

Infrastructure, regulatory and financial information for the antenna industry

ABOVE GROUND LEVEL

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DECEMBER 2008

Looking Toward the Future

2009 outlook for tower developers

2009 forecast for public tower companies

Future of the tower business

How to protect sites from ground potential rise

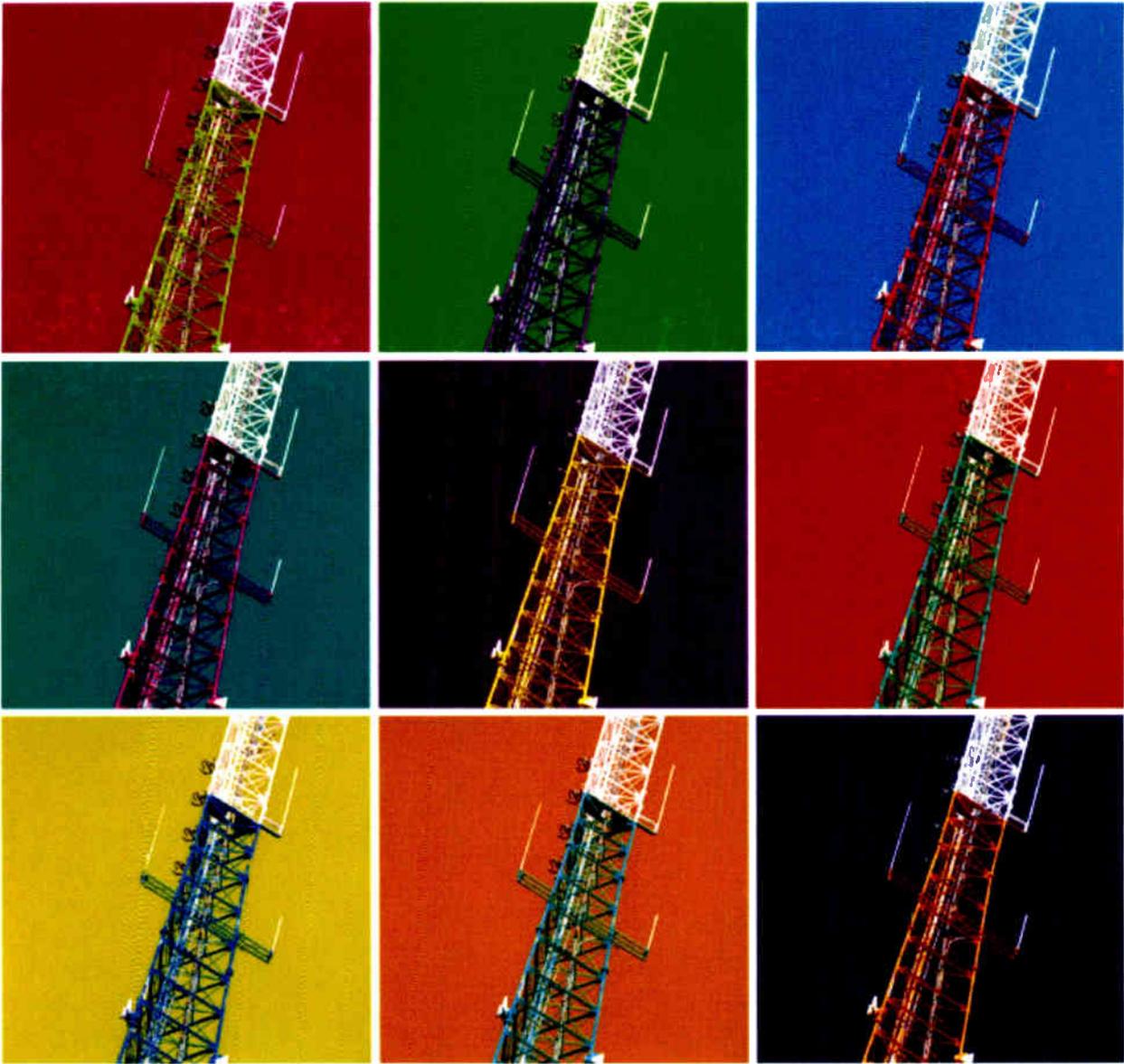
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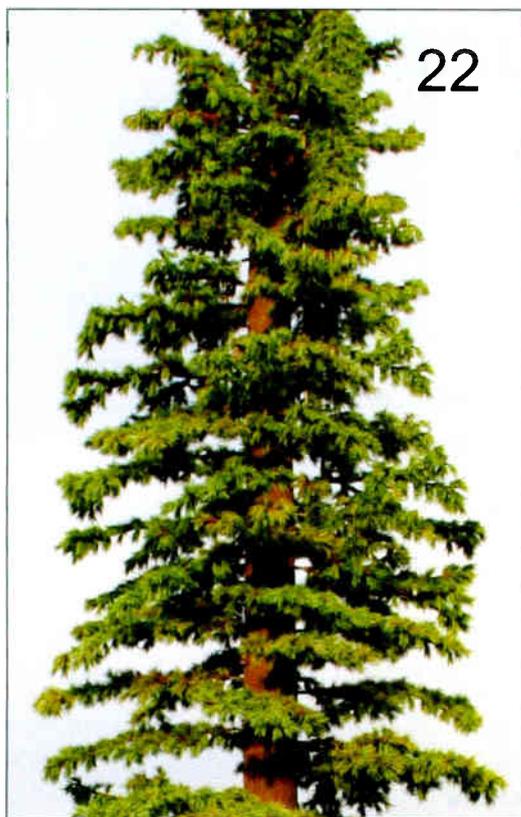
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Can't see the tower through the trees? Look again. Designed to blend into its surroundings, this 80-foot monopine offers a nice balance between cell coverage and maintaining the natural environment. Originally a slip-sleeve monopole, it was manufactured by Sabre Towers and Poles, the tower division of Sabre Industries. Located in Troy, N.Y., it is used by Verizon Wireless for cellular/wireless communications.

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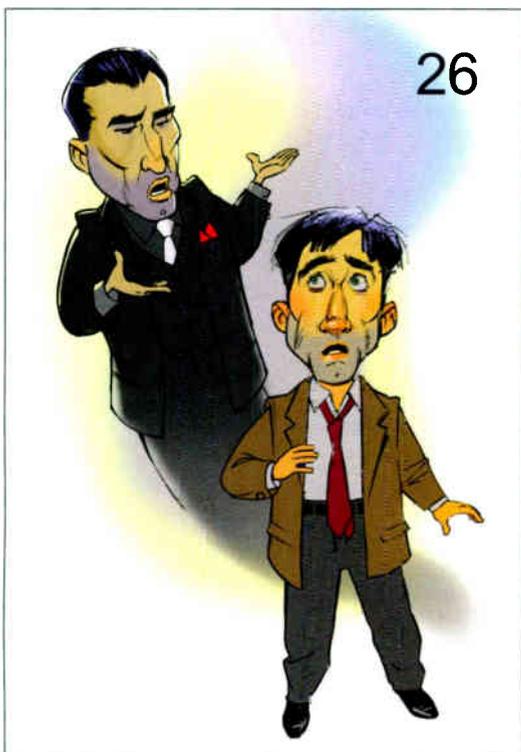
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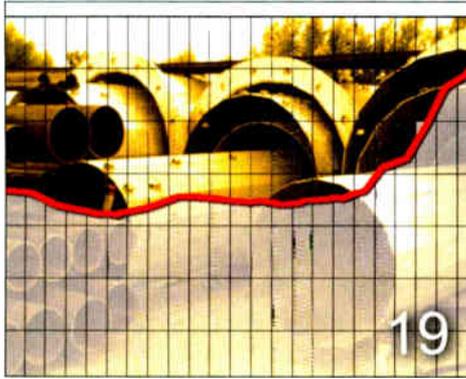
Verizon and AT&T are reported to be aggressively building to meet demand and improve coverage, which spells good news for tower owners. Burgeoning demand for backhaul also means that wireless carriers will be leasing new microwave dish space from tower owners.

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on the cover

The science of postulating possible, probable, and preferable futures is called Futurology, or Futures. In this, our fourth annual "Futures" issue, we'll again look at the tower industry as it is today, how it is likely to change in the future, and where potential pitfalls may lie.

Cover art by Scott Dolash.

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AGL is the official commercial magazine for PCIA and provides a forum for commentary, news and information for that trade group. However, opinions, policies and information submitted to the magazine by PCIA do not necessarily reflect the opinions or news judgment of Biby Publishing, the publisher of AGL. Likewise, news items, product information, commentaries and featured articles produced by AGL do not necessarily represent the opinions, policies or endorsements of PCIA.

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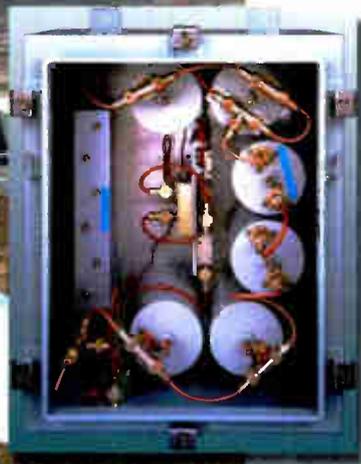
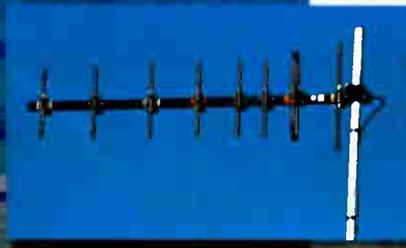
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Change Is Coming

I'm sorry if you're not happy about it, but change is coming, like it or not. We have a new president-elect, and what an unbelievable milestone the presidential election was for our country. Perhaps because I'm a D.C. native, seeing a smooth change in leadership is always a proud moment for me.

When the political party in control of the White House changes, changes follow at the federal agency that matters to all of us in the wireless infrastructure industry: the FCC.

It is clear that major changes will be coming at the FCC, where at least two of the five commissioners are "outta here."

The initial indication from the president-elect's advisors is that they are looking for

qualified people, and not necessarily at party affiliations, when considering potential commissioners. They selected Henry M. Rivera as the head of the FCC transition team. Rivera, a Democrat, is a former FCC commissioner. Rivera is a partner in the D.C. law firm of Wiley Rein. Named partner Richard E. Wiley, a Republican, is a former FCC chairman. It looks a little incestuous when you consider the number of people from Wiley Rein who are involved, but the nice thing is that Wiley Rein



Many of the new and emerging technologies have already been set in motion and are going to see implementation

has ex-FCC chairmen and numerous ex and future FCC commissioners associated with the firm. Do a Google. The transition appears to be going in a

by Rich Biby, Publisher
rbiby@agl-mag.com

6 above ground level

good direction.

What is going to change? In many ways, for us, the tower guys, not much. Many of the new and emerging technologies have already been set in motion and are going to see implementation. As I write this, the FCC just released its Second Report & Order regarding unused analog TV frequencies called White Space, so I haven't had much time to evaluate and reflect on the effect of the order. Regardless of the specific details, the R&O will offer a number of opportunities for new wireless services to use many of the 6-MHz-wide channels that will be made available virtually everywhere in the United States on Feb. 17, 2009, the digital TV transition date.

I had a little to do with some of the technologies used to evaluate how VHF and UHF channels would be re-packed, and a lot of spectrum will be available. If you have ever had an idea that required spectrum, this is a great time to make it happen. The result I see for us who have available tower space is that there will be more folks who will want to rent space. This is in addition to the demand resulting from Advance Wireless Service spectrum assignments, the deployment of WiMAX technology and everything else already in play.

For the wireless infrastructure industry, change is relative. Several regulatory issues remain pending, including backup power for cell sites and avian mortality — the birds. I hope the new commission will at least pay attention to physical reality and be objective. If telecommunications towers are responsible for massive bird kills, then we need to address the problem and work to fix it. If it is nothing but tabloid science driving the perception of a problem, then

let's have due process and be done with it. I don't believe much science is involved. We'll see. I believe that the backup power issue will get a fair shake under any new administration. And I can only hope, from what we've seen so far, that perhaps true bipartisan government may be possible.



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Brother, Can You Turn On a Dime?

When credit markets close and share prices plummet, tower companies lose two sources of currency for acquisitions and growth. Financial market changes



such as those in the fourth quarter of 2008 demonstrate how quickly conditions that favor the use of OPM – other people’s money – can change to favor the use of one’s own cash. From one end of the economy to the other, the byword has been “deleverage,” meaning, retire debt, acquire little or no new debt, and

use cash flow to finance operations, construction and acquisitions.

The Depression-era song, “Brother, Can You Spare a Dime?” recalls a time of economic collapse no one wants to see again. “Brother, Can You Turn On a Dime?” might be the question for business owners as they quickly turn the dial from using debt to grow their enterprises to using free cash flow to retire debt. The idea would be to avoid the need to refinance during a time when refinancing not only might be expensive, but perhaps nearly impossible.

One public tower company after another has expressed its much-improved balance sheet compared to its balance sheet from six years ago, the time of pre-

vious financial stress. At that time, there were five public tower companies, and two of them reorganized under Chapter 11 of the bankruptcy law.

