GTS) and a long tail of smaller providers, the market is bound to experience consolidation waves in the future. Brazil presents a relatively efficient operating environment and towercos have been able to add new towers to their portfolio at low incremental cost.
Investors noted how Mexico, Colombia and Brazil are extremely competitive markets in which to operate. And the attention of towercos and investors is shifting to less obvious options such as Peru, Argentina, the Dominican Republic and El Salvador, to name a few.

Making a successful exit

It may be stating the obvious but the quality of assets is crucial when it comes to looking for a successful exit. Sophisticated towercos will walk away from deals rather than overpaying for “bad towers” and this is particularly true in CALA where there’s often a mismatch between the expectations of the seller and the offer price of the buyer.

Investors agreed that the CALA tower sector is moving towards a consolidation phase and expects acquisitive towercos such as AMT, SBA and Phoenix Tower International (PTI) to seize high quality portfolios across the region.

In reality, portfolios aren’t really evaluated in their entirety but literally analysed tower by tower. Investors noted how they won’t buy mediocre, unlicensed sites, and expect each tower to be built with high engineering standards.

Investors and management teams need to work during the course of the life of a towercos to meet all the characteristics that make a portfolio attractive to a buyer. The rule is actually very straightforward. A seller won’t achieve the full expected multiples unless everything is done just right.

On top of the specific requirements of a portfolio, the macroeconomic conditions of the region have forced some investors to rethink about their exit strategy, as the forex crisis in some countries negatively impacted their chances to obtain the desired multiples.

Diversifying investments beyond towers

While carriers push for towercos to start offering more than just towers, investors and towercos often conclude that the economics and actual management of small cells, fibre and data centres is fundamentally different from the ‘steel and grass’ tower business model.

The tower industry in CALA is ruled by a straightforward real estate model and most towercos do like to keep things as simple as possible. And opinions on stage couldn’t be more diverse.

In fact, some panellists underlined that they felt there was no synergy between leasing towers and managing a small cell portfolio and therefore no industrial logic behind the diversification, especially in light of the stark economic differences. In order to run small cells, operators need to build a network beforehand, invest to add new tenants and simply accept a riskier model.

On the other hand, some investors agreed that the concept of towercos becoming a one-stop-shop to carriers does make sense. But the question is whether than can be done with just one management team. In fact, towers, small cells and fibre all require a very unique set of skills and know-how. And they went on to note that while the return expectations aren’t the same for towers, small cells and fibre, the diversification could still be attractive if the models are comparatively profitable.

A practical example was offered by Tillman’s Sachit Ahuja who discussed their joint venture with JCDecaux. The partnership is granting Tillman access to over 1.5mn billboards which can be utilised to host small cells. Ahuja noted how the business model is fundamentally different in terms of both revenues and growth expectations but it’s
The investibility of operator-led towercos

Operator-led towercos are a relatively new trend and one that investors don’t necessarily appreciate. From a business model standpoint, many of these towercos need to make a considerable transformation to become commercial entities whose core business is leasing and co-locations. And this is particularly crucial and challenging when management teams of operator-led towercos come from an MNO background.

Another challenge this type of towercos have to deal with is the acceptance of other MNOs of their independence. Only when towercos exist as a standalone company - especially from a balance sheet perspective - will co-locating on their sites not be perceived as giving an advantage to their MNO competitors by other operators.

From a financial perspective, investors expect operator-led towercos to generate returns that are less impressive than those of pure-play independent towercos.

Operator-led towercos often look for minority investors because they want to maintain a good degree of control over their operations, which may not be the optimal approach for equity investors used to actively participate in the life of the towerco.

Towercos need considerable capital to grow and prosper and that often comes with a deeper engagement of the investors in the activities of the towerco. Minority positions can be acceptable for some (and a recent example is offered by KKR which has completed the acquisition of 24.8% of Telxius this October) but many equity investors will shy away from them.

To comfortably back up a towerco with a minority stake, investors need to fully believe in the management team and strategy behind the company.

Variety is the spice of life

Once again, investors committed to the Central and South American tower market proved that there simply isn’t one successful recipe that fits all. The region is made of many diverse business models and markets and each investor must work to find their own comfortable niche, which might not be as attractive to others. And this is particularly true now that the CALA tower sector has moved beyond the obvious targets of Brazil, Mexico and even Colombia and is eyeing new markets, exploring alternative business avenues and addressing the needs of a more mature industry.

TowerXchange expects the next few months to be driven by consolidation among towercos and pockets of M&A with MNOs. And looks forward to report on the evolutionary tale of the CALA tower industry at the fifth TowerXchange Meetup Americas, 20-21 June 2018, in Boca Raton (Florida)
Towercos should be aggressive yet responsible in M&A

Finding the balance between scaling up and taking on too many risks remains key

During the fourth TowerXchange Meetup Americas, Dagan Kasavana, CEO of Phoenix Tower International (PTI), David Porte, Vice President - International at SBA Communications (SBA) and Diego Mahecha, CFO of Andean Tower Partners (ATP) took centre stage for a panel discussion on the drivers of inorganic growth and the future of acquisitive towercos across CALA.

Jon Atkin, Managing Director at RBC Capital Markets moderated the session and started by asking panelists for an introduction of their respective companies and to discuss where CALA towercos are looking for growth nowadays.

Porte introduced SBA as a “classic tower company that owns, buys and operates towers” and with regards to the growth expectations in CALA he stressed that if growth is defined by new MNO portfolios coming to market in CALA, then we are likely to experience a slow few years ahead. In fact, little is left to acquire in the region with América Móvil not selling its sites and, if anything, transferring assets to Telesites and Telefónica having divested all of its sellable sites and now either transferring the remainder to Telxius or retaining them. Some carriers, such as Entel and to a certain extent Tigo, still own their tower portfolios and could divest them in the future but the majority of large portfolios have all been sold in the past.

Mahecha was next and defined ATP as a “tower-centric, privately owned entity”, backed by various private equity firms and strategic partner Interconexión Eléctrica S.A (ISA), a Colombian high-voltage infrastructure company with over 17,000 assets that ATP can leverage across the Andean region.

Talking about the growth potential in the Andean region, Mahecha noted that Tigo and Avantel have divested their sites in Colombia while Claro and Telefónica have retained them. In Peru, Entel, Claro and Bitel own their tower portfolios while...
Telefónica took a diversified approach and divested some assets to independent towercos, transferred a portion of its portfolio to Telxius, while also retaining some towers.

Kasavana recalled how PTI’s initial business plan in 2013 was to be a “multinational start-up towerco”. Back in those days PTI’s management felt that the way to compete against larger and established entities like SBA and American Tower would be to have a broad and flexible mandate able to serve carriers across multiple markets.

Since 2013 PTI has proven itself as a strong local partner able to compete with public entities across CALA and has been looking for growth opportunities across various regional markets such as Peru, Colombia, Panama and the Dominican Republic among others, and not shying away from more challenging ones like El Salvador.

**How do investors and shareholders measure growth and risks?**

Investors in the tower industry are generally well educated about the business model and understand its fundamentals. If returns in terms of cash-flow are key, the value that cash-flow creates is equally if not more important than returns and transactions should be structured to maximise the value of the assets. And this is why towercos need to focus on scaling their portfolios carefully, not building or acquiring overlapping sites and always offering quality products.

Publicly traded companies, whose growth is often predictable and safe, tend to focus on having the highest quality growth AFFO per share. “We are a destination towerco” in Porte’s words, which means that most independent towercos build portfolios with the final aim to sell to one of the larger entities and they can afford to take on risks that listed companies cannot afford to. “They drive out the risk of certain deals and portfolios” Porte added “and eventually we are going to pay a certain amount for a properly de-risked portfolio.”

Risks can also come in the form of joint ventures with carriers. This type of agreement might be not acceptable for listed towercos which need to consolidate results, indeed it should be accepted under strict conditions even by private towercos. In fact, most towercos still prefer to retain full control over their assets and will bend towards a joint venture only if deemed highly strategic. This is particularly true for private towercos looking for an exit, who need to make sure they don’t get stuck in deals that don’t make sense to a buyer.

Private equity investors often focus on Internal Rate of Return (IRR) and Multiple On Invested Capital (MOIC) and typically utilise 5-7 year models to calculate them. Their return thresholds are often
quite aggressive and don’t necessarily take into consideration the higher level of risk taken on by towercos in CALA versus in the U.S.

On the risk side, the fluctuation of currency has to be dealt with a great degree of flexibility in determining the timeframe for an exit. In fact, while PE-backed towercos might need to work with a 5-7 year exit horizon, the forex challenges in Brazil, the Andean region and Mexico might compel them to adjust their exit horizons to maximise their chances of satisfactory multiples.

Forex is a crucial matter in an industry that tends to expand beyond national borders and, while the ideal scenario would always be to invest in stable currency or US Dollar markets, towercos are often forced to adopt escalators tied to inflation or other financial solutions to secure stable growth in less predictable markets. And even so, sometimes the value created through lease-up and escalators remains at risk of being wiped out by forex.

Investing in markets that do not trade in US Dollars requires a deep degree of financial acumen but also a fundamental respect of the basic notion that US Dollars will (almost) always be worth more than the local currency. And this is particularly relevant when towercos seek an exit at times of local currency depreciation and have to return capital in US Dollars.

Looking at this dynamic from the perspective of an acquisitive (often listed) towerco, it’s key to remember than listed towercos always have a choice between acquiring third-party assets or buying their own stocks back. And if they opt for acquiring an existing portfolio, the decision will be based on a detailed and disciplined approach to modelling future returns from the deal.

...With all constitutes a gentle reminder to ensure the math is right when making investments in currencies other than US Dollars!

A look at the state of play in various CALA markets

Panellists discussed some of the specific dynamics of CALA markets and noted how the gruelling task of providing coverage to rural Brazil has forced RANsharing to expand more than in other CALA countries. From their side, towercos can refuse to allow carriers to enter RANsharing agreements or can price it in their contracts.

In the United States and Central America, RANsharing hasn’t been much of a trend and these regions are definitely benefitting from healthier lease up activities. And on the other hand, one market where clauses related to RANsharing have been notoriously lax is Colombia.
Panellists noted how before the opening of the Colombian market, the CALA tower industry was fairly disciplined. ‘Destination towercos’ expected smaller towercos to come to market with quality portfolios, not having signed bad MLAs and not having granted huge discounts to their tenants. But something changed when BTS towercos entered Colombia.

Colombian carriers - maybe more aware of the dynamics of the industry following the opening of other markets like Brazil and Mexico - were quite aggressive in pushing some BTS towercos to accept commercial terms that compromised the quality and integrity of their portfolio. The panel mentioned clauses related to RANsharing, lease discounts, transferability as well as the possibility to cancel the contract altogether that put at risk the returns (and exit) of Colombian BTS firms, and which may leave investors looking for a profitable exit disappointed.

RANsharing doesn’t have to be as value-destructive for towercos as many fear, and it is often a necessity in rural areas, so rather than forbid RANsharing, towercos should impose contractual restrictions that limit the impact on their business. Mahecha stressed that negative decisions and bad clauses do have an immediate effect on the value of a tower and that the market is naturally inclined to go through cleansing phases which happened in Brazil too, where several small companies folded due to the uninvestible terms agreed in their MLAs.

The CALA tower market is split between those who understand the model and those who don’t. It’s a simple business but one that requires discipline and the ability to react to market conditions...

**Wearing the CFO hat...**

Discussing the cost of capital and the strategies of public and private towercos with regards to funding M&As, Porte noted that SBA doesn’t win deals due to the lower cost of capital but thanks to the diligent evaluation of the expected returns in 5, 10 and 15 years.

In PTI and ATP’s cases, both companies have European holdings which are used to repatriate cash to finance investments in other markets. Kasavana added that PTI often seals related-party loans, a complex financial structure that enables the towerco to move and utilise capital across multiple countries without taking new equity.

Panelists added that the IFRS accounting changes that will come into force in 2019 mean that while now carriers can divest their towers or enter BTS programmes off their balance sheet and absorb it through EBITDA, in the future every tower lease will go on the balance sheet as a liability. A
As an example, a European towerco has already switched its model from real estate leases to service contracts which is something the participants in this panel did not advocate, especially since CALA markets protect towercos with solid real estate laws and, in Kasavana’s words “towercos are in the real estate business, not in the service sector.”

But are small cells and DAS services or products?

Questioned regarding the nature of small cells and DAS, Kasavana noted that PTI treats these solutions as real estate products and structures its contracts with carriers incorporating escalators and other clauses similar to a tower lease. According to ATP, as a real estate company, a towerco must react to market conditions and follow the trend of what carriers are demanding. The key is to structure the offering as an extension of the towerco business model.

On the other hand, Porte, who has been involved in the DAS space for several years, pointed out that while a DAS is typically worth less than a tower, it can still be a good investment. The key reason for the difference in multiples is that DAS presents lower barriers to entry while requiring more capital and anyone entering the DAS industry should model their returns accordingly.

Commenting on the growth expectations for the next two to three years, PTI is looking at small cells, IBS and DAS to complement its macro-tower offering while always assessing transactions of scale across CALA.

Having recently raised over US$200mn, ATP is focused on putting that capital to use and scaling up its business via both BTS and M&As across the Andean region. “We’ll be aggressive in a responsible manner” Mahecha stressed.

SBA will keep growing the cash-flow on the towers in its portfolio as well as assessing acquisitions if and when the portfolios for sale meet (or exceed) the expected return threshold. Porte added that “markets work better where there are only rational tower operations. SBA doesn’t mind being second or third as long as its portfolio yields high returns.”

In conclusion, while panelists all noted that the CALA tower industry is facing a delicate phase of adjustments that might push some companies out of the competition, they also remained bullish about their companies’ growth horizons. Much is left to be done in CALA both in terms of consolidation among towercos and carriers’ portfolios that could come to market. What remains to be seen is who will make it through these tough times and TowerXchange once again bets on those diligently following the rules while creatively driving growth.
Tough times for the build-to-suit market in CALA

Only disciplined yet creative firms are likely to succeed and beat the competition

The build-to-suit panel at the fourth TowerXchange Meetup Americas offered a unique 360 degree perspective on the industry thanks to the presence of three towercos and a carrier, between them representing markets including Mexico, Nicaragua, Guatemala, Peru and Colombia. The panel focused on the practicalities of rural deployment, the tough competition among towercos, as well as the need for towercos to expand their offering to embrace small cells, DAS, fibre and more.

Keywords: 4G, ARPU, Americas, Americas Insights, BTS Towers, Build-to-Suit, C-Level Perspective, Central America, Colombia, DAS, Entel Peru, Fibre, Guatemala, IBS, Insights, Leasing & Permitting, MLA, Mexico, Mexico Tower Partners, Nicaragua, Off-Grid, Peru, Private Equity, Regulation, Small Cells, South America, Tenant’s Perspective, Torrecom, Urban vs Rural

Read this article to learn:

- Deploying challenging sites in CALA: rural sites, small cells and more...
- The constant battle between price and quality: can towercos and carriers meet in the middle?
- Why towercos aren’t ready to deploy small cells, DAS and fibre
- Why permitting remains the toughest job in new deployments

The panel opened with a brief introduction of Maria Scotti, CEO of Torrecom, José Sola, CEO of Mexico Tower Partners (MTP), Mariano Gomez, EVP at newly formed BTS Towers (and former EVP of NMS) and Entel Peru’s Fernando Álvarez, who quickly jumped on the main topic of the anticipated build volume for the years to come in CALA.

The build-to-suit (BTS) market in today’s crowded CALA

Entel Peru, whose entrance in the country in 2014 changed the competitive landscape and brought lot of new BTS activities to the market, has so far deployed 50% of its sites in-house but is aiming at outsourcing 70% of new builds to towercos going forward.

Torrecom runs a 752-site portfolio across four markets and, with the exception of the 25 sites they recently acquired in Panama, has built all of its sites via BTS. However, Scotti noted how Central American BTS activities, which have been very positive over the past couple of years, are likely to slow down as carriers are now focused on driving consumer usage up rather than on expanding their networks.

MTP is reporting a slow year in Mexican BTS and isn’t expecting that to change dramatically in the near future. In fact, AT&T hasn’t assigned any BTS work to towercos beside an estimated 800 sites soon after its entrance in Mexico, hence disappointing the expectations of the many infrastructure companies counting on its expansion plans.
BTS Towers was created following the sale of NMS Towers to Uniti Towers and is now resuming its BTS activities in Mexico, Central America, Colombia and Peru. “Fiercely competitive markets” in the words of Gomez but as “new beginners” for the second time around, BTS Towers knows very well the rules of the game.

When it comes to network extension, much work is needed in rural areas and we often wonder how the towerco business model can work in areas where towers could remain single tenant for a while.

Nicaragua and Guatemala for example are more rural than urban, and towercos do face tough pricing pressure by the carriers when it comes to negotiating BTS terms. Building a rural site is an expensive proposition due to complex logistics, security and operational issues such as remote, inaccessible locations and weather/terrain conditions. Moreover, many new sites are beyond the existing grid, hence requiring power connectivity, or distributed generation via solar or other renewable solutions, and will often need access control measures.

Towercos aren’t opposed to building rural sites but do need to counterbalance operational and financial considerations with the tough price conditions often imposed by carriers. And in countries with a multitude of towercos, the risk of prices being driven down below sustainable levels is real. A risk that can lead to low quality towers being built at heavily discounted prices.

Beyond macro-towers...

Rural sites are just one example of tough deployments. Entel Peru, and many carriers across CALA, have to comply with stringent coverage targets as set by their licenses and to meet their own sales plans. In the case of Entel Peru, a challenger in its own market ready to experiment new solutions, the status of the network is being reviewed every two weeks by the CEO but negotiations with towercos don’t move as fast. With over ten towercos active in Peru, it is hard to find one that offers a comprehensive array of connectivity solutions and according to Álvarez, and what’s often shown in presentations - small cells, DAS, fibre et cetera - doesn’t always translate into reality as most towercos aren’t ready to actually deploy them. On the other hand, towercos pointed out that now every carrier bets on innovation and quality and often the approach is less focused on partnerships and more on cheap solutions.

Innovation requires towercos to look beyond the pure real estate model offered today in CALA and expand into new site typologies, active solutions and even power. A change in skillset, business and financial modelling that will take quite some time to digest! Carriers are already trying to push for the change but most CALA towercos aren’t quite there yet.

The slow approach to change links back to the business model adopted by most towercos, which is one of high margins and returns for shareholders and private investors. Conventional towercos are putting their expected returns at risks while...
competing with a wide array of new BTS firms, who are sometimes ready to offer carriers deeply discounted terms other towercos simply cannot match. And this spiral needs to be contextualised with the reality of markets like Mexico or Colombia where demand for new sites is not high enough to justify the growing number of infrastructure entities, whether they be conventional towercos or construction companies now offering BTS services.

What is clear is that towercos aren’t ready to offer what carriers are starting to need, and needing with increasing urgency. Thus carriers are self-deploying small cells, fibre and DAS in the absence of third parties to do the job. Is innovation moving too fast for CALA towercos? Are they too focused on their low risk real estate businesses?

Do towercos understand carriers?

Interestingly, Torrecom’s Scotti highlighted that towercos often don’t pay enough attention to what drives the carriers’ business and tend to disconnect from the reality of consumer activity, ARPU, subscriber churn et cetera. Some towercos might not be able to meet the needs of carriers because of the way they are financed, but all towercos should know more and understand in depth the reality of the mobile market, since they are one of its key partners. And if towercos are under pricing pressure, the same can be said about carriers which are squeezed between the cost of network deployment and new technology and a subscriber base that requires more data for less money.

The discussion on prices could extend way beyond the time and scope of the panel and panelists agreed that while MLAs lock prices regardless of the location of the site, a dynamic pricing structure would allow towercos and carriers to agree on prices depending on the location, prices of permits et cetera. But would carriers agree to pay a premium when needed? “Some carriers just care about a cheap solution” was one of the comments from the panel but Entel Peru countered that price was not the problem, and that they’d be willing to pay more for the right service or product in certain circumstances.

