



**Small Cell Technology is Ready,
but are Carrier Organizations?**

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With the upcoming wave of small cells, wireless carriers are facing a significant shift in the way networks are designed, deployed, and operated. In general, their organizations, processes, tools and vendor relationships are not structured to fully benefit from the speed, cost, and quality advantages that small cells can offer. Worse yet, the large carriers are often encumbered by a macro-network mindset that makes the development and implementation of a comprehensive small cell strategy even more challenging. Carriers will need to strategically evolve existing capabilities in order to achieve the improved price points and shorter timeframes associated with small cell deployments.

There is little argument that data growth on carrier networks will necessitate continued coverage improvement and densification that cannot be accomplished just by adding more towers. When carriers shift voice traffic to VoLTE the need for data capacity is exacerbated. Global mobile data consumption grew 81% in 2013 and is forecasted to grow at a compound annual growth rate of 61% over the next five years.¹

Small cells are a critical tool for the carriers to more efficiently utilize their spectrum assets and to take a more surgical approach to adding network capacity. In the past, carriers would identify an overloaded sector and have to either add radios or deploy an additional cell site. Other than costly DAS networks, these solutions gave little flexibility to address the consumption profile that was causing the capacity constraint (e.g., was there a particular commercial area that was the source of the problem or was it capacity demands across the sector). Firemen don't douse an entire neighborhood with water when one house is on fire – carriers shouldn't throw up a new macro site when the problem may be solved with an appropriately placed and much more attractively priced small cell.

EVOLVING CARRIER NETWORK ORGANIZATION CAPABILITIES

Small cells enable carriers to deploy targeted solutions to address the root cause of their network capacity and performance issues. However, carrier network organizations are not built to execute on these solutions. Historically, in-building and DAS systems were managed by dedicated teams that specialized in the nuances of these types of deployments. These capabilities will need to be scaled or more broadly distributed across the organization as small cell deployments grow to represent a much larger share of the workload.

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Table 1 – Process, Tool, and Organizational Changes Necessitated by Small Cells

Functional Area	Process, Tool, and Organizational Implications
RF Design & Optimization	<ul style="list-style-type: none"> • Engineering teams will need to design and optimize an exponentially larger number of sites • Design must be performed at a much more intricate level (i.e., address coverage and capacity at a more granular level, while managing interference, and avoiding the degradation of macro network performance) • Engineers will need to understand the specific usage patterns on the street and within buildings • Drive testing a street route is no longer sufficient to measure performance
Site Acquisition	<ul style="list-style-type: none"> • Carriers will be competing for space at a micro level where, unlike towers, there may be less willingness to accept multiple installations • Likely a much larger number and diversity of landlords with a wider variation on price points and contract terms • New types of MLAs and site acquisition vendors likely to emerge, potentially leading to new types of vendor services agreements • Structure identification must consider a much broader base of candidates than typical tower databases provide • Leasing, zoning, and permitting processes will change significantly as the structure types differ (e.g., cable strands, utility poles, indoor mounts, lampposts), which may require franchise agreements, coordinating with conservancy groups, etc.
Backhaul	<ul style="list-style-type: none"> • Must achieve a more favorable price point where dedicated backhaul is utilized • Potential for shared backhaul with landlords and relaxation of performance requirements (e.g., ‘consumer’ vs. ‘carrier grade’) • Challenges getting backhaul to atypical locations that are favorable for mounting small cells
Deployment	<ul style="list-style-type: none"> • Construction and installation services require different skillsets than macro sites (e.g., pulling aerial or underground fiber/CAT6 vs. tower cable runs, replacing utility poles in high traffic areas) • Program managing tens of thousands of active deployments requiring different milestones, work allocations, and vendor management (e.g., invoicing, change orders, acceptance) • Logistics of moving and storing large quantities of small equipment with little customization vs. logistics of moving small quantities of large equipment with extensive customizations • Sites will present unique access restrictions (e.g., inside of a restaurant)

Functional Area	Process, Tool, and Organizational Implications
Network Monitoring & Management	<ul style="list-style-type: none"> • Potential for many unique operating scenarios (e.g., responsibilities could be shared with a corporate IT department, the carrier could be managing a public WiFi network) • Active monitoring of a much larger number of nodes with potentially varying service level requirements and performance tolerances
Maintenance & Repair	<ul style="list-style-type: none"> • Field organizations will need to be equipped with potentially large number of replacement devices where swapping is preferable to repair • Sites will present unique access restrictions (e.g., inside of a restaurant, utility pole). • Increased cell site volumes require a balance between headcount and response times • Field technician dispatch systems may need to integrate with new third party maintenance and repair systems
Property Management	<ul style="list-style-type: none"> • Managing potentially hundreds of thousands of landlord agreements with a much higher degree of variability in lease terms • Increased fragmentation introduces larger number of payments, payment issues, and inbound landlord call

Carriers will need to launch focused initiatives to make the system, tool, process, and organizational changes required to achieve the improved price points and shorter timeframes associated with small cell deployments. Asking the existing organizations to absorb the deployment and management of small cells can quickly erode the expected benefits and may result in fragmented approaches across carrier regions. This organizational maturation is a critical activity in moving from the technology phase (i.e., trials and analysis) to commercial deployment at scale.