There is a time for leveraging, an interesting word often used to mean borrowing money, and there is a time for deleveraging, meaning paying off debt. When lenders are unwilling to refinance loans, cash is king.

Fortunately for many tower companies, cash income is something they say they have plenty of. Maybe that will allow them to turn their businesses on a dime. **agl**

by Don Bishop, Exec. Editor
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Pictures of the Month

In addition to providing feature layout, illustration and cover design, AGL Art Director Scott Dolash occasionally leaves the mind-numbing hum of his computers, monitors and modems to photograph tower sites.

Last month’s Tower of the Month resulted from one such photo assignment. Typically, readers and advertisers provide the Tower of the Month image. Sometimes, we shoot our own pictures. More often than not, photographers shoot tower pictures from the ground looking up, or from a distance to show a profile. Dolash photographed a Lenexa, Kan. monopole shown at the top right by climbing a 75-foot ladder on a city fire truck — with the help of Lenexa firefighters. His perch allowed the unusual perspective from an elevation looking down. Expect to see more of his work from this shoot in future issues.

We’ve also sent our art director to meet with advertisers and industry leaders. This past spring, while in Southern California, our “Keeper of Artistic Integrity” visited the 32,400-square-foot corporate headquarters and manufacturing facility of Peabody Engineering in Corona.

In the second photo, Dolash (left) is shown meeting with Peabody’s vice president, Robert Hunt, to view one of the company’s site-concealment projects. Using fire-retardant resins and custom molds, the company creates structural shapes that mimic the look of host buildings. Concealment technologies play an important role in antenna site development, and AGL will include information on the subject in 2009.

If you have suggestions for stories or pictures, give us a call.





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The Road Ahead: Policy Challenges and Opportunities

– by Jackie McCarthy –

D.C. is abuzz. Construction is under way on Capitol Hill for stages and bleachers, and carriers are preparing for a significant increase in network usage in our nation's capital on January 20, as we inaugurate Barack Obama as the new U.S. president. Of course, with these changes come additional shifts. A new Congress begins its session, and many federal agencies undergo leadership changes. At PCIA, we look forward to 2009 with excitement about the opportunities for policies that encourage robust wireless infrastructure. We are also keenly aware of the significant regulatory and legislative challenges faced by our industry. We approach a new year with a renewed focus on and a passion for enabling the wireless future. To that end, we expect to engage on a variety of issues at all levels of government.

Federal outlook

As is customary in the waning days of a presidential administration, the FCC has left numerous issues open for further development in 2009. At press time,



these issues included its proposed backup power order, its court-ordered review of NEPA compliance measures for the effect of towers on migratory birds, and its proposed revisions to the pole-attachment process. Leadership changes at the FCC offer a significant opportunity to provide

education and resources to new staff and new commissioners. At every turn, we provide this outreach by making the connection between the overarching goals of the FCC — including broadband deployment, spectrum efficiency and a competitive telecommunications marketplace — and a vibrant network of wireless infrastructure.

On Capitol Hill, a new Congress and changes in party and committee leadership provide yet another opportunity for outreach. Here, we will target our message to the need for revisions to the Telecommunications Act of 1996 that better serve the goal of rapid site development and efficient use of existing infrastructure.

State outlook

In state capitals across the country, legislators reconvene to tackle pressing issues in a difficult budgetary climate. From Sacramento to Albany, we monitor the feasibility of, and political will for, legislation providing for streamlined (i.e., administrative) approvals of collocations, and reasonable limits on application fees and review time lines. We began implementation of our 2009 state legislative strategy in summer 2008 through coalition building among our members and the larger community of wireless industry stakeholders. We embark on state siting legislative efforts in close cooperation with carrier members, and do so in places where both need and political feasibility are high. We also coordinate with state wireless associations where applicable, to inform the process with real-world context and expertise from the “site development front lines.”

Local outlook

Our local policy approach combines providing a wealth of resources to local

policy makers with aggressive targeting of illegal and unreasonable anti-siting measures. PCIA will continue to work with policy stakeholders such as the American Planning Association, the National Association of Counties and the National League of Cities to promote our model zoning ordinance. The South Dakota Public Utilities Commission recently endorsed the model zoning ordinance as a resource to counties and cities statewide. More generally, PCIA will speak out about wireless infrastructure as a public safety and economic must-have. In addition to these long-standing ties, PCIA looks forward to expanded outreach with organizations such as the National Association of Telecommunications Officers & Advisors and the National Association of Realtors.

As local governments establish or revise wireless facility siting ordinances, alone or with an impetus from a municipal consulting firm, PCIA stands ready to provide responsive comments to guide the process. These comments provide food for thought, such as items a local government should consider before hiring a municipal consulting firm. The comments also provide resources, such as our model zoning ordinance, targeted to the community at issue.

Join the effort

The industry benefits from a unified approach that emphasizes common interests in pursuing pro-development policies. Please join that effort by contacting my colleague, Mike Saperstein, or me at 703-759-0300. We want your input, and we value your contribution. **agl**

Jackie McCarthy is director of Government Affairs at PCIA — The Wireless Infrastructure Association.



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DAS: Improving Wireless Coverage and Capacity Today and Tomorrow

by Barton Filipiak and Dave Schneider

Distributed antenna systems first became a viable commercial possibility in the late 1980s. Although DAS deployment experienced tremendous growth in the past six years, the technology is only just reaching the first turn of its growth curve. Several aspects have contributed to its growth and will continue to drive DAS network deployment.

The first DAS networks were designed to extend wireless voice coverage inside buildings where analog coverage from a macro antenna was lacking. Recent studies have indicated that more than 80 percent of cellular phone calls originate or terminate indoors, so it is only logical that indoor coverage should be every bit as important as outdoor coverage. Dropped calls are a primary factor in wireless customer dissatisfaction. Although customers expect their wireless calls to remain connected outdoors, they do anticipate that calls occasionally may drop when going from outdoors to indoors. How

often have you overheard someone say, or even said yourself, "Hold on, I may lose you. I'm about to go inside"?

Obstacles can attenuate or block analog radio-frequency (RF) signals. Multitudes of blind spots exist outdoors, particularly in valleys or areas obscured by prominent geographic features and buildings. In the early 1990s, first-

generation analog cellular began to be replaced by second-generation digital PCS. Signal propagation reduced by higher operating frequencies made these blind spots more pronounced. Additionally, cell tower density grew nearly three-fold to provide the same level of coverage as the analog system. It did not take long for intelligent entrepreneurs to determine DAS technology could be used outdoors as well.

has completely ditched their traditional landline for wireless-only service, thanks to nearly ubiquitous coverage, free long-distance service and zero roaming fees. According to a September 2008 Nielson report, it is expected that by the end of 2008, one in five Americans will have "cut the cord." Additionally, we no longer use our phones just to talk to one another; we now use them to check email, weather, news, sports and even investments. Recently, we have also been able to download music and video on our "phones." Pretty good for a system designed to efficiently carry voice-only connections — right?

POTS to FTTH

Recall that the plain old telephone system (POTS) was engineered and optimized around the human ear and is quite limited in its ability to transmit digital data. With the advent of personal computers and the Internet, we began using the POTS system for

far more than just voice. Sure, it worked, but not as well as today's fiber-to-the-home (FTTH) broadband Internet connections. Early-stage data connections are reminiscent of dial-up, while 2.5G and 3G systems will remind many users of the switch from dial-up to the relatively blazing speed of the first broadband connection offered.

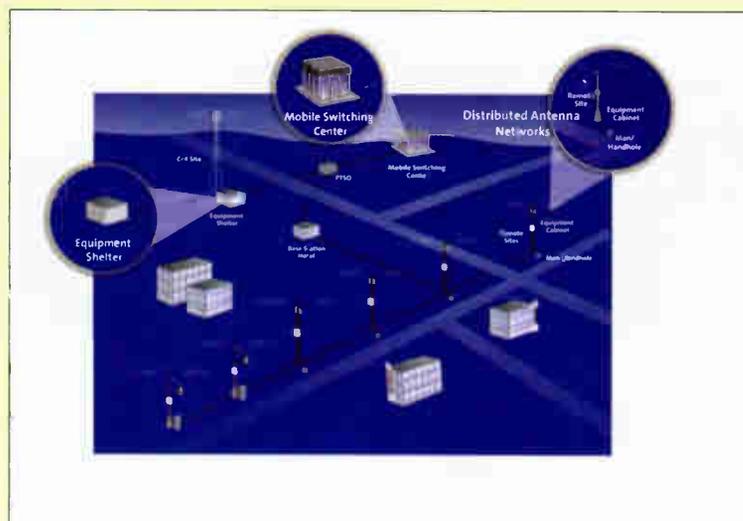


Figure 1. DAS seems like the Swiss Army knife of wireless, but that's not necessarily the case. In fact, DAS has commonly been a carrier's last resort, primarily due to cost. In most cases, to provide the same coverage as an average macrocell, a carrier would need to deploy more than six DAS nodes. DAS nodes require more cable infrastructure than traditional macrocells.

Moving into the current decade, far more people have and use cellular phones than those who do not. CTIA — The Wireless Association estimates that during the past 10 years, the number of cellular subscribers in the United States has grown from just under 61 million to nearly 263 million. In fact, almost 17 percent of the population in America

The 4G systems will be another step for users such as the step taken to use a FTTH network for wireline broadband connections. Until 4G systems are deployed two to five years from now, data will continue to be the secondary use of mobile networks. Not because it is unimportant but because the system was just not designed for it. DAS provides connectivity to a smaller service area than a macrocell and can boost data throughput 120 to 190 percent using current 2.5G and 3G technologies.

Particularly in urban and metro areas, user concentration can quickly overwhelm a macrocell, especially if those users are smartphone addicts trying to watch streaming video on demand. In such instances, the heaviest users are often concentrated in a small section or corridor of the macrocell coverage area. A DAS deployment there

could offload the heavy users and free up the macrocell's frequencies, base transceiver station (BTS) and backhaul infrastructure for the rest of the carrier's subscribers to use.

In other areas, a carrier may be trying to expand its coverage or add coverage to compensate for nearby cells that were reduced in size. In this case, a wireless carrier obtains the best bang for its buck by constructing a new macrocell. Unfortunately, constructing a new cell site is an incredibly arduous task and could take years. Many cities have lengthy and difficult approval

processes for new cell towers, further hampering a carrier's efforts to serve its customers. Everyone wants four bars of coverage, but they don't want to see the tower from their kitchen window. DAS antennas are usually installed on utility poles or even hidden in decorative lampposts to eliminate NIMBY (not in my back yard) concerns.

So far, DAS seems like the Swiss Army knife of wireless, but that's not necessarily the case. In fact, DAS has commonly been a carrier's last resort, primarily due to cost. In most cases, to provide the same coverage

as an average macrocell, a carrier would need to deploy more than six DAS nodes. DAS nodes require more cable infrastructure than traditional macrocells (see Figure 1). Members of the DAS Forum recently conducted research into the cost of deploying a DAS network to help shed some light on what to expect when considering the feasibility of a DAS deployment.

System costs

As with any communication system, the total cost can be broken down into the cost of components and the costs

Distributed Antenna System Cost Breakdown

Products

Cable and HW

Passives – 10%

- Optical cable
- Cable assemblies, closures, racks, hardware

Actives

Actives – 30%

- Remote nodes
- Base station electronics

Services

Engineering

Engineering – 20%

- RF design, route engineering
- System installation / commissioning
- Network integration and optimization

Construction

Construction – 40%

- Cable installation (trunk and laterals)
- Splicing (trunk and laterals)
- Base station hotel / Remote node mounting
- Passive plant testing
- Project management

Figure 2. The total cost for a DAS network can be broken down into the cost of components and the costs of design and installation services. The products represent about 40 percent, and services represent the other 60 percent. Note that the passive components represent the smallest overall portion of the cost while construction of the system represents the single largest aspect. In addition to being the largest cost element, construction is also the most variable of the costs.

of design and installation services (see Figure 2). For DAS, the products represent about 40 percent, and services represent the other 60 percent. Note that the passive components represent the smallest overall portion of the cost while construction of the system represents the single largest aspect. In addition to being the largest cost element, construction is also the most variable of the costs.