So maybe it’s true that while towercos and carriers don’t always understand each other, some carriers and some towercos are more willing to come to terms and find common grounds to work together. But that isn’t always true in a market filled with so many BTS entities TowerXchange struggles to track them all!

Consolidation is more of a buzzword than reality

What could make sense due to the high number of BTS firms often struggling for new business would be to consolidate them. And some of the towercos on stage and attending the TowerXchange Meetup Americas surely have an appetite to roll-up existing portfolios across CALA. However, as Torrecom’s Scotti noted, many of these portfolios are built in ways that a disciplined towerco - or a smart investor - would find simply not buyable. Some of the less disciplined entities might have been financed by banks who don’t look at the final product - the tower - the same way an industry investor does. And this
has happened in countries like Mexico where some new firms ramped up to build hundreds of towers after the entrance of AT&T only to find themselves with no more than a handful of towers, and with an unsustainable company structure to maintain.

Something similar happened in Colombia where carriers aren’t yet committing to huge capex while waiting for the 700MHz auction to run (an auction that has been planned for over two years) and tens of towercos crowded the market without enough search rings to go round. This situation has once again resulted in a price war and in some firms accepting very discounted rates and unfavourable conditions which risk of jeopardising the balance of the market and halting the potential for consolidation among towercos in the long run.

Yet another example is Argentina... Less than two years since the entrance of its first towercos, Torresec, Argentina is already starting to look overcrowded with several firms exploring opportunities and only a handful actually deploying, while the government is busy sorting out a new telecom law and general regulatory framework.

These market related, structural problems seem to affect most countries that present attractive conditions on paper such as Colombia, Argentina, Mexico and, to a certain extent, Brazil. And disciplined towercos often refrain to compete for BTS at unsustainable conditions, preferring to grow at a slower pace, building good towers, with all the right paper, at a fair price.

**Is permitting getting any better in CALA?**

Talking about paperwork, the United States have been dealing with a tough permitting landscape for years and panelists noted that over time it has only gotten worse. So it shouldn’t come as a surprise that CALA countries aren’t equipped to deal with permits for telecom infrastructure yet and are just as behind in understanding the model and creating a favourable regulatory environment.

In countries like Guatemala, Nicaragua and Mexico, the regulation is essentially non-existent and towercos often visit municipalities with drawings of towers to literally showcase the final product. So in a way, it’s up to towercos to drive the change and improve the state of things but this is a complicated and expensive proposition both in terms of man-hours and fees. “This remains the most time consuming and expensive part of the deployment process” panelists agreed.

But this isn’t the case everywhere in the CALA region and countries like Peru have a solid regulation and very clear set of documents each municipality requires. In Peru, new towers will meet the resistance of local communities more than anything, indeed the Not In My BackYard (NIMBY) mentality remains a crucial inhibitor to rollout almost everywhere in CALA.

Consumers sometimes don’t understand how mobile services work or how an internet connection reaches their device. It could be worth for carriers, whose brands are often highly recognisable to subscribers, to help the educational process with informative handouts literally explaining the importance of infrastructure in enabling mobile phones to function.

In the case of Entel Peru, the carrier does work with schools and local communities to educate
final consumers and ensure NIMBY issues don’t cause delays in deployment. Local carriers and towercos should be creative when building sites and come up with solutions to secure the desired location and avoid the discontent of the community. TowerXchange has collected examples in the past of towercos giving out tablets to a school that was finally reached by signal... A practical and effective way to demonstrate the benefits of coverage!

And on a final note, panelists stressed that “towers built in the middle of the night”, without the painful but necessary process of community acceptance and obviously permitting, hurts the industry as a whole, and don’t contribute to the acceptance of new infrastructure by local populations.

In conclusion, the panel offered a candid overview of the challenges being faced by carriers and towercos in their day to day activities. The discussion brought the attention to the real problems of negotiations, rural sites, tough competition, and permitting and showed that the traditional towerco business model is indeed evolving, although the change will take quite some time.

It is encouraging to witness the openness and candour of TowerXchange’s panelists on stage, enabling the sharing of information and best practices across the industry and deepening the level of communications among different but complementary stakeholders in the same industry, which sometimes struggle to understand each other - so special thanks are due to Maria, José, Mariano and Fernando!
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**Keywords:** 2degrees, 4G, 5G, Active Infrasharing, Americas, Americas Insights, Andean Tower Partners, Business Model, Central America, DAS, Digital Bridge, Fibre, IBS, ip.access, Infill, Infrastructure Sharing, Insights, LTE, Market Forecasts, Multi-Operator, QoS, RANsharing, SLA, Single RAN, Small Cells, South America, Trilogy International Partners, Uptime, Viva, Wireless 20/20

**Read this article to learn:**
- Understanding the evolving needs of the MNOs
- How can towercos successfully diversify to provide sites and services in the heterogeneous network era
- The role of neutral hosts in extending the sharing paradigm
- Middle-prises and DAS

**Towercos and Distributed Network Systems: towards a different business model**

Infrastructure companies might need to look beyond towers to maximise growth

During the fourth TowerXchange Meetup Americas, panelists took centre stage to discuss the future of the towerco business model and how towercos can remain relevant in an ever-changing technology world. Moderated by Berge Ayvazian, Senior Industry Analyst and Consultant at Wireless 20/20, the panel saw the participation of Estrella Zaharia, CMO of Andean Tower Partners (ATP), Edgar Geidans, Group CTO at Trilogy International Partners and Nick Johnson, CTO, ip.access.

**Understanding the need of your customer**

The panel opened by discussing how towercos can meet the needs of MNOs in terms of new technology and products without getting out of their comfort zone and too far from their core business model.

Estrella noted how towercos need to look beyond macro-towers in today’s competitive market and simply listen to their customers’ demands. If it’s true that small cells require a higher level of complexity - in terms of maintenance, fibre et cetera - while macro-towers remain the core of towercos’ activity, thanks to its sister company ExteNet, a small cells pioneer in the United States, ATP is now able to transfer that experience into Peru and Colombia and its customers have been extremely receptive. “We are running the equipment for our customers, replacing it when necessary as well as performing the necessary maintenance” Estrella added.

The crucial point, according to Edgar, is that the moment a towerco adds an active electronic component to its range of products, it will need to change its structure to serve clients 24/7 with a guaranteed 99.99% uptime in its SLAs. This would represent a significant change for a CALA tower industry very much focused on the real estate model.

On the other hand, while carriers tackled the densification challenge first by focusing on adding extra outdoor coverage and utilising available assets like street lamp poles, the shift towards indoor...
connectivity is tougher and more complex as “dark fibre is less available indoor and players need to deal with property rights and landlords” according to ip.access’s Nick Johnson.

When it comes to outdoor solutions, Edgar noted that carriers review the best possible products, including looking beyond primary vendors, although they tend to work with one of the existing providers (often Huawei or Nokia) for the purposes of simplicity. In Trilogy's case, the operator has about one hundred small cells in place, not really for densification yet but more to fill holes in the network or to overcome Not In My Back-Yard (NIMBY) issues. But - in Edgar's words - “if someone had 200 multi-frequency small cells in place with backhaul, which we could access just by plugging in, we’d be all over that! Usually we buy small cells and our vendors deploy them but we’d be very open to Small Cells as a Service (SCaaS) agreements.”

**What role for towercos?**

Moderator Berge Ayvazian then asked a provocative question to towercos “if Nokia and Huawei can host small cells on behalf of an operator in a given band, then what’s the role of towercos? How can towercos serve multiple operators?”

ATP’s Estrella highlighted that one thing is to manage small cells for the carriers’ own purposes and another one is to serve carriers as a neutral host, deploying first and then offering capacity to customers. ATP can support both models if the economics make sense and its clients in the Andean region are quite open to both options. But while ATP is willing to acquire equipment directly, Estrella stressed that often large carriers can leverage volume discounts better than towercos.

With regards to the choice to outsource versus self-deploying, the panel stressed that each carrier has its own strategy. And while leaders are often inclined to self-deploy, those with lower market share tend to opt for outsourcing, especially if they’ve already sold their passive infrastructure and are used to work with third parties. In-house engineers tend to prefer to have their own network which they can control and manage. But when the volume of small cells grows, the best way to accelerate time to market is to opt for a neutral host and again, this is particularly true for operators seeking a competitive edge against a strong incumbent market leader.

**How to enter the small cell and DAS business**

Berge asked how towercos enter the heterogeneous network business and Estrella stated that after having secured the exclusivity in a few premium venues, ATP is now focusing on iDAS since this is the number one priority for carriers. She added that many carriers are currently trying to deploy cheaper small cell solutions rather than DAS, but ATP is now designing and installing iDAS and then offering it for co-location.

In fact, towercos can either wait for clients to approach them or build solutions and then offer SCaaS. And the ability to either deploy upon request or deploy and then offer for co-location will be particularly crucial as the industry moves towards 5G; a many-headed beast that will surely require a considerable densification effort from all parties.

In the case of ATP, the support and experience of ExteNet has been critical in expanding the inherently multi-operator DAS model to the Andean region. And in Mexico, Mexico Tower Partners, another company of the Digital Bridge family, has...
been learning from ExteNet too and has already deployed DAS in a dozen venues.

Winning small cell customers and extending the sharing paradigm

Discussing the issue of competition among small cell providers, Nick stressed that ip.access competes against its larger competitors by appealing to the pockets of their customers. In fact, while revenues are falling, demand for data is growing at a fast rate and operators simply cannot continue to own their networks indefinitely. ip.access has attacked the problem from an economic perspective as well as from a regulatory angle since many operators do not have time to understand the ever-changing regulatory framework in each market whereas third party hosts often do include this as one of their key services.

Sharing doesn’t mean compromising quality

of service, but it is often a means to facilitate a healthier competition and to manage costs. Often sharing is a necessity that goes beyond passive infrastructure and this is particularly true when it comes to spectrum availability. In some markets, carriers aren’t allowed to combine spectrum or RANshare but at the same time, the GSMA has a mandate to push infrastructure sharing in emerging markets and is tasked to negotiate at a government level to overcome those limitations.

Sometimes active sharing is the only way to bring connectivity in rural areas and, since the ultimate mission of telecom regulators is to raise the standard of living by connecting otherwise underserved remote areas, we are bound to see some changes when it comes to RANsharing and other types of active sharing agreements.

Middleprise market

Berge asked how players can crack the code in the “middleprise” segment which is often too small for DAS and not necessarily multi-operator from day one. In Nick’s words “ip.access identifies great pent up demand among middleprises, especially since enterprise venues need multi-operator services but carriers still want to own the enterprise relationship” ip.access tries to “address this issue with a neutral host model to serve all carriers, the enterprise and their customers with huge positive impacts on their businesses. In fact, the impact of bad mobile service on shared workspaces or hotels can cost 20% occupancy or more!”

Berge concluded the panel by asking how big the diversification opportunity was for towercos in enabling the heterogenous network. ATP’s Estrella noted that as 4G is just the base for 5G, the industry needs to gear up for radical changes - there is simply “no end to the evolution”. To which Edgar replied with the carrier’s perspective “we need space, towers, real estate and small cells. We as operators will welcome a service proposition as we are inclined to preserve capital for other business areas.”

In conclusion, it seems that the road is still quite long for CALA towercos to fully diversify beyond macro towers, but the discussion is there and a few entrepreneurial companies are putting themselves at the forefront of the evolution from the traditional business model. Towercos can become a unique trusted intermediary between landlords and carriers to effectively deploy multi-operator small cell and DAS solutions wherever they are needed, whether indoor or outdoor.
Ganzi and Seiner on Andean Tower Partners’ acquisition of Torres Unidas

Transaction lights blue touch paper for consolidation in CALA towers

Just when we thought that the tower deal making for 2017 was over, Andean Tower Partners (ATP) announced the acquisition of Torres Unidas. The new entity will be the largest private tower company in the Andean region and will be led by former Torres Unidas’ CEO Daniel Seiner, while Estrella Zaharia, former President of ATP, will continue with her responsibilities as Chief Marketing Officer. In this exclusive interview, TowerXchange talked with the Founder and Executive Chairman of ATP, Marc C. Ganzi and CEO Daniel Seiner about the deal, what it means for the two companies and their teams as well as their business strategies going forward.

Keywords: Acquisition, Americas Insights, Andean Tower Partners, Build-to-Suit, Change Management, Chile, Colombia, Consolidation, DAS, Digital Bridge Holdings, IBS, Insights, Peru, Private Equity, Rooftop, Small Cells, South America, Torres Unidas

Read this article to learn:
- Why the Torres Unidas-Andean Tower Partners deal makes sense?
- What’s next in terms of portfolio and team integration?
- What does it take to reach a successful exit?
- Is consolidation going to be a key theme in the CALA region in 2018?

TowerXchange: First of all, congratulations for the recent deal and the creation of a powerhouse towerco for the Andean region! What can you tell us about the deal?

Marc Ganzi, Founder and Executive Chairman, ATP: This transaction is indeed a transformative one for Andean Tower Partners. We are extremely excited to welcome Torres Unidas’ management team on board and Daniel Seiner’s leadership going forward. First and foremost, this transaction was about a great team of people, the possibility to combine forces with Torres Unidas, and expanding wireless infrastructure through the region with the premier best in class management team.

We’ve been following Torres Unidas’ impressive achievements over the past five and a half years, towards becoming one of the largest and more solid private entities in the Andean region. So the opportunity to finally combine it with Andean Tower Partners is thrilling. And it will mean a lot for our customers as well. We’ll offer the largest wireless site portfolio in the Andean region with 2,400 towers, 31,000 master lease sites, twelve DAS networks and a series of additional products such as rooftops, small cells and utility transmission poles – we believe the product offering for our carrier partners is compelling and second to none from a footprint and coverage perspective.

TowerXchange: What are the next steps in terms of management changes and portfolio integration?
Daniel Seiner, CEO, ATP: This transaction offers us greater capability to compete for business in the region. You see, sometimes one plus one adds to more than two, and we foresee a significant increase in business demand for the next couple of years as well as an increase in our product offering. We are trying to keep every member of staff in place and ensure that the team is available to meet the needs of our clients and to ensure we are ready for the deployment of the next generation networks.

TowerXchange: So what’s in the cards for the future? Will you focus on build-to-suit or consider more M&A? Or maybe entries into new markets?

Marc Ganzi, Founder and Executive Chairman, ATP: Our first focus is to integrate people, regional offices and portfolios. We are also very focused on maintaining and strengthening our co-brands in the markets and making sure we have a unified approach to how we best serve our customers. Between Torres Unidas and Andean Tower Partners, we have a rather substantial build-to-suit pipeline of approximately 740 sites that we are building between Colombia, Peru and Chile. Plus we are working on some exciting small cells initiatives in the region. I believe that as carriers work to densify their networks, small cells and DAS will become a more relevant theme over the next couple of years and ATP is the leading developer of small cell networks in the Andean Region today.

Andean Tower Partners is able to deliver indoor and outdoor small cells solutions through a variety of products: our urban ePole solution, Indoor DAS systems, as well as traditional fibre feed outdoor small cells and nodes. Additionally, we have access to ISA’s 35,000 km of dark fibre which allows us to bring fibre to the tower for our clients in Peru and Colombia. All of this creates a holistic package of products and solutions that allows us to best serve our customers and remain ahead of our competitors.

So yes, while geographic expansion is always an interesting opportunity, we see a stronger opportunity to deepen and strengthen our relationships with our wireless customers in the three core Andean countries where we already operate, and that is where we will focus our people, ideas and capital.

In terms of M&A, there are always occasions to acquire portfolios in the region, but they’ll need to have the same credit qualities, location characteristics and underwriting discipline that Daniel has implemented in Torres Unidas for us to be interested. Most M&A opportunities in the region are overpriced, and we are and will remain very selective.

TowerXchange: Daniel, what can you tell us about the discipline needed to get to this milestone deal?

Daniel Seiner, CEO, ATP: This transaction makes sense because our two companies have a very similar
approach to business. Going forward, we need to maintain the same discipline and high standards in how we build towers, how we structure and negotiate ground leases, how we relate to the authorities and how we maintain our sites among other. All these while being responsive to the needs of our clients.

Over the past couple of years, there’s been a wave of newcomers, many of them under-capitalized, entering the market at rather aggressive terms. These newcomers have managed to create some uncertainty in the market by overpromising on terms and not delivering. We are now starting to see many of these players exit the market.

We will remain focused on having the best solutions available for our clients for their long term enjoyment.

TowerXchange: What have been the critical steps in the evolution of Torres Unidas from start-up to acquisition? What can other tower companies worldwide learn from it?

Daniel Seiner, CEO, ATP: Our company story began in 2012 when Torres Unidas was founded and the company acquired a portfolio of 350 sites in Peru. The following year we made acquisitions in Chile and Colombia. We continued our expansion in 2014 and 2015 with the acquisitions of the OLO portfolio in Peru and Nextel portfolio in Chile. While these acquisitions marked huge milestones for Torres Unidas, the key to our evolution has been to always be responsive to our clients’ needs in terms of new construction and co-locations, while maintaining a high level of financial responsibility and discipline.

TowerXchange: What can we expect for 2018? More consolidation in the cards for the CALA region?

Marc Ganzi, Founder and Executive Chairman, ATP: The Torres Unidas transaction is a leading indicator that consolidation is going to be a theme in the future. In fact, some of the key equity sponsors in the region are reaching their third, fourth and fifth year of commitments and might be looking at monetizing their investments soon.

While I believe that there will be more opportunities to consolidate in the region, we’ll look at each portfolio selectively, and the ATP discipline will remain the number one driver of our business. We’ll only seize the right opportunity at the right price, with the right credit attributes and collateral.

We are keenly aware that in 2017 new site construction costs were far lower than per tower M&A prices and that is an important metric for us and the sector to consider. In 2018, Andean Tower Partners will remain a value conscious buyer and builder of sites while looking to increase our footprint and adding value for our customers with innovative site solutions. At the end of the day, we exist primarily to serve our customers, so the most important driver will be serving their needs with infrastructure that is delivered on time and at the right value proposition for their business plan and needs.
Exclusive: Discussion with Berkshire Partners about Torres Unidas

The firm’s experience investing in the Andean region

The acquisition of Torres Unidas by Digital Bridge this past December lights the blue touch paper on the consolidation of CALA’s private towercos. In this exclusive interview, Beth Hoffman, Managing Director at Berkshire Partners, discusses with TowerXchange the investment criteria, business challenges and lessons learned during their Torres Unidas’ experience.

**Keywords:** Americas Insights, Asia, Berkshire Partners, Build-to-Suit, Colombia, Consolidation, Country Risk, Digital Bridge, Exit Strategy, Indonesia, Insights, Investment, Investors, Market Entry, Peru, Private Equity, Protelindo, Regulation, South America, Torres Unidas

**Read this article to learn:**
- The initial investment criteria behind the Torres Unidas venture
- Dynamics to investing in an international business: beliefs and lessons learned
- Were the initial expectations met upon exit?
- Comparisons between investments in Asia and Latin America

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**TowerXchange:** Beth, please tell our readers about your current role within Berkshire Partners and the company’s activities in the telecom infrastructure industry.

**Beth Hoffman, Managing Director, Berkshire Partners:** I am one of the Managing Directors of Berkshire Partners – I joined the firm back in 2003. Within Berkshire, I am focused on the telecom infrastructure investment practice.

Our experience in this segment dates back to the mid-nineties when we invested in what is known today as Crown Castle. Over the past 20 years, we’ve invested in and partnered with Crown Castle a number of times. Since our initial investment in Crown Castle, we have invested in other tower companies both domestically and abroad, including Southeast Asia and Latin America. We have also invested successfully in data centres, fibre, and managed network services companies serving customers on a global basis.

