

WIRELESS COMMUNICATION FACILITIES

Background

Congress passed the Telecommunications Act of 1996, deregulating the telecommunications industry in an effort to promote free markets and open competition. Today, there are about seven wireless communications companies (carriers) doing business in Wisconsin, but recent trends point toward consolidation in the industry.

Major carriers include U.S. Cellular, Verizon Wireless, Sprint PCS, and Nextel. However, these firms do not actually construct towers. That is left to third-party firms such as SBA and American Tower. An additional tier of “players” often includes subcontractors with real estate expertise who locate and rent the properties where the towers are sited.

In some cases, individual carriers pay for short, single-antenna towers (about 70’) to fill gaps in their coverage. More often, at least in the past, carriers have built tall towers (130’ – 200’) and leased space on their towers to other carriers. Leasing is a significant source of income to carriers as they attempt to pay off the high costs of tower construction and maintenance. However, with consolidation beginning among carriers, fewer companies are available to request space. Consequently, tall towers are becoming poor investments, since their antenna space is increasingly difficult to fill.



(Photo courtesy Dan Danbeck)

Regulation

Section 704(a)(7)(B)(i) of the Telecommunications Act of 1996 reads:

The regulation of the placement, construction, and modification of personal wireless service facilities by any State or local government or instrumentality thereof –

- (I) shall not unreasonably discriminate among providers of functionally equivalent services; and
- (II) shall not prohibit or have the effect of prohibiting the provision of personal wireless services.

The Act, like many such massive bills, *speaks only in broad terms*, leaving tremendous discretion to the Federal Communications Commission (FCC) and to state Public Utility Commissions charged with implementing its provisions. Exactly what depth of coverage constitutes adequate “provision of personal wireless services” is likely to be decided in the courts on a case by case basis.

It is clear, however, that local governments *cannot* unilaterally prohibit cell towers by ordinance, zoning, or any other means. Companies who find willing landowners may sue if necessary to protect their right to build. Local governments can, however, enact ordinances to prohibit towers from certain specially identified areas, regulate tower height, specify minimum setbacks, require collocation strategies, and encourage landscaping and camouflaging techniques.

Most importantly, an ordinance gives a community 1) decision-making consistency, thereby lessening the chances for discrimination against a particular company, and 2) a verifiable basis for conditional use provisions or denials – which is critical since the Telecommunications Act requires all denials to be in writing and supported by substantial evidence.

Aesthetics

To satisfy concerns about tower appearance, wireless companies have disguised their towers as flagpoles, silos, artificial rocks, pine trees, palm trees and windmills. However, these design innovations cost the companies up to three times the typical tower construction cost, and they are most effective with shorter towers, which typically carry only one antenna.

Companies have also located antennas on stadium light poles, church steeples, and school and municipal buildings. The schools and local governments can earn \$12,000 - \$15,000 per antenna in lease payments annually.

Tower Sharing

Ideally, companies would coordinate their networks to ensure maximum coverage with the minimum number of towers. Called *collocation*, several antennas are located on a single tower. However, there are several obstacles:

- The companies are competitors, so they are not eager to help each other.
- A tower is limited in the number of antennas it can carry. And each antenna can only handle a certain number of calls.
- Digital (PCS) and analog (cellular) use different frequencies, which means some companies may need towers every two miles, while others need them every five miles.
- Companies grow at various rates, go out of business, merge, etc. – all of which make it extremely difficult to coordinate network configurations with certainty.
- Land use and population growth is generally not easily predictable, which makes it difficult for carriers to anticipate where new towers will need to be placed in the future to ensure coverage.

Health Effects

Public concerns have arisen over the health effects of a tower's radio frequency (RF) emissions, but *only the federal government has jurisdiction in this area*. (So far no conclusive evidence has tied health hazards to cell towers, but experts say more studies should be conducted before drawing final conclusions.) In short, a town or municipality cannot deny a request based on RF emission concerns.