When installing cable infrastructure,

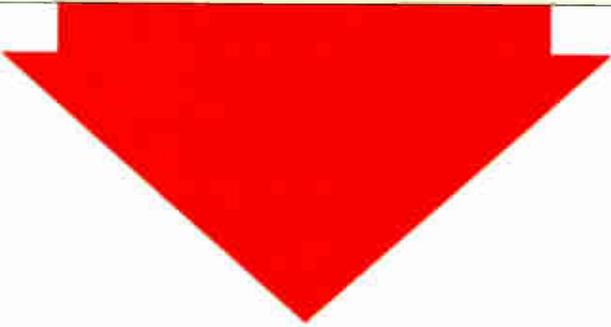
there are generally two choices: aerial or buried. Aerial installation is substantially less expensive than buried in most cases but may not always be an option. We would all love to see a string of brand-new poles along our desired route with only a single-phase electrical run and perhaps CATV cable installed on the poles, leaving plenty of room for new plant. It would be even better if make-ready costs

were \$10 per pole, and every local public utilities commission (PUC) was amenable to the idea of allowing the DAS. Unfortunately, make-ready costs often exceed \$300 per pole, and delays in processing the requests could exceed several months. Furthermore, DAS is a relatively new technology, and many PUCs don't understand how DAS fits in. Additionally, a utility pole route may already be overcrowded with no remaining space to add another cable. Such circumstances require either constructing another pole route or burying the cable. Both options increase the cost dramatically. A purely aerial DAS installation could cost as little as \$86,000 per node, while a similar buried installation would be closer to \$170,000 per node. However, an existing manhole-duct run with leasable duct space would be cheaper. Realistically, a new DAS network would involve some combination of aerial and direct-buried infrastructure, and associated cost would fall somewhere in the middle on a per-node basis.

In recent months, PUCs have become more informed about the technology and infrastructure requirements, thanks in large part to groups such as the DAS Forum Advocacy Committee. Further acceptance will enable system and deployment costs to trend downward, which will lead to wider deployment of DAS technology in the future. DAS systems are already deployed in 32 major metropolitan markets throughout the United States, and it is widely anticipated that the mobile market will continue to push wireless consumption to greater limits. In turn, DAS will increase in usefulness and importance as a critical tool for system deployment.

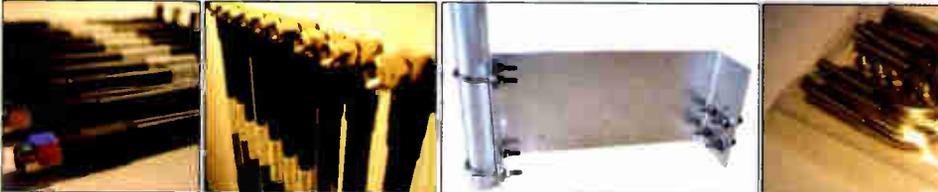
Carriers have a need for speed

As wireless users continue to trek toward multi-feature devices that incorporate advanced data and messaging applications, multimedia and navigational tools, wireless service providers — the carriers — require high-speed data, technologies and levels of high-volume usage. With the increased costs of adding each new subscriber, the economics of solving network quality issues is becoming



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paramount, and these network issues are occurring at a time when carriers are under pressure to decrease their expenditures for network deployments.

This challenging convergence, where carriers are using new or different technologies to respond to their customers' greater demand, will ensure that DAS continues to be a system architecture that will allow for a fundamental shift in cost structure in high-density, high-capacity metropolitan areas.

Providing cost-effective "everywhere, all the time" networks is a key success factor for carriers. Infrastructure cost, technology and regulatory solutions are required.

Until recently, mobile communication systems were primarily designed to provide effective coverage for moderate voice and data demands on a substantially regional basis. If carriers leave their current network designs in place with overlays on existing sites and further layers in new technology upgrades, network quality will diminish. This will be extremely inefficient from a capital and operating expense perspective.

The challenge facing carriers is to use system deployments that result in cost reduction. Reducing equipment cost will help reduce the total cost, but alone, it will not be enough. Passive equipment is only a small part of the total deployment costs compared with the overall design, acquisition, construction, operation and maintenance of mobile communications facilities. A simple but extremely effective way to capitalize on the existing investment is to redeploy existing *active* equipment assets into a DAS network to manage and allocate centralized RF resources dynamically.

Shared infrastructure resources

DAS makes efficient sharing of infrastructure resources available, resulting in a reduction of necessary new sites. With fewer sites, the effect on expenditures becomes evident when carriers no longer need to add fully provisioned base stations to meet a specific coverage and capacity need. With DAS implemented, existing assets can be efficiently extended to provide coverage. Radio assets

can also be easily added to the hub location to handle increased capacity requirements. This is faster and more economical than the current practice of developing an entirely new site into an area.

The financial aspects of augmentative DAS deployments can be compelling, but the technical aspects make DAS even more significant. With a ubiquitous

RF distribution infrastructure, new technologies can be plugged into the system and can be up and running immediately. This eliminates retrofitting the entire network with every new generation of technology.

The increase in bandwidth/data rate demand will continue to increase the need for better RF quality. Fourth-generation (4G) technology will also

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increase the requirement for more infrastructure, including more sites. However, customers expect to pay less for more services, trending toward “all-you-can-eat” plans. DAS architecture is one tool to solve this challenge. From a hardware perspective there are a number of initiatives focused on more efficient approaches. These include OBSAI (Open Base Station Architecture Initiative) and CPRI (Common Public Radio Interface) that allow BTS equipment to be “split.” It includes provisions for remote radio units that are quite similar to DAS nodes. In other words, these alternatives are, in effect, a DAS solution integrated with the BTS infrastructure.

Because of its reduced power requirements and smaller equipment dimensions, DAS is particularly adaptable to federal and state regulatory changes. For example, the FCC is currently in the process of requiring eight hours of battery

backup for every cell site — the so-called Katrina Rule. Although the fate of the FCC requirement remains subject to ongoing legal challenges, DAS architecture is being developed and deployed to meet this requirement with minimal effect on cost or convenience to the carriers.

Wireless access as a necessity

Communities are beginning to recognize that faster and more comprehensive wireless access is not a luxury; it is an economic necessity. Municipalities want to retain and attract businesses and ensure that their citizens have the ability to utilize wireless services that have inevitably become a quality-of-life issue.

However, as systems continue to evolve for the consumer, a significant trade-off parallels their development because increased use on any particular site results in a reduced range of service for that site. Therefore, using existing

infrastructure results in the need for additional sites, including the need for more towers.

To this point, community officials have faced significant challenges to protect local interests, such as imposing reasonable land controls while promoting the development of new wireless telecommunications technologies. The placement of wireless infrastructure has become a blistering issue among community officials and has caused public objections based on property values, aesthetics and safety. Few communities were equipped with the appropriate local regulatory control to deal with facility siting issues, and many communities hastily adopted local regulations in a piecemeal fashion without disciplined understanding of the technologies or the implications for land use and the day-to-day use by businesses and residents.

Initially, DAS systems have been

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considered minimally invasive. However, while many communities have embraced the aesthetic trade-off of DAS deployments versus traditional macro-site siting issues, they again find their codes absent of appropriate regulations.

Some states, such as Michigan, Florida and Texas, have recognized the use of community rights-of-way as a vital resource for providing wireless access to residents and businesses and have adopted statewide regulations and processes for communities to implement. Other states, such as Massachusetts, have somewhat close regulatory statutes. These statutes impose requirements that likely did not completely consider the implications associated with the deployment of this relatively new technology. They place undue hardship upon the communities to approve DAS networks. In one recent Massachusetts community's approval of a DAS network, the city was obligated by the state's statutes to mail notifications of the required public hearing to more than 2,700 abutters of the proposed fiber network. Not a single resident appeared before the city council to discuss the proposal on the night of the public hearing.

Educational efforts

Given the pressure under which community planners and elected officials implement policies and regulations related to land use, it will be imperative that DAS providers and organizations such as the DAS Forum continue educational efforts to assist local communities in the preparation of appropriate development regulations for DAS deployment. Regardless, DAS is almost always considered a less obtrusive, more desirable answer to communities for providing wireless service than traditional macro-site technology.

Commercial property owners have recently realized wireless coverage is a constant challenge within their buildings and campuses. DAS is providing just what is needed for indoor wireless connectivity. DAS networks turn indoor buildings' challenges into business opportunities. Indoor DAS solutions can provide cost-effective and unobtrusive distribution of radio signals throughout buildings. Indoor networks are typically used in shopping malls, convention centers, airports

and residential/mixed-use buildings. DAS is viewed as a targeted solution to address highly specific coverage or capacity needs. DAS is distinct from traditional mobile communications systems because it provides a flexible and scalable deployment for carriers. DAS will not completely take the place of more traditional network installations. However, as consumers place higher

demands on networks, and technology continues to advance, carriers will blend macro-sites and DAS solutions into their networks to maximize the benefits for their customers. **agl**

Barton Filipiak is market development manager at Corning Cable Systems, and Dave Schneider is director of Community Relations at ExteNet Systems.



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"Consider It Done"

New England Wireless Association

by Jeffrey Previte

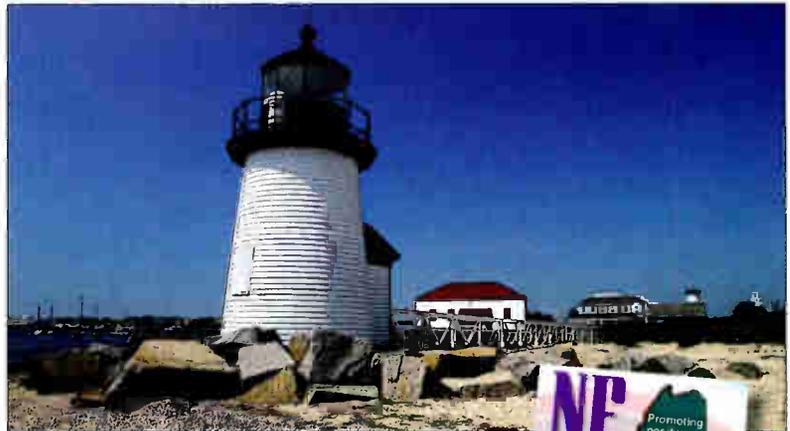
The New England Wireless Association (NEWA) is enjoying its second year serving the interests of a six-state region. Like the wireless infrastructure industry, the organization is consistently evolving to meet the needs of the community. Attendance continues to increase, and carrier participation has been good.



The NEWA website is currently being updated at www.negwa.org. NEWA has raised thousands of dollars for cancer research and also has donated to local organizations. The Boston Harbor boat cruise was well received last year and was repeated this year in the fall.

The September golf outing was a success. The weather was perfect, and the speaker, Berge Ayvazian from Yankee Group, gave a presentation on the history and future of wireless networks. NEWA has formed an alliance with Yankee and Mobile Internet World, which had its national conference in Boston on October 21-23.

Please call me at 617-308-4484 if I can help or provide anything regarding the New England wireless community. **ajl**



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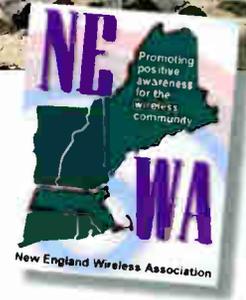
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Steel Prices Increasing Faster than Inflation

by Beau Aero and Jason Hubbard

Consumers are feeling the price sting of commodities each time they go to the store or fill up the tank; however, consumers of steel products are feeling an even bigger sting. The price of steel has increased 67 percent since Jan. 1, 2008. This is the most significant steel price increase in recent memory.

Steel prices have increased to a record high, according to the U.S. Bureau of Labor Statistics. Experts say there are many reasons for the price increase, one being that our country is in a recession. The annual inflation rate surged to 5.6 percent in July,

question that increased international demand is putting pressure on steel and steel commodity prices.

Steel is the essential material found in a wide range of goods worldwide. It is found in every business, home, vehicle, supermarket, and hospital. The rising cost of steel and other commodities has outpaced inflation; however, this is just the cost of doing business in tower manufacturing.

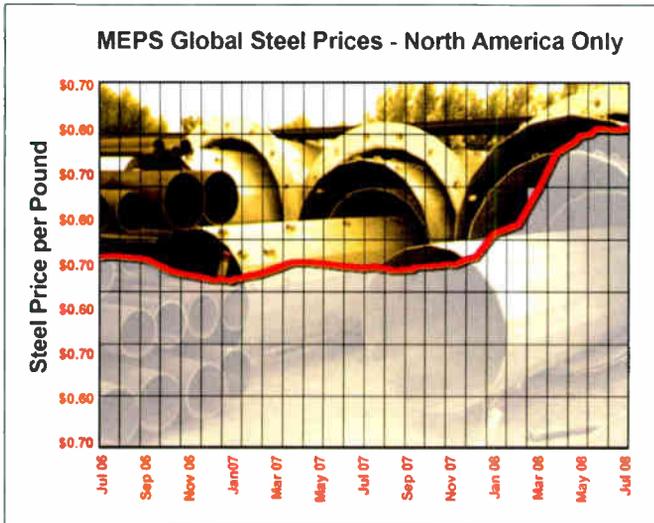
The increase in the price of steel is leaving its mark in both the tower and construction industries. A buyer of steel or other construction materials that wants to move forward with a construction project has to incorporate those higher prices as part of their cost. Construction projects get very expensive for the customer. Price increases can lead customers to think about shelving projects. This hasn't happened

spring of 2006, so the price was set early. However, other price increases are not going unnoticed. Our gasoline bill has increased 35 percent just to run the buses."

The rapidly increasing prices are not climbing at the pace they were in July, but prices have not yet reached a peak, and companies and consumers will be dealing with price increases for many months to come.

agl

Beau Aero is senior project manager for GlenMartin, a global tower solutions provider based in Boonville, Mo. Jason Hubbard is the company's purchasing manager.



to us yet, but the customers do notice the increased prices.