Today, our interest in the sector goes well beyond towers and includes data centres, fibre and other elements of the network. Within our technology and telecom infrastructure focus, we are interested in anything below the application layer, whether a hard asset, software, a service or a combination of these elements. Network and computing environments are becoming increasingly distributed and complex and we are interested in nearly all aspects of effectively deploying and managing these environments, both internationally and in the United States.
TowerXchange: Can you summarise the criteria behind the initial investment in Torres Unidas?

Beth Hoffman, Managing Director, Berkshire Partners: Broadly speaking, I think that the first three criteria to consider relate to the market and its opportunities, the management and lastly, the platform.

With regards to the market, when we started looking at Latin America back in 2012, most investors were focused in Brazil. On the other hand, we eyed an opportunity to enter the Andean Region which looked quite appealing to us.

Peru and the other countries we examined presented the type of growth characteristics that we were looking for: growing demand for coverage and data, a large pool of “data-hungry” consumers, early mobile penetration as well as an underdeveloped infrastructure and telecom sector. The shared infrastructure model wasn’t the norm but these countries enjoyed relatively favourable regulatory environments. Additionally, with three to four strong carriers each, stable economies and acceptable country risk, the Andean Region ticked most boxes we were interested in.

From a management standpoint, we were fortunate to meet Daniel Seiner, who brought years of experience in the Latin American telecom space and who proved to be an outstanding business leader. Daniel then went on to assemble a very strong management team who greatly contributed to the growth of Torres Unidas.

Additionally, we had the strong support of our Advisor Director, John Kelly, who had previously served as CEO of Crown Castle for a decade and whose experience and leadership gave us a lot of confidence when we started Torres Unidas. He effectively served as Chairman of the towerco and worked very closely with Daniel Seiner, especially during the initial stages of the company.

TowerXchange: 2012-2017 is a perfect five year lifecycle for a private equity backed towerco. How did Torres Unidas achieve its milestones? And how much interaction and synergies occurred between the management and Berkshire?

Beth Hoffman, Managing Director, Berkshire Partners: In 2012, when we acquired the first 350 towers from Telefónica in Peru, we were a start-up company. We had quite a lot of experience in the sector but effectively were the new players in the market region. As a result, the involvement of Berkshire Partners was quite high in the beginning.

Daniel Seiner was new to a CEO role but is smart, commercial and was very familiar with the local markets. We had quite a few lessons learnt and beliefs from previous investments that we wanted to apply, and Daniel and his team were terrific partners in building what we believed is a first-class wireless infrastructure company.

Over time, as the management team grew stronger, our day to day involvement took a step back and we remained more active only during major M&As or the hiring process of senior management, while acting as a traditional board and allowing Daniel and his team to run the business.

It might not work for others, but we tend to be advisors to our investments and we don’t like to operate on behalf of the management of the companies we commit to.

TowerXchange: If you could give other private equity firms two or three pieces of advice on how to invest in an international towerco, what would they be?

Beth Hoffman, Managing Director, Berkshire Partners: During our time at Crown Castle, we formed some beliefs that were then reflected into Torres Unidas.

I guess that one crucial component is the processes and systems we put in place from the start to track the assets and manage operations. Towers are a highly detailed business to operate; although not complex assets, the attention to detail is crucial to run them properly. From our prior experience in the tower sector, we knew the importance of careful asset management, what was important, and where to turn. This experience helped us to set up Torres Unidas relatively fast and create a platform capable of managing several thousand towers.

Another aspect that we think made a difference was our local presence, knowledge and experience. I
believe that managing a foreign business from the United States without a senior local management team would have increased the complexity and risks. Daniel is from Peru and had worked with Latin American telecom companies for years. While we had an office in Florida, we set up a strong local presence with strong in-country leadership while also selecting the specific elements of the U.S. tower business model that could be and should be applied to the Andean Region. We had to evaluate the realities of the local market and understand the applicability of our learnings from investments in the United States.

Being local also helped us gain the trust of the operators which at the beginning weren’t that familiar or comfortable with the infrastructure sharing model. Daniel recruited an outstanding team over time and we were very fortunate to work with them in this venture.

Lastly, I would strongly recommend to adopt a zero tolerance and robust compliance policy from day one, and that needs to start at the top of the organisational chart all the way down. In the region, there are plenty of opportunities to successfully compete in a very compliant way. We, the board and Daniel, paid a great deal of attention to ensure that the right culture was in place.

_TowerXchange: Thinking about the initial expectations in terms of exit, portfolio growth and overall footprint, how much has been accomplished?_

**Beth Hoffman, Managing Director, Berkshire Partners:** In the early days, when we signed the first deal in Peru, there were no tower companies of scale except American Tower and the industry was in its very early stages.

We established Torres Unidas from scratch and over a period of time, it became a respected provider of shared wireless infrastructure that partnered successfully with carrier clients and achieved positive financial results.

We exceeded our co-location targets, enjoyed strong new build activity, and exceeded our modeled expectations.

On the other hand, we expected more in terms of inorganic growth - that could have gone better had the carriers decided to divest their assets. We thought we could scale to over 5,000 towers but not as many carrier portfolios came to market as we originally expected.

Another factor that didn’t help was the foreign exchange. That said, we were able to achieve positive growth in our business in spite of a 30% foreign exchange headwind.

In terms of operations and overall success, we were pleased with the results we achieved during our ownership chapter. We expected a lot of Daniel and his team and they outperformed our targets. Did it go perfectly? No, it never does. But it exceeded our expectations in spite of quite a few third party factors that played against us.

_TowerXchange: How does the Torres Unidas experience compare to Protelindo’s?_

**Beth Hoffman, Managing Director, Berkshire Partners:** The two investments are considerably different. In fact, Protelindo is a publicly traded company on the Indonesian stock exchange, it runs a much larger portfolio and has been in business for over ten years now. Our level of oversight and time commitment are different too, since we are a minority investor in the business.

Similar to Torres Unidas, Protelindo runs its balance sheets in a very conservative way and enjoys strong leadership. From a market perspective, both are earlier in the deployment of 4G networks and small cells and consumer adoption of data is at an earlier stage than what we see in United States, for example. Like the Andean region, Indonesia presents an attractive carrier landscape with multiple carriers looking to invest in their networks to catch up with wireless demand, and sharing infrastructure makes real economic sense when faced with limited capital budgets. These factors don’t differ much between Indonesia and the Andean region.

_TowerXchange: Is Berkshire considering further commitments in Latin America?_

**Beth Hoffman, Managing Director, Berkshire Partners:** We are always looking for compelling opportunities and remain open to different types of investment in Latin America and other international markets.
A reality check on CALA towers with SBA Communications
How to seal effective deals, which towers are likely to be acquired and the future of BTS

SBA Communications has been an acquisitive force in Central and Latin America since 2010 and has sealed several landmark deals with both carriers and towercos. In this interview with TowerXchange, David Porte, Vice President, International within the company, shares with us insights into the recent deals SBA closed with Torres Andinas, Highline do Brasil and others as well as his thoughts on the consolidation trends hitting CALA and on the guiding principles of the tower industry.

Keywords: Acquisition, Americas Insights, Brazil, Build-to-Suit, Central America, Colombia, Consolidation, Deal Structure, El Salvador, Exit Strategy, Highline do Brasil, Insights, MLA, Market Forecasts, Market Overview, Millicom, Peru, RANsharing, SBA Communications, South America, Tigo, Torres Andinas, Valuation

TowerXchange: What can you tell us about the acquisitions SBA Communications recently sealed in Central and South America?

David Porte, VP International, SBA Communications: Highline do Brasil, Tigo El Salvador and Torres Andinas are the major deals SBA Communications signed over the past few months.

Highline and Torres Andinas are both private deals, in line with our strategy of direct negotiations that ensure the best outcome for both the seller and the buyer. In fact, we’ve been negotiating quite a few private deals to ensure fair returns and conditions for both parties, without the involvement of banks and brokers.

With regards to Highline, we’ve added approximately 900 towers to our Brazilian portfolio as well as a build-to-suit pipeline. In fact, the Highline portfolio included a set of solid build-to-suit contracts with positive terms that were negotiated before a wave of mediocre contracts were signed by numerous towercos across the region.

The acquisition of Torres Andinas’ sites represents a step forward in our footprint across Colombia and Peru. We’ve known the management of the towerco for a few years and we were glad to pick their portfolio up when they were ready to exit the region.

On the other hand, the announced deal with Tigo El Salvador sites did follow a bidding process. We’ve been strong in El Salvador since 2010 and we were...
glad to seal the deal with very solid T&Cs for both parties.

TowerXchange: Can you give us some details regarding the key differences between private and public deals?

David Porte, VP International, SBA Communications:
Private deals offer more flexibility to the seller and don’t force parties to stick to a certain timeframe, as it happens when deals are carried out by banks. In fact, in public processes the seller is constrained to a given deadline to sell while in private deals, the sale can be put on hold if needed.

Private deals are beneficial, both for those looking at quick sales as well as for those who don’t want to rush, offering a higher degree of control. The real key is that bid processes involve complex negotiations and often result in suboptimal T&Cs for the seller. Whereas in private negotiations, both parties can sit down and discuss their terms without any pressure to reach a deal.

TowerXchange: What is driving independent towercos to start divesting their portfolios? Is it just a function of their investment lifecycle coming to an end?

David Porte, VP International, SBA Communications:
I would say that there are three key drivers that are pushing independent developers to divest their portfolios.

On one hand, some of them are indeed getting to the natural end of their investment cycle and looking at exiting, as they originally planned. This has happened in a number of cases such as Torres Unidas, Highline do Brasil and Torres Andinas over the past few months. In some cases the investors had to delay their exits for one or two years later than planned due to slower growth and FX reasons.

A second aspect to keep in mind is that towercos could decide to wait longer to divest their assets but they aren’t going to double the money they’ll make by selling in the first five years. There is a 3 to 5-year sweet spot for growth in the industry and although the seller can hold on to its assets for longer, the growth levels won’t be the same on a percentage basis.

Another factor that is driving exits is that there isn’t much build-to-suit (BTS) activity across CALA anymore. In fact, BTS volume is slowing across the region, especially for companies that are not willing to agree to poor contract terms and conditions. So those who want to play by the books and have already built a good portfolio of sites are ready to exit in order to maximise their returns.

To give you an example, we’ve recently looked at a portfolio for sale during a private process but the MLAs were the worst we’ve ever seen and simply walked away from the deal.

TowerXchange: We’ve been advocating the importance of playing by the books for years now, how come some developers still build towers that acquisitive companies won’t buy?

David Porte, VP International, SBA Communications:
Some of those entities are backed by investors who aren’t educated enough on the industry principles to understand what is being agreed when signing MLAs and how those terms will lower their chances of making a good exit. While some blame the management teams, the investors need to be educated and engaged. Management incentives need to be aligned with value creation, not simply increasing tower count.

We still have some time to wait before people really learn their lessons and investors wise up. The companies with bad contracts are beginning to mature and investors will need to exit.
That's when they will be disappointed and hopefully the whole investment industry will absorb those lessons. It's started already where we have seen a few tower portfolios across CALA which quietly went unsold due to bad underlying contracts, low quality towers and lack of permits.

**TowerXchange: We've talked about it many times but it's worth stressing it again:** what are the key factors that make a portfolio enticing for an acquisitive towerco?

**David Porte, VP International, SBA Communications:** Good MLAs with customers are key; while there are plenty of good rules that towercos should follow during negotiations, such as escalators that keep up with underlying currency inflation and FX, there are a few bad terms that will jeopardise deals.

I am referring to clauses allowing free RANsharing, or the ability to cancel leases without notice. Towercos commit to a US$120k (or more) investment to build a tower for a tenant and shouldn’t grant them the right to notify and leave in 30 days. Contracts have to last until the end of the lease and there is no negotiation around that.

On the other hand, ground lease contracts should always allow sublease as well as cancellation upon notice and shouldn’t include odd escalators.

One might argue that towercos demand terms that are the opposite of what they request to their landlords. But the difference is that towercos commit to a considerable investment upon signing those MLAs while land owners don’t invest anything. And this is a significant element to keep in mind!

Another key element is the underlying paperwork and permits. If a permit is required, towercos should get it, even if it’s after building the tower! In fact, any sort of approval, permit, paperwork will be checked and considered when assessing the value of a portfolio.

Towercos should only build good towers. I am referring to structurally sound towers, able to bear three or more tenants and located in good areas. And this is particularly crucial for those towercos whose investors are pressuring them to cut costs and who might give in and build bad towers as a quick solution.

Lastly, but not least important is the towers shouldn’t be built within the same RF-range of another tower. All of us consolidators price towers off of their growth potential. If you build a site that has no growth potential because it is close to another site, you can’t expect to even recoup your money from that site.

I know that all of the above seems quite straightforward but there are quite a few towers in CALA that no one is going to buy, as a function of those rules having been bypassed.

**TowerXchange: If you think about the beginning of SBA’s activities in the CALA region, do you think the overall expectations have been met so far? And what could have gone differently?**

**David Porte, VP International, SBA Communications:** Our overall expectations with regards to the region and our growth here have been exceeded. We are quite proud of the job we’ve done and although we haven’t done any splashy deals or entered any frontier markets, we’ve managed to grow in line with our disciplined approach.

If you ask me if things could have gone differently, the answer is sure! But I don’t think we’ve ever made a mistake at the time we’ve decided not to enter a market or not to seal a deal. We might have decided not to buy a portfolio in a given country and then found that that particular market was growing faster than expected or delivering more returns than originally forecast. But we didn’t go ahead in light of the set of information we had at the time and in retrospect we couldn’t guess what the future might hold. I wouldn’t call it luck but there is a certain degree of uncertainty when you make a business decision, especially in new, relatively emerging markets. SBA is disciplined and will remain that way.

**TowerXchange: Do you foresee new private equity-backed towercos entering the market now that some “old ones” are looking at exiting? Are there still gaps in the market?**
David Porte, VP International, SBA Communications:
Since the volume of BTS isn't likely to grow and there may only be small gaps in the market, there isn't much room for new entrants to reach scale. So no, I don't think that many new players will enter CALA.

Torres Andinas and Torres Unidas were originally created because none of the larger towercos were interested in doing business in those particular markets back then. Now they've been acquired and their buyers (in this case, SBA Communications and Andean Tower Partners) will take on the responsibility of building sites in those countries. Towercos that are looking for an exit generally leave stronger and more stable tower markets behind.

TowerXchange: With Brazil and Mexico effectively almost “sold out”, acquisitive towercos are eyeing carriers portfolios in less obvious locations such as El Salvador, Paraguay and beyond. Why do these markets make sense for towercos?

David Porte, VP International, SBA Communications:
If a market allows a towerco to reach scale and get good returns, then it makes sense to enter it. Markets like El Salvador still present good growth patterns and chances for us to put capital to work and we will always seize this type of opportunity across the region.

TowerXchange: Do you foresee Argentinian carriers divesting some assets over the course of the next twelve months?

David Porte, VP International, SBA Communications:
In reality, the only portfolio that could be put up for sale in Argentina is Telecom Personal's. In fact, Telefónica is already transferring sites to Telxius and Claro Argentina is likely to stick to the group's strategy not to sell its towers (and if anything, divesting them to Telesites).

That said, the major hurdle to any divestment is still the tax regime in Argentina. No one can afford to sell or buy towers in the country and take on 30% of the purchase price in taxes on fully depreciated tower assets! While the government is looking at addressing this as well as other crucial issues like the out-of-control municipal inspection fees, towercos cannot reach scale in Argentina by buying BTS firms because none of them have considerable portfolios yet.

TowerXchange: Do you agree that 2018 is shaping up to be a year of consolidation among CALA towercos, and if so, how would you summarise your message to tower owners who are thinking about selling?

David Porte, VP International, SBA Communications:
I would say that 2018 isn't going to be bigger than 2017 in terms of deals. Many big players exited the market and there are a few remaining portfolios that could be put up for sale. But questions remain as to whether they are good portfolios!

All I can say to tower owners is that we offer a winning solution for anyone looking at selling, as long as they have good towers. SBA is happy to sit down in private negotiations and partner to achieve desired results for all parties.
Tower One: a new listed towerco for the Americas

Are new towercos better off going public?

Is there an alternative to starting up as a private equity backed towerco? Tower One was created just over two years ago with a new concept in mind: being a lean, agile, healthy public company that operates in the tower industry wherever is needed, from Canada to Argentina. In this candid interview, its CEO Alejandro Ochoa shares his innovative vision with TowerXchange’s readers.

Keywords: Acquisitions, Americas, Americas Insights, Argentina, Build-to-Suit, C-Level Perspectives, Canada, Central America, Colombia, M&A, Market Overview, Mexico, Permitting, Regulations, Sale & Leaseback, South America, Tower One, Towercos

TowerXchange: Please tell us about Tower One, its operations and footprint.

Alejandro Ochoa, Chief Executive Officer, Tower One Wireless: Tower One was launched in 2015 with an atypical approach to the ownership, acquisition and construction of telecom tower sites. Our view is quite different from the view of private equity backed entities who tend to build portfolios with an exit in mind.

Tower One is listed on the Canadian Stock Exchange and therefore entered the industry as a public firm with a mission to create a long term alternative investment platform for those investors interested in the telecom infrastructure sector, but who might not want to invest in a private equity fund or in larger public towercos.

I am the Chief Executive Officer of Tower One and prior to this role, I was one of the Directors of a Canadian investment firm which is now one of our first investors. To date, Tower One counts on more than 1,200 investors and has operations in Canada, the United States, Germany, Colombia, Argentina and, starting in Q1 2018, Mexico.

Tower One draws on the expertise of some of the top executives from across the telecom and infrastructure industries. Among them, Luis Parra as COO, who used to manage QMC Telecom in Colombia and is a build-to-suit (BTS) expert, and Advisor Rolland Bopp, who served as Chairman, President and CEO of Deutsche Telecom in the United States.

Read this article to learn:
- Why being a listed towerco is a plus
- Tower One’s footprint, activities and future plans
- Tower One’s lean business model
- The reality of doing business in Colombia
- The challenges of site permitting in Argentina
TowerXchange: Why did you decide to list Tower One on the Canadian Stock Exchange?

Alejandro Ochoa, Chief Executive Officer, Tower One Wireless: The Canadian Stock Exchange has sealed agreements with various stock exchanges across Latin America, such as Chile, Colombia and Mexico. Therefore, we can easily register Tower One’s stocks in various local markets as well as attract local capital funds who otherwise wouldn’t be able to invest in Tower One.

Our entity is able to operate regionally and access the capital markets of various countries which helps to diversify risk. Our business decisions aren’t always driven by tower market drivers but also by macroeconomic considerations that allow us to increase the value of our stocks.

You see, if we were investors in the stock market, we’d have to choose between American Tower, SBA Communications and Crown Castle. That’s it. These are mature, large companies where the growth perspectives aren’t as exciting as in a start-up environment, and whose price per stock can be prohibitive to many.

When Tower One listed on the Canadian Stock Exchange, the stock was valued at CAD0.15. We now stand at CAD0.32, and the potential for good returns and growth for our investors is virtually limitless!

TowerXchange: What are the differences between being a public company versus a private equity backed towerco?

“A private equity firm often forget that this is Latin America, and their rules simply don’t work in this region.”

Alejandro Ochoa, Chief Executive Officer, Tower One Wireless: When you operate in a private equity environment, the rules of the game are completely different and you have to target very strict key performance indicators. Your investor will often impose to you a certain opex to respect, a given net profitability et cetera, but private equity firms often forget that this is Latin America, and their rules simply don’t work in this region.

Companies like American Tower and SBA Communications can operate also during challenging macroeconomic periods because they have a liquidity surplus. But for some private equity backed entities, the reality of Latin America has proven too challenging. And this is also why I am glad that the crisis hit Colombia as hard as it did, as it helped clear the landscape and consolidate the tower market in a more rational way.

Working in a public environment means that our investors trust us to make the right business decisions and investments and don’t question each and every aspect of our operations.

TowerXchange: Tower One is equally interested in build-to-suit (BTS) as it is involved in the M&A game. Tell us more.

