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# Telecommunications And Broadcasting Transmission Facilities In Vermont

*Update On An Industry, For Citizens,  
Legislators and Municipal Officials*

Prepared by Will Lindner  
Legal Research by David Lashway  
Copy Editing by Anne Humes Peracca

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This primer is designed to provide accurate and comprehensive information with regard to the subject matter covered. It is not intended to provide specific legal or technical advice, but rather to serve as a general outline of issues relating to the Telecommunications Act of 1996 and the siting of telecommunications and broadcast facilities within the state of Vermont.

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### List of Acronyms

ANSI .....	American National Standards Institute
BANM .....	Bell Atlantic NYNEX Mobile
CTIA .....	Cellular Telecommunications Industry Association
DPS .....	Department of Public Service
DPW .....	Department of Public Works
EPA .....	Environmental Protection Agency
FAA .....	Federal Aviation Administration
FCC .....	Federal Communications Commission
IEEE .....	International Electricians and Electronics Engineers
NCRP .....	National Council on Radiation Protection and Measurement
NEPA .....	National Environmental Policy Act
PCS .....	personal communications systems
PSB .....	Public Service Board
RFI .....	radiofrequency interference
RFR .....	radiofrequency radiation
TCA .....	The Telecommunications Act of 1996
VPR .....	Vermont Public Radio

# Foreword

by Stephen J. Holmes, Acting Executive Director  
Vermont Natural Resources Council

At one time, in the early years of Vermont's transformation from a state of isolated villages and farmsteads to one linked by modern transportation and communication, a new highway was proposed. Compared to the Interstates that were constructed later on, which largely traverse the valleys and hug the riverbeds of our state, this earlier conception would have been almost airborne. The vision for the Green Mountain Parkway back in 1933 was of a road originating in Massachusetts and wending northward through Vermont nearly to the Canadian border, seeking the higher elevations and the dramatic views for most of its distance with respite provided by a sojourn through the Champlain Valley. The Great Depression was on, and the Roosevelt Administration was offering federal assistance through programs providing both jobs and measured access to the wilderness. The Green Mountain Parkway was just such a New Deal program.

Public debate over the Parkway presaged Vermont's current environmental discourse, more than half a century later. The issues have grown familiar: the value of Vermont's uncommon beauty as we shift to a tourism-based economy; exploitation versus conservation of our natural resources; and, as ever, the distrust of a federal presence in Vermont's economic affairs.

As we know, the Green Mountain Parkway never happened. A public vote put an end to the proposal in 1934.

But Vermont has developed a roadway of sorts across those peaks - its waystations taking the form of telecommunications towers that soar above the ridgelines and pierce the once-uninterrupted sky. Most of us didn't even see it coming. There was, after all, no New Deal trumpeting its arrival or inviting public debate about the merits of this skyway. But suddenly it's there. We might call it "the Green Mountain Information Highway." Fortunately, it's not too late for Vermonters to discuss where this road will lead us, and perhaps to alter its course.

Like highways of concrete and asphalt, the Information Highway presents environmental implications, particularly in the realm of land use. This is what beckoned the

Vermont Natural Resources Council to the subject in 1995.

Our interest escalated in January 1996, when VNRC staff attended a conference at the Vermont Law School. It became clear that our state didn't have a cohesive policy framework for siting broadcast and telecommunications facilities; nor did the public grasp the complex environmental, aesthetic, and public health issues posed by the proliferation of cellular communications facilities. We became more aware, also, of a related problem: radiofrequency interference from broadcast facilities that erodes the quality of life in some Vermont communities.

Then, on top of it all, Congress passed the Telecommunications Act of 1996 (TCA), and the ground shifted again under the issues of federal authority, local government control over siting, and preemption.

Over the past 18 months, VNRC has dipped its oar into those waters. Aided by funding from the Vermont Community Foundation, we have participated in further conferences and explored the myriad environmental issues of communication transmission facilities in our magazine, the *Vermont Environmental Report* (March 1997 issue).

We have also undertaken the study and report reflected on the following pages, departing as much as possible from the legalistic and scientific language in which the subject, of necessity, is usually addressed. We do not offer a science primer, nor a lawyerly tome on state and federal law - though we do try to point readers to further materials in those directions. Our goal is to convey useful information in clear and understandable language; to take the issues as people encounter them in their daily lives and fit them into a framework that helps readers understand what's happening around them in the telecommunications revolution.

Out of knowledge comes strength. We hope with this report to provide Vermont citizens, legislators, municipal officials, and others interested in the diverse environmental implications of the Green Mountain Information Highway a form of power - the power to help shape the future by which communications will continue to work changes in Vermont's scenery, its people, and their way of life.

# Executive Summary

The face of communications in our world has changed. Everywhere, it seems, there are screens imparting the bytes and tidbits of the information age, and interactive electronic media that shrink the world to a global village in which we can all converse.

In this more compact world, our means of communications are changing, too. The inventions of the 19th century enabled us, for the first time, to converse in staccato code over vast distances, using the earthbound apparatus of telegraph poles and wires. By the latter part of the century, that hardware had been adapted to carry the sound of the human voice.

Now, at a quickening pace, wireless communications employ the open spaces above the earth sending messages among friends, adversaries, and associates. The traditional telephone remains widely in use. But an increasingly mobile society has garnished the C-shaped instrument with pocket-sized cellular devices that fold up like wallets, and with equipment installed in automobiles that eschew the hand-held phone altogether.