Other companies and trades are noticing the inflation and increased energy costs as well. The Boonville School District is building a new school, Hannah Cole Primary School, which was scheduled to be completed in August 2009. "We basically beat the steel increased prices to the punch," said Mark Ficken, Boonville Schools superintendent. "We received bids early, and the bond issue passed in the

which is the highest point in 17 years. The cost of energy surged 61.1 percent annually for household fuel oil, and 37.9 percent for gasoline, according to government statistics.

An explanation for this fluctuating figure in the price of steel includes the worldwide demand for scrap metals and the cost of energy rising significantly. Given the amount of energy it takes to make steel and other commodities, such as lumber and plastics, this should not come as a surprise. Also, there is little

Month	Steel Price per Pound	Steel Price per Ton	% Change from Jan of Same Yr
Jul 06	\$0.37	\$731.0	
Aug 06	\$0.36	\$729.0	
Sep 06	\$0.36	\$718.0	
Oct 06	\$0.34	\$674.0	
Nov 06	\$0.33	\$658.0	
Dec 06	\$0.32	\$642.0	-12.2%
Jan 07	\$0.32	\$639.0	
Feb 07	\$0.33	\$657.0	
Mar 07	\$0.34	\$678.0	
Apr 07	\$0.36	\$713.0	
May 07	\$0.36	\$710.0	
Jun 07	\$0.35	\$704.0	
Jul 07	\$0.35	\$690.0	
Aug 07	\$0.35	\$691.0	
Sep 07	\$0.34	\$681.0	
Oct 07	\$0.35	\$682.0	
Nov 07	\$0.35	\$697.0	
Dec 07	\$0.35	\$704.0	10.2%
Jan 08	\$0.37	\$734.0	
Feb 08	\$0.41	\$817.0	
Mar 08	\$0.43	\$851.0	
Apr 08	\$0.49	\$975.0	
May 08	\$0.57	\$1,131.0	
Jun 08	\$0.59	\$1,184.0	
Jul 08	\$0.61	\$1,223.0	
Aug 08	\$0.61	\$1,220.0	66.2%

GlenMartin photography by Scott Dolash

Liquor May Equal Liability: Steps to Protect Everyone

by David Saul, AAI

'Tis the season for ... limiting social-host liquor liability.

If a bartender is legally liable for serving alcohol to a patron who becomes intoxicated and then injures a third party, is the exposure the same for a business if it hosts a social event where alcohol is served, such as an open house or employee holiday party?



According to the Insurance Information Institute, liquor

liability exposure is not just limited to those whose primary business is the sale of alcoholic beverages. Most states currently have social-host statutes or common law that holds private-event hosts liable for the actions of their guests. You are considered a social host if you provide alcohol to individuals in a noncommercial manner. It is important to know the law in your jurisdiction and to take the appropriate steps to control your risk.

Liquor liability program and coverage considerations

An important first step in limiting your liquor liability is to implement a risk-management program. The liquor

liability program must have the support of management, be communicated to supervisors and employees and include a policy that advises employees to drink responsibly at company events.

The program should outline the procedures for handling intoxicated guests. This includes delegating who will assess and address the situation, such as hotel security or someone from your organization, and outlining appropriate actions for dealing with or removing a guest who has overindulged.

If an incident occurs, fill out a liquor liability incident report, which documents the measures taken to control an intoxicated person and helps your defense in the

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event of an alcohol-related accident.

In addition to proper liquor liability planning and education, review your company's current general liability insurance policy to determine your coverage in social host situations. Remember, even with the proper coverage, a liquor liability policy does not eliminate your exposure if alcohol service is in violation of a statute, a minor is served, or an already intoxicated person is served.

If your event includes a program or speaker, schedule it for after dinner and drinks are served. This allows additional time for alcohol to wear off.

Before your company hosts its next event, contact your insurance agent. The agent can review your coverage and assist in developing a risk-management plan that keeps safety at the center of your company-sponsored events. **agl**

David Saul is executive vice president of Atlantic Risk Management, Columbia, Md., and an accredited risk advisor in insurance (AAI). His email address is dsaul@atlanticrisk.com.

Liquor Safety Program

For third-party vendors:

- When working with a vendor, such as a caterer or bartender service, verify that they are licensed and insured.
- Stipulate in your vendor's contract that only those who have received alcohol-awareness training should serve or sell alcohol at your event.
- Require the vendor to provide certificate of liability insurance to include liquor liability coverage naming your company as additional insured.

At company-sponsored events:

To promote the safety and sobriety of your employees and guests at company-sponsored events, review these recommended control measures:

- Serve drinks to guests rather than offer a self-serve bar.

- Set up bar stations instead of having servers circulating the room.
- When being served, people are inclined to accept drinks they don't really need.
- Place table tents at each bar reminding employees and guests to drink responsibly.
- Offer a range of low-alcohol and alcohol-free drinks at no charge.
- Require servers to measure spirits.
- Always serve food with alcohol.
- Close the bar an hour before the scheduled end of the party.
- Do not offer a "last call" as this promotes rapid consumption.
- Entice guests to take advantage of safe transportation options by subsidizing taxis or promoting a designated driver program.



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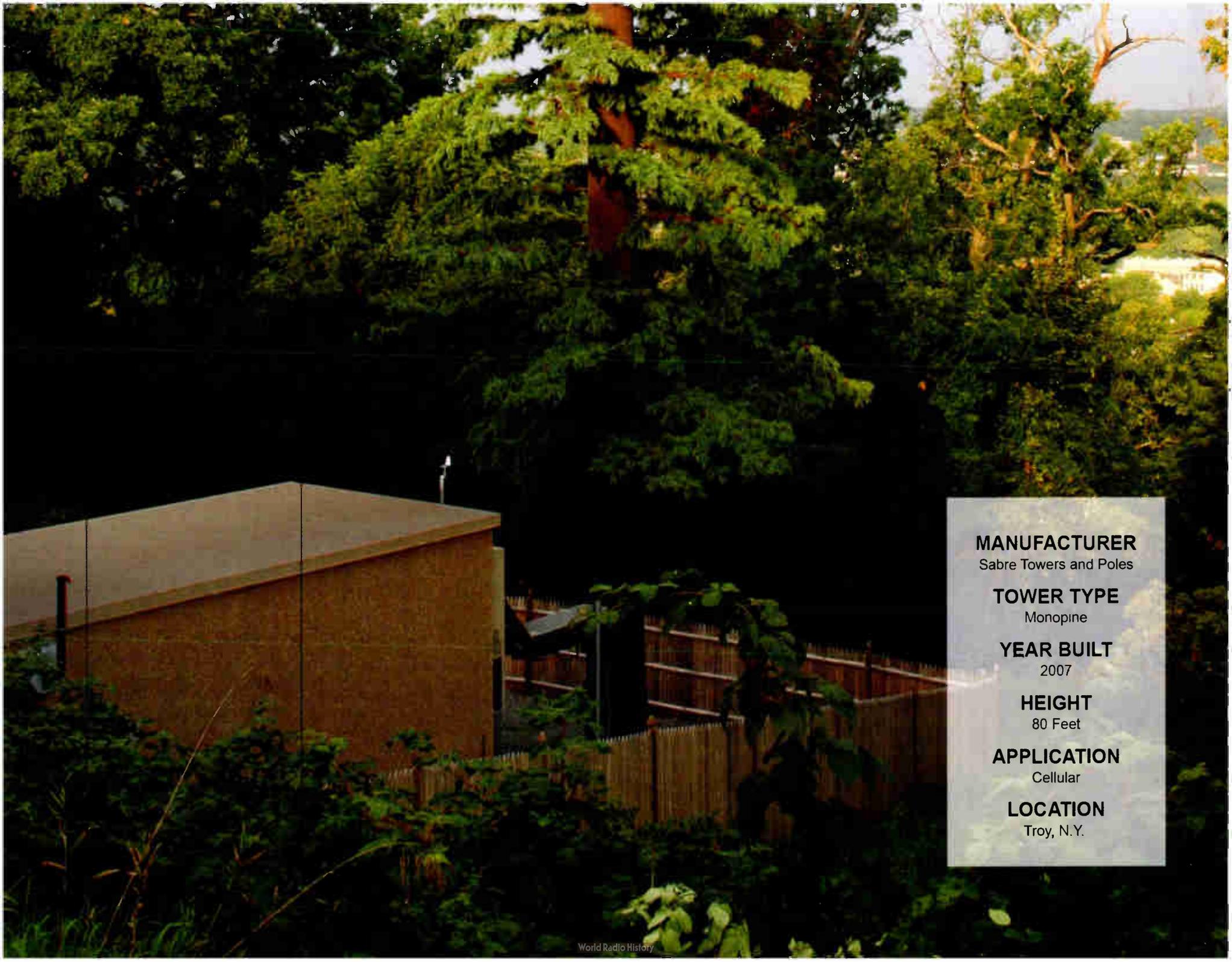
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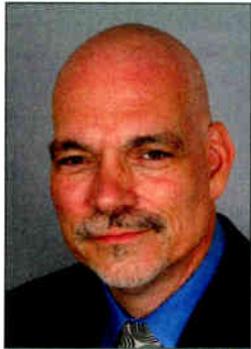
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Holiday Wish List

by William Sill

With the election behind us, we turn our attention toward the holidays as our kids are finalizing their lists of presents they want left under the tree, by the



menorah or near the kinara. All of which begs the question: Has the wireless industry made its wish list and checked it twice? And if not, what should the wireless industry wish for from the FCC? While some, with visions of sugar plums dancing in their

heads, might ask for the elimination of all regulations that impede or make telecommunications tower deployments more costly, a more realistic “ask” would simply be for the FCC to tackle tower issues and provide the industry with the consistency and certainty it needs to bring advanced wireless services to the American public. To this end, I have drafted a modest FCC wish list containing less than a handful of wishes to be sent to the 8th Floor where the chairman, the commissioners and their elves reside:

Dear 8th Floor:

FCC Wish #1. Please avoid political gridlock and turn to the important tower siting issues before you.

The FCC currently consists of three Republicans (Chairman Kevin Martin and Commissioners Robert McDowell and Deborah Tate) and two Democrats (Commissioners Michael Copps and Jonathan Adelstein). By the time this issue of *AGL* is published, it is possible that we will have seen the departure of one, if not more of the 8th Floor residents. If that were to occur, gridlock could result if there were two commissioners remaining from each party and they voted along party lines. The delay and uncertainty surrounding

the arrival of new appointees, the status of various political appointments at the staff level and delays in setting administration policies and processes could well slow down, if not halt, effective policy making. Our wish is that the political leadership of both parties work together in a bipartisan manner to advance wireless infrastructure investment and deployment on a timely and predictable basis.

FCC Wish #2. Please move forward and address the issue of public notice in the migratory birds proceeding.

In its February 2008 remand order, the U.S. Court of Appeals for the District of Columbia Circuit instructed the FCC to “proceed with dispatch” on migratory bird issues related to the FCC’s antenna structure registration (ASR) process. In particular, the court directed the FCC to

some ... might ask for the elimination of all regulations that impede or make telecommunications tower deployments more costly

develop an ASR advance notice procedure that would give the public an opportunity to comment on ASR applications prior to their grant. PCIA, along with other industry associations, wireless carriers and tower owners, suggested that the FCC issue a notice of proposed rulemaking on how to design and implement a public notice procedure that would provide the public with an opportunity to comment and that would afford tower owners certainty and predictability. The FCC should move affirmatively to fashion a new procedure that would accommodate both the public’s and the industry’s concerns.

FCC Wish #3. Please grant the shot-clock petition for a declaratory ruling.

One of the most significant roadblocks to the expeditious buildout of new facilities is the local zoning process that grows longer each year. In recognition of this problem, the shot-clock petition presently being considered by the FCC urges:

- The establishment of set deadlines (a shot clock) for local zoning authorities to act on wireless facility siting applications: 45 days for collocations and 75 days for other applications
- The automatic grant of zoning applications where the local authority has failed to act within the designated time frame
- The FCC to prohibit local authorities from barring entry into a market (by not granting a siting application) on the basis of another provider’s presence
- The FCC to preempt those local ordinances and state laws that subject wireless siting applications to unique, burdensome requirements, such as those treating all wireless siting requests as requiring a variance

PCIA, along with 10 other commenters representing the communications industry, filed comments in late September supporting the petition and provided a plethora of examples of egregious delays by local authorities. The industry made clear that defined time limits are essential if the industry is to further the FCC’s goal of promoting broadband deployment. As expected, numerous commenters representing state and local authorities opposed the petition, instead advocating that the FCC lacked authority to set deadlines on the local zoning process and

that many processing delays are due to incomplete applications. The hope is that the FCC will make this a high priority and act quickly to, as PCIA has stated, balance the "critical need for wireless infrastructure with reasonable standards of land use review."

FCC Wish #4. Please reform the pole attachment rules.