Local Government Strategies

- Enact a 60-180 day moratorium on the construction of new towers to allow time to conduct a study and develop an ordinance to control tower siting and appearance. A few area communities already have ordinances that can be used as models.
- Consider offering reduced permit fees and faster processing times to companies that agree to disguise their towers or are able to collocate with others.

There are some planners who advocate a pre-siting map or template for a community that attempts to promote collocation by pinpointing tower locations, sizes, and antenna capacities. Others go even further and propose that such planning be done on a regional level, across municipal lines. Certainly, the concept of planning and working together has merit. However, like most technologies, telecommunications is a field of fast-paced change, both in the technology itself and among the industry players. This makes long-range planning extremely difficult.

One industry consultant offered this opinion: “. . . the development of a grand master plan for placement of future towers at any point in time would seem to be a function of future demand and any attempt to determine placement of new towers based on today's technology and population densities would appear to be a wasted effort . . .”

Future Directions

Satellites. Some people hope satellite communication technologies will eventually replace land-based towers. Though changes are certainly possible, this is probably unlikely, since Motorola-backed Iridium filed for bankruptcy in 1999 after its failure to sign up enough subscribers to its global satellite phone service led to a \$1.5 billion debt default. “While we cannot foretell the future, it would seem that the [major providers] have satisfactorily proven the non-existence of a mass market for satellite personal telephony,” said Ahmad Ghais, President of the Mobile Satellite Users Association.

Tower heights. According to Mark Reider, Head RF engineer for Alamosa Wisconsin, a tower construction firm, “. . . in the cities that are built out there today like Green Bay, Appleton, Oshkosh, Fond du Lac, we really want to bring the height of our towers down. We don't want tall towers in these cities anymore. We want as low heights, not low, but lower heights because our problems coming up are not the coverage of these cities. Our problems that will be coming up are issues that will be happening with supporting the customer base within those core units and core cities. We want to add capacity, we don't want one tower higher than another one and it is over shooting. . . . We are building towers like at 80 feet rather than the 170 feet that would have been built say two to three years ago.”

An antenna has a finite data carrying capacity. Consequently, in built-up areas the problem is not so much broad coverage of the extent of the area, but rather sufficient depth of coverage. This has become of greater importance as a higher percentage of people buy cell phones. It will also grow in importance as customer expectations increase.

“In my opinion, when third generation (3-G) services are fully deployed, more people who have and use Palm Pilots or similar Internet technology or have wireless Internet laptop capabilities at their office, but due to tower zoning (locating) ordinances prohibiting towers in residential areas, will not have the same services at home. At some point in time I see some version of a shorter tower on possibly every 3rd or 4th block in a residential neighborhoods to provide broadband wireless service. That may be 3 to 5 years in the future, but the younger generation growing up with this technology will one day control the economy and the government and they will demand the same service in their residential homes that is available in their business offices,” said John Santroch, a telecommunications consultant.

Economic woes. Even though growth in wireless minutes-of-use and new wireless applications is expected to mean the deployment of additional cell sites, losses sustained in capital markets are forcing wireless carriers to reduce deployment plans. As a result, American Tower, for example, reduced its new tower build guidance from 400-500 towers to 300-400 for the remainder of 2002.

This would appear to contradict the assertion in the previous section that a greater number of towers will be built in the future. However, this prediction makes some sense when taking into account the notion that towers will be lower (and therefore less costly) and industry consolidation will likely restore some financial muscle to the remaining wireless companies.

Sources: Federal Communications Commission; Wisconsin American Planning Association June 12, 2001 “Wireless Communications Tower/Antenna Siting” seminar; L.A. Times (March 17, 2001); Boston Globe (March 28, 2001); About.com interview with Ahmad Ghais, President of the Mobile Satellite Users Association; Letter to Town of Grand Chute, Wisconsin Plan Commission, August 14, 2002 by John Santroch; *RCR Wireless News* (various issues).

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