Additionally, we are interested in any inorganic growth opportunity and several funds and banks see us as a possible way to enter the portfolio acquisition game. Larger public entities don’t need to call smaller towercos looking for an exit. It’s the other way around! Tower One is constantly looking for potential deals, whether they are BTS orders or existing portfolios up for sale. But we play a different game than other public towercos.

To give you an example, we were approached by a towerco seeking to sell its portfolio. They said they received a 16x offer by a larger towerco. However, we won’t compete in the multiple game. We offer a combination of both cash and stock, which allows the possibility to keep working with us to grow and make returns superior to a short term vision of comparing offers on a cash basis. This is
what happened in Mexico where we met with a tower provider who had the relationships and the agreements with MNOs but lacked the capital to deploy. And we believe that our future partnership with this Mexican firm will generate considerable growth for both of us.

TowerXchange: How can you ensure that Tower One grows at a good pace?

Alejandro Ochoa, Chief Executive Officer, Tower One Wireless: Our business model is sustainable thanks to the fact that we outsource all the construction, engineering and maintenance to third parties. Therefore, we are able to move very nimbly across the region without the need of an onerous structure. On the other hand, we need solid local partners in each country where we operate.

Because we aren’t looking for an exit, we take into consideration every single opportunity that is presented to us. We want the small orders that other towercos aren’t interested in because if we multiply that order by the many countries where we operate, we will be able to build a considerable portfolio while diversifying operations and minimising the risks.

In a way, the micro-management of an individual country portfolio is less important when a towerco is able to leverage its regional presence. And while we keep expanding in our existing markets, we are also looking at adding a new country to our portfolio every year.

TowerXchange: What are some of the challenges of working in a country alongside an operator-led towerco?

Alejandro Ochoa, Chief Executive Officer, Tower One Wireless: Operator-led towercos are a completely different breed of companies. It’s relatively easy to shift towers from one balance sheet to the other. What’s hard is to deploy towers. And when it comes to BTS, there’s very little difference between Tower One and any operator-led or public towerco. It all depends on how well one knows the market, its dynamics and procedures.

TowerXchange: Why did Tower One enter Colombia in spite of its challenging operating environment?

Alejandro Ochoa, Chief Executive Officer, Tower One Wireless: I am Colombian and I am glad to have the opportunity to operate in my home country with Tower One.

Over the past two years, the depreciation of the local currency in Colombia was such that the investment plans of all mobile network operators changed drastically. Additionally, in July Telefónica dealt with the fine (approximately US$548mn) imposed by a Colombian arbitration court for the installed network infrastructure that the MNO failed to return upon expiration of an agreement with the government over a decade ago. Lastly, the fact that the 700MHz spectrum auction hasn’t been completed yet has resulted in further delays in new network investment by local operators.

On the towerco front, Telesites created much disturbance with its entrance and rumoured take over of Claro’s BTS orders. But eventually it announced that it wouldn’t engage in BTS activities, which to be honest was a relief. In Colombia we have a pipeline of around 150 sites but I have to admit that without the operations we have elsewhere, the current situation in the country would have seriously jeopardised our business.

While some towercos panicked and looked for exits, we decided to invest in other growth avenues in Colombia and sealed important agreements with some municipalities and infrastructure businesses which will be handy when the market picks back up.

Beyond Colombia, we are looking at other markets with interesting growth drivers such as Argentina, which presents broad BTS opportunities at the moment, and Mexico, where we believe there will be various interesting possibilities in the near future thanks to both AT&T and ALTÁN Redes.

TowerXchange: Can you share with our readers some insights into Tower One activities in Argentina?

Alejandro Ochoa, Chief Executive Officer, Tower One Wireless: Argentina is an interesting example of how international investors are skeptical to invest in the country for fear of being unable to repatriate funds. On the other hand, institutional investors who have been operating in Argentina for a while know how to operate following the country’s rules
and simply deal with its changing dynamics. Being able to offer an investor a local bond or stock doesn't only lower our cost of capital, but also allows international investors to comfortably invest in us.

Large towercos entered Argentina in expectation of a tributary reform. Once that happens, it should enable a flow of sale and leaseback deals. But for now, the large towercos aren't really interested in BTS. Tower One is active in the BTS space and is the number one towerco in Argentina for new deployments. And when the time comes we'll look at acquisition opportunities.

In terms of the challenges, I'd say that obtaining permits is still the key task we face in Argentina. In fact, MNOs still deploy their own towers while starting to work on BTS and they have worked in this field for decades and are able to better negotiate with municipalities. Only when the deployment of sites will be entirely done by towercos we will be able to improve our relationship with local entities and take over this crucial part of the BTS work.

**TowerXchange: Which markets are you eyeing for 2018?**

**Alejandro Ochoa, Chief Executive Officer, Tower One Wireless:** In terms of new countries, we are interested in any market that presents good opportunities. We'll consider every new potential market from Central America to Peru, Ecuador and even Bolivia.

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**See you at our future events!**

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**UPDATED: The Sale & Purchase Agreements & Master Lease or Service Agreements that underpin tower transactions**

A closer look at two important parts of the contractual framework for infrastructure sharing

The devil is in the detail – the detail of painstakingly constructed and hard negotiated Sale and Purchase Agreements (SPAs) and Master Lease or Service Agreements (MLAs) that define the main terms in any tower transaction. Jeff Eldredge and Rob Dixon, Partners at Vinson & Elkins, have advised on numerous sale and leaseback transactions in the last few years across Africa, Asia and Europe. Rob and Jeff kindly agreed to meet with TowerXchange and to provide us with an overview of tower sharing SPAs and MLAs.

**Keywords:** Anchor Tenant Privileges, Due Diligence, Infrastructure Sharing, MLA, Novation of Leases, Regulations, SLA, Service Level Agreements, Transfer of Assets, Vinson & Elkins

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**Read this article to learn:**
- The conditions precedent that need to be fulfilled before assets are transferred
- What happens to towers that aren't transferred in the first close
- Why the real value lies in the MLA
- How critical towers are sometimes treated differently

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TowerXchange: What are the key components of a Sale and Purchase Agreement (SPA) in a tower transaction?

Rob Dixon, Partner, Vinson & Elkins: There are of course many components common to all SPAs, but let's concentrate on those components which are unique to towers deals. A key example is the structure and content of the conditions to closing. First, we'll typically have a set of transaction conditions precedents that need to be fulfilled before the deal can happen at all. These would include any over-arching regulatory requirements (for example an operating licence or a competition approval). It's in the tower company's interests, however, to close as swiftly as possible to minimise asset deterioration in the interim period.

Secondly, we'll typically have a set of conditions precedent that need to be fulfilled (or waived) before a specific tower can be transferred. These would normally include good title, satisfactory ground lease arrangements (for example, the right to sub-lease the tower to third party co-locators and to assign leasing arrangements in security) and compliance with regulatory requirements (for example, building permits and environmental consents)... It's potentially a long list!

The buyer will require a certain number of towers before the deal is economically viable. Typically, therefore, the deal will be structured so that closing does not happen unless and until a certain number of towers are ready to be transferred (i.e. the tower-specific conditions precedent are satisfied or waived).
Jeff Eldredge, Partner, Vinson & Elkins: One key point in the process is the extension of ground lease terms. Towers deals can involve thousands of different parcels of land. Different ground leases will expire at different times, giving uncertainty on future costs. The buyer will therefore seek to have the ground leases extended for a reasonable period as part of the transfer process.

Rob Dixon, Partner, Vinson & Elkins: As a result of that and certain other conditions taking time to satisfy, there are typically a number of closings at different times, giving uncertainty on future costs. The buyer will therefore seek to have the ground leases extended for a reasonable period as part of the transfer process.

TowerXchange: What happens to any towers for which the CPs cannot be satisfied?

Rob Dixon, Partner, Vinson & Elkins: The treatment of ‘stub sites’ depends on the deal. The operator is unlikely to have the ongoing capability (or desire) to maintain and operate the sites so the towerco may agree to manage the sites (with the operator retaining ownership). The buyer is likely to conduct legal diligence on a representative sample of sites so that it has a reasonable idea of the position before signing the deal. The SPA is, of course, only one part of a sale and leaseback deal. It’s relatively short-lived compared with the MLA which will often govern the parties’ relationship for many years. The MLA needs to be as future proof as possible.

TowerXchange: So tell us about the critical consideration when drafting Master Lease Agreements.

Jeff Eldredge, Partner, Vinson & Elkins: The MLA is where the real value is for the tower company and where most of the real complexity lies in a deal. It’s a long term contract (with a significant initial term and then options to renew) and a large value contract. The operator needs sufficient flexibility to manage its needs to deploy and maintain equipment, while the towerco needs sufficient control to maximise the co-location opportunities and create a robust long term revenue stream – that’s how they build value. Thus, there’s a natural tension that needs to be resolved to everyone’s satisfaction. Effective governance mechanisms are important.

The MLA is an umbrella agreement which – traditionally – defines the operator’s rights as anchor tenant in terms of leasing space and capacity (wind load) on the transferring towers and the towerco’s obligations to the anchor tenant in terms of such space and capacity (including the service levels which apply). Different rights and obligations typically apply to different towers. For example, network planners can get very nervous about sharing particularly critical towers with other operators and therefore a small number of the towers might be identified as exclusive to the anchor tenant.

Rob Dixon, Partner, Vinson & Elkins: The service levels for different classes of towers are also likely to vary and be closely negotiated. These will typically be set out in a service level agreement, which may form part of the MLA. The impact of IFRS16 on the way in which tower companies provide services is a key topic. There are also of course other agreements which are important in most towers deals – for example the Build to Suit Agreement – but perhaps all of that is for another time!
Women in Towers: Central and South America
Fourteen leading tower professionals on their careers and expectations

TowerXchange is committed to encouraging and enabling diversity and equality across the telecom infrastructure industry. As part of our ongoing work in the tower community, we are pleased to profile some of the most senior women in CALA towers. Women in Towers is a live project and we will be updating it regularly, as well as adding content for the other regions we serve. We have been delighted with the industry response to this project and hope to together inspire the next generation of female leaders! If you’d like to be considered for this feature, or to nominate a colleague, please email me at aneri@towerxchange.com

Keywords: 4G, Acquisition, American Tower, Americas, Americas Insights, Andean Tower Partners, C-level Perspective, Cartesian Capital, Central America, Digital Bridge, Due Diligence, EBITDA, IFC, Infrastructure Sharing, Innovattel, International Finance Corporation, LTE, Leasing & Permitting, Mexico Tower Partners, Regulation, SBA Communications, Small Cells, South America, Torres Unidas, Torresec, Tower People, Towercos, Women in Towers

Read this article to learn:
- The who’s who of women in CALA towers
- Their career paths towards telecom towers
- How the industry has changed since they joined
- Greatest achievements and future ambitions

Please tell us about your background and current role within your company.

Currently, I serve as the Regional Vice President of Operations for Andean Tower Partners (ATP). I oversee local operations across Peru, Chile and Colombia and I am also responsible for the deployment of new products and solutions. Additionally, I head the teams in charge of product design, development and implementation as well as create the company’s vision for new product deployments based on our clients’ needs.

Saira Ballesteros, Regional Vice President of Operations, Andean Tower Partners/Torres Unidas

Arianna Neri, Managing Director, TowerXchange
How did you enter the telecom infrastructure industry? And how have things changed since then?

My first job in the industry was as a NOC operator within Gilat Colombia, a multinational satellite company that was very involved in projects aiming at reducing the digital divide in rural areas of Colombia.

Since then, things have changed radically in the telecom infrastructure sector and we are now in a new growth cycle. Telecommunication solutions are now more widely available to people regardless of their location, social class, age and other factors and telecoms are starting to really look like a universal service. However, the level of deployment is still not enough to guarantee universal access and we are still working to increase capacity and coverage to meet the challenges of the current “data tsunami”.

The broader access to telecommunications is driven by many factors such as demand and society evolution as well as the affordability of new technology. These factors are generating an unprecedented demand and are pushing for alternative services and solutions to boost connectivity.

The characteristics of the average consumer have also changed and the evolution is partly due to the effect that technology has on society. Who would have anticipated 10 years ago that people would meet and have relationships over the internet or social media? This requires not only coverage but densification of the available infrastructure.

What has been the greatest achievement in your career so far?

What moves me is to create and be part of a team able to bring telecom services to underserved areas and to witness how this generates growth to the community, contributing to enhanced education and breaking social barriers.

Connecting people, families, enabling rural schools with technologies via satellite, mobile or fibre – this is my greatest achievement!

And looking ahead, what is your greatest professional ambition?

I hope to be able to continue contributing to the deployment of new infrastructure across the Andean region, to change lives and bring people closer together.

Professionally, I will do my best to always be one step ahead of our customers’ expectations. And I will keep structuring our operational model and product offering to generate real value and to meet our customers’ needs.

Patricia Bogarin, Vice President and General Counsel, Mexico Tower Partners

Please tell us about your background and current role within your company.

I graduated in Law from the National University of San Marcos in my native Lima, Peru and was later admitted by the CAL (Lima Bar Association) to pursue private practice with a specialisation in strategic consulting for the acquisition, disposition and development of real estate.

I worked for several years in private practice prior to moving to the United States and continuing my career here.
I have been the Vice President and General Counsel of MTP since its creation in 2013, in charge of providing MTP with the legal instrumentation to run its commercial operations. I am also the Director of Compliance and, as such, am responsible for defining, developing and executing the company’s policies, procedures and corporate programs.

**How did you enter the telecom infrastructure industry? And how have things changed since then?**

After over 10 years of holding several leadership roles in the South Florida real estate sector, specifically in the title business, I was ready for a change. I began my career in the telecommunications industry in 2011 when I joined Global Tower Partners (GTP). There I was an instrumental and key player for the development and implementation of the Legal Division in Latin America. This division was responsible for the legal matters of the company in Mexico and Costa Rica.

As the company grows, so does the need to implement and standardize new processes and create corporate policies. This needs to be done without losing track of our daily activities and with efficiency and clarity that drives us towards our key goals.

**What has been the greatest achievement in your career so far?**

My greatest professional achievement is to deliver on our goals through high-demand times. We are constantly working on something new that pushes us beyond our day-to-day routine. For example, at the origination of MTP we functioned as a startup, particularly in managing our operations and administration. Shortly after, we had to quickly shift and scale when we acquired a large and complex portfolio of towers. Recently, we focused on using our tower infrastructure to establish a local market asset-backed security, the first of its kind in Latin America. We are constantly setting the bar for ourselves and the rest of the industry, and once we exceed the bar, we look for new opportunities to grow and innovate.

I pride myself in being able to combine all the predictable tasks of a general counsel with the unexpected hurdles that these new projects throw at us. I believe that this balance between our foundation and innovation is what makes MTP a standout company in the telecom infrastructure industry.

**And looking ahead, what is your greatest professional ambition?**

The tower market in Mexico is growing at a very high rate and according to multiple studies, will need to keep growing to expand capacity. I want to be a part of this growth and not just witness changes in the industry, but position MTP as the innovative leader of these changes.

My goal is to contribute to the transformation of the market into a healthy sector that allows for multiple operators, strong competition, and therefore, greater market penetration. This will spur significant infrastructure development, while increasing efficiency of the utilisation of existing infrastructure to guarantee better service.

I hope to accomplish all of this while maintaining a work life balance that allows me to keep enjoying quality time with my husband and daughters.

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**Pilar Caudillo, Vice President – Network and Technology, Mexico Tower Partners**

Please tell us about your background and current role within your company.
My background is in Computer Science and Telecommunications, and during my second year of university, I started working in the largest bank in Mexico (now Citibank, formerly Banamex) in System Architecture. Then I worked for American Express implementing front and back office for their travel agencies.

In 1996, I switched to telecoms as an entrepreneur, representing and selling RF products antennas, repeaters, filters and turnkey projects for both indoor and outdoor coverage.

In 2003, I started a new company Unwired Solutions, which was the first company in Latin America to implement a Neutral Host system in (at that time) the tallest building Torre Mayor.

I was hired by Mexico Tower Partners to develop the company’s DAS portfolio and our first project was Torre Diana (AT&T’s headquarters). Nowadays we have 20 DAS systems, including two iconic buildings (Torre Diana and Torre Manacar).

**How did you enter the telecom infrastructure industry? And how have things changed since then?**

I entered the telecom industry representing a pioneer Swedish company, Allgon, that developed antennas, repeaters and filters. During that experience, I came across and familiarised myself with the key concepts of indoor and outdoor coverage and implemented over 100 turnkey projects for Iusacell.

During those years, I helped all Mexican carriers to implement their first DAS systems as an integrator.

Things have changed with the advent of new technologies. I started working with 2G CDMA - the inception of data - then worked with 3G and 4G, whose speed and quality allow video streaming and beyond. We are now expecting higher speeds with 4.5 and 5G, and more infrastructure needed to achieve the demand.

**What has been the greatest achievement in your career so far?**

My greatest achievement has been to start the very first Neutral Host company in Latin America. And I would like to continue being a pioneer in this industry!

**And looking ahead, what is your greatest professional ambition?**

I want to continue implementing new technology. Our country needs more infrastructure in order to grow and to be competitive, and our job is to provide mobile and internet access to more people. Many of us are now involved in this mission...

The Red Compartida (ÁLTAN Redes shared network) is an ambitious project whose main objective is to reach the farthest towns in order to offer internet access to all our population.

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**Martha Coronel, Operations Director, Mexico Tower Partners**

Please tell us about your background and current role within your company.

I used to serve as Head of Telecom Site Projects for Vant Exgon, a Mexican contractor specialised in the deployment of telecoms infrastructure. Then in 2015, Mexico Tower Partners approached me to work as Head of Operations and since then I have worked in multiple projects and have seen the company growing to more than 1,850 sites. In 2017, I was promoted to Director of Operations.

**How did you enter the telecom infrastructure industry?**
I was always interested in practically contributing to community development and this is the main reason why I studied civil engineering. Once graduated, I cooperated with Axtel for the design of a fibre optic network and then worked in various projects focused on creating strong foundations for telecom towers. This is how I came across the telecom infrastructure sector and in a way, met my goal of contributing to community development by granting them network connectivity.

My career is driven by the desire to enhance the telecom sector in Mexico. I am strongly motivated by the practical impact of telecom infrastructure on society and economies.

In June 2016, the United Nations declared Internet access a human right and this resolution pushes countries across the globe to provide their populations with network access while it condemns those nations that deny this freedom and right; my career mission is in line with this principle.

Nowadays, mobile connectivity is often the one and only means to access internet and this is made possible by companies like MTP, who efficiently deploy infrastructure across Mexico.

And how have things changed since you first entered the market?

Mobile penetration has boomed in Mexico over the past ten years. And will keep growing!

I have also seen the role of women in the industry evolve thanks to our hard work, dedication and perseverance. Many women serve in executive roles and are among the decision makers of this industry.

I am also quite pleased to see how new talent is attracted to this industry. There are increasingly more young girls who decide on an engineering career that has always been historically seen as very tough and manly. We are all mothers, sisters, friends and more... But most of all we are the women behind a new Mexico!

What has been the greatest achievement in your career so far?

Working for MTP and taking over the role of Director of Operations is indubitably a great achievement for me. In this role and thanks to a very strong team, we can contribute to the development of new standards and practices that position Mexico at the forefront of telecoms innovation.

MTP counts on specialised teams able to deploy sites in any environment, being that urban, suburban or rural. We are very strong at working closely with local communities to help them embrace new infrastructure that will be transformative to their lives and to Mexico as a whole.

I am very proud to be working for a company that has been recognised as one of the best places to work for in Mexico by the Great Place to Work Institute. Additionally, MTP has been received recognition as a socially responsible company.

And looking ahead, what is your greatest professional ambition?

I am very excited to be part of this new phase of network advancement and to be looking at 5G! In fact, we are already preparing our infrastructure to be 5G ready. To meet this wave of innovation, I am eager to get involved in new technology projects with DAS and small cells among others.