Unfortunately, as PCIA has pointed out in the FCC's ongoing rulemaking proceeding on pole attachments, "many pole owners continue to discriminate against wireless attachers." This impedes wireless voice and broadband deployment. The FCC should conclude its pending rulemaking proceeding and modify its rules governing pole attachments in accordance with the suggestions of PCIA to:

- Make clear that wireless attachers have the right to access pole tops for antennas and right-of-way access for equipment according to reasonable terms and conditions
- Clarify safety standards and make-ready deadlines
- Provide a reasonable cost-based rate structure for pole-top attachments so that wireless attachers are no longer subjected to "market rates" that are substantially higher than the regulated "telecommunications rate"

Conclusion

If the Commission grants any of these wishes, it will be giving the gift of advanced wireless services to the public. That certainly would be more welcome and more valuable than a fruitcake of indeterminate age or a sweater with a life-sized, three-dimensional face of Rudolph, the red-nosed reindeer, complete with a red nose that actually glows (batteries optional). Best holiday wishes to you all, and to all a good night! **agi**

William Sill is a partner in the law firm of Wilkinson Barker Knauer. He chairs the firm's Tower Group, and his email address is wsill@wbklaw.com. Another attorney with the firm, Billy Layton, contributed to the article.

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The Ghost of Towers Past

A ghostly apparition visits Johnny Multiple not only to remind him of past challenges faced by tower owners, but also to offer advice for weathering a financial crisis — one smart ghost!

by R. Clayton Funk

It's been phenomenal — the PCIA Wireless Infrastructure tower show. Our tower hero, Johnny Multiple, has been in the business a long, long time and seen his fair share of tower shows. After all, Johnny has built towers since the time cellular was starting in the mid- to late-'80s, and he got into the tower “vertical real estate” business in the late '90s when



PCS exploded on the wireless landscape. He's been to a lot of tower shows, many a late night conference in Vegas, Nashville, Tenn. and Hollywood, Fla., and torn up the local scene with large steak dinners, copious amounts of beer and wine — let the buyer name the

drink as guys like Johnny always got wined and dined — and a late-night scene that major athletes would be jealous of had they known the details.

After a long night of carousing and “networking,” Johnny stumbles to his bed and proceeds to fall asleep. But it's not a restful sleep.

Suddenly, Johnny sees himself at a half-finished tower site, and he knows the location. It's a site he's currently building for Perfect Coverage Wireless. It has the perfect compound, the perfect steel, the clean title, SHPO, THPO and LIPO. But wait. Someone else is there. It's a man dressed in a black suit. His dark hair is slicked back. He looks like the character of a hired assassin you would see in a movie, and he is walking toward Johnny.

“Who are you, dude? Some NEPA/SHPO guy?” Johnny asks in an incredulous tone of voice.

“No, Johnny. I'm the Ghost of Towers Past,” says the man in black.

“Huh? What, are you kidding me? There's no ‘towers past’ because I'm still at the best tower conference ever! Vendors are booking record business purchase orders, tower owners are forecasting strong lease up and everyone is banking on 2009 being one of the best years ever!” says Johnny, defiantly.

“Johnny, where have you been? Public stock prices for the tower companies Big Boca Communications, Tiara Towers and USA Tower have declined more than 50 percent in the last two months and the stock market overall has declined even more than that!” exclaims the ghost. “Wake up, pal! It's a new world out there. I know you wishfully named your company 20x TCF Tower Company, but the days of towers getting priced at those levels are becoming rare. For the right towers? Sure. But the new normal is lower than it was even only a couple months ago.”

“But why?” Johnny whines. “We had a huge drop in prices years ago and everything bounced back. I thought the public tower companies had their problems figured out, carriers were back to spending money like crazy and tower values were as high as they were in the late '90s. It was always supposed to stay that way!”

The man in black retorts, “Get a grip, Johnny. That's what a lot of people thought. But let's discuss the reality of the situation that you think is just a dream but that is quickly dissipating into

a nightmare for guys like you. Similar to the world of residential and commercial real estate where you had a bunch of borrowers able to access cheap, easy financing, the availability of cheap, easy debt in the corporate world, which was readily available to tower buyers, helped to drive up prices to levels that aren't sustainable unless that access to capital remains available. But it's gone, baby. Gone, gone, gone,” he says, shaking in his Elvis-like pleather suit.

Johnny looks dejected for a moment, and then another thought comes to mind. “But the carriers bought a ton of spectrum in the latest 700 MHz auction, and they need to build it out. Everyone says next year is the time we'll start seeing all the initial build-out!”

The Ghost of Towers Past replies, “Yes, but only if they can access capital and actually want to build out the new networks. If capital remains scarce or expensive, wireless carriers — who aren't immune to macroeconomic factors — won't build out their systems if the money isn't there. And what stops AAA Wireless and Perfect Coverage Wireless, the two biggest nationwide carriers by far and the biggest owners of this new spectrum, from simply deciding to not build out the new spectrum for a while? After all, it's not as if Walk Push-to-Talk Wireless is going to really compete against those companies for years. Why should the two biggest players spend billions of dollars only to end up competing against each other even more? They could just sit on the spectrum for as long as possible and defer the capital expenditures for as long as possible.”

Johnny sits there, silently.

The ghost continues, "Johnny, it's not as if the entire tower industry is going away. There may just be a resetting of valuations and expectations. While I, like you, believe the tower industry is a great space and it's tough to beat the investment characteristics and underlying fundamentals, it is not immune to the macroeconomic environment. America has lived off credit and cheap, easy money for years, and that helped fuel the prices people would and could pay for towers. Once these hot times cool off, the tower industry will cool off as well. It could be a 'new normal' for tower owners," says the ghost with a glum face that almost matches Johnny's.

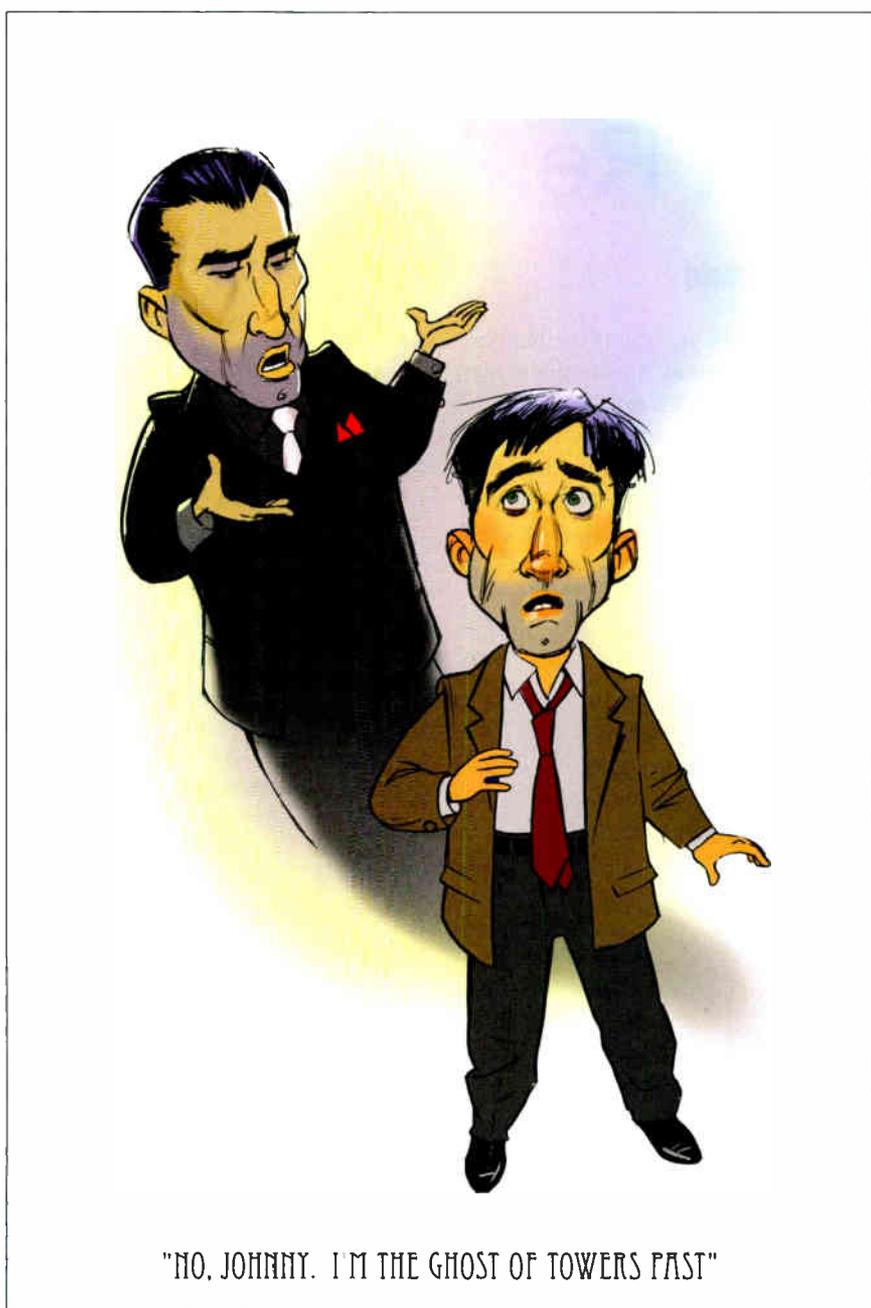
"Dude, you really bummed me out," says Johnny. "So what now? Am I stupid to keep building towers?"

"Of course not!" the ghost replies. "That would be as ridiculous as thinking millions of birds die every year from running into towers or guy wires! Johnny, this is the perfect time to do a few housekeeping items that you may not have been able to get around to because you were so busy.

"First, build and buy as many towers as you can, assuming you and your investor, Flush With Cash Capital, can still make your return. Your investor never modeled that every tower you sold would be at 20x tower cash flow, right? Stay with your core business and you'll be fine.

"Second, this is the perfect time to go out and negotiate to extend out as many of your ground leases as possible to longer than 30 years. Why? The longer the ground leases extend, the better! Heck, buy the ground outright or get permanent easements if you can. Don't you think some of your landlords need and want cash right now? Make them the offer! Don't be shy. The longer the underlying rights to own the tower at that site the better. If your ground leases only average 25 years, get those extended to 30, 40 or 50 years, assuming renewals if you can. Unlike a putt at the golf course or the next exit on the highway when you have to hit the bathroom, with a lease, it's the longer the better.

"Finally, get your towers compliant with current structural standards. Do you



question whether your tower can hold all those tenants and still be compliant with Rev G? Why not check it out? The TIA/EIA 222-G standard is affecting how some tower buyers look at the value of the tower, especially older sites. Get your tower up to the current standard and you'll preserve value in the long run," says the ghost, finally out of breath after his long lecture to Johnny.

"C'mon, Johnny," the ghost adds, "We've been here before. Values flatten out, and two things happen. Either tower owners adjust to the market conditions and

still sell, or these same owners hold on to their sites in hopes that higher purchase prices return. But no one can accurately predict the future. They can only guess."

And with that, the Ghost of Towers Past turns his back on Johnny and walks off into the distance directly in line with a four-carrier monopoly on the horizon, one that Johnny owns. **agl**

R. Clayton Funk is managing director of Media Venture Partners, San Francisco. His email address is cfunk@mediaventurepartners.com.

Lease Optimization Isn't Just Rent Reduction

by Tom Leddo

What would you say if the landlord of your apartment building decided to charge you more rent because you upgraded your couch to a sectional with a built-in recliner? Or if your office lease payment went up when you added 10 new employees? Or if the mortgage on your ranch doubled when you added 20 head of cattle?

The answer to these questions is pretty obvious — you'd say no way



am I going to pay more just because I enhanced how I use the same amount of space. While this seems like a no-brainer, you'd be surprised how leases between cell site tenants and landlords often lack this kind of conventional wisdom that we logically apply to our business practices.

In the ongoing conversation about cell site lease optimization, it should be understood that "optimization" is about much more than a rent reduction. Take a look at the other enhancements cellular tenants are seeking to incorporate into their cell site leases.

Then and now

A mid-year 2008 survey by CTIA — The Wireless Association reminds us that less than 25 years ago there were 599 cellular base stations. That is only a handful compared with today's census of 220,472 cell sites. With an average 4.8-percent rent rate increase year over year, it's easy to see that early industry initiatives were focused on launching the network. But now wireless carriers have officially acknowledged the magnitude of their real estate portfolios and are taking steps to control skyrocketing expenses and manage vast site portfolios as networks continue to evolve.

In the 1980s, first-generation (1G) mobile technology was based on circuit-switched analog systems designed to singly accommodate voice communication. The second generation (2G) was a total replacement of the first generation of networks and handsets. The recent upgrade to 3G and 3.5G digital technology is yet a new iteration that has extracted a tremendous investment from global carriers. According to Wikinvest, in the United States alone, three of the largest carriers have spent a combined \$10 billion on developing their 3G networks. And even with the wonders of iPhone technology still burning bright in the eye of the consumer, carriers are already pursuing the dream of 4G and evaluating how it will help them handle the increasing amount of data traffic that results from email, music play, photo storage, Web surfing and video streaming.