Wireless communications, propelled by the convenience they offer, are spreading widely in the world, and Vermont is no exception. The three companies licensed to operate

in this state are Atlantic Cellular (doing business as Cellular One), Bell Atlantic NYNEX Mobile (BANM), and US Cellular. Cellular One is the only provider boasting corporate offices in Vermont (Colchester) and is licensed to serve the entire state. BANM competes with Cellular One everywhere but in Bennington and Windham counties; there, the competitor is US Cellular.

These companies are filling in their service territories with new transmission facilities to offer coverage in every corner, valley, and gore – no small feat in a state permeated with “dead spots,” where the mountain terrain cuts off

signals and leaves the cellular-dependent customer helpless. Atlantic and BANM, providing most of the service in Vermont, are expected eventually to have roughly 60 and 40 transmission facilities in place, respectively. Some are independent towers, while in other locations the companies lease space for their equipment on existing towers; in some cases, cellular transmission devices are attached unobtrusively to tall buildings or other structures.

This expansion follows a national trend. The Cellular Telecommunications Industry Association (CTIA) reported a growth rate of 40 percent among its members in 1995, bringing the total number of wireless customers in the U.S. to 33.8 million at the end of that year. Those customers were aggregated into 22,663 separate “cells” - groups of customers in small geographical regions who are served by the same transmission facilities.

Cell-to-cell transmission facilities enable customers to communicate when they travel beyond the reach of their own cells. The Vermont Department of Public Service reports that the three service providers have established blanket coverage along the interstate arteries, I-89 and I-91, so that cell-phone-toting travelers are never incommunicado. The highways are flanked by towers plainly visible on the forested ridgelines that border the parallel ribbons of roadway.

So-called “blanket” coverage is not just the goal of the companies that operate in our state; it is the policy of the United States government, as expressed in the 1996 Telecommunications Act (TCA). But along with the convenience of wireless communication come complications and public concerns: Does radiofrequency radiation (RFR) from these facilities present a public-health threat? And can radiofrequency interference (RFI) - the impeding of one broadcast facility's signal by another's - be regulated locally to prevent the nuisance and disruption it causes?

Thus, the question necessarily arises whether the TCA preempts state laws and local statutes and regulations that might provide citizens an opportunity to address such issues.

## Siting and Federal Preemption

The TCA derives from the 1934 Communications Act, which created the Federal Communications Commission (FCC). The FCC was given regulatory authority over the electronic media - predominantly radio, at that time, though its scope enlarged - using the natural resource of the country's airwaves and electromagnetic spectrum.

The TCA promotes deployment of wireless telecommunications in part by anticipating, and neutralizing, barriers that local governments and civic boards might erect to thwart tower and transmission facility construction. Section 704 of the Act requires these local authorities (such as municipal zoning boards) to process applications in a fair and timely manner, not to discriminate among providers, and to leave a clear paper trail substantiating the panel's process and decisions. In sum, subsection (II) says that actions by local governments “shall

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not . . . have the effect of prohibiting the provision of wireless services." This language has been used in litigation and appeals to the FCC by telecommunications companies around the country, with some success, to override local government decisions against them.

But the provision of the TCA that most clearly preempts local authority is subsection (iv), which says: "No State or local government . . . may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions," so long as the facilities comply with FCC emissions regulations. By "environmental effects," Congress was referring to radiofrequency radiation.

Although the intentions, the reach, and the ramifications of the Telecommunications Act remain matters of debate a short year after this complex legislation was passed, it appears that in other respects the law preserves significant state and local authority. Indeed, it claims to do so, stating in Sec. 704 (a)(7)(A) that "(e)xcept as otherwise provided . . . nothing in this Act shall limit . . . the authority of State or local government . . . over decisions regarding the placement, construction, and modification of personal wireless service facilities."

The Act does not carve out a preemption for siting broadcast facilities comparable to that for personal wireless services. Yet the FCC continues its authority over radiofrequency interference, and requires its licensees to correct interference problems during the first year of operation. However, what the FCC means by interference is not always what citizens mean. For people who live or work close to broadcast transmission towers, interference can mean the malfunction and perhaps permanent impairment of home and business electronic equipment.

In Vermont, a citizens group in Charlotte coalesced around a plague of interference problems caused by a local FM radio transmission tower. The forums for their efforts to get the 10-year-old tower removed have included the town zoning and select boards, the District 4 Environmental Commission and Vermont Environmental Board (both with jurisdiction over Act 250 land-use permits), the state's Environmental Court, and federal district court. The group contends the FCC's dominion over RFI does not pertain to the manifestations they are experiencing in their homes and businesses. They seek legal support for the latter contention in a 1982 Congressional report, which said that while the FCC could force manufacturers of home-based electronic equipment to build products resistant to RFI - thus regulating RFI without forcing action by the broadcasters - the same did not hold true for "devices intended for office and business uses."

In sum, municipalities may have more power than they realize over siting proposals, both for wireless communications and broadcast towers. But in Vermont and elsewhere, outdated zoning regulations frequently do not anticipate, nor provide for, applications for tower construction. As a result, applications in many cases are not sufficiently judged on their merits. For whatever reason,

a nationwide survey conducted in 1995 by the American Planning Association found that out of 1,390 permit applications, 92 percent were approved.