My career goal is to keep progressing within this industry, taking over roles of even greater responsibility and impact in order to bridge the equality gap in the telecom sector even further.

I have also seen the role of women in the industry evolve thanks to our hard work, dedication and perseverance.
Please tell us about your background and current role within your company.

I have been working in the financial sector for thirty years now, twenty of which I spent as a CFO for various organisations. Among them, I worked in IT companies such as Sun Microsystems, Computer Associates (now CA Technologies), Hitachi Data Systems and in the consulting sector at McKinsey & Company, where I acted as CFO for Latin America.

I then started looking for a new professional challenge and a recruiting company presented me with the opportunity to join American Tower, which at that time was looking for a CFO in Brazil.

Ironically, I had never heard of American Tower or the tower industry before and as I was researching the sector, I realised what a tremendous opportunity this job could represent. American Tower was in the process of sealing important deals in Brazil and the potential for growth was huge.

I joined American Tower three years ago and must say that the journey has been very exciting. Just to give you a sense of the speed of growth of the company, around 80% of the sites the company owns today have been acquired over the past six years!

How has it been to operate as the company’s CFO during the turmoil that affected Brazil?

The crisis that hit Brazil has been mostly political but had an impact on the economy of the country and its industrial sector. Since 2015, MNOs in Brazil have been heavily affected and obviously this has reflected on the tower sector. However, by being a leader in the country and thanks to our solid financial and operational structure, American Tower has been able to stick to its strategy, by continuing to seal deals only when they make sense, not at any cost or price. American Tower has been delivering excellent service throughout this phase, striving to be a great partner to our customers and yes, while there have been some difficult discussions to have and decisions to make, we’ve also been able to promote successful negotiations and alliances that will help MNOs deploy their own strategies.

I guess that our competitive advantage lies in our scale, the expertise we’ve achieved over the years as well as the team we’ve built. On this last point, we’ve also been fortunate to welcome some former MNO and telecom suppliers’ employees who help us better understand our clients’ needs.

What has been the greatest achievement in your career so far?

I think that being a woman and have a CFO career is a challenge and an achievement. While the sector is a male dominated one, that has never really bothered me. That said, I have been fortunate to join American Tower, which is a company that values diversity in all its forms; in fact there are several leading women in key positions across the organisation.

I built my career on two pillars. On the one hand, I want to drive results and make a difference in the company I work in. On the other hand, I am
business oriented and I don’t like to hide myself behind numbers and accounting processes. Most of my time is dedicated to the business units so that I can support them to model our strategies and future moves from a financial standpoint. I also like to directly visit some of our customers and not only their CFOs, but their core business teams, to understand their needs and perspectives.

My team is 100% involved in ensuring that American Tower’s financials are spot on, whether we are talking about how to control internal expenses or defining future structures and strategies. My successes often depend on our ability to set the business team free to focus on sealing deals and finding opportunities while we take care of the financials.

And looking ahead, what is your greatest professional ambition?

I would love to work on an international assignment within American Tower either at the corporate level or in a different Latin American market. Additionally, I think I could add quite a lot of value by modelling a project for a shared service center to take care of non-core functions, something that I have done before and that could deliver great results. Lastly, I am quite passionate about support creating new revenue streams for the business, modelling its financials and being part of a new vision for the future.

Lynne Hopkins, Director, Corporate & Brand Communications, SBA Communications

Please tell us about your background and current role within your company.

My background and expertise are primarily in global marketing and communications for publicly traded organisations, with focus on brand strategy and digital media. I have worked in a variety of sectors, from financial to market research, for Fortune 500 companies in the Business-to-Business segment.

After having worked for New York City-based companies for many years, I accepted a position in Florida at Office Depot, heading the Marketing Communications & Intelligence Department, before joining SBA Communications in June 2010. My position at SBA was newly created, and I originally focused on communications, digital and the brand revitalisation in our U.S. and Canada operations. Within a short time, however, SBA quickened its international expansion into Central and South America and so did our communications and marketing initiatives to support those markets.

How have things changed since you initially joined SBA?

Over the past seven years, much has changed, especially since SBA entered Latin America. Including the United States, SBA is now in thirteen countries in the Western Hemisphere.

One of the most interesting aspects of our growth has been helping to foster the synergies and dynamics between different offices via brand and communications initiatives, ensuring new associates in our international markets feel part of the same organisation. Our emphasis is on local markets backed by the expertise, proven execution and best practices of a global entity. This kind of “organisational connectedness” creates efficiencies, wherein employees can achieve high performance to help SBA execute business strategy and achieve business goals in a coordinated way.
I have always been accustomed to working with international teams spread across multiple countries. At one point, I managed marketing and communications for a company with eighty, large offices worldwide! At SBA, I have particularly enjoyed seeing the company's amazing growth trajectory and how that has influenced how the company is perceived externally by our customers, our investors and the communities in which we serve.

My focus is to ensure that our communications, external marketing strategies and brand are consistent globally. A strong brand identity and cohesive messaging platform help convey the unique SBA story, which is one of excellence and industry leadership in a fast-changing environment.

Another exciting factor at SBA is that the wireless sector is still growing and changing, especially compared to other industries that have reached their maturity.

It’s been rewarding to see the growth in mobile adoption and data demand and how that has impacted some of the achievements of SBA: Attaining the 26,000+ tower mark, completing over 1,000 mergers and acquisitions, consistent operational excellence, on course to attain $10 of AFFO per share by 2020, growth of our vibrant and diverse workforce, and our inclusion in the S&P 500.

What has been the greatest achievement in your career so far?

Like most Brand, Marketing & Communications professionals, I like to think that greater achievements are yet to come. At SBA, I have been very proud to guide new employees in their understanding of our brand and messaging platforms. This is particularly true for some of our international ventures where I am focused on ensuring that teams think globally while interacting locally and genuinely feel connected to the larger SBA organisation.

Additionally, I had the opportunity to spearhead the philanthropic program for SBA, which matches the donations made by our employees to over 100 different national and international charities of their choice. This has become a very popular program at the company and a positive one for the company in terms of Corporate Responsibility and Outreach. It has given me great personal satisfaction to see the program grow and help to change lives.

A couple of years ago, I was honored to be named one of the “Top 25 Most Influential Business Women of the Year” by the South Florida Business Journal. This led to my being invited by the publication's CEO to join a group of other honorees, called “Influentials”, which focuses on women in business and their leadership goals. As part of my activities with the Business Journal, I also mentor women through the “Meet your Mentor” program that helps women find their way in the business world through the advice of more experienced peers. I am very proud of the work this group has been doing to help women achieve their career goals!

Susanne Kandel, General Counsel - Latin America, American Tower

Please tell us about your background and current role within your company.

I joined American Tower in March 2013 and am currently General Counsel for Latin America. Prior to that, I worked for nearly nine years at Paul, Weiss, a leading New York City law firm.
At the firm, I was mostly doing tower deals as a part of their real estate practice, many of which were in international markets. In fact, I represented Millicom in its sale and leaseback in Ghana back in 2010 (the very first sale and leaseback in Africa) and then again in its sales in the DRC, Tanzania and to American Tower in Colombia, as well as Cell C in its deal with American Tower in South Africa.

I happened to know quite a few of American Tower's executives from my years at Paul, Weiss but had never represented the company. Shifting from a law firm to a corporate environment was an easy transition given that I was already acquainted with a lot of key people.

What has changed in the market since the beginning of your career?

I am not directly involved in M&A these days, but what we are seeing across the board is that negotiations are getting more sophisticated. Back in 2009, towercos and MNOs didn't really understand each other's priorities and negotiations could be quite painful. Nowadays, parties tend to know each other and understand each other's pressure points (for better or for worse).

Technology changed too so the priorities in that aspect have shifted accordingly.

What would you say has been one of the most

rewarding aspects of your career so far?

I remember that sense of excitement of doing those first deals in Africa. We knew that cell sites were really changing the way people lived in countries like Tanzania or DRC. We saw the advent of things such as mobile money, mobile health or people being able to quickly assess the value of their crops before going to market. We contributed to a substantial impact and change on people's lives and I have been fortunate to be part of it.

Since I have joined American Tower, I have enjoyed seeing the company grow at an impressive rate. It's been exciting to be part of that growth and expansion across Latin America.

What have been some of the challenges you've dealt with as a lawyer operating in various international environments?

Over the course of my career, I represented tower companies in the United States, operators in Africa and in Latin America and now work for a global tower company with operations across five continents so I have quite a broad perspective on the industry and its dynamics.

I guess that some challenges have been fairly basic, such as language barriers and different attitudes or habits related to how business gets done. As a NY lawyer, I had to become more flexible to understand and successfully function in different environments and cultures.

What is missing from your career that you'd hope to be able to accomplish in the future?

American Tower is such a global organisation that I can see lots of potential for future geographic expansions, new lines of business or adaptation to technology changes. And I cannot wait to see what comes next!
I studied political science and international relations at Goucher College, just north of Baltimore, before moving to Washington DC at the beginning of my career. I wasn’t sure what I wanted to pursue back then and I started working as an Assistant to the President of a non-profit in health and human services, mainly for the Hispanic community. I served in various roles for the group and developed several projects in cities with large Hispanic populations such as Miami, Chicago and Hartford.

After that, I decided to go to law school in Puerto Rico and started my career as a litigator. Just when the Telecommunications Act of 1996 was released, AT&T Wireless came to Puerto Rico to start operations and were my first telecom clients. I acted as an outside counsel for AT&T Wireless on their real estate matters. Back in the days I dealt with landlords I am still meeting nowadays at Innovattel!

During those years, we also worked with Crown Castle, Sprint and Open Mobile, a local carrier for which I did a lot of work beyond real estate such as churn agreements, roaming agreements as well as corporate and commercial litigation. That gave me a new insight and angle on the industry, more focused on the operational side of telecoms rather than the infrastructure business.

How did you see the market evolving since you started working in the sector?

The industry has changed a lot since then. Back in the nineties and early two-thousands, operators preferred not to share their infrastructure as they were convinced that that would keep competition at bay. I remember that there were a lot of so called “tower farms” in Puerto Rico... Pieces of land with two or three towers one next to the other, each one owned by one carrier. Landlords were enjoying that!

Then the government decided to enforce infrastructure sharing and operators were pushed to reinforce existing sites and decommission parallel ones. At the beginning, carriers were just sharing sites among themselves and then towercos entered Puerto Rico to professionalise the sector and offer shared infrastructure.

I think that operators were quite ready for the change while landlords had to accept a major shift. But to date, there are still a few “tower farms” in Puerto Rico.

Please name the number one challenge in your day to day work

One of the most interesting and challenging aspects of my work is the cross-country knowledge needed. In fact, Innovattel runs operations in several countries across the region and this requires a lot of attention and expertise on a variety of legal matters. I have to always ask myself what the implications of each and every operation we perform are, while also trying to standardise our practice and meeting our quality requirements.

What has been the greatest achievement in your career so far?

In my legal career, I recall a case related to a deep-seated slope failure between two residential areas that lasted over thirteen years. It was a complex case between federal and state courts. It was successfully settled after a long litigation and I was the only woman representing the defendant company, a French design/supply firm. That was definitely a highlight of my legal career!

In the telecom field, in 2010 I supported Manuel Aviles in a deal between his then company Innovation Wireless Group, Crown Castle and Berkshire Partners for the sale of 112 towers for US$165mn. That was a great deal I am very proud of having been a part of.

And looking ahead, what is your greatest professional ambition?

I have never dealt with the entrance into a new market from scratch and I am very much looking forward to that opportunity with several new projects at the company. Innovattel is always on the move so I hope I have the chance to make it happen! I am also very excited to work in
Argentina where we run the largest build-to-suit firm in the country. There are several new things in the pipeline for Innovattel and a very exciting time to be part of this company!

I also look forward to advancing the presence of women in the telecom industry, identifying opportunities to mentor new talent and strengthen the network of women in telecom. I believe the increased presence of women will contribute to the industry greatly.

Beth Michelson, Senior Managing Director, Cartesian Capital

Please tell us about your background and current role within your company.

I have been working in the private equity sector for twenty years. Currently, I am a Senior Managing Director at Cartesian Capital Group.

Cartesian is a global private equity manager operating primarily on emerging markets. Our funds are global and opportunity focused.

We are good at building businesses and consider ourselves a throwback to the original concept of private equity: providing growth capital to build companies. Cartesian backs management teams and their strategies to achieve this.

My role is quite multi-functional. I source, evaluate, structure and manage our investments and ultimately help formulate and execute exits. I serve on our companies’ boards; I also work on a weekly and sometimes daily basis with our CEOs and CFOs.

How did you enter the telecom infrastructure industry? And how have things changed since then?

In 1999, we launched a private equity TMT fund, so my experience in the telecom sector dates back to then. At Cartesian, we are thematic investors and agnostic in terms of geographies and sectors. We call our themes “continuities”. Continuities are broad, long-term trends that are driving global growth. One of the continuities we are focused on is the Dominance of Wireless.

So in the early 2000s, we invested in a number of wireless companies primarily in emerging markets. We also started investigating the tower sector. Then, mobile carriers still owned most of their towers, but it didn’t take long for the global recession to push them to outsource their portfolios and monetise them. That’s when we developed a build-to-suit strategy, which we executed with our investment in NMS.

Our idea was to complement American Tower and SBA’s tower expansion strategy in Latin America. However, we didn’t have asset acquisitions in mind but instead new builds. The strategy was to execute new tower builds for carriers, add colocations, achieve critical mass and then sell those portfolios to the large tower companies.

The NMS team was uniquely qualified to execute this strategy because they came from the engineering and construction side of the business. We supported NMS in their initial builds in Nicaragua, which then expanded to Mexico and Colomba. At the same time, we also acquired a small stake in Grupo TorreSur in Brazil.

We sold our Nicaraguan towers to SBA in 2014 and sold the balance to Uniti Towers in January 2017. Following the successful experience with NMS’ management, we are backing them in their new venture, BTS Towers.

How has the wireless industry evolved over the years?

At the beginning of my career the market was
driven by voice services while today the entire telecom business is dominated by data in a way that was unimaginable back then. The appetite of consumers seems insatiable and in the U.S. and in Latin America data demand is increasing dramatically. As a result, carriers had to adapt to this change very quickly - leaping from 2G to 4G, which required installing new antennas and additional towers. So, the tower industry has been flourishing.

What has been the greatest achievement in your career so far?

I have been working with the same colleagues for twenty years. This is rare in the private equity field and in any industry these days. So I consider myself very lucky that I found the right people to collaborate with so many years ago.

In our business and any investment we make, I believe the most important asset and the most important decision we make, is who we are partnered with. The right formula is not found in any Excel spreadsheet or ROI analysis – it is about people, judgment and gut. I am grateful that my gut was correct twenty years ago. Over two decades, we have been able to build successful businesses in countries all over the world.

And looking ahead, what is your greatest professional ambition?

It occurs to me that one of the reasons I am drawn to private equity and emerging markets goes back to my grandfather, who taught me that we should always be either improving ourselves or improving the world. One of the most interesting and appealing things to me about private equity is the ability to translate my values to results. Private equity provides a continuous learning process, and the ability to utilise that to building global businesses and helping them expand into emerging markets. My ambition is to continue to deepen my expertise in the tower industry and extend my learning across other sectors. I hope to become more of a true operational partner to my CEOs and assume more of a leadership position on the boards.

Priscila Oliva, Country Manager – Chile, American Tower

Please tell us about your background and current role within your company.

I am originally from Brazil and I joined American Tower back in 2005 in its sales department. For around four years I was responsible for managing carriers’ accounts across Brazil’s southeast region and then started dealing with corporate accounts too. I was promoted to a business development role and at that time, American Tower was starting to seize opportunities in new markets beyond its existing operations in the U.S., Mexico and Brazil. In 2010, when American Tower entered Colombia, Chile and Peru, I moved to Santiago to head the sales department of the newly formed Chilean entity. To date, I am the country manager for American Tower in Chile.

Working in a new country startup has been an amazing experience. I thoroughly enjoyed hiring the first members of staff, contributing to establish all operations from scratch and getting to know and understand a new market such as Chile.

How did you enter the telecom infrastructure industry? And how have things changed since then?

I got into the tower business early in my career when I started working for ATC. Over the past twelve years the industry has completely changed. Back in 2005, the infrastructure sharing model was not that common and assets were still a competitive differentiator for carriers.
When we first acquired towers in Brazil, barriers were huge and carriers were just getting acquainted with our way of doing business.

Since then, American Tower has grown exponentially and we are very aware of our markets and their dynamics. We have been expanding and so has the competition! Originally there were two or three towercos in Brazil and now there are more than ten. Chile is a very different market and a less crowded one but we are seeing a shift there too as competition increases and we can see a more structured and organized business environment in our industry.

Can you scan through the key differences between Brazil and Chile?

Brazilian carriers accepted our business model more quickly than Chilean ones and as a result, the market picked up very fast once they decided to divest their towers. In fact, Brazil is definitely more advanced than Chile in terms of towercos' penetration rate.

In Chile, the telecom law changed in 2012 and American Tower had to adjust its business model to be compliant. This new regulation has halted the entrance of many new towercos and raised the barriers to entry.

Most towers in Chile are still in the hands of operators and since 2012, there haven't been significant divestments so it's harder to grow in Chile than in Brazil.

On the other hand, Chile is more advanced in terms of densification and network so we are working on a lot of alternative site typologies such as light poles and other low coverage solutions; while Brazil is more focused on macro-towers.

What has been the greatest achievement in your career so far?

I think that working as a young foreign woman in Chile has been a great challenge to overcome. I am very proud of the goals we’ve achieved especially since we’ve been able to grow our business much faster than we originally planned.

And looking ahead, what is your greatest professional ambition?

I would love to be able to apply what I learned over the past twelve years to other regional operations that American Tower is running, especially in Latin America. And I am particularly interested in taking care of people development. American Tower employs some amazing talent and I believe that their training and coaching area fundamental component of our company's growth and success. One of my ambitions is to engage and promote people to allow them to grow in Chile and beyond.

Cecilia Reissmeier, Senior Director - Marketing, Digital Bridge Holdings

Please tell us about your background and current role within your company.

Currently I serve as Senior Director of Marketing at Digital Bridge Holdings, LLC, and Andean Tower Partners (ATP).

Digital Bridge, is a global leader in mobile and internet infrastructure, focused on the ownership, investment, and active management of assets in the towers, data centers, and small cells/fiber sectors. I oversee all marketing and communications activities on behalf of Digital Bridge and in
coordination with its portfolio companies.

ATP is a portfolio company of Digital Bridge and it is the largest privately-owned provider of wireless communication infrastructure in the Andean Region of South America including Colombia, Peru and Chile. At ATP I work hand-in-hand with our business development areas and the CMO, Estrella Zaharia to grow our portfolio.

Over the last 20 years, I have worked in different marketing positions, in the U.S. and Latin America with a special focus on telecommunications. Most recently, I served as Vice President of Marketing and Communications at UUX, a global white-label and cloud-based over-the-top video solution for mobile operators headquartered in Miami. Prior, I headed marketing efforts for Totalmovie.com at Grupo Salinas, where we launched an over-the-top subscriber video service across Latin America running head-to-head with Netflix and the first FTTH service Totalplay.

How did you enter the telecom infrastructure industry? And how have things changed since then?

I started working as a project leader at Telmex in product management. Back in the day, Telmex had been privatised for only five years. New leadership strived to bring change from a government-run company and generate new revenue streams.

Our biggest challenge was to launch long-distance as a service.

Over the last decades things have changed. A series of game changing innovations coming from long distance calls, internet, mobile telecommunications, all the way to nowadays the smartphone age. Now that mobile phones became the most personal piece of technology it is most important to build solid infrastructure and with ever rising demand and competition the need for infrastructure providers like Digital Bridge portfolio companies will only grow.

What has been the greatest achievement in your career so far?