MULTIPLE VENDOR MODELS ARE LIKELY TO EMERGE

In addition to the evolution of the internal carrier organization, the relationship with vendors must also change. Several models (and hybrids of each) are emerging as carriers explore their options. Over time, carriers will settle into a vendor model that achieves their cost, speed, and performance objectives.



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Model	Benefits	Risks
<p>Carrier Self Performance – Carriers utilize internal resources for most activities including project management and leverage vendors for few specific tasks</p>	<ul style="list-style-type: none"> • Carrier retains end-to-end control • Easier to quickly change approach or priorities • Improved ability to keep focus on the business case 	<ul style="list-style-type: none"> • Less opportunity to benefit from vendor innovations and ideas • Encumbered by the way things have been done • Reduced ability to share risk
<p>Backhaul Provider Managed Service – Companies with extensive fiber plant provide a turnkey service from design through deployment and maintenance</p>	<ul style="list-style-type: none"> • Vendors have real estate and fiber assets, two key parts of the solution • Existing field force in the same geographic areas • Built-in incentives to drive backhaul prices down in order to increase volumes 	<ul style="list-style-type: none"> • Must relinquish some control of the network • Vendors have limited RF capabilities in house • Complex contracting relationships • Geographic coverage limited • Potentially more expensive as vendor likely to sub out some work
<p>OEM Managed Service – Equipment manufacturers provide or partner to provide a turnkey service in an effort to drive small cell sales</p>	<ul style="list-style-type: none"> • Deep knowledge of the equipment and network • Can perform across all geographies • Close relationships exist already 	<ul style="list-style-type: none"> • OEMs may be focused on selling equipment instead of on the best solution for the situation • Services costs likely higher and complex contracting • Challenges getting them to fully support other equipment • Historically not the best performers of deployment
<p>Independent Entity Managed Service – Companies that do not have a real estate portfolio, fiber plant, or small cell product act as an aggregator to provide a turnkey service</p>	<ul style="list-style-type: none"> • Can perform across all geographies via subcontractors • Potentially fewer vendors to manage • Opportunity to leverage scale and buying power of multiple carriers (i.e., ‘shared infrastructure’) • May be able to absorb broader scope than others 	<ul style="list-style-type: none"> • Unwind can be challenging if the relationship sours • No large national player has emerged; may be fragmented or commit to a vendor to help scale • May not achieve same price points as self-performance
<p>Hybrid – Carriers engage third parties in a best-of-breed structure for many of the activities like design, deployment, integration, etc.</p>	<ul style="list-style-type: none"> • Leverage strengths of each provider • Specialization enables achievement of scale • Ability to replace individual vendors where performance warrants • Can gradually migrate functions back to carrier as org matures 	<ul style="list-style-type: none"> • Larger number of vendors to contract with • Increased number of process handoffs can introduce delays and financial risk • Potentially more expensive as scale is spread across multiple vendors

REALIZING THE BENEFITS OF SMALL CELLS

The small cell deployment wave is fast approaching and carriers must invest the time and resources now to achieve the desired benefits. Neglecting the required organizational, process, tool, and system changes will result in a delayed ramp of small cell deployments and could cause a long term impact to the underlying business case (e.g., cost precedents set for real estate and backhaul, burdened by complex managed services relationships). Focused efforts on organizational evolution, process design, vendor sourcing, and project management will allow carriers to accelerate deployments and avoid costly mistakes.

The organizational impacts reach beyond the Network teams. Decisions on when, where, and how to deploy small cells will ultimately involve a broader group of carrier participants (e.g., sales, marketing). There are marketing messages, customer relationships, and business cases to consider. The volumes are simply too great to allow things to ‘fall into place’. Carriers must take a proactive approach to defining their comprehensive small cell strategy across the enterprise.



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ABOUT THE AUTHOR

Greg Weiner is a managing Partner and co-founder of Vertex Consulting. He has over 14 years of industry and consulting experience with a strong emphasis on sourcing/outsourcing and the telecom industry. Previously he was a Vice President of Strategy and Business Development with Mobilitie, a wireless infrastructure owner with tower and fiber assets across the US country. Prior to Mobilitie he was a co-founder and CIO of Pace Harmon, a boutique consultancy focused primarily on supply chain and strategic sourcing.

ABOUT VERTIX CONSULTING

Vertex Consulting provides pragmatic and actionable insights on the most critical issues faced by telecom and other evolving industries. We pursue our collective passion for helping companies by working with carriers, OEMs, tower companies, MSOs, network services and equipment vendors, and telecom services consumers to help them resolve their most complex sourcing and technology challenges. Our telecom expertise, focus and simplified delivery model differentiates our practice from other management consulting firms, enabling Vertex to deliver an alternative vision for our clients: producing client-centered telecom advisory solutions for a select group of highly-complex industries in a way that only experienced and proven professionals can truly deliver.

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