## A Public-Health Issue?

Telecommunications towers employ microwave radiation to transmit their signals from tower to customer/receiver. "Radiation" is a word that always arouses concern. The electromagnetic spectrum consists of both ionizing and non-ionizing radiation. The ionizing forms (such as X-rays and Gamma rays) are known to be dangerous. Radiofrequency fields are in the non-ionizing spectrum, but those, too, can be dangerous under certain circumstances, particularly when exposure to them produces a thermal, or heating, effect. This can happen particularly when a person is exposed close to the source of the radiation signal.

Under normal conditions, there is little risk of thermal exposure. But scientists disagree whether there is a health risk from non-thermal, long-term exposure, such as that experienced by users of cellular equipment or residents who live near FM broadcasting towers.

Despite the fact that it is not a medical agency, the FCC is responsible under federal law for protecting the public from the technology it regulates. The agency does not enforce radiation emissions limits; rather, it sets standards for exposure, which a licensee can meet by protecting its workers and keeping the public at a distance. Perhaps motivated by the knowledge that U.S. exposure limits have always been more permissive than the limits set in Europe and Russia, Congress directed the FCC in the TCA to employ stricter standards. In compliance, on August 1, 1996, the FCC announced it would adopt standards established by the National Council on Radiation Protection and Measurement (NCRP).

Even so, these exposure standards are still more lenient than those found in other countries. They do, however, establish differing guidelines for workers in the industry and for the general public. The NCRP standards were to have been implemented at the beginning of 1997, but in December the FCC announced a delay.

## Vermont's Environmental Protections

Questions of federal preemption, the public-health effects of RFR, and jurisdiction in cases of RFI might be sufficient to occupy the residents of any other state, but Vermonters have a unique additional concern: How effective

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is Act 250, their landmark environmental law, in regard to broadcast and telecommunications towers?

Arguably, it is stronger in the summer of 1997 than it was a few short months before. During the 1997 session, the Vermont Legislature passed a law extending Act 250's jurisdiction automatically over all communications towers

20 feet or more in height. The new law at least would appear to close escape routes, like Act 250's famous 10-acre loop-hole, that enabled developers to avoid environmental review.

Act 250 cannot surmount the federal restriction against rejecting personal wireless facilities on the basis of

environmental effects (RFR). But Criteria 1, 8 and 10 of the Act provide an opportunity to evaluate projects based on air pollution, aesthetics and whether they conform to town and regional plans. The latter two criteria have proved to be effective tools for parties wishing at least to modify transmission tower proposals.

Criterion 8 demands that projects not have an "undue adverse" effect on the scenery and natural beauty of an area. Procedures for quantifying these values were established in the Environmental Board's 1985 Quechee Lakes decision. There have been important cases in which applicants have been denied land-use permits under Act 250 strictly on aesthetic considerations. These include a 1984 proposal by VELCO for a microwave transmission tower in Sheffield, notable because it was the first major project rejected solely on aesthetic grounds under Act 250. The case was decided

a year before Quechee, and the permit eventually was awarded on appeal when the applicant agreed to reduce the height of the tower and the circumference of the two dishes mounted upon it.

Criterion 10 requires projects to comply with established local and regional plans. This provides another opportunity, apart from zoning regulations, for communities to establish guidelines they believe are basic to attractive and appropriate development. A proposal for a telecommunications tower in Rockingham faltered when the developer neglected to explore the option of co-location (affixing his equipment to suitable existing facilities) before submitting his application.

The successes of tower applications before Act 250 commissions vastly outnumber their failures. Still, the Act has had notable successes in turning down tower proposals that did not fit into the vision of appropriate development that Vermont embraces.

Vermont is not the only state where citizens have sought to determine just what they can and cannot do to protect their communities against unwanted intrusion by electronic transmission towers, or to mold those projects into forms more acceptable. But Vermont experiences an unusual tension produced by its conscientious rural and environmental ethic and a population that is keenly aware of, and involved in, developments in the modern world.

If the state is to maintain its identity when both industry and the federal government are encouraging communities to lower their standards of development, Vermont and its communities must strengthen the tools at their disposal. Municipalities must examine and upgrade their zoning ordinances so they are prepared to impose their will upon telecommunication tower applicants. And the supporters of Act 250 must resist any and all moves to diminish its power to protect our civic and aesthetic principles.

If we can do that, we may be able to manage - on our terms - the new world of communications.

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## CHAPTER I

# Deployment In Vermont

The increasing presence of the cellular communications industry in Vermont can be verified by everyday experience. The technology is not new, having derived from the development of radar in World War II. The earliest towers in Vermont date to the 1950s and were used for dispatch purposes by trucking companies. Members of the telecommunications industry point to the 1984 Los Angeles Olympics, where organizers turned to portable phones to coordinate logistics, as the beginning of popular dissemination of the technology. Once a person becomes aware of cellular transmission towers, the structures seem to be everywhere.

This is most true in obvious places: areas of high population density, and along the interstate highway system. In Vermont's larger municipalities the higher concentration of cell-phone subscribers translates into a demand for more facilities to serve them. Within our metropolitan downtown areas, the transmission facilities may be less noticeable and less obtrusive, because the buildings themselves prominently populate the skyline. Also in the downtowns, the architecture can substitute for the spindly cellular towers that we see more clearly against an uncluttered sky. Upon agreement between the property owner and the cellular telephone company, dishes and antennas can be mounted upon these buildings (and steeples, bell towers, etc.) at sufficient height to serve the company's signal relaying purposes.