Helping pave the way for more telco infrastructure funding and development.

Working for Digital Bridge has been most rewarding since we have success stories like ATP. Starting as one of ATP’s first 20 employees to later be able to see ATP’s operations expand to Colombia, Chile and Peru with a portfolio of over 34,000 managed sites and 2,150 owned sites only two years later is just remarkable.

And looking ahead, what is your greatest professional ambition?

As mobile usage surges the need for digital infrastructure is critical to increase coverage and capacity. The telecommunications market contributes to economic growth.

Communicating the importance of a healthy wireless market, sharing best practices from one region to another, helping propagate information about new technologies is key to impact positively in the regions where we operate. Achieving this has become my passion.

Maria Scotti, Chief Executive Officer, Torrecom

Please tell us about your background and current role within your company.
Presently, I am the CEO and a Managing Partner of Torrecom. A leading towerco/infrastructure provider in the LatAm region. My career in the telecom industry started in the early nineties, as Manager of Engineering with a U.S. National Paging Company, Message Center Beepers (MCB). I take those early network development days with me into the tower industry today. Thinking like a carrier gives you extensive knowledge in knowing what the next best site will be.

In 1995, the company was sold but retained its infrastructure portfolio of rooftops and towers. Even at that time we had been hosting other telecom providers on our infrastructure, which led to formalizing Message Center Management, Inc. (MCM). In the mid-nineties, there was very little knowledge regarding infrastructure sharing including towers, and very few were deploying rooftops. With our first tower in 1962 and our first rooftop utilisation in 1986, we were real pioneers in the field of vertical real estate!

In the late nineties, the FCC created an auction to allow for the development of a more robust and competitive cellular carrier environment. Eliminating the “two carriers per state” framework and moving to four, five or six per state depending on the markets. At that time, there wasn’t enough infrastructure to support such growth, no comprehensive or consistent zoning and building regulations either at local and federal level, little knowledge on the formalisation and long-term, growth-based contractual arrangements and a whole host of other obstacles that we faced on a daily basis. With new carriers and the incumbents’ race to build, that was an important time in the history of this industry to witness its birth and its growth. Our means of communicating both in the work environment and in our homes were changing at a rapid pace, which further fueled towerco growth.

I am very proud to say we were part of creating the learning curve of the towerco industry in the United States.

From the creation of the U.S. tower industry to the launch of the Latin American one... How did that happen?

In life, you never know who you may meet and how communicating in its simplest form can create great opportunities. A simple encounter on a plane introduced us to our future partner and next adventure. We first discussed Mexico in 2008 but took a pass and then later re-engaged in communication and looked at an opportunity to launch in Costa Rica. In fact, prior to 2009 Costa Rica was a one carrier market. Costa Rica caught on that the more carriers offering services to consumers, the better the pricing and would allow for more utilisation of services to those who might not previously be able to afford such technology. We started operating in Costa Rica on the eve of a spectrum auction attended by Telefónica and Claro (América Móvil). Then moved to Guatemala, Nicaragua and later Mexico. In 2012 we did a sale and leaseback in Peru and had already opened Chile. In 2017, Torrecom began operations in Panama. Our moves have been driven by carrier demand for build-to-suit infrastructure providers that could bring know-how to areas unfamiliar with the concept. I am talking about tough markets in uncharted territories and I surely had to carry courage along with our know-how and financial resources.

What was the secret sauce of your successes? And what has been the greatest achievement so far?

Our sauce has no secret. Much of our success is the chemistry between us managing partners (myself, Roberto Woldenberg and Eric Zachs). Eric and I have worked together for over 25 years and with the addition of Roberto we created a winning trio. I have to add that we have an excellent Board of Directors. This is a difficult sauce to make but when the recipe is right you stick with it.

We achieved a lot in a short amount of time. The majority of our tower portfolio, 800+ and still growing, has been built by us. The SLB transaction we did in Peru with Telefónica was challenging and rewarding. I spent the better part of five months working in Peru with Telefónica and the team to close that deal. There were not many SLBs done in the region and the negotiations were quite
complex! But we had great teams on both sides of the table, who were extremely dedicated to see it through.

I am also proud to have been involved in one of the first build-to-suit programs in the region. Not buying pre-existing sites but building from scratch. Back in the early days, only nine short years ago, carriers in Latin America did not share their infrastructure, very much like the U.S. in the mid-nineties and just prior to the auction creating the competitive landscape.

The idea was that by not sharing you could delay the other from entering the market or at least make it difficult and expensive for them. While this could block competition in the short term, the long-term end result was obvious. Too many single user structures and a diversion of what the carrier does best, building wireless networks that bring robust services to consumers. Letting us deal with the infrastructure while carriers focus on their network allows them to make better use of their resources and capital.

Thinking ahead, what is the next move in your career?

I love what I do and I love the industry. We have aged or better yet matured together.

While I cannot foresee leaving the industry, I can see my career shifting towards a more advisory-focused role. For the few of us who have been in the industry since its inception it seems to be a natural transition.

It is amazing that what we learned years ago is so relevant today. When speaking to large groups and folks just getting started, they ask the same questions, they are encountering the same issues and are faced with the same challenges. While it is a bit of a “Back to the Future” feeling for me, it is so critical that we share what we are learning on a daily basis. Creating industry best practices in these markets is imperative.

Aniko Szigetvári, Global Head - TMT Group, TMT, VC and Funds Department, International Finance Corporation (IFC)

Please tell us about your background and current role within your company.

I am the Global Head of the TMT group at IFC. I manage IFC’s TMT business globally including a US$1.2bn portfolio of investments across various emerging markets. I oversee a team of close to 50 professionals who work with me from 9 hubs spread across the globe.

Within our group, we invest in various segments of the TMT ecosystem, from tower companies to data centres, broadband networks as well as mobile network operators. We invest across the capital structure via equity, mezzanine as well as senior debt.

I have been at the IFC for 19 years now, 16 of which has been in the TMT group. I have been managing a growing team for the past 7 years.

How have you seen the telecom ecosystem evolving since the beginning of your career?

If I think back to the early 2000s, those were the golden days of mobile telephony in emerging markets when most 2G networks were being built. MNOs were tapping into large unmet demand for communication services.

At that time, MNOs were very profitable and were able to get returns from their investments in both infrastructure and services.
Then a mix of increased competition, efforts by governments to increase rural connectivity and higher direct and indirect taxes brought onto MNOs started to impact their profitability.

MNOs saw their margins shrink considerably in a relatively short period of time. Back in the early 2000s, EBITDA margins were often 45%-60%. Such margins shrank to a 25-35% range over the past 6-8 years. In certain markets, being the third or fourth operator often means operating at a loss.

This is when MNOs started to sell their non-core, non-return generating passive assets and to outsource new builds in an effort to focus their investments on deployment of services.

Those were revolutionary days in the industry and IFC was at the forefront of that phase, supporting the establishment and growth of tower companies in emerging markets from the very beginning.

Nowadays, the tower sector is well established and other related sectors are developing quite fast as well. In fact, we are seeing fibre assets being spun out of MNOs to wholesale fiber operators, carrier-neutral data centres being built at a faster pace than before. In general, there is a convergence of the telecom infrastructure ecosystem, as a result of infrastructure sharing as a business model being embraced. In the tower sector, while some tower companies remain active only in the pure tower space, others are shifting to become digital infrastructure providers looking to own fiber networks and/or data centers to maximise value and return. With respect to this shift, we are seeing Latin America at the forefront of the development of integrated companies and in general a more interconnected approach to the various layers of the ecosystem.

What has been the greatest achievement in your career so far?

Some of the highlights of my career include supporting highly developmental projects in the TMT sector.

One of these investments is IFC’s participation in the O3b Networks project, which led to the creation of a satellite system, a first of its kind, that offers affordable broadband services to emerging markets including rural and remote geographies. I was an investment officer at that time and saw the project as a ground-breaking and highly developmental idea that deserved a try. Seeing it coming to fruition and success gave me great satisfaction.

Another one is our early support of the development of independent tower companies in Africa and other emerging markets. In the late 2000s when we first looked at the concept of tower infrastructure sharing, it was considered a pie in the sky idea. We ended up supporting a number of early ventures that today are successfully pan-regional companies. I am proud to have been able to contribute to the development and success of the sector.

What’s next in our busy agenda?

We are currently focused on accelerating internet adoption as well as the development of digital economies in emerging markets. Hence, I am leading a digital infrastructure initiative that promotes the creation and expansion of wholesale carrier neutral open access fibre networks across emerging markets. We identified 50 markets that could potentially benefit from the creation or expansion of such networks. We are pursuing various business models (from pure private sector approaches to collaboration with governments) to help accelerate the deployment of 4G and eventually 5G networks. I am spending a lot of my time promoting this initiative to key stakeholders across the globe and putting it into practice.

Those were revolutionary days in the industry and IFC was at the forefront of that phase.
Please tell us about your background and current role within your company.

Currently I serve as the Chief Marketing Officer of Andean Tower Partners (ATP) - Torres Unidas. ATP just acquired Torres Unidas and became one of the largest private digital infrastructure firms in South America.

My role has changed from being the president of a start-up to now oversee all sales operations across Chile, Peru and Colombia. And my main responsibility is to meet our build-to-suit and co-location targets but most importantly, to support our teams in the deployment of new technologies such as small cells.

The newly formed ATP-Torres Unidas entity is much more than a tower company. In fact, we are supported by the in-house expertise of ExteNet Systems and we’ve also recently acquired AxxcellNet in Colombia, a key player in the outdoor small cell deployment field. Therefore, we are actively looking for other opportunities such as DAS and small cells, 4G coverage, Smart Cities moving towards 5G.

How did you enter the telecom infrastructure industry? And how have things changed since then?

My career in telecom infrastructure dates back to 1997 and I have experienced the critical evolution of this industry over the past twenty years. The digital revolution is the new industrial revolution!

The key aspect of this revolution is that governments are now investing and adopting telecoms policies and strategies. Governments and leaders are now aware of the importance and direct impact that good telecommunication networks can have on their national economies, level of education and overall wealth. Therefore, they are adopting stronger policies to support coverage, capacity and new deployments.

The effects of these changes are now having a waterfall impact on municipalities and local cities and this will further stir the change in our markets. And this is a great transformation to witness!

What has been the greatest achievement in your career so far?

I have worked in the industry for many years now and have been able to achieve some incredible milestones with different teams in various industries across the region, such as satellite, fibre and now telecom infrastructure.

One of the greatest achievements of my career has been to adopt and deploy new technologies and see how these are changing the way people communicate in Latin America.

And looking ahead, what is your greatest professional ambition?

I hope to be able to contribute to the creation of a new generation of telecommunication professionals by helping them believe in their goals. Telecoms can support the development of a better world and help bridge the digital gaps in our countries and I am fully committed to this cause!
Please tell us about your background and how you started working in this sector.

Neptuno is a family business and it was created by my father, an Italian immigrant, in Venezuela in 1972. His desire was to build a better future for his family and thanks to Neptuno, he went on to participate in the creation of some of the very first mobile networks in the region.

I grew up in the industry and towers have always been part of my life. Maybe because of that and in order to prove myself as a professional, I decided to take the difficult path and decided not to join the family business straightaway.

My career actually started at Merrill Lynch, in a completely different field which I actually enjoyed very much, then I decided to pursue a dual Master degree program, one in Investments and one in International Business at the University of Miami, so I moved to the United States. Curiously enough, the graduate internship that followed was at Nortel, which at the time was one of the leading network equipment companies in the world.

I worked at Nortel for almost five years only to realise that if I had to put all that energy and effort into a job, it might as well be for the family business! In 2001, I decided to join Neptuno.

What have been some of the greatest achievements of your professional career?

I would say that having brought Neptuno to the United States has been my greatest achievement so far. In fact, we started operating in the U.S. in 2003 and that hasn’t been an easy venture.

It is quite complex to build a name for yourself here in the U.S. so I am very proud of what we’ve accomplished. One of the very first questions we were often asked at the very beginning of our activities was “What have you done here in the States?” It was almost like more than three decades of international experience and know-how were worthless, and we had to overcome quite a bit of scepticism!

The U.S. is still not our main market but we have made great progress, I am proud to have recently been asked to be part of the WIA/SCC national task force for smart cities and after 15 years of activities, we are being recognised as an active, innovative and relevant player in the field.

Looking ahead, what is your greatest professional ambition?

Neptuno is now led by the “new generation” of the family and we are all involved in communicating that the company is much more than a tower manufacturer. We are actively involved in bringing on the innovation via new ways to perform site surveys, applying 3D technology to ‘virtualize’ and create digital libraries of the telecom assets, and creating new ways to manage assets lifecycles, all with the ultimate goal of helping towercos, operators and regulators create solid emergency recovery programs and promote network resiliency. We are very focused on creating value and enabling transformative changes for customers and partners.

What are some of the key changes in the industry you’ve seen over the course of your career?
First of all, we’ve seen that many of those players that used to dominate the market when I started my career (Nortel and Lucent for instance) don’t exist anymore and have been replaced by different type of companies, definitely more software-driven companies. The entrance of towercos in Central and Latin America happened at a slightly later stage of wireless deployment compared to the U.S., so towercos have become a new category of customers for us and they have changed the way we do business in a very short time!

The ecosystem is a bit more complicated, with less customers and more competition but that has allowed us to focus on adding new services and products to our portfolio. And in a way, to innovate.

Lastly, over the past few years more women have joined the industry and contributed to changing its balance. This isn’t only a very male dominated industry but we are also active in a very male dominated region and I recall times, back in the days, when I would struggle to make my voice heard during meetings with customers or prospects. Those days are gone. Us women are now at the very heart of the industry and I am proud to say that Neptuno is now a Women Owned Business (WBENC), which allows us to work with a variety of highly diverse and entrepreneurial organisations that strive to give Women Owned Businesses a fair chance at earning their business ✨
Meetup Americas 2018

The fifth annual retreat of the top CALA telecom infrastructure elite

To discuss your participation, contact Annabelle on +44 7423 512588 or email amayhew@towerxchange.com
ABLOY: Helping MNOs and towercos to achieve operational excellence
Site security solutions for greater flexibility, transparency and efficiency

Securing telecoms sites has never been more important as they are increasingly considered a part of critical national infrastructure. Sabotage, internal theft, vandalism and changing shape of the infrastructure are challenges telecom tower owners face in today’s world. These challenges and their impact can be overcome by intelligent security solutions from ABLOY, one of the leading manufacturers of locks, locking systems and architectural hardware in the world.

Keywords: Abloy, Access Control, China, Fencing, India, Interview, MNOs, Operational Excellence, Opex Reduction, Outdoor Equipment, Regulation, Shelters, Singapore, Site Visits, Southeast Asia, Towerco, Urban vs Rural

ABLOY has major MNO customers using its CLIQ technology in over a dozen countries and an installed base of more than 90,000 locking points utilising the CLIQ mechatronic locks and keys.

Read this article to learn:
- ABLOY’s footprint and client base
- Market dynamics in Asia’s telecom industry
- Top security issues faced by MNOs and towercos
- Cutting-edge solutions for MNO and towerco operational excellence

TowerXchange: Please introduce your company, your footprint and how you fit into the telecoms infrastructure ecosystem in Asia.

Pauli Jormanainen, Regional Director, ABLOY: With 110 years of history, ABLOY is one of the leading manufacturers of complete high security solutions. ABLOY door and asset locking solutions are used extensively within high risk, high value markets as well as by infrastructure, government, and defence end users who demand the ultimate in high security.

ABLOY has a proven history of telecommunication business for decades. Along with the new technology in telecom business, ABLOY has introduced new methods and systems to create value and fast pay-back time to telecom customers. We provide a complete solution including hardware, project management, and managed services from installation to managing access rights.

ABLOY is active in all major Asian markets thanks to our own sales and support units in Singapore, India and China. Other countries have a wide network of well-trained distributors to look after the specific requirements of each customer.

Our product range includes electric locking, key cylinders, padlocks, small locks and associated products to secure the door or asset. Together our solutions offer secure, compliant and lasting solutions trusted by organisations throughout the world across a variety of industries.
The high security range from ABLOY is capable of securing applications ranging from large corporate headquarters, network buildings, data and media centres, retail outlets, down to the smaller base stations, gates and equipment cabinets as well as anti-climb hatches, road site cabinets, monopoles, masts, hubs, feeders and chamber pits. We understand that all have their own unique security requirements and a demand for long serviceable life.

Our ABLOY CLIQ CONNECT is a revolutionary product and has been recognized worldwide with prizes such as the Golden Award in the Access Control category at the Merlion Awards in the Safety & Security Asia 2015 Exhibition and the Gold Medal in MTP Securex 2016 in Poznan, Poland.

**TowerXchange: As a global company, you serve clients worldwide. How would you characterise the Asian market compared to some of the others you are active in?**

Pauli Jormanainen, Regional Director, ABLOY: We have a deep understanding of the telecom industry and its dynamics in Asian region, thanks to our 30 years’ experience in Asia. Operations in the telecommunication infrastructure are very much similar everywhere, naturally with its own flavors in each market/country.

In Asia manpower is still quite affordable and operators and towercos handle many of the processes which are outsourced to different partners in many other regions. Fast growth of telecommunication infrastructure, strong competition between the operators, mergers, new technologies and changing requirements are putting telcos to quite demanding position also in Asia.

In many countries in Asia also, MNOs own their towers and are not sharing them with others. This is one of the reasons tower counts are high and new towers continue to be built as MNOs extend their coverage. On the other hand, in the countries where towercos exist, you see a mixture of state-backed entities with strong positioning in the market alongside independents. So there are varied and interesting market dynamics in the region.

**TowerXchange: What are some of the top security challenges faced by MNOs and towercos in Asia? And how can you help?**

Pauli Jormanainen, Regional Director, ABLOY: According to our customers, the main security challenges for them are the unauthorized access to sites, high running costs, theft (be it materials or information and perpetrated by external or internal parties) and vandalism.

Lost keys are rarely reported and the percentage of returned keys is often smaller than unreturned. Also, with current mechanical locking systems, the patent can be already expired and the number of keys out in the field is unknown. MNOs and towercos are thus experiencing sizable costs when rekeying or replacing locks and losses with stolen equipment and wiring.

Carriers also need to be prepared for possible outages, which in turn can damage their reputation and bring substantial financial consequences.

Mechatronic master key systems overcome these challenges by not only providing a high level of physical security in the key mechanism, but also full flexibility in the electronic element. System owners can maintain full control of keys, thereby preventing any unauthorized access. The full audit trail, from either key or locking point, enables the owner to narrow down who has gained access and when to counter the threat of internal theft.

**TowerXchange: What would you say has driven the shift from “padlock and key” to more sophisticated security solutions such as what ABLOY offers?**

Pauli Jormanainen, Regional Director, ABLOY: Actually padlocks and keys are still needed, but not only the traditional mechanical padlocks and keys but more intelligent mechatronic ones with double security features. Intelligent security solution is needed to allow flexible granting of access rights and give reliable, online information who, when, and how long has had an access to the sites. With electronic locking systems security is not compromised in case of say lost keys.

Operational excellence drives many companies today and telecom companies are no exception. Incident management must be handled promptly and preventive maintenance in an efficient manner. No one wants field engineers to drive hundreds of kilometers just to get a key and notice at the site that it is a wrong key! Investment in mechatronic system brings greater efficiency and productivity of personnel, reduce aborted visits, and improve management of contractors on site.
Carriers play a central role in fighting emerging security threats. In the future, securing the entire internet value chain will be an even bigger priority. The pressing need for secure networks and high service levels is a central challenge that is already been addressed in security standards and protocols.

In the future we expect to see various governing bodies start to enforce certain level of security standards to ensure satisfactory protection of the operators’ assets and at the same time service availability.

ABLOY can offer a system where every key holder has only a single identifiable key. In the system there are flexible ways to grant (and also take out) access rights, monitor, and measure key users online as well as offline. The ABLOY system offers tower cos with great possibilities to plan, control, and measure workforce even at remote areas.

