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Mark was a Senior Manager with Deloitte Consulting and a Leader of the firm's Wireless Real Estate Practice before he joined Mobilitie. Mark manages all of Mobilitie's significant investment activities and transactions. At Deloitte, Mark provided strategic real estate and portfolio capitalization strategies for corporate users, including the development of operations and asset strategies for three of the Big Six Wireless Carriers. Previously, at Cleveland Real Estate Partners, a boutique firm acquired by Deloitte, Mark specialized in managing complex lease and fee transactions. Prior to attending graduate school, Mark was a Principal Planner with the Lake County, IL., Department of Planning, Zoning and Environmental Quality. He holds an MBA from the Weatherhead School of Management at Case Western Reserve University, and a Bachelor of Science in Landscape Architecture from the University of Wisconsin - Madison.

Coverage maps exaggerate! They purport to provide ubiquitous coverage and the promise of high-speed services to all. Yet those who live in or travel through many suburban and rural communities will attest to the fact that notwithstanding the map, they do not have access to the same services as those living and working in more densely populated communities. In fact, they may not have service at all. It's simple economics. The potential revenue available to competing wireless carriers in rural communities is simply not sufficient to justify the independent investment in robust network infrastructure by the four or more operators that compete in each market.

Wireless carriers collectively have spent billions of dollars on new spectrum in recent years in order to bring new data services to U.S. consumers. These advanced network technologies are designed to bring a plethora of multimedia services like on-demand video programming, location-based wireless services and mobile marketing solutions to consumers. Customers – whether they are urban, suburban or rural – are just as likely to use these new wireless services while they are at home on the couch as they are to use them while they are on the go. Initial deployments of first- and second-generation wireless technology largely were built along the urban highways, and gradually spread to city centers and suburban areas. Tomorrow's 4G deployments will require adequate cellular coverage not only in densely populated cities, but in suburban and rural areas as well. Carriers have the added challenge of making sure coverage reaches into people's homes, not only to their streets.

Multi-standard base stations that host several wireless protocols have the potential to change the way wireless operators deploy networks and serve communities outside their core markets, giving wireless operators the ability to satisfy those customers' voice and data needs with robust service, as well as offer enticing content that can result in better average revenue per user for suburban and rural customers.

The Roaming Solution

National wireless operators have long used roaming agreements with smaller regional and market-based carriers as a tool to bolster the breadth of coverage that they advertise. Changes in the competitive landscape and the economics of roaming are causing such agreements to be less

Mobilitie \mō-bil-i-tee\ *verb*

1: the quality of being mobile **2:** the fastest growing tower company in the United States **3:** 50% revenue share and no equipment limits **4:** \$500 million on hand to invest in towers, DAS, and broadband backhaul networks

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attractive every day.

As the trend of wireless operator consolidation continues, national carriers increasingly find themselves roaming not with affiliates, partners and local wireless operators, but on the networks of their primary competitors. Hundreds of millions of dollars are now exchanged annually between competing carriers to roam on each other's networks. This is strategically untenable to wireless executives.

Wireless executives are not only concerned with the fact that they have become dependent on their competitors' networks, but also with how much they are paying to allow their customers to roam. In the early days of wireless services, when the increased cost associated with roaming was largely passed to the consumer directly, the rates that roaming partners charged each other were not of great importance to the operator. But as consumer usage increases, particularly of data services, on rate plans that are increasingly "all you can eat" offerings, wireless operators are finding that their roaming expense is growing at a rate many times higher than the rate of the associated revenue growth. Fixed revenues and growing variable expenses lead to quick erosion of operating margins.

As a result of these strategic and economic considerations, roaming overbuild programs are a current priority of wireless operators. These programs compete for scarce capital and human resources with legacy network coverage and capacity builds, and more importantly with next-generation deployments. Where roaming expenses are very high, the investment required to build a new network is financially justified by the roaming savings to be achieved. And while the coverage provided by the typical roaming overbuild is sufficient for the wireless operator to paint its coverage map, the traditional roaming overbuild is a thin design: It provides adequate coverage and capacity for legacy technologies, but it typically does not provide robust coverage nor can it support the next-generation technologies. Furthermore, there are many areas where despite the strategic desire to eliminate roaming on a competitor's network, the potential roaming savings cannot financially justify even a minimal overbuild.