But a stroll or a leisurely drive along the rural roads that circumvent Vermont's population centers, which are frequently located in lowland areas, provides a sweeping panorama. That vista now is likely to be punctuated by towers positioned on the surrounding hilltops, many of them bedecked with multiple antennas and dishes, carrying on their silent conversations. The situation is perhaps analogous to the dissemination of electric utility poles in the early part of the 20th century; it was in the settled areas, where the density of customers made an investment in poles and wires by the burgeoning private utilities worthwhile, that the equipment of electricity was most concentrated and most visible.

Vermont has also experienced cellular saturation along its interstate arteries, I-89 and I-91. The Department of Public Service reports that those highways are now "blanketed" by cellular communications facilities. The transmitters serve Vermont's growing population of business travelers and commuters, as well as the motorists who use the interstate links between the megalopolises of the Northeast - Montreal, Boston and New York City.

The level of activity in Vermont mirrors what is occurring nationwide. The Cellular Telecommunications Industry

Association (CTIA) claimed a growth rate of 40 percent in 1995, which brought the total number of wireless customers in the United States to 33.8 million at the end of that year - served by 22,663 "cells" (aggregations of customers who are served by the same transmission facilities). The industry reported 1995 revenues of \$19 billion, 34 percent higher than in the previous year.

The Federal Communications Commission (FCC) licenses companies to provide cellular service in designated areas. Unlike the traditional "monopoly" assignment of service territories to electric utilities (a regulatory circumstance likely to be altered by "restructuring"), the FCC creates "duopolies" of cellular service providers, permitting two companies to compete for customers within each territory.

Vermont is divided by the FCC into four service territories - two in the southern part of the state, one in the Burlington area, and the fourth comprising all the rest of northern Vermont. Three companies are licensed to operate here. Atlantic Cellular, doing business as Cellular One, is permitted to serve the entire state. Bell Atlantic NYNEX Mobile (BANM) serves all but the two southernmost counties, Bennington and Windham. US Cellular operates only in those counties. Thus, the duopolies are shared mainly by the first two companies, with Atlantic Cellular and US Cellular competing in Bennington and Windham counties.

In December 1996, Atlantic Cellular reported that it had positioned transmission facilities at 40 sites in Vermont. More sites are being developed, though it is estimated that the 40 sites now operational represent more than half of Cellular One's eventual need. BANM, with somewhat less territory to cover, is expected to construct somewhere around 40 sites in Vermont.

### Building Out The 'Honeycomb'

But not all sites are towers. And not all towers are the same.

One can picture the service territory of any of these providers as a huge honeycomb; each of the compartments of the honeycomb represents a "cell" - small geographical units of customers that are served by the provider, and for which the transmission facilities that send the signal to the customer can be positioned at relatively low altitudes. Within these cells, the towers commonly associated with

*The level of activity in Vermont mirrors what is occurring nationwide. The Cellular Telecommunications Industry Association (CTIA) claimed a growth rate of 40 percent in 1995*



the industry might not even be necessary and are sometimes avoided. In urban settings transmission equipment can be mounted on steeples, office buildings or other structures; in more rural areas silos can be used. The objective is merely to elevate the equipment above the treeline or manmade structures that would impede the signal.

Greater elevation is employed for the transmission facilities that actually beam signals from one cell to the next. The industry calls this "line-of-sight" location. These are the sentinels that the eye can detect against the skyline at many points along the major highway arteries.

How many transmission structures will there be in Vermont when the build-out is complete?

It's a hard question because it is difficult to determine exactly how many towers are now in existence. The Vermont Environmental Board doesn't know, because many of the current crop of towers weren't required to obtain land use

permits under Act 250; either they were grandfathered into the Act in 1970 or the projects involved fewer than 10 acres of land, which was the threshold for the Act's review until the Legislature changed the law in 1997 (see Chapter

5: "An Environmental Perspective"). Companies wishing to upgrade the earlier generation of towers sometimes avoided Act 250 review by maneuvering their property holdings so as to slip through the 10-acre loophole.

Nor would tallying the towers and facilities operated by the three communications providers yield any usable statistic to indicate Vermont's tower population, since facilities for microwave transmissions are now the province of hospital emergency rooms, county sheriffs' departments and local rescue operations, as well as private paging services and point-to-point voice, video and data transference related to business activities.

Whatever the current number, one often hears that Vermont will host another 200 towers by the end of the century - merely three years away. Nationwide, the industry estimates there will be 115,000 transmission facilities for mobile phones by the year 2000, which would require some 68 installations a day. Traveling some of the major thoroughfares in this country, that's believable.

But the evolution of policies, by towns and regions but also by the telecommunications companies themselves,

could affect that outcome. If zoning ordinances and regional plans stress co-location - encouraging users to double up on new or existing towers - the number of towers, if not of transmission devices, may be held in check.

On the other hand, such concentration of transmission equipment could in some circumstances result in radiofrequency radiation (RFR) exposure above FCC limits. Additionally, providers might conclude that the best policy is to reduce the aesthetic impact of their facilities by reducing their height and minimizing the clutter of antennas and dishes. Either of these decisions would mean building more towers.