Access rights can be given for as short as five minutes! The rights can be given only when needed and even by using a smartphone. Audit trails can be carried out both from keys and locks, and from keys even in real time. Instead of manual keeping of records, key holder and audit trail information can be pulled from the administration system any time to fulfill regulatory audit requirements.

TowerXchange: When it comes to urban versus rural sites in Asia, what are some of the considerations in maximising site security? Can you share some success stories with us?

Pauli Jormanainen, Regional Director, ABLOY: The nature of the requirements for security tends to differ between cities and remote areas. Within cities, problems depend on the level of security of specific neighbourhoods.

According to our customers, urban sites are many times more vulnerable if they aren’t properly protected. Naturally in cities the sites can be reached easier and faster, whereas in remote areas the response time can take longer. On the other hand, rural areas communities tend to value the sites and the connectivity they ensure, which can mitigate some of the risks.

But both in city and rural sites we need to implement solutions that are at the same time strong enough to resist any attempt of non-authorised access and flexible enough for efficient remote planning, granting, and controlling of authorised access. In both cases, not only access to site needs to be protected, but also the equipment, batteries and any other subcomponent as they are in high demand on the black market.

TowerXchange: What is the typical capital outlay per site to install your solution? And how does this translate to efficiencies and savings?

Pauli Jormanainen, Regional Director, ABLOY: Every case is unique and the complete solution price tag depends on many different components. The product/lock has naturally one price, but it also depends on the level of security, model, size and features.

Mechanical solution is the most cost effective, offering high physical and key security, but less flexibility to control access rights and monitor the system.

The full solution can include site surveys before building up the proposal, system planning, integration, installation, and service. Based on the wide experience of complete solution users, normal return of investment for the customer is less than 24 months.

TowerXchange: Lastly, what is the ABLOY advantage? How does your solution differentiate from your competitors?

Pauli Jormanainen, Regional Director, ABLOY: We have decades of experience working with telcos and have always been developing suitable solutions for them. This often means customized solutions both in hardware and software, and that is one of our strengths.

We can combine both economical mechanical systems with the more advanced electronic systems to cover all of our customers’ security needs. We can integrate our software into the customers’ existing RMS, access control, HR, or job management systems which will offer flexible use of all systems.

ABLOY has a proven track record of producing strong locking products against physical attacks, products that work superbly under any environmental conditions and exceed many quality and performance standards. We have a global approach and references, but also permanent local expertise in consultancy, planning and implementation, and service functions. We have been around for almost 110 years and have very high commitments for the next 100 years.
Enhanced security and operational efficiencies through improved access control

An interview with leading access control provider - Acsys

Poor access control can not only lead to security concerns but it can also have a significant impact on a company's operational efficiency and bottom line. In this interview, we speak to leading access control system provider, Acsys, to understand how the telecom tower industry has been affected by poorly managed access control and discuss the advantages that mechatronic locks can bring to the sector.

Keywords: Access Control, Acsys, Africa, Health & Safety, Job Ticketing, KPIs, Logistics, Masts & Towers, MLA, MNOs, Monitoring & Management, NOC, O&M, Operational Excellence, RMS, Site Level Profitability, Site Surveys, Site Visits, SLA, Towercos

Read this article to learn:
- Limitations with mechanical locks
- Challenges in controlling access to NOCs
- The importance of access control in enforcing SLAs
- How mechatronic locks can contribute to increased efficiency
- Safety and security benefits afforded by mechatronic locks

TowerXchange: Please can you describe some of the limitations of mechanical locks and keys?

Olivier Meganck, VP Sales, Africa, Acsys: There are several limitations in the use of mechanical locks and keys; keys can be copied, lost and forgotten or unreturned and the cost of replacing the lock is often higher than the lock itself. In managing keys, operators need to employ numerous amounts of workers who require training and the wrong keys can be given to the vendor. With traditional mechanical lock and key there is no way to prevent collusion, and users can forget to close sites (intentionally or not). Regular audits need to be undertaken to ascertain the amount of keys in use and the keys' location and the management of keys and locks requires dedicated space and security. Managing keys on weekends or during an emergency is a problem as staff will not be present, it is critical to be able to respond quickly to downed sites but if access is prevented in the absence of keys then the only way is to cut the locks which will require a lock replacement and sites can stay unsecured for quite some time.

When keys are copied it is difficult to detect when a theft or loss occurs and with picking and bumping there is no proof of break and entry and as such there are high insurance premiums. The result of these inefficiencies is that some vendors eventually make their own copies of the keys to gain access.

TowerXchange: In relation to controlling access and NOCs, what are some of the operational challenges faced?

Olivier Meganck, VP Sales, Africa, Acsys: The NOC
deals with a complex set of equipment that is scattered around a region and is impossible to control efficiently with mechanical locks. The NOC also deals with a large amount of vendors, who are responsible for site maintenance. It is hard for the NOC to respond efficiently to emergencies as they don’t know where the vendors are located and false alarms can cause disorder.

Access to the NOC is impossible to control. Vendors are requested to do maintenance and only do it when they are able to do it, not necessarily when the NOC has requested that they do it. When sites are down it can be difficult to find the vendor, the NOC then needs to call other support to get someone to the site.

The NOC is looking for a solution whereby tickets are issued and acted upon as quickly as possible in a first phase. In a second phase the NOC needs to know when the vendor has arrived, what he has done, whether the problem is fixed and when he has left the site. NOC operations need to rely solely on the vendors assertions

TowerXchange: What challenges can poor access control systems have on SLA implementation and adherence?

Olivier Meganck, VP Sales, Africa, Acsys: MNOs and towercos will have SLAs in place with their vendors to regulate site maintenance. These SLAs have escalation clauses that dictate when a vendor should arrive on location. It is hard for the NOC to see when vendors are going to the sites and if they completed the job correctly making SLAs redundant.

Olivier Meganck, VP Sales, Africa, Acsys: The solution is a standard padlock and Euro-Din cylinder configuration meaning that no modifications are required to install them. The padlocks and cylinders can be fitted on all equipment and no maintenance is required. The stainless steel plating prevents corrosion on the padlock body and cylinder and what’s more anyone can use the solution.

TowerXchange: What are the advantages of implementing mechatronic locks for remote site management?

Olivier Meganck, VP Sales, Africa, Acsys: Mechatronic locking systems cannot be picked/bumped, hacked, copied or corrupted in any way. Telecom customised software enables the NOC to manually or automatically control where users can go, for how long wirelessly and in real-time with minimal cost.

Mechatronic solutions allow the NOC to control precisely what assets can be opened and when. All keys and locks memorise the last thousand actions giving an incorruptible record of the user’s actions, providing the NOC and operator with valuable operational data.

The mechatronic locks combine four important solutions into one system; a wireless and real-time access control system, a high security lock and key solution, a time and attendance solution and a key management solution.

TowerXchange: What are some of the basic practical advantages of mechatronic locks?

Olivier Meganck, VP Sales, Africa, Acsys: Users can service more sites in one day and a user’s position and length on site is controlled and monitored. The NOC can have a real-time view of site status looking at the number of sites, which sites have guards and are they present or not, which site is in need of maintenance and for what reason and which and how many vendors are on the site.

By implementing mobile apps, the NOC is now able to receive real-time site information and user performance, such as when did the user receive the task, accept the task, arrive on and leave the site. This system can also monitor what the user did on the site (watermark GPS pictures) and can also receive information on whether the user closed the locks after leaving the site.
This data has significant value to determine SLA adherence because the tower owner can now see exactly what is happening on their site. Being able to understand who is going where and for how long means that the owner can make smarter business decisions. Data collected by mechatronic locks gives concrete undisputable data on whether the vendor has been meeting the SLAs. Furthermore upon additional analysis of the data, site operators can create and negotiate more suitable SLAs using the information collected.

**TowerXchange: How do mechatronic locks increase site and user security and reduce theft?**

Olivier Meganck, VP Sales, Africa, Acsys: With regards to safety and security, as the NOC knows who is on the site and for what reason, in the case a vendor does not request a locking code (because of a fall or injury) the NOC is able to act on that.

In relation to thefts, most thefts are caused by people who had a mechanical key at one stage and copied it. The mechatronic keys can have an embedded feature that monitors where the key is being used, if the user tries to fraudulently use the key three times, the key will automatically block themselves thereby forcing the user to go back to the NOC or programmer to update his key.

**TowerXchange: What information can be collected to monitor behavioural patterns and how does this translate into more cost effective operations?**

Olivier Meganck, VP Sales, Africa, Acsys: The NOC will be able to download the access logs stored on the key through programmers and study what sites or assets were accessed and when, how long the vendor spent on each site, whether the user tried to access sites or assets without authorisation and on which day, time or location.

By collecting data on user performance the NOC and operator are now able to obtain site maintenance benchmarks which in turn allow them to set KPIs for certain tasks.

In addition, mechatronic locks allow for increased flexibility. When a technician is unavailable, another can be called as a substitute with no wasted time or resources. A temporary access can be instantly granted ‘on the fly’ for a site normally outside of this technician’s work zone.

By collecting data on behavioural patterns, the financial department is also able to control how much time was spent on site by users, thereby gaining a better control over payment of billable hours to vendors.

**TowerXchange: How will the data that mechatronic locks provide influence the way in which the telecoms sector works?**

Olivier Meganck, VP Sales, Africa, Acsys: Using the data that mechatronic locking systems provide effectively will lead to more efficient access policies, enhanced SLA agreements and increased productivity. The data collected does not only benefit the site owner, but is also valuable for tenants and vendors. The data helps build relationships between the ecosystem by aiding their understanding and giving evidence of site activities. The more a database is built and the further it is integrated the more valuable it becomes to its users.
Jet powered microturbine gensets offer a more efficient alternative to traditional DGs

Innovative solution is more cost effective, cleaner, greener, quieter, burns just about any liquid or gas fuel and breaks even compared with DGs after approximately 15 months

It’s not often TowerXchange comes across a genuinely innovative alternative to a traditional diesel genset that provides primary or backup power to many emerging market cell towers, but when we heard about Bladon Jet’s micro turbine gensets (MTGs), we had to find out more! While the MTG is cleaner and quieter than a traditional DG, with almost no maintenance requirements, what makes the MTG particularly interesting to towercos is the fact that they are more efficient and are cleaner and quieter than a similar powered DG. Delivering cleaner and more efficient energy are key business requirements we continuously see from mobile operators and towercos.

Keywords: Africa, Asia, Bladon Jets, Capex, DG Runtime, Energy, Fuel Cell, Hybrid Power, Off-Grid, Opex Reduction, RMS, ROI, Rooftop, Shelters, Site Visits, Skilled Workforces, Solar, Spare Parts, Unreliable Grid, Uptime, Who’s Who

Read this article to learn:
- How Bladon Jets harnessed the power of choice at 40,000ft for static power solutions
- The size and weight advantages of MTGs over traditional DGs
- A low maintenance solution: no oil, no water, only one big moving part
- The importance of an energy efficient solution that compliments your existing supply chain – MTGs can run on almost any liquid or gas fuel
- Months to breakeven/crossover in different scenarios, compared with traditional DGs

TowerXchange: Where do Bladon Jets fit in the telecoms infrastructure ecosystem?

Stuart Kelly, VP Market Development, Bladon Jets:
We have invested considerably in R&D over the last 5 years and perfected the design and manufacture of low cost jet powered microturbine gensets (MTGs). Our MTGs are positioned to replace diesel generators as the primary or backup power solution at cell sites, thanks to our superior performance and reliability. Bladon’s MTGs are ultra quiet, clean and green, small and light, which is critical at shared cell sites.

Jet engines aren’t new. This is a 70 year old technology, and is the power of choice at 40,000ft. Our secret sauce is not so much a new technology as a manufacturing methodology that enables us to produce microturbines economically in volume. One of our most important manufacturing techniques is a process to cut turbine blades from a single piece of material. Our units are about 30% smaller than a diesel generator, yet they generate the same power. We’ve been able to manufacture to a price point such that our MTGs are commercially viable compared to reciprocating diesel gensets.

TowerXchange: How did your micro jet engines evolve as a solution for cell sites?

Stuart Kelly, VP Market Development, Bladon Jets:
TATA became excited about our micro turbines and invested via Jaguar Land Rover in 2010. The first incarnation was actually in the Jaguar CX75 concept supercar, but the ancillary application of
the technology was for static power solutions for telecoms.

We are finalising our market entry strategy to sell 12kW MTGs into telecoms. For us the towercos, managed service providers and MNOs themselves are all prospective clients.

**TowerXchange: Which telecom markets are you targeting and why?**

Stuart Kelly, VP Market Development, Bladon Jets: Given the Tata connection, an early market will be India. The continent of Africa is also a key market for Bladon's products. We have conducted field trials in Africa over the last few months and learned valuable feedback from our partners there. Some of our field trial units have been running nonstop for 1000+ hours without ANY filter changes or servicing. That's a really compelling proposition to towercos that are crippled with genset maintenance costs.

We have attended TowerXchange Meetups around the world to share Bladon’s vision with MNOs and towercos. With so many assets changing ownership in Africa, there is a new focus and financial drive to leverage tower assets harder. When towers are bought, or being prepared for sale, audits often reveal the assets aren’t operating as efficiently as the owner might have thought. But the new owners don’t want to create too much turbulence in the supply chain, so it’s important that our solution complements the existing energy supply chain in developing markets.

**TowerXchange: Tell us about your solution’s maintenance requirements.**

Stuart Kelly, VP Market Development, Bladon Jets: Microturbine engines are a low or no maintenance solution. Unlike a diesel reciprocating engine, there is no oil and no liquid coolant in our solution. We have just one moving part, the turbine itself, which runs on air bearings with no liquid lubrication. Maintenance is a key issue at remote sites that might be many hours drive on a lousy road – the cost to get there can kill the TCO – so a technology with the potential to dramatically reduce site visits can be very compelling. There is a very low skill requirement to maintain our MTGs – in the highly unlikely event of a turbine failure, our strategy is remove and replace, not rebuild onsite. For lesser maintenance issues, such as filter changes, the O&M subcontractor can readily maintain a stock of fuel and air filters.

As well as reducing fuel and maintenance costs, thieves are less inclined to steal our MTGs as there are few if any parts they can recycle.
Aspiring ESCOs that are currently in the business of maintaining traditional diesel gensets have an opportunity to profit handsomely by deploying a more reliable solution like ours – their goal of selling at a price per kWh rate becomes more compelling. Our MTG unit has robust telemetry built in, so you need fewer field engineers as many settings can be changed remotely. From the NOC you can see if units are operating outside of their tolerances, enabling preventive maintenance rather than waiting for it to break. Also, and not insignificant for the tower operator, is the use of telemetry to know where the unit is as well as having the inbuilt electronics to stop the unit operating if moved without permission – the same technology as a tracker system on a car.

TowerXchange: Okay, so what are the advantages of micro jet engines over other alternate energy solutions such as fuel cells or solar?

Stuart Kelly, VP Market Development, Bladon Jets: There is no reliable or sustainable supply chain to support hydrogen or methane fuel in Africa yet. As a technology that is hostile to the current supply chain, the practical challenges of keeping fuel cells running are prohibitive to embracing that particular alternative energy solution in more than perhaps 20% of the estate. Let’s be honest, green power is not widely used on cell sites. In India for example, eco-friendly cell sites account for less than 1% of the estate, but tower owners still want to migrate away from the reciprocating diesel genset because of the substantial energy and maintenance opex it incurs. We don’t see our solution as an alternative to a 200sqm PV array; our solution is so much more compact that the use cases differ significantly. Solar isn’t the optimum alternate energy solution for all cell sites; even in Africa, sites don’t get good quality sunshine all the time, especially in high rise areas with shadows. You can install solar panels on an urban rooftop, and find that six months later the neighboring building has had five floors added! Our solution doesn’t succumb to such vagaries. Solar has to be a part of the future, but in the context of telecom towers it’s not a killer app, it’s a point solution. Our MTGs can be used to smooth power from solar as well as replacing a chugging tractor engine based generator. When renewables work the MTG can become a part core part backup, there are no startup issues even if it’s left idle for some considerable time between use. The fuel will contaminate before the genset has a problem!

But the important thing is that this is an evolution not a revolution – the MTG can be adapted to any local fuel supply resource. Bladon gensets, in keeping with all turbine based solutions, run on a wide range of fuels, including green alternatives such as natural gas and biofuels as well as diesel and kerosene. Bladon MTGs will also tolerate a blend of fuels like diesel mixed with kerosene thus making the mix useless for thieves planning on using it for other diesel engines.

TowerXchange: How does the capital outlay for your MTGs compare to traditional DGs, and when does the Total Cost of Ownership (TCO) crossover?

Stuart Kelly, VP Market Development, Bladon Jets: The capital outlay for an MTG is currently slightly higher than a quality diesel genset solution, but the price difference is a double not triple digit percentage. Running for 12 hours a day in SSA in 30° heat then within 15-19 months the TCO will crossover having recovered the difference in capital outlay through fuel and maintenance cost savings.
TowerXchange: How near are your MTGs for telecom to being a market-ready solution?

Stuart Kelly, VP Market Development, Bladon Jets: We go into production later this year. The first run of MTGs have already been ordered, and we’ve signed distribution agreements already with partners in Africa and India. We’ll be manufacturing in the UK, and in Asia soon too, and from the US in due course.

TowerXchange: What is the sweet spot in terms of the load your solutions can support?

Stuart Kelly, VP Market Development, Bladon Jets: Our Bladon MTG12 MTG delivers up to 12kW, with output options 230V AC or 120V AC. We also have a 48V DC output variant that telecom clients tend to like. Most telecom sites need somewhere between 3kW and 6kW for constant power, maybe 9kW if there is a hybrid arrangement requiring battery bank charging. Since the MTG runs at variable speed to match the load our efficiencies are much better at partial loads compared to traditional DGs.

TowerXchange: How do you ensure modularity as power requirements increase with the addition of multiple tenants?

Stuart Kelly, VP Market Development, Bladon Jets: Given that operators are trying to drive power consumption down, a new BTS might need 1kW when the last model needed 2kW. At the moment the applications we see don’t consume more than 3kW in total, so it should be possible to add a second tenant without upgrading the MTG. Because our unit doesn’t de-rate over time, its ability to deliver continuous power is stronger. The MTG is a more reliable means of delivery of consistent power than a conventional DG for a multi-tenant site. If additional tenants are added beyond what one MTG can provide, the answer is to add a second unit in a daisy chain. And if the power requirement reduces again, our units are relatively easy to relocate to another tower. Another critical consideration is that the MTG can be 25% more efficient as a reciprocating engine when running at part load.

TowerXchange: How do you bring Bladon Jets to market – do you sell direct or through channel partners?

Stuart Kelly, VP Market Development, Bladon Jets: Our model is to sell through partners. Towercos and MNOs need the credibility of boots on the ground to provide after sales service, even with a low maintenance solution such as ours. We are targeting key managed service providers on the front lines of tower builds, upgrades and maintenance, with the objective of creating a pipeline for thousands of unit sales.

TowerXchange: Finally, please sum up how you would differentiate Bladon Jets from other cell site energy solution providers.

Stuart Kelly, VP Market Development, Bladon Jets: We’ve taken a well known form of power generation in the reciprocating engine, turned it on its head and married it with another established technology in jet engines, then developed a manufacturing process to bring to market an innovative solution with a lower TCO business case for telecom tower operators. Micro jet engines are ultra reliable, super durable, low maintenance, and generally have a TCO runway in Africa and India from 9 to 19 months. The MTG is designed to support the current supply chain, which means our solutions can be easily introduced with an expectation of a short term payback. The fact that it’s an exciting jet engine is only so interesting – what matters is reducing fuel bills, and the ability to deploy it into the field easier and cheaper than a regular diesel genset.
Calzavara: from traditional carpentry to integrated tower and software design
The Italian firm shares its path towards software, harmonised structure and beyond

Italian firm Calzavara first spoke with TowerXchange following their success at the Milan Expo 2015 and discussed with us the evolution of concealed towers from artificial trees to their then futuristic Mosaictower. In this interview, we take a look at what two years of innovation brought to the company’s catalogue of solutions and its enhanced geographical footprint.