In fact, the international telecommunications regulatory and standardization bodies are working for the official deployment of 4G networks as early as 2012, but critical definitions or base requirements have yet to be released. That basically amounts to a moving target for carriers when it comes to network

planning and cell site functionality.

And yet, in this swiftly moving techno-evolution, existing cell site lease language is still couched in a 1G world. Most landlords believe a call from a tenant representative such as ours is just about rent reductions — but it is much more. Although the tenant is certainly interested in paying fair market rates on its rents (see "The Role of Tenant Representatives in the Wireless Industry" in the November 2008 issue), equally, if not more important, is the tenant's interest in the terms of the lease. It's the terms that protect the carrier's ability to keep its cell site network in sync with a rapidly changing marketplace and protect its billion-dollar investment in techno brawn and bandwidth.

Necessary lease language

Let's take a look at some of the main commonsense lease enhancements necessary to ensure a cell site's long-term flexibility.

Expansion of Use and Premises — "Expansion of use" gives the tenant the right to add, exchange or modify new equipment and/or add new technology or frequency use within the same square footage it is currently renting. Let's face it — cell sites were originally designed for 1G voice communication. Often, the original lease language simply referred to operating a communications facility. As part of the negotiating process, some landlords interpret this general language to mean voice only and demand more money when tenants ask to modify a cell site to accommodate new technology. But as noted, that's like the rent on your apartment going up because you decide to upgrade your sofa. One exception to this might be an increase in the number of antennas, which should at least be prenegotiated to accommodate the

tenant's future needs.

"Expansion of premises" gives the tenant the option to add square footage at a prenegotiated rate to accommodate future equipment needs. It's fair that more space should mean more rent, but without a prenegotiated rate, the cell site can be held hostage when carrier modifications are necessary to meet both regulatory and consumer demands. Most landlords can agree that a prenegotiated rate is fair, especially when the need to maintain the long-term viability of the network is involved.

Additional Frequencies — With each advance from one generation of technology to another, the tenant's existing, licensed bandwidth is becoming depleted and it must purchase additional spectrum at FCC auctions to accommodate the many services previously mentioned. Some landlords argue for a 1G interpretation of a lease that was written for voice services versus voice plus WiMAX or other similar technology. But that's like increasing the rent on a real estate broker's office when that broker expands to also offer mortgage services.

24/7 Access — Carriers want to be able to maintain their networks in nonpeak hours to avoid downtime. If a site needs repair at midnight, they don't want to wait until 9 a.m. to service it, which would hinder phone service during morning rush hour. Further, it becomes a safety issue if there's a 3 a.m. emergency and the victim is unable to call 911 because the network is down. According to CTIA, hundreds of thousands of 911 calls are made daily using cell phones, so there is a societal responsibility to maintain the network, and landlords play a crucial role. Usually cell site equipment is in a place that won't interfere with business operations. Of course, the lease language should be tailored to protect the integrity of particular activities, such as refraining from repairs at a site on a church during the pastor's Sunday morning sermon.

Assignments and Subletting — As lease negotiators, we spend a lot of time on this issue. Some tenants want the right to assign or sublet the space they rent without restrictions or landlord approval. However, it is reasonable for

the landlord to be able to control or at least approve which subtenants and/or assignees come onto the property. In certain cases it is also reasonable for a landlord to expect revenue sharing in the event that a tenant uses its expansion rights in conjunction with its subleasing rights to share the property with a third party, especially if the tenant is taking down additional square footage. Thus, regarding an assignment, it is reasonable for a tenant's rights to be restricted to a company controlling, controlled by or under common control with the tenant, or one that buys majority control of the tenant company, which is a common occurrence. Regarding sublease rights, landlords often stand firm on this issue and make it subject to landlord consent and include a negotiated revenue share.

Fixed Escalators and Automatic Renewals — Because carriers have tens of thousands of sites to manage, efficiency and accuracy are paramount. Fixed escalators and automatic renewals are key administrative strategies that are employed across their entire lease portfolio. A single annual or term-based rent increase for the life of the lease is more efficient than CPI escalators that have to be calculated annually on a case-by-case basis. While landlords speak to the fairness of a CPI, it is difficult to maintain across a portfolio of

sites. Also, tenants have too many leases to know with confidence that renewal notices or consent letters have been properly processed at the end of each term in the life of a lease. When leases renew automatically every five years, the risk of losing a lease because of a data entry error in the lease-management software is reduced and there can be surety that the network stays intact.

What's next?

Speaking of new standards and regulations, the current debate over the need for cell site backup power could also affect current leases. So important has the network become to the fabric of our society that the FCC is in the process of evaluating what carriers may be further mandated to do to keep the network stable. Generators, batteries or other hazardous materials may become staples of cell site equipment. Tens of thousands of leases are silent on this issue and could eventually need amending. Something like this further underscores that the network is bigger than any one site, and tenants are compelled to structure their leases according to the big picture. **agl**

Tom Leddo is vice president of operations for Md7 in San Diego, Calif. His email address is tleddo@md7.com.

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Salvatore Carbonaro

How to Protect Sites from Ground Potential Rise

Eliminating equipment damage caused by lightning and increasing the reliability of cellular and PCS networks involves more than following National Electric Code requirements. An important step entails preventing large fault currents from propagating in the copper conductors connecting the cellular equipment to the carrier's central office facility.

Today's telecommunications network and services are evolving rapidly toward more use of cell phone and PCS services over traditional copper wireline telephony. These services not only include voice-grade communications, but also now provide high-speed data, email and Internet services as well as meter-reading services for utilities.

Research studies have confirmed this migration from wired to wireless services, fueling the explosive growth in the cell phone sector. More than 30 percent of all wireline subscribers have cellular or PCS services and are opting to make cellular service their only service provider. Market data reveals that wired telephone service growth is less than 2 percent and cellular service growth is at 10 to 15 percent annually. Cellular subscribers expect the same service quality and availability as they have come to expect from wired services. Recently, the FCC mandated a 24-hour battery backup capacity for central office facilities and an 8-hour backup capacity for cell sites. The intent of the ruling is to maintain public communications capability during prolonged power outages, such as seen after severe hurricanes and tornadoes. These weather conditions, also accompanied by lightning strikes, are a principal source of equipment damage to cell site towers.

Wireless sites still pose safety risks for personnel because of exposure to *ground potential rise* (GPR) events, but those events can be effectively mitigated.

Anatomy of a cell site

Cellular and PCS sites consist of a tower, an equipment room or equipment cabinets containing the radio — commonly called the BTS or base transmitter station — and logic equipment that routes the wireless signal to and from the site via leased copper facilities to a local telephone central office. This connection is usually one or several T1 circuits connected to a *customer service unit*, commonly known as a “smart jack.”

To extend the reach of T1 signals, *CSU* and *high-bit-rate digital subscriber line* encoding equipment is required. This electronic equipment is vulnerable to lightning damage if not properly protected. Given that T1 lines carry voice and data-multiplexed signals, they are a critical link in maintaining wireless network continuity.

Cellular and PCS site installations are bonded and grounded according to the National Electric Code, which spells out methods intended to minimize lightning damage to equipment at the site. However, code specifications do not prevent GPR from occurring during the lightning strike. GPR causes significantly large fault currents to propagate in the copper conductors connecting the cellular equipment to the carrier's central office facility, which then acts as a remote ground path for the current to follow.

The magnitude of GPR is a function of the amount of grounding electrode in contact with the soil (ground rods only = poor, ground mat = better), soil resistance and other factors such as the number of parallel conductors leaving the site (including power lines).

During lightning strikes, the GPR can be as high as several thousand volts. The damage caused by GPR can range from destruction of the CSU to complete destruction of the telecommunication cables feeding the site.

Current grounding practices tend to protect the tower, hard-line and radio frequency equipment to a great extent during a lightning strike. The application of shunt-type surge protectors will *not* prevent GPR from sending large fault currents from the site and from causing damage to facilities. Even if these protectors operate and protect the CSU, outages will result, ranging from a few hours for electronic card replacement to perhaps days for cable replacement. In fact, when a shunt-type arrester fires, it connects the tower site ground directly to the central office facilities and causes fault currents to flow.

The only way to protect a cell site and associated cables from GPR damage is

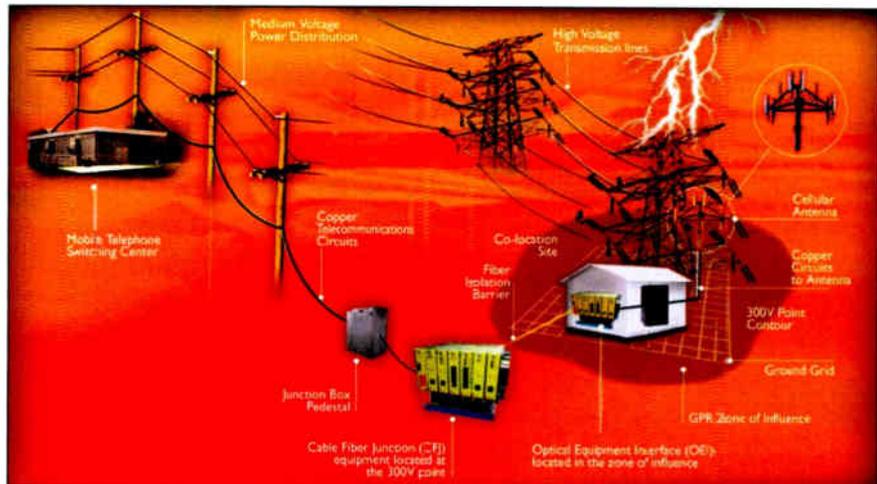
through isolating all metallic wires of the telco line feeding the site. This type of isolation is provided by Positron's Teleline and TeleLite HVI, or *high-voltage interface* systems.

For years, telcos have mandated such isolation equipment where cellular and PCS sites have been collocated on high-voltage transmission towers. The rationale is that if an insulator failure were to cause the high-voltage transmission line to short to the tower structure, the central office cable would be protected. This sound reasoning provides service continuity and reduces failure during a fault. However, the number of insulator failures is small compared with the number of lightning strikes. It is of utmost importance to follow through with the same protection philosophy to lightning damage, which is more predominant, than to insulator failures. The same applies for stand-alone cell sites. The majority of the more than 120,000 tower sites in the United States do not use HVI protection. This leaves the door wide open for equipment and critical service outages when these are most required.

Reliability issue

Wireless providers have developed best practices in the design of equipment and installations to provide for the best service possible. Wireless services are no longer viewed as an optional convenience but instead are considered to be an essential service. This perspective has become paramount in view of the accelerated growth of cell service, and in many cases, cell service is the only service a customer uses. Cell sites must provide the same level of network reliability as that of traditional telcos and as such must employ protection philosophies similar to those developed by telcos. Customers expect the same level of service from cell sites as they do from traditional telephone services.

With more and more subscribers becoming completely dependent upon wireless service, reliability has become an important issue, as evidenced by the FCC's recent backup



A high-voltage interface isolates all metallic wires of the telco line feeding the site to protect the cell site and associated cables from ground potential rise damage.

power requirement rulings. The key area of improvement in the chain nationwide is the use of proper GPR protection at all vulnerable cell sites in North America.

The Wire Line Subcommittee of the IEEE Power Engineering Society, which is open to all stakeholders, has begun work on IEEE Standard 1692. The standard will provide reliable and best practices engineering methods to help the industry correctly mitigate this vulnerability.

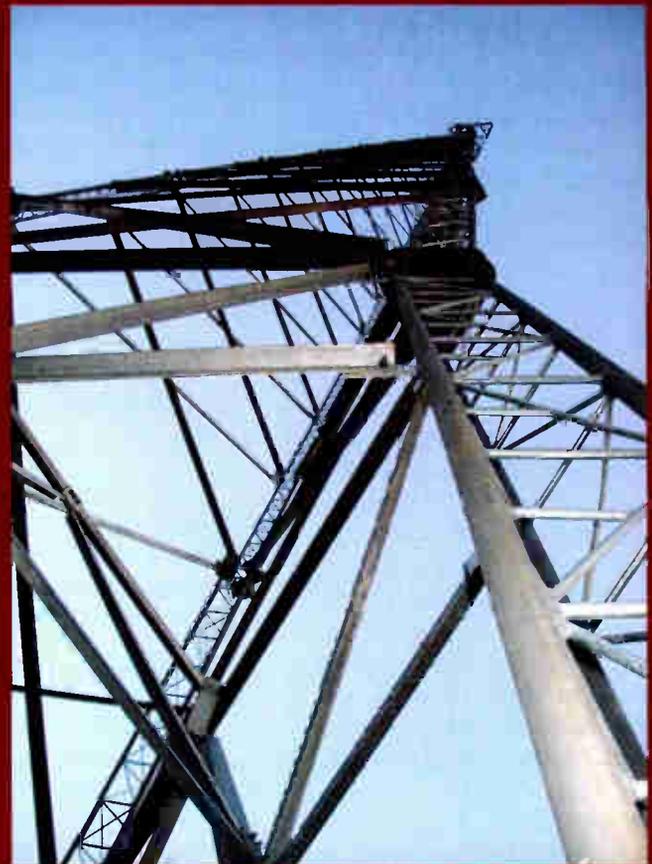
Because reliability of wireless services has become a key issue, best practice would indicate that an appropriate wireline or fiber-optic high-voltage interface be installed at all cell/PCS sites that connect to the telco central office through copper facilities. This philosophy will lead to more reliable service when it's needed most and will raise the bar in service level offered by cellular operators. This will without a doubt enhance the marketing success of these services with customers, a win-win situation.

agl

Salvatore Carbonaro is manager of systems engineering with Positron in Montreal, Quebec, Canada. Positron has been involved with electrical current surge protection for more than a quarter century, working with wireless service providers, telephone companies and utilities. For more information, visit www.positronpower.com or email info@positronpower.com.