Moreover, predictions about the eventual build-out of facilities and the mark they will leave on the environment are further open to question because the industry itself is in flux. An emerging technology called personal communications systems (PCS) is almost upon us. The FCC has assigned a former television bandwidth for these transmissions, and sold the rights to that bandwidth at auction. PCS will add more towers to the Green Mountains. The current analog systems transmit voice messages. PCS uses digital technology to convert the sound of the voice to encoded numerals and transmit them to a receiver which recreates the vocal sound. Digital transmission is accomplished at lower power levels, but requires more facilities per area served - breaking the honeycomb chamber into two or three "micro-cells."

Sales of the spectrum width designated for PCS netted the U.S. Treasury some \$20 billion. Sprint and Omnipoint purchased the PCS rights for Vermont and are expected to be ready to offer services in higher-population centers in 1998.

Their entry into the field offers new opportunities for Vermonters, both as customers and industry employees. But the implication for the environment and for state, regional and municipal regulatory entities is unmistakable: It will translate into more siting proposals, even in areas where cells appear to be settled and defined.

In addition, it will speed humanity's growing detachment from the wires that used to convey our signals across mountains, plains and prairies, and down city streets. It will put those signals in the air, sending them upon invisible waves of radiation - out of sight and perhaps out of mind. The combination of towers we can see but wish we could not, and radio waves that we can't see though it may be better if we could, is a cause for vigilance as we monitor the regulatory framework constructed around this technology.

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## CHAPTER 2

# Siting: The Legal Framework

Vermonters have embraced many of the electronic conveniences of our age, particularly those related to communication (perhaps to offset a sense of geographic detachment). Most of us listen to radios and watch television and many support the valuable programming of not-for-profit broadcasters. In our homes and offices, we use computers for work, entertainment, and communication. Employees are tethered to their duties by pagers affixed to their belts. We want our fire, police and paramedical services to be equipped with the latest communications technology, so they may respond quickly in our time of need.

When it comes to picking up the phone for business or personal purposes, increasingly it is a hand-held, cellular phone we use. Added to the convenience is a security factor: These devices are viewed, and marketed, as a form of protection when calamities of the roadway occur.

Yet we do not welcome the sight of the transmitting and receiving equipment (e.g., towers) that enable the myriad electronic conveniences we enjoy. Vermont's ridge lines, after all, present us with a pristine landscape, not a cityscape, and we want it that way. Our concerns turn quickly from the aesthetic to the physical when the microwave towers get too close. Wary of radiation, we want them kept at a distance from our homes and schools.

So where, then, are the towers to be? The nature of the technology dictates that if we preserve the scenic ridge lines, we opt, perhaps without knowing it, for a greater number of towers. For lower installations cannot cover as much territory with their signals. A related choice is to encourage "co-location" - mounting multiple reception or transmission devices upon the same structure. The price of that choice is that the towers then become far more unsightly, and the cumulative radiation emissions are greater at those sites.

To balance these public-health and aesthetic concerns - and to probe the limits of just how much influence citizens have over the siting, or even the existence, of microwave towers in our communities - we turn to the mechanisms that provide constituents with power at the local level: zoning ordinances, planning documents, and in Vermont, Act 250.

In general, the companies that sell us broadcast and communications services don't share the popular concern about them. They are comfortable with the technology, and believe that so long as they meet the licensing requirements of the Federal Communications Commission (FCC), they are operating safely, with no risk to public health. While it is unfair and inaccurate to lump all companies under the broad rubric of "the industry" - for they do exhibit a range of sensitivity and accommodation to public attitudes - the

companies believe with a degree of justification that they have the law on their side.

For many citizens, government officials, and service providers, therefore, the question becomes: Who has the authority to regulate tower siting?

The following pages discuss existing federal, state, and local statutes and regulations that govern the placement of communications facilities. Chapter 5 reviews the protocols and practices that have developed under Act 250 as district commissions and the state Environmental Board have considered tower applications.

### Federal Law:

#### Attention To 'Personal Wireless Services'

The first issue to be addressed is whether federal law absolutely controls the siting of communications facilities. The Communications Act of 1934 - 47 U.S.C. Sec. 151 et seq., amended by Section 704 of the Telecommunications Act of 1996 ("TCA"), 47 U.S.C. Sec. 332 (C)(7) - is the federal statute most relevant to this discussion.

Titled "Facilities Siting, Radio Frequency Emissions Standards," Section 704 purports to preserve state and local authority over the placement of "personal wireless services facilities" - by which it means cellular towers (or alternative emplacements for wireless transmission equipment) and, presumably, Personal Communications Services (PCS) facilities when eventually they are deployed. At Sec. 704 (a)(7)(A), the law states: "Except as otherwise provided in this paragraph, nothing in this Act shall limit or affect the authority of a State or local government or instrumentality thereof over decisions regarding the placement, construction, and modification of personal wireless service facilities."

But such limitations follow forthwith in subsection (B). Predominantly, their thrust is to protect companies from arbitrary exercises of power and discrimination by local governments, as well as to further Congress' objective - which is unmistakable in the law - of promoting the deployment of wireless communications technology.

Thus, local governments, in the exercise of their authority, are required:

- to respond in a timely manner to applications for zoning

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- permits or other approvals;
- to ensure that companies offering to provide functionally equivalent services have an equal opportunity, within the local jurisdiction, to develop their proposals and site their facilities;
- to support denials of such proposals with clear, written reasoning.