Keywords: 3G, Australia, Calzavara, Chile, China, Co-locations, Construction, Europe, Hybrid Power, Installation, Interview, Masts & Towers, Meetup Preview, Middle East, Renewables, Small Cells, South America, Steelwork, United States, Who’s Who

Read this article to learn:
- Calzavara’s expanded footprint and enhanced catalogue of products
- Beyond towers: when sites integrate and communicate with cities
- What is new in harmonised urban furniture
- Some of Calzavara’s latest international projects

TowerXchange: Although known to TowerXchange, please reintroduce our readers to Calzavara and its role in the telecom infrastructure ecosystem.

Marco Calzavara, CEO, Calzavara S.p.A.: Our headquarters are located in Basiliano, a small village in the north-east of Italy, not far away from Venice and close to the Slovenian and Austrian borders.

Established in 1966, Calzavara’s core business has been the development of innovative infrastructure for the mobile telecom industry. Our strategy was and has always been to be different from traditional tower suppliers. In fact, we operate in a niche sector with the involvement of different stakeholders such as municipalities, regulators for urban city landscapes, tower companies and, of course, network operators.

Calzavara offers tailored infrastructure solutions that adapt to the specific requirements of the market. We specialise in low environmental impact solutions such as harmonised and urban design structures at reasonable prices.

TowerXchange: What is the scale of your telecom business and what is your global footprint?

Andrea Pupil, General Manager, Calzavara S.p.A.: We now employ 130 people and operate in Europe, the Middle East, the United States, South America, the Middle East, Australia, as well as China.
Today, Calzavara is a well-established company with a worldwide presence achieved thanks to a strong network of commercial partners who are able to deliver our products and services, and to guarantee excellent customer support.

**TowerXchange: Tell us about a couple of your latest projects.**

**Massimo Calzavara, Business Development Director, Calzavara S.p.A.:** Our latest expansion plans took us to the Middle East as well as the United States, China and Australia.

In the Middle East, we recently worked on an urban furniture project in Saudi Arabia for the city of Riyadh which was extremely rewarding. To date, we are bidding to work for the Dubai Expo and we are seeing a big push for harmonised solutions across the Middle East in countries like Saudi Arabia, the UAE and Qatar. But we’ve been deploying harmonised urban solutions in other markets such as Panama.

In LatAm, we have launched a joint venture in Chile where we are adapting our solutions to their landscape requirements and created an ad hoc harmonised tower that resembles the typical Chilean palm tree. Additionally, in China we’ve installed several multiservice towers suitable for small cell deployments, as well as our well known Dicecell in Beijing.

**TowerXchange: We understand concealment and EMF regulations are particularly strict in your domestic Italian market; how has the design of cell sites evolved to accommodate these requirements?**
Andrea Pupil, General Manager, Calzavara S.p.A:
With regards to concealments, we first offered artificial tree solutions around 20 years ago. Back then, we utilised our long-standing experience with steel structures and combined it with innovative know-how in fibreglass, resins and plastic materials. Once we introduced our tree solutions, we realised that the market was seeking different tree models depending on the geographical location and local flora, so we started designing black and maritime pines, different types of palm trees and cypresses.

Since the launch of 3G, our new challenge has been to develop design products able to meet certain aesthetic standards, specifically designed for urban areas and suitable for co-location. Towers are becoming urban furniture and with this in mind, we aren’t only working on practical and safe solutions, but also creating a product in harmony with the urban environment. In order to answer to the need for beauty, we’ve come up with a new line of infrastructure, perfectly integrated with urban surroundings, known as Telestyle.

Telestyle is certainly not our final innovation. In fact, we are committed to constantly pursuing new solutions for the market able to incorporate new materials, LED lights, monitoring devices, displays and other integrated features to respond to new needs and requirements.

The deployment of networks featuring micro and picocells represents the latest frontier to the growing demand for connectivity – anytime, anywhere – characterising both urban environment and densely populated areas. And we should keep in mind the future evolution of IoT technologies for smart cities.

**TowerXchange: How is the telecom infrastructure industry evolving in terms of site typology demand and how is Calzavara keeping up with these changes?**

Massimo Calzavara, Business Development Director, Calzavara S.p.A: We have just participated in the Mobile World Congress and once again realised that the infrastructure and smart technology worlds don’t necessarily interact with each other. We are now heavily involved in the design of new site typologies with the ability to offer greater levels of connectivity and suitable for smart cities, 5G deployments and beyond.

With regards to 5G, this technology requires a set of macro-towers able to host antennas even larger than those utilised for LTE and also micro-cells to intensify coverage in specific areas.

Products such as Cells-on-Wheels (CoW) are traditionally utilised to cover large events but we are going beyond with our newly launched Dicecell in the United States. This product has been developed and engineered as a modular pole that can measure anywhere between 4m and 12m in height for the various types of coverage required.

This pole is an interconnection point for telecom companies and smart cities as it can host one or more small cells operators as well as 4G LTE antennas. It features two types of modules of

Calzavara provides a wide range of harmonized solutions including many types of palm, cypress and pine trees (in the picture a Pinus Nigra, 24m high, for 2 carriers).
different measurements which can be personalised and offer various types of services such as security cameras, public lights, mobile phone chargers, parking payment machines. Additionally, we are developing a management software to allow the true concept of smart pole, which will be enriched with smart metering hardware to measure temperature, humidity, pollution levels and beyond (e.g. traffic control, security proactive warnings).

So this type of poles is designed and conceived for urban context – not only to fit by size but also to serve urban environments. It is smaller and modular and allows our customers unprecedented levels of personalisation in terms of fitting adverts, branding or other images on each module.

These products are also useful to avoid the installation of unfitting, un-harmonised structures in a given territory and to speed up the permitting process by the city councils and other municipal authorities. In addition, towercos and operators can offer municipalities value added services such as security cameras or pollution sensors by installing these poles.

These poles are fiberised and suitable for 4G, LTE and 5G multi-operator services and will serve large-scale gatherings like concerts or sporting events where traditional systems usually fail.

By next June we'll have developed the beta version of a software to allow different parties to manage their components on the pole, verifying the status of their antennas, assessing the need for inspections or maintenance, checking the temperature of their equipment, et cetera. This will fully enable towercos to rent spaces on these poles to multiple tenants and enabling each of them to manage their bits. And this type of management isn’t restricted to operators, extending to anyone utilising the pole such as advertising agencies, security companies, et cetera.

This is a new type of service to remotely manage infrastructure which will allow considerable long-term savings.

**TowerXchange: Finally, please sum up how you would differentiate Calzavara from other telecom turnkey infrastructure providers?**

**Marco Calzavara, CEO, Calzavara S.p.A.:** Our design is like no other and I am not only talking about the aesthetics (beauty), but also to the engineering and overall quality. This year we’ve gone even further in terms of our service offerings and we are expanding the software component and beyond.

We have 50 years of history and are now becoming a design, engineering and software firm in line with market demands.

Our catalogue goes beyond traditional solutions such as macro-towers to offer urban furniture, harmonised solutions and more. Not many companies out there are actually able to “walk the talk” and carry out what they set out for themselves; we pride ourselves on offering options for all types of settings, no matter how complex their permitting or environmental needs are.
Sera4: Combining advanced security software with custom made hardware

An innovative approach to tower security

Security continues to be a major challenge for businesses in every sector, especially when valuable equipment out in the field is at risk of theft or vandalism. No security measure is 100% reliable, and electronic solutions present some risk of being vulnerable to hacking. Many towercos are striving to eliminate the need for physical keys that can be copied, and to combine advanced electronic security measures with sturdy doors, gates and locks. We recently spoke to David Coode, CEO of Sera4, an exciting new security solution provider that traces its roots back to Blackberry.

Keywords: Access Control, Data Room, NOC, RMS, Sera4, Who’s Who

TowerXchange: Please introduce your company and tell us about your background.

David Coode, CEO, Sera4: We’re a three year-old Canadian company providing secure distributed access solutions, born out of the ashes of Blackberry. The founder of the company is our CTO, and he worked on Blackberry’s wireless technical team. The security technology that Blackberry is famous for is the same that we use to manage remote locks which can be accessed using smart phones. Towercos have been among our first clients, and we have been operating with telecoms companies in LatAm which is helping us learn the niche and local needs of the companies there and the value that the solution brings. Our clients had towers that were being vandalised and robbed quite frequently, and they were happy with the ROI of our solution as it is a fraction of the cost of vandalized tower equipment.

My background is in medical electronics. I spent over a decade at ON Semiconductor, the tenth largest semi company in the world, focussing on electronic solutions at board and system level. The medical electronics industry is highly regulated and requires very high reliability and security. The skills learned there translate well into industrial electronics.

TowerXchange: Tell us about your solution and some applications in the field.

David Coode, CEO, Sera4: The solution has three
components; we provide a cloud-based Network Operations Center (NOC), electronic controllers and smartphone apps that provide access. Keys are provisioned to end-user smart phones via the NOC, then used via a secure Bluetooth protocol. Encrypted security certificates unlock the mechanism in the lock. The keys can be programmed at the NOC to expire, and the locks keep a log of every use, letting clients know who has entered and at what time. This makes it much more difficult for contractors to pull off inside jobs as all movements are tracked and linked with a smartphone. We also integrated some electronic and hardware features on the locks to keep people from getting locked out.

The main feature is the security software behind the mechanism, which is so important in this era. There was a competition at this year’s DEF CON conference in which hackers were given fifteen minutes to open sixteen smart locks. When the time was up, twelve out of the sixteen locks had been compromised. We did an analysis of the methods that were used to hack the locks, and we're happy to say that ours would have been invulnerable to any of the attacks used. To date none of our locks have been hacked successfully, but that’s not to say that it hasn’t been attempted.

TowerXchange: What differentiates your product from others on the market?

David Coode, CEO, Sera4: Most of our competition in LatAm are selling a complete locking cylinder or a specific type of hardware. They’re basically lock companies selling hardware with an added electronic component. We’re selling an electronic solution based on many layers of abstraction, that provides data capture and is usable out of mobile coverage. We then work with integrators and installers to create different mechanisms tailored to a client’s physical needs from a security perspective and based on the size and layout of their facility. It works with cabinets, shelters, doors, fuel tanks and gates, which can all be connected to the same system. We sell a powerful security technology that can be integrated with any physical lock.

We work with partners to do custom ironwork; as an example for a cabinet they would install a three foot angle bar which would take ten minutes with a grinder to get through. We work to integrate our technology into existing small locking mechanisms like drop bolts and swing locks. Our premium solution for towercos is a small black box with wireless control of high-power lock actuators and sensors built-in to detect unauthorised access.

TowerXchange: What is the typical capital outlay per site to install your solution?

David Coode, CEO, Sera4: This varies a lot because our solutions are often customised and we often sell through integrators who do the ironwork. Our clients are happy since the cost of the solution is a fraction of the cost of a theft. We provide security for access to whole site or it can be on specific cabinets with equipment.

TowerXchange: How can data from access control systems be integrated with maintenance workflows and job ticketing to reduce O&M costs?

David Coode, CEO, Sera4: A big strength of smart locks is the simplicity of contractors not having to go pick up a physical key, and in addition it’s risky when multiple people hold keys to the site; there’s always a risk associated with this. On our system the keys sent out to the end users’ mobile phones are active only for specific time windows, and data logs are maintained to see who’s been in, and for how long. Our clients have access to this data and use it to improve efficiency and know who has been on site. It can also give updates on the location of a lock and sends alerts if a door or lock is open.
when it shouldn't be. Sometimes a door isn’t closed properly or something makes it jam, but the clients are promptly alerted so that security problems can be addressed immediately.

**TowerXchange: What else can you tell us about your NOC?**

**David Coode, CEO, Sera4:** The NOC is an interface to our secure servers. We operate a robust, global server network. NOC support is optional with our solution and clients can manage site security in-house integrating the server with their NOC or dashboard through the API. Most of our clients prefer having security experts like Sera4 managing and maintaining the service. The portal that they access the NOC through can be customised and branded or re-skinned, and it is always kept up to date with the latest features from Sera4.

**TowerXchange: Please sum up how you would differentiate your solution from your competitors’?**

**David Coode, CEO, Sera4:** Our company is about technical leadership and customer service. We bring the latest technology to solve the challenges being faced by our clients. We deliver the best in security, features and ease-of-use to any lock. We are not a lock company who is adding electronics to extend a traditional product line. Over the next six to twelve months we will push the edge even further and will stay ahead of the curve based on this technology, which is the core of our business.
Accruent’s SaaS site management solution delivers for towercos

Siterra helps optimise key tower management tasks, and the service is constantly evolving to meet client needs

Accruent’s Siterra provides a platform much like a dedicated ERP for towercos and MNOs – they are experts in helping clients clean up and organise their data, making the solution ideal as companies scale their operations across multiple regions and countries. In the latest of a series of interviews exploring the capabilities of Siterra, TowerXchange focuses on the merits of using a native SaaS platform, and on data accuracy and standardisation, critical to accelerating time to market for tenants, and critical to driving tenancy ratio and valuation growth for the towerco or MNO.

Keywords: Accruent, Americas, Asset Lifecycle Platform, Asset Register, Capacity Enhancements, Central America, Europe, Infrastructure Lifecycle Management, Infrastructure Sharing, Job Ticketing, KPIs, Monitoring & Management, Multi-country Partner, NOC, O&M, Operational Excellence, RMS, Site Level Profitability, Site Management System, Siterra, South America, Transfer Assets, Who’s Who

Read this article to learn:

- Accruent’s position in the telecom ecosystem and global footprint
- How Siterra helps manage the full tower site life cycle
- How Siterra enables working with subcontractors
- The benefits of a SaaS site management platform

TowerXchange: Please introduce your company – where do you fit in the telecoms infrastructure ecosystem?

Bill Glass, General Manager of Telecom, Accruent: We have developed an enterprise-class Software as a Service (SaaS) product for tower companies which encompasses the full site life cycle from site construction to co-location and the decommissioning of towers. Our software facilitates efficient operations and drives strong revenue growth for tower operators and managed service providers.

Think of us as an Enterprise Resource Planning (ERP) provider for tower companies and MNOs. We have the capacity to manage the entire ecosystem that surrounds tower infrastructure.

Co-location is one area we have a special focus on; most tower companies want to increase their co-tenancy ratio. What makes our company unique is that it has the capacity to manage the entire process from marketing through to fulfilment and operational management.

TowerXchange: The first question our readers will want to know is ‘how proven is your solution in the field?’ Can you please tell us about the performance of your solution in the field – who is using it and what results have been achieved?

Bill Glass, General Manager of Telecom, Accruent: Our solution has strong credibility in the market. Thirteen of the top 121 tower companies listed by TowerXchange are already current Accruent
customers. At present, we operate in twelve countries across five continents and have a particularly strong focus for 2016 on Europe and Central and Latin America. We are constantly adding new portfolios for our current customers and carrying out implementations in multiple countries.

At first, many of our clients purchase our solution to use it in a particular territory. However, once they have the solution installed, they realise that they can achieve operational efficiencies by rolling it out across all of their countries and portfolios, and we can support them in this endeavour. If a company wants to roll out our solution to multiple countries, we can help them standardise processes by handling data in a digestible manner, tower companies and MNOs can make towers available on the market faster and more cost efficiently, thereby increasing tenancy ratios.

One of the selling points of our solution is that it cleans up and standardises data. It puts data into a much more efficient site-centric format, which makes it easier for MNOs and tower companies to buy, integrate and market their assets. What’s more, by handling data in a digestible manner, tower companies and MNOs can make towers available on the market faster and more cost efficiently, thereby increasing tenancy ratios.

TowerXchange: How does your solution help manage different stakeholders within the tower supply chain from tenants to subcontractors?

Bill Glass, General Manager of Telecom, Accruent: The solution can help tower companies handle leads and administration models. In addition, the asset register and customer portal integration that sits at the heart of Siterra’s colocation solution can be used to provide up-to-date information on colocation. For example, a tower company may wish to inform an MNO of open towers that are available for rent. They will be able to do this through our portal.

Our solution can also be used to support contract and service provider management. In fact, Siterra uses a permissions-based model. If an operator or tower company wants to give a contractor or service provider access to the system it can do so very easily. The contractor or service provider can then carry out a task and post a photo to provide proof that the project has been completed. Siterra offers sophisticated tools for project managers to efficiently review work submitted for accuracy and quality. What’s more, the system has built in security features so that each contractor’s access and visibility is limited to only the assets, tasks, and sites that are necessary for their work.

TowerXchange: How can your SaaS platform be configured to adapt to different towercos’ unique business processes and workflows?

Bill Glass, General Manager of Telecom, Accruent: We are constantly developing and upgrading our platform to suit the needs of tower companies. As things currently stand, Siterra provides for more than 90% of tower companies’ needs straight out of the box. The remaining 10% can be easily configured on the platform so customers can adapt it to meet their specific requirements. We come to the engagement with our customer with best practices available to immediately drive efficiency based on our knowledge of the industry.

We’ve also developed many feature requests in partnership with our clients. A client will typically come to us with a request for a particular feature. Once we have developed that feature we will incorporate it into later versions of our platform so that other customers can take advantage of it.

Thanks to our focus on long term partnerships and successful product co-development, we’ve been able to create a stable platform for tower portfolios. However, we notice that many companies in the market continue to invest in custom software. We feel that this is a failed strategy because, over the long term, companies end up wasting IT resources and limiting the potential to make long term efficiency gains.
TowerXchange: How can a robust approach to asset registers and asset lifecycle management improve the valuation of tower assets?

Bill Glass, General Manager of Telecom, Accruent: The main benefit comes in being able to understand the condition of the assets and the inventory associated to those assets. Being able to keep track of inventory is a benefit, particularly for large, international tower companies. Smaller companies, on the other hand, are looking to maximise their tower valuation for strategic buyers. That’s exactly where the site-centric focus of our software comes into play.

Our platform can provide complete access to maintenance records, site information and pictures of site equipment. This makes it extremely useful for strategic buyers and companies that are seeking to sell their assets.

For example, it isn’t really feasible for a strategic buyer to use manpower to inspect four thousand towers when purchasing a portfolio. By using Siterra, buyers and sellers can perform clean searches without digging through files and records to get access to the right information. We find that most buyers and sellers prefer to use Siterra to carry out the portfolio valuation process – at the end of the day our system reduces acquisition risk for acquirers and improves return on investment for sellers.

TowerXchange: Please sum up how you would differentiate your solution from your competitors?

Bill Glass, General Manager of Telecom, Accruent: Our annual product investment is larger than most of our competitors’ revenues – that in itself differentiates us from our competitors.

On top of this, Siterra is a SaaS platform, so we have benefited from the shift towards cloud applications. Unlike many other solutions on the market, our SaaS application was not built from scratch based on an on-premises application – all of our incremental investments have been to enhance its functionality. Total costs for the customer can escalate quickly if a solution needs to be re-built over time or requires extensive support. That’s why it makes much more sense to purchase a proven SaaS solution like Siterra.

With some solutions on the market, users tend to become beholden to professional service teams after deployment. That’s not the case with Siterra. Once a customer has bought the solution and implemented it, they’re up and running. They don’t need to constantly check in with our professional services department. Of course, our professional services and customer teams are always available if needed, but we are strongly of the opinion that our customers should not be dependent on us for their daily business needs.

There’s also a huge amount of functionality built into Siterra that allows customer system administrators to modify workflows, create new reports and manipulate site data on a large scale within the administration console. Users don’t need to receive any code or help from Accruent to make these changes.

In summary, our market share, our investment, and our product functionality significantly outweigh our competitors’ products, and over the last fifteen years, we have successfully brought the best of the best when it comes to industry best practices and knowledge.
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