Strong wireless subscriber growth continues to fuel new tower construction. Savvy tower developers may increasingly favor higher self-supporting towers instead of monopoles.

A 2009 Outlook for



by John Paleski

Recent growth in the U.S tower industry has been driven largely by increased 3G subscriber penetration rates. The wireless service providers currently account for some 70 percent of total tower leasing revenues, and the number of 3G subscribers in the United States has increased to 64.2 million in the past year, representing a growth rate of 80 percent

that further 3G developments alone will contribute to consistent tower site growth throughout 2009.

Tower site operators will continue to grow their portfolios by either building or buying new towers. New builds have historically enjoyed higher returns given the relatively low new build costs.

The value of a tower site depends

on wireless service providers. As tower owners become more savvy about additional diversification of users and additional revenue sources, tower developers may choose to build high-capacity, mid-level self-supporting towers whenever possible.

Local zoning regulations will continue to challenge a more rapid expansion

Tower Developers

(*Cellular News*, September 2008). Average minutes of use per customer have increased dramatically, creating strains on capacity in particular markets, which caused the need for cell splitting. This translates into a requirement for additional cells carrying more traffic.

Consumers have embraced the 3G standard because it provides data rates as fast as 2 Mbs, much faster than existing 2G and 2.5G applications. Technological innovation in the form of smaller units with longer battery life, increased functionality — such as the iPhone, the Google G1 and the BlackBerry Storm — and improved 3G digital services have made wireless communications indispensable. Finally, network quality has improved dramatically, but it still has a tremendous way to go.

Another major component of this growth has come from the rollout of higher-frequency digital PCS services. Because of the nature of signal propagation at higher frequencies, PCS cell sites at 1.8–1.9 GHz, for a given level of transmission power, have less reach than their 800–900 MHz cellular counterparts. Subscribers per cell site have remained constant at about 1,050. This suggests

upon lease-up rates, cost to build the site, cost of capital, users per site and site location. The most important factor of a tower's value, in my estimation, is its lease-up potential. The strategy for Subcarrier has been to construct larger and higher-capacity self-supporting towers. We feel that building towers in the range of 250–400 feet AGL gives the tower owner added opportunity to increase revenue by appealing to a broader array of telecommunications users. These users include federal, state and local agencies; utilities; security companies; broadcasters; and transportation companies.

Smaller monopoles with lower capacity are not designed to accommodate these additional user arrays. Monopoles are pre-engineered to add wireless service providers exclusively at predesigned tower levels. Self-supporting towers give the wireless service providers added flexibility to more accurately place their antennas at their desired rad centers. Tower developers who specialize in monopoles may be limiting their potential future income and, therefore, growth, by appealing solely and exclusively to the

of the tower industry. Prior to tower construction, tower owners must obtain approval from local officials, as well as state historic preservation offices and the Federal Aviation Administration. Given the strong “NIMBY” attitude prevalent in many communities, zoning authorities have not been favorably inclined toward multiple tower developers building separate towers. This environment, however, still represents an opportunity for tower developers because collocation is the preferred route.

Next year could be something akin to a catch-up year for tower developers to monetize a broader array of telecommunications users that, in the past, have built the traditional 180-foot monopole.



John Paleski is CEO of Subcarrier Communications, Old Bridge, N.J. His email address is john@subcarrier.com.

The Future of the Tower Business

Verizon and AT&T are reported to be aggressively building to meet demand and improve coverage, which spells good news for tower owners. Burgeoning demand for backhaul also means that wireless carriers will be leasing new microwave dish space from tower owners.

by Bruce McIntyre

I have been in the wireless industry for more than 30 years. Although I had previously built towers as a part of systems, in 1985 I became involved in the tower business on a full-time basis. In the 1980s, broadcasters, radio shops or small companies that recognized the need for antenna sites owned most of the towers. UHF repeater and 800 MHz trunking systems were growing like crazy, and those systems needed transmitter sites. It was too expensive for small-system operators to build their own towers, so they looked for sites on which to rent space. At that time, it would have been difficult to convince banks and investors that towers were a business, yet we were growing at 20 to 25 percent per year — pretty impressive.

In the early '90s, many in the business recognized the need for representation. In May 1993, we formed the Site Owners and Managers Alliance under the National Association of Business and Educational Radio (NABER), and we achieved initial recognition as a

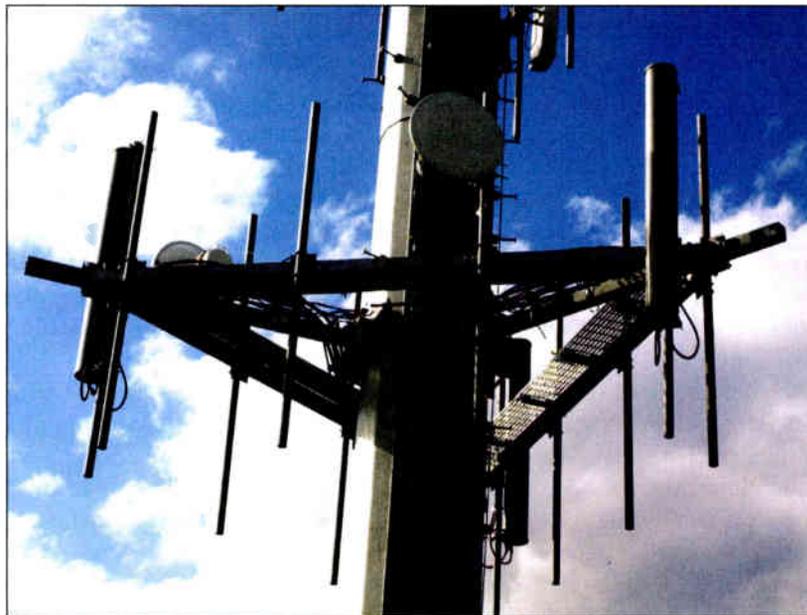
“real” business. SOMA started with more than 125 members.

In the mid '90s, Wall Street took notice of the growth the tower industry was experiencing, and public companies were put together by buying up the assets and income of the small companies. American Tower,

years. Yet, there is still a growing demand. To a lesser degree, the mandate in 1996 for HDTV caused a spurt of new broadcast towers to be built to hold the new digital antenna systems.

We have been talking about 3G cellular systems for 10 years, and we finally have operational systems.

With the data rates that these systems require, cell sites must be placed closer together. As data rates between the handset and the cell site increase, the distance between sites decreases. When you look at the engineering for a 4G system, it is evident that cell site coverage must shrink even smaller to maintain the signal strength to achieve the necessary data rates



Photography by Scott Dolash

Crown Castle, SBA and Pinnacle Towers were born. All of a sudden, we were an industry.

The growth of cellular telephone communications has been a driving force in the tower industry, and the number of towers in the United States has more than doubled in the last 10

to a handset. There is a secondary effect here. In the past, T-1 circuits were sufficient to backhaul information from a cell site, but with 3G and 4G systems, T-1 circuits no longer are sufficient. Cell sites will require 15 to 20 Mbs of bandwidth. How do you get that? Fiber-optic cable is the most

obvious choice, but few towers sit next to installed fiber cable. The alternative is microwave circuits. Years ago, many people pronounced microwave technology dead, but it is coming back strong, and it represents an income opportunity for tower owners. Every carrier on a tower will require at least one and perhaps two microwave dishes. That is new income.

So what do I see in the future? *Growth.* According to the trade news, Verizon and AT&T are aggressively building to meet demand and improve coverage. This will require many new sites. Sprint has been on hold, but should start building again soon. Zohm/Clearwire is also going to be building. It is estimated that the WiMAX system requires 1.5 sites for every CDMA site that Sprint operates. That is good news for tower owners. Again, according to the trades, T-Mobile is behind in 3G. They need to aggressively build to catch up. That

is more good news for tower owners. There are also small regional and local operators of wireless Internet systems. They need antenna space. And don't forget public safety. Although most state and local agencies own their own towers, many don't. When M/A-Com built out the state of Florida, they rented a great deal of tower space for that system. Federal agencies almost always rent tower space. They are excellent tenants.

As a site developer, we are seeing a demand for more greenfield builds. Metropolitan areas continue to expand outward, and as the population moves out, communications coverage must follow. It is estimated that 80 percent of the U.S. population has cell phones, and those users are demanding coverage wherever they go. Many of the areas are rural and have no sites to cover them. This is another opportunity for

tower site developers.

In 2007, we were predicting 2008 and 2009 to be big years for build-outs. The economy has slowed that

T-Mobile is behind in 3G. They need to aggressively build to catch up. That is more good news for tower owners.

down a little, but it appears the overall economy has had little effect on the wireless business. I expect to see a resumption of expansion of the existing systems, plus we have not yet seen the effect of the AWS auction, and we can look forward to the 700 MHz channels being built out in 2009 and 2010.

All in all, I have an optimistic view of the tower business going forward for the next three to five years. **agl**

Bruce McIntyre is the owner of Tower Innovations Inc., and he is a member of AGL's editorial advisory board.



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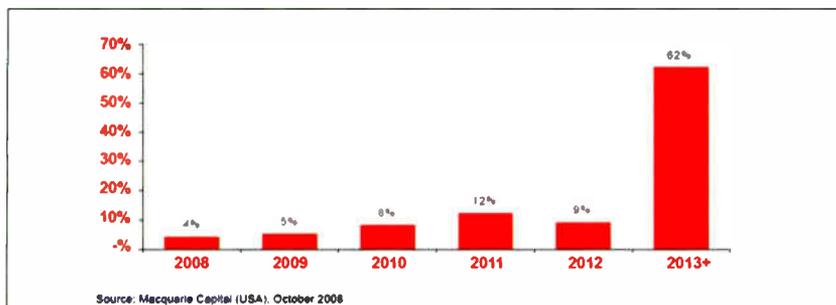


Figure 5. Estimates of the percentage of tower revenue up for renewal in a given year show that few lease contracts are up for renewal until 2013, so there is minimal risk of revenue being lost through cell site cancellations in the near future.

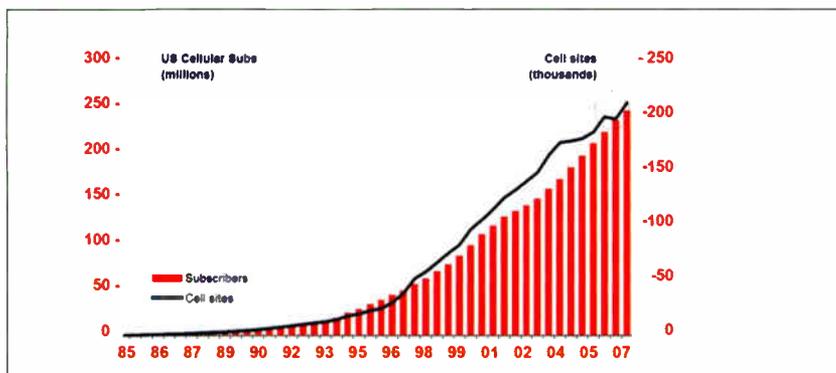


Figure 6. A chart of the number of U.S. cellular subscribers versus the number of cell sites shows a steady growth of cell sites from a handful in 1985 to more than 200,000 in 2007. For 23 years, the relationship between tower operators and cellular carriers has been close as subscriber demand led to more and more cell sites. The year 2006 shows a small dip, reflecting the AT&T-Cingular merger that resulted in a consolidation of some networks and cell sites.

SBA's site-leasing revenue grew at a clip of 24 percent. Cash flow growth topped 29 percent, while adjusted EBITDA rose almost 27 percent.

"We had another very solid quarter in our core site-leasing business," Jeffrey A. Stoops, president and CEO, said in a prepared statement. "Recent news from our customers shows that wireless continues to perform well. In response, our customers have been actively investing in their wireless businesses, either building new markets or improving and strengthening existing networks."

Total revenue in the third quarter was \$118.7 million, compared with \$103.2 million in the same quarter last year, up 15 percent. Site leasing revenue was \$100.5 million and

operating profit was \$75.8 million.

American Tower's results

Compared with the same quarter last year, third-quarter 2008 rental and management revenue for American Tower increased 10 percent to \$394.4 million and adjusted EBITDA grew 11.6 percent to \$277.5 million, which Jim Taiclet, company CEO said reflected the stability and growth prospects of the tower industry.