In sum, subsection (II) says that actions by local governments "shall not . . . have the effect of prohibiting the provision of personal wireless services."

But for state and local bodies, the most significant limitation on their regulatory rights lies in subsection (iv),

which says: "No State or local government . . . may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions," so long as the facilities comply with FCC regulations concerning such emissions.

"Environmental" effects is construed by interpreters of the Act to refer to public health. In effect, the Act vests the full authority for determining what are safe levels of radiofrequency emissions and exposure with the Federal Communications Commission

(representatives of which have expressed clearly that their agency is not prepared to be an arbiter of issues of human health; see Chapter 4).

The import of Section 704 is that in specifying the procedural expectations placed upon local jurisdictions, and by singling out "environmental effects" related to personal wireless facilities as exempt from local governance, it expresses the limits of federal preemption over the siting of "personal wireless service facilities."

This is a significant change in the legal framework that governs siting. Prior to 1996 and the adoption of the TCA, there was no restriction on the FCC's authority to regulate siting; as a result, federal authority consistently preempted state and local authority over the placement, construction, and modification of communications facilities.

Notably, Section 704 expressly preserves state and local control (within the limitations noted above) only over "personal wireless service facilities," not all communications facilities. The distinction is important. Section 704 defines those personal wireless services as "commercial mobile services, unlicensed wireless services, and common carrier

wireless exchange access services"- meaning, in general, transmission facilities for such devices as cellular phones and pagers. It does not apply to broadcast facilities - for example, radio and television towers. (footnote 1)

Section 704 also has jurisdictional consequences. Subsection (v) requires that any person adversely affected by a state or local government action that appears to violate the limitations discussed above - except for those relating to radiofrequency emissions - seek relief in local, state, or federal court, rather than at the FCC. (47 U.S.C. S 332 (C)). It is the courts, therefore, that are the final arbiters of disputes concerning a particular state or local zoning regulation that pertains to siting, and whether that local law violates Section 704. (footnote 2)

The FCC is not the sole federal agency with siting authority and interests pertaining to communications facilities. The Federal Aviation Administration (FAA) also holds regulatory authority over towers and antennas. It considers objects to be obstructions to air navigation if they are more than 500 feet above ground level - a measurement that is reduced to 200 feet within certain proximity to an airport. Relevant FAA regulations focus on any permanent or temporary construction or alteration. (14 C.F.R. Sec. 77.5). Every new or altered antenna structure, registered on or after July 1, 1996, must conform to appropriate painting and lighting regulations imposed by the FAA. (footnote 3)

The FAA encourages co-location or development of "antenna farms" - clusters, or concentrations, of such facilities - whenever possible, to limit any threat they might pose to aviation.

## Federal Lands:

### Vermont's Green Mountain National Forest

The Telecommunications Act expresses an obvious Congressional interest in facilitating the placement of communications facilities on federal lands. In Vermont, that includes the Green Mountain National Forest.

Section 704 (C.) of the TCA requires the U.S. Forest Service and all other departments and agencies to "make available, on a fair, reasonable, and nondiscriminatory basis, property, rights-of-way, and easements under their control for the placement of new telecommunications services. . ." The Act establishes the expectation that requests for the use of federal property will be granted, "absent unavoidable direct conflict with the department or agency's mission, or the current or planned use of the property, rights-of-way, or easements in question."

The reference to planning is important in regard to the Green Mountain National Forest, the stewardship of which is guided by the Green Mountain National Forest Land and Resource Management Plan. That plan contains language that would indicate a conflict with any prescription for using public lands to foster the development of visually prominent features, such as utility corridors, large cleared areas, and electronic communications sites. The plan specifically protects high lands and ridge lines.

The U.S. Forest Service currently is reviewing and revising the Land and Resource Management Plan, with hopes to complete the process around the year 2000. The extent to which the new plan will take into account the Section 704 (C) mandate is unknown. Public hearings are ongoing, and open for the input of industry representatives as well as private citizens. For now, the Forest Service says that while the 1996 Telecommunications Act encourages the agency to facilitate applications from electronic service providers and to approve their projects, in practice the Act does not appear intended to preempt the forest plan.

The telecommunications law is just a year old at this writing, and in terms of challenges to the Land and Resource Management Plan, it is untested. However, the National Environmental Policy Act (NEPA) affords strong protections, particularly of wilderness areas.

At present, there are two electronic communications sites in the Green Mountain National Forest, both of which have operated since the 1960s. One is on Mt. Snow and the other on Lincoln Peak. The development and usage of those small sites - Mt. Snow's, for example, is about a tenth of an acre - is guided by plans specific to those locations, which take into account not only the forest values expressed in the Land and Resource Management Plan but also the electronic facilities already in place. Both of the sites host several (four or five) users already, predominantly two-way mobile transmission facilities like those used by trucking companies to communicate with their drivers. The Mt. Snow site, which holds two towers, also has a cellular facility. An expanded Lincoln Peak site plan is presently under redevelopment, and parties interested in adding their equipment there must wait until the plan is finished so they can meet its terms.

Applications to add equipment at the existing sites weigh electronic calculations heavily. Technical data sheets are reviewed not only by the FCC but by the owners and users of facilities already on site, to prevent installations that would cause radiofrequency interference with present equipment.