A shared neutral host network based on multi-standard base station technology can provide the national wireless operator a coverage solution that offers:

- better coverage than that provided by a typical roaming overbuild (i.e., sellable coverage)
- lower roaming rates than traditional roaming agreements
- improved mobility and hand-off between networks than traditional roaming
- support for next-generation technologies
- requires zero capital investment by the wireless operator, and
- eliminates dependency on competing carriers' networks

The Tower Collocation Model

As carriers built out the first generation of wireless networks, they were loath to permit their competitors to collocate on their new tower structures. Cell site locations were viewed as providing a competitive advantage over a rival's network. But as pressure from municipal governments to limit the number of cell site locations mounted, and as mobile operators learned that they could not compete on the relative strength of their networks alone, the tower collocation industry was born. This was a first small step toward limited sharing of wireless infrastructure among carriers.

Virtually all wireless operators own portfolios of tower sites on which they allow their competitors to collocate. Some, including AT&T Mobility and T-Mobile USA have large tower portfolios that they actively market and manage in a manner similar to that of independent third-party tower companies. Yet tower marketing and management is not and should not be a core competency of a wireless operator. Similarly, the capital investment a carrier must make in the concrete and steel of tower construction does not produce nearly the return that that same capital investment in new technology, devices, and services will produce. Time has proven that both the investment in and marketing of tower structures is better left to a neutral third-party tower owner.

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Any wireless operator could invest in the infrastructure necessary to build and operate a sharable network based on multi-standard base station technology. But as with the tower collocation model, such investment is better left to a neutral third-party host. A neutral host can assure each wireless carrier sharing the infrastructure is treated equally, and assumes the responsibility for network operations and maintenance allowing operators to focus on and invest in their core business.

The Multi-Standard Deployment

The ingredients for a successful neutral-host network based on multi-standard base station technology are few:

Multi-Standard Equipment. Most telecom equipment manufacturers today sell some type of multi-standard base station, which has one platform to house different air interfaces and different frequencies in the same unit. Multi-standard base stations are able to accommodate a number of standards-based protocols, including GSM, CDMA, iDEN, UMTS and HSPA-based technologies. Major base-station providers today also are confident that LTE and WiMAX technologies can be integrated into the same housing with one base station and one antenna set. Adding a new carrier channel is accomplished simply by plugging in a new card.

Neutral Host. The neutral host is an independent third-party network operator responsible for deploying, funding, operating and marketing the network for and to its roaming partners.

Spectrum. The neutral-host model works because the host is not a traditional carrier, and thus does not have spectrum of its own to contribute to the enterprise. Spectrum may be contributed by any one (and potentially more than one) of the roaming partners. In exchange for its contribution of spectrum, the contributing wireless operator receives most-favored roaming rates.

Multiple Roaming Agreements. The economics of multi-standard deployment work because one network is built to support the sum of the traffic of multiple wireless operators. Multiple operators effectively share the cost of operating and maintaining the network while paying below-market rates for only the voice and data traffic that their customers demand.

Summary

With the advent of multimedia services, wireless consumers desire to use the new generation of smart devices to access information wirelessly, when they want, how they want, and where they want. This phenomenon is not limited to consumers in urban environments; it's universal. As penetration rates near 90% across the United States, wireless operators that want to continue to grow their business also will want to deploy more equipment to reach subscribers in suburban and even rural areas.

Deploying multi-standard base stations that can house a number of air-interface protocols across a range of wireless frequencies is a way for wireless operators to reduce costs associated with expanding their coverage, thus enabling their rural and suburban customers to have the same access to robust voice services, new content, and data applications that their urban customers enjoy, and that their national marketing campaigns advertise.

Using a trusted, neutral third-party partner to manage site deployment and network operations will collectively reduce the capital and ongoing operational costs of such networks for each participating carrier. Wireless operators that embrace this model of shared deployments can ensure that they are offering their customers better service, at a reasonable cost structure, and may be able to upsell those suburban and rural customers' data plans and content that enable the operator to increase its incremental revenue from such customers.

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