"For the full year 2008, we anticipate tower revenue and adjusted EBITDA to increase approximately 10 percent and 14 percent, respectively, excluding the impacts of foreign currency fluctuations and straight-line revenue and expense recognition," Taiclet said in a prepared statement.

Low financial leverage and lack of near-term refinancing requirements paint a bright financial picture for 2009, according to Taiclet, who also expects significant free cash flow generation. "Moreover, even in the face of uncertain credit markets, we have maintained our solid financial position," Taiclet said. He projected double-digit growth in tower revenue and adjusted EBITDA for 2009.

Crown Castle to repay debt

Crown Castle International also reported positive year-over-year results for the third quarter. Site rental revenue increased \$27.2 million, or 8 percent, to \$354 million from \$326.8 million. Adjusted EBITDA also increased \$21.9 million, or 11 percent, to \$217.7 million from \$195.8 million. Recurring cash flow was up 23 percent from \$100.8 million to \$123.5 million.

The outlook for Crown Castle's 2009 growth was tempered by fast-approaching debt maturities that may have to be paid with cash flow.

Crown Castle expects to generate \$670 million of recurring cash flow during the fourth quarter of 2008 and

'Even in the face of uncertain credit markets, we have maintained our solid financial position,' Taiclet said. He projected double-digit growth in tower revenue and adjusted EBITDA for 2009.

the full year of 2009. Over the next 14 months, \$472 million of its debt will mature. Jay Brown, chief financial officer of Crown Castle, indicated that the company plans to reduce discretionary capital expenditures and allocate the majority of cash flow to

eliminate upcoming debt maturities, unless it is able to refinance the debt.

“Given the predictable level of cash flow that our business produces and that we have no other significant debt maturities until February 2011, I am comfortable that we will be able to navigate the difficult credit markets without impacting the core growth or execution of our business as we drive toward long-term value creation for our shareholders,” Brown said in a prepared release.

Towers’ investment role

Towers remain a stable market and thus an attractive investment in these volatile economic times because they are the essential infrastructure for the wireless industry, according to the Macquarie report (see Table 1).

“Once the tower asset is constructed and tenancies commence, the tower produces a steady, stable and growing

to Macquarie.

Another factor that lowers the investment risk of the tower industry ties directly into its function as infrastructure. Once a carrier has designed its wireless coverage, there are few economic incentives for it to change. Carriers are mostly concerned with growing the existing coverage footprint and filling in gaps.

“The significant transaction and fractional costs to operators of ‘churning’ their leases (stemming from the high costs of relocation, network reconfiguration and interruptions to service) cause the customer leasing base to be particularly sticky,” the report said.

While the top-line can be grown,

As with other infrastructure, such as highways and fiber optics, many factors slow the growth of tower construction. Regulatory barriers, both

Once the tower asset is constructed and tenancies commence, the tower produces a steady, stable and growing stream of cash flows

at the federal level and through local community zoning boards combine to restrict the construction of new towers, which drives up the number of tenants per tower. As tenancy rates increase, the rate of return improves for tower owners and operators.

Carrier capex concerns

Excluding Sprint, Macquarie’s research shows current wireless revenues to be strong and capital spending to be high. For 3Q

2008, the research firm is modeling \$4.7 billion among the Big Four (AT&T, \$1.6 billion; Verizon Wireless, \$1.5 billion; T-Mobile, \$850 million; and Sprint, \$750 million), up 21 percent year over year. Cellular revenue and spending directly affect growth prospects in the tower industry.

“Next year is largely already set for the tower operators, in terms of revenue contracted, and prices will rise 3 to 4 percent based on built-in contractual escalators. The big question is how much growth gets lost from any carrier pullback in capex,” Stretch said. “While we expect that some top-line growth will be given up, it is not going to meaningfully change the financial position of the tower operators.”

agl

Table 1. Towers remain a stable market and thus an attractive investment in volatile economic times because they are the essential infrastructure for the wireless industry.

Survey Thematic	Comment
Greenfield tower development is slow, uncertain and expensive	<ul style="list-style-type: none"> ▪ Barriers to entry ▪ Pricing power ▪ Positive setting for lease-up potential ▪ Leverage of fixed-costs
Industry consolidation improving balance sheets; improving returns	<ul style="list-style-type: none"> ▪ Competitive frontier moving from price to quality of service provision = more cell sites ▪ Carrier commitment to capex in network
US wireless telephony still in relative infancy	<ul style="list-style-type: none"> ▪ Under-penetrated market relative to global peers ▪ Ongoing fixed to wireless migration ▪ Data as % of ARPU on growth path
New spectrum and technologies provide enhanced top-line potential	<ul style="list-style-type: none"> ▪ 700mhz auction = a new nationwide network build-out of cell sites ▪ WiMAX ▪ 3G, 3.5G, 4G services overlap with existing services

Source: Macquarie Capital (USA), October 2008

stream of cash flows,” the Macquarie report said.

Cash flow is driven by new leasing tenants as well as through 4 to 5 percent rent escalators for existing tenants. Additionally, cash flow can be improved through continued build-out and acquisition of new towers, the report said.

“The stability in the cash flow stream is a function of long-life lease contracts with built-in rent escalators,” according

the owning and operating costs of towers, for the most part, remain fixed, including ground leases, maintenance, utilities, insurance and property taxes. The recurring capital expenditures average less than \$1,000 per tower annually.

“The nature of the highly fixed cost base generates powerful economies of scale as the tower portfolio grows and makes the aggregation opportunity highly attractive,” the report said.



Surge Suppressors

PowerTrip transient voltage surge suppressors from Alltec include optimal response circuit technology. Using electro-chemical encapsulation, PowerTrip transient voltage surge suppressors dissipate large amounts of surge energy internally. The suppressors feature discrete all-mode circuitry, let-through voltage performance, response/recovery time of less than 1 nanosecond, tight clamping levels and sine wave tracking.

www.allteccorp.com



AC Surge Protection

ZoneMaster from Atlantic Scientific supplies AC surge protection for flexibility, easy installation and power-handling capabilities. It can handle the heaviest power loads of 170 kA or 200 kA surge per phase. The ZoneMaster features: replaceable bolt-in modules, remote indication capabilities, NO/NC dry contacts for remote monitoring and NEMA 1-, 2-, 3-, 3S-, 4-, 4X-, 12- and 13-rated enclosures.

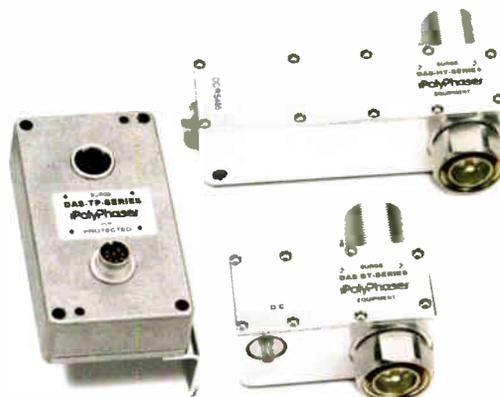
www.atlanticscientific.com.



Grounding System

TerraDyne from Alltec is a multipurpose grounding system designed to provide long-term protection from lightning, electrical transients, static discharges, electromagnetic interference and other electrical hazards. TerraDyne has been designed for use in any type of soil condition.

www.allteccorp.com



RETA Lightning Protection

AirSmart from PolyPhaser is an AISG-compliant lightning protector for coaxial RETA (remote electrical tilt antenna) applications. This integrated unit provides protection for data, DC and RF lines with high power capability up to 750 watts in broadband frequency ranges. The AirSmart family combines data, power and RF signals at the bottom of the tower.

www.polyphaser.com



Surge Protection

Raycap has developed medium-voltage surge-protection devices (SPD) that provide continuous protection from over-voltage and other transient voltage activity. Designated Strikersorb 40-3000, Strikersorb 40-4000, and Strikersorb 40-5000, the medium-voltage SPD modules protect equipment from lightning strikes, power surges and spikes without performance deterioration.

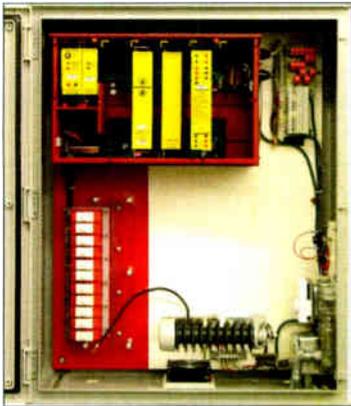
www.raycapinc.com/strikesorb



RF Lighting Protectors for Tower-Mounted Amplifiers

The 3409 Series Huber+Suhner RF lightning protectors are designed to provide DC continuity for powering tower-mounted amplifiers while simultaneously providing intermodulation performance. It is suitable for multi-carrier systems and is available for applications from 380 MHz to 18 GHz.

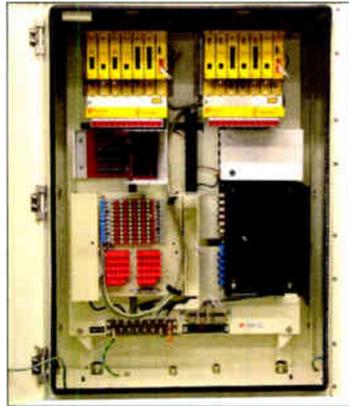
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Span Powered T1 Isolator

Positron's Teleline enhanced T1 isolators (751329R2, 751329SP) include a span-powered option, providing cost-effective configurations and installation flexibility for the T1 terminating equipment. Voice and data communications circuits carried over T1 facilities from a wireless site must be protected and isolated from lightning-induced ground potential rise.

www.positronpower.com



Fiber Optic Isolation

The TeleLite optical isolator product line from Positron isolates and protects telecommunications facilities and personnel from the hazardous voltages associated with ground potential rise. TeleLite provides electrical isolation between two points on a telecom landline.

www.positronpower.com



Broadband RF Lightning Protector

The Huber+Suhner 3400.17.0428 broadband RF lightning protector uses 1/4-wave stub technology in a slim-line package and is suitable for Wi-Fi and WiMAX applications. It features broadband operation (2 GHz to 6 GHz), return loss better than 20 dB, insertion loss better than 0.2 dB and 300 watts max RF power.

www.hubersuhner.com



Power-over-Ethernet Protection

Transtector's ALPU-ALVR is a primary power-over-Ethernet surge suppressor and is UL 497 listed. This advanced lightning-protection unit protects 10/100Base-T POE CAT5 indoor and outdoor network equipment operating in the range from 5 VDC to 90 VDC.

www.transtector.com

RF/Coaxial Surge Protection

SureLinX series quarter-wave stub (QWS) DIN 7/16 protectors from ACData Solutions protect base station radio transceiver equipment. It features a dual-band design, bulkhead body, DC blocking and bandpass filter, easy installation and maintenance-free construction. Operating using frequency-domain technology, ACData's SureLinX QWS uses a precision frequency-calibrated resonant chamber.

www.surgeblox.com

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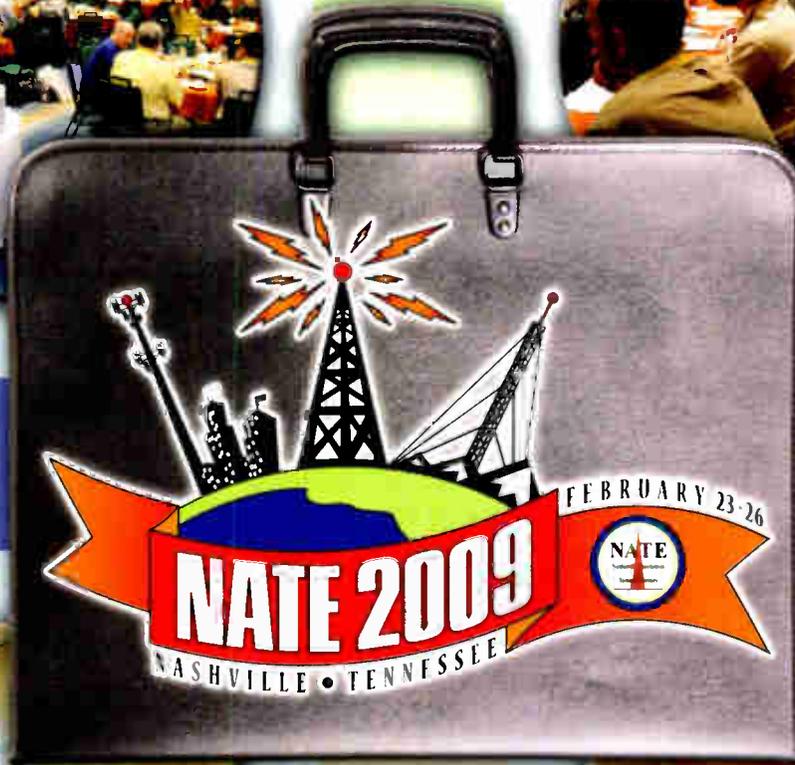
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