The future of the Green Mountain National Forest, in an era governed by a 1996 Telecommunications Act with its eye on public lands, is hard to predict. A clash of federal interests could ensue. But since the TCA provides an exception for planned public lands, it would appear that the first thing developers would have to do if they wish to erode the forest's protections and construct more freely in the forest is to work changes into the plan.

### Vermont State Law: Low Profile

To the extent that state and local governments retain legal authority over the siting of communications facilities, that authority in Vermont rests primarily in municipal zoning ordinances and Act 250, Vermont's development control law. In an era that promotes market competition within industries that formerly were more regulated, Vermont's state government appears reluctant to embrace an authoritative role in siting issues.

A bill passed by the Legislature in 1996, in fact, declares

a state interest in offering public property (lands and buildings) for wireless communications facilities, much as the TCA invites telecommunications companies onto federal land. The new law allows the secretary of administration to negotiate with companies interested in contracting with the state for use of its property; and permits citizen review of those contracts by a panel drawn jointly from the public and private sectors.

Yet the Vermont Public Service Board (PSB) and the Department of Public Service (DPS), have been charged by the Legislature with regulating the telecommunications industry. The Board and Department maintain jurisdiction over a variety of industries referred to jointly as "public utilities." "Public utilities" include, but are not limited to: "a person or company offering telecommunications service to the public on a common carrier basis." 30 V.S.A. Sec. 203. "Tele-communications service" is defined as the "transmission of any interactive, two-way electromagnetic communications, including voice, image, data, and information. Transmission of electromagnetic communications includes the use of . . . wires, cables, television cables, microwaves, radio waves, light waves, or any combination of those similar media." See generally, 30 V.S.A. Sec. 203.

As overseers of these industries, the DPS has drafted an exhaustive update of its earlier Vermont Telecommunications Plan, this recent edition being published in December 1996.

The Plan is broad and general in nature, and deals with almost every facet of telecommunications, from phone rates for both wireless and traditional telephone service to cable TV and public access television, from "telecommuting" to electronic library access. It includes a review of economic development in the state and some analysis of how telecommunications should be kept current in order to serve and facilitate such development; it presents an evaluation of the current telecommunications network, and an assessment of future needs in the state based on demographic trends. A chapter heading, "The Vision: An Electronic Community By 2001," clearly reflects the policy set forth in the enabling legislation - 30 VSA Sec.202d(e). The Legislature's and the Department's intent is that the plan will encourage the deployment of modern communications technologies throughout Vermont; The statutory goals it sets forth on behalf of the citizenry include: reasonable cost, availability of service to all Vermonters, superior quality of service, stable local exchange rates for all consumers, and "obtaining for all consumers in the state a technologically advanced telecommunication network serving all local service areas..."

Where the Plan addresses issues of consumer protection,

*In an era that promotes market competition within industries that formerly were more regulated, Vermont's state government appears reluctant to embrace an authoritative role in siting issues.*

it does so from the standpoint of unfair or misleading trade practices by providers. The goals and objectives spelled out in this vast policy statement, far-reaching as they are, fall short of pronouncements regarding the siting of telecommunications facilities

*The extent to which a local government can control tower siting depends on the extent to which it has adopted zoning provisions applicable to towers.*

An interesting conundrum faces telecommunications providers in their relationship to the DPS and the PSB. Although, as noted above, they are covered by the definition of "public utilities," many cellular and PCS companies do not want to be regulated as such because, typically, traditional "public utilities" are subject to price controls and rate setting.

However, if those companies are not treated as traditional "public utilities," they are unable to take land and rights-of-way for siting by eminent domain. Therefore, they must site each tower in accordance with state and local siting laws. (footnote 4)

### Local/Municipal Law: The Power of Zoning

To the degree that the Telecommunications Act of 1996 preserves state and local control over the siting of telecommunications facilities, local zoning may be the best tool for the purpose. Act 250, employed to address economic and population-settlement issues on a broad, regional scale, remains essentially an environmental law. (As such, Act 250 is discussed in Chapter 5 of this text, which deals with environmental issues relevant to towers and tower siting.)

Zoning laws, on the other hand, are a tool by which communities can decide what kind of housing, business, commerce or other activities can go where (and, conversely, what can't), and, within limits, how those structures or enterprises are to look and operate. And as noted in Chapter 5, zoning laws can also affect Act 250 decisions under its Criterion 10.

Zoning authorities must be mindful that the 1996 Telecommunications Act puts certain limits on the

regulation a local government can apply: Laws and regulations cannot have the effect of excluding the technology; they cannot discriminate among providers; they cannot prohibit or regulate the construction or placement of wireless facilities on the basis of radiofrequency radiation (so-called environmental impacts).

The extent to which a local government can control tower siting depends on the extent to which it has adopted zoning provisions applicable to towers. Unfortunately, statistics suggest that local zoning regulations have not significantly affected new tower construction. For whatever reason, the American Planning Association's (APA) survey of municipalities nationwide found that out of 1,390 permit applications for towers in the municipalities surveyed, 92 percent were approved. See, American Planning Association, Cellular Tower Survey (1995).

One reason that municipalities apparently do not invoke their full authority under zoning laws is that wireless communications companies are among the wealthiest and most powerful corporations in the country, with exhaustive legal and financial resources. When those companies argue that the 1996 Telecommunications Act expresses a federal policy facilitating seamless nationwide cellular service, they are correct. The issue to be decided on a case-by-case basis, however, is whether the restrictions imposed by the FCC preempt the local law. Municipalities that pursue that issue - or better yet, modify their zoning laws in anticipation of the issue arising - may find they have more power than they had thought.

While the majority of Vermont municipalities have zoning regulations, most of those codes fail to provide for adequate review of proposed tower sitings - a shortcoming revealing that Vermont's communities have not been able to keep pace with the development of communications technology. A bill in the state Senate in 1996 sought to exploit that situation. S.209 proposed that if a municipality's zoning laws did not specifically designate a district in which cellular facilities were a permitted use, such facilities would have to be treated as a conditional use in any district - that is, they could be built virtually anywhere in the village or town. The bill was not successful.

## CHAPTER 3

# Radiofrequency Interference

A young, single woman lived alone in the suburbs of a city, renting an apartment that her landlord had constructed in the unused space above his garage. A doorway opened onto a staircase leading to her second-story living quarters, but the stairs could also be reached through the garage. When the wide, overhead door was raised noisily by its electric motor, allowing the landlord's car to come and go, the stairway was exposed to the outside world. Only a lightly built interior door at the top of the stairs stood between her modest rooms and a possible intruder.

The arrangement seemed safe enough to the woman, except for one thing: Frequently at night she could hear a rumble as the metal bearings on the sides of the garage door rolled in their tracks, the floor vibrating beneath her as the door lifted in response to some silent command. Later - sometimes much later - the door would rumble down again, but during the course of the night it was apt to open and close repeatedly. When she heard the heavy door lumbering to the open position, leaving her stairway accessible to prowlers or passersby, she lay uneasily in the dark until the electric switch answered another command and ran the motor backwards. Her tension subsided only when she heard the door settle cumbrously upon the concrete floor.

The woman's landlord assured her he was not coming and going at all hours of the night. The problem was radiofrequency interference (RFI). He used a remote device in his automobile to open the door as he drew near the house. But the door's erratic behavior indicated it was responding to another transmitter as well, its mechanisms triggered by a signal intended for some unrelated purpose.

Up to the time she moved away, the tenant never figured out where that maverick signal was coming from.

### Charlotte: A Case In Point

Controlling RFI is the job of the Federal Communications Commission (FCC). The phenomenon is chiefly associated with broadcast signals rather than wireless communications signals, because radio and TV signals are far more powerful. In some instances, though, electronic paging systems have caused RFI problems, for example with people's television sets.

For licensing purposes, the commission considers RFI to be interference of one radio or television signal with another station's signal - a sort of traffic jam of the airwaves, which the agency tries to police through its licensing powers. For lay people, though, RFI also refers to the unfortunate effect microwave signals can have on household, business, medical and institutional electronic devices. It might cause

them to malfunction: i.e., garage doors responding capriciously to a wayward signal, computers and telephone answering machines locking up, or, even more seriously, medical equipment behaving improperly. It might also cause the equipment to become damaged or completely disabled.

There have been many cases throughout the country of RFI impeding the proper behavior of equipment used in homes, hospitals, schools and other settings. In Vermont, the most well-known case is in the Chittenden County town of Charlotte. The story of Charlotte is instructive in understanding the legal and regulatory issues surrounding RFI.

In Charlotte, 88 residents and businesses reported electronic interference in an informal survey in January 1996. People cited problems with baby monitors, stereo receivers, clock radios and postage meters. A small business owner claimed that RFI had disabled a series of answering machines until he was forced to contract with a commercial service at considerable expense. A local veterinarian encountered problems with a heart-monitoring device used to gauge the stability of sick animals. A pastor reported interference problems with his church's public address system and with headsets worn by hearing-impaired parishioners. The school board complained that electronic interference played havoc with computers and other

expensive educational technology at the Charlotte Central School (see Chapter 5).

The culprit is a 50,000-watt transmitter owned by Burlington Broadcasters Inc., which beams the signals of FM radio station WIZN from a 199-foot tower erected about two-thirds of the way up

a low summit called Pease Mountain. A group comprising some 200 Charlotte residents banded together as "Citizens for the Appropriate Placement of Telecommunications Facilities," to rid the town of the tower, the RFI, or both. Along with the Zoning Board of Adjustment and the Charlotte Select Board, the citizens group has confronted the radio station in a variety of legal and jurisdictional settings, from zoning board hearings to actions before the

*The FCC considers RFI to be interference of one radio or television signal with another station's signal - a sort of traffic jam of the airwaves; which the agency tries to police through its licensing powers. For lay people, though, RFI also refers to the unfortunate effect microwave signals can have on household, business, medical and institutional electronic devices.*

District 4 Environmental Commission, the Vermont Environmental Board, the state's Environmental Court, and federal district court.

For its part, the station has made some efforts to mitigate the interference problems caused by its transmitter. But the problems have not gone away. The station has resisted

removing the tower (which also hosts telecommunications transmitting equipment owned by Bell Atlantic NYNEX Mobile - or BANM - as well as transmitters used by the town's emergency rescue service). Station personnel have claimed that so long as they comply with the requirements of their FCC broadcast license,

*The citizens assert that Section 704 of the Telecommunications Act allows for state and local control over telecommunications facilities within specified limitations; those limitations, they argue, do not prevent the town from regulating towers based on RFI.*

WIZN's operations are legal and safe for the community.

Those arguments are familiar. But in Charlotte, WIZN has met with local boards and citizens who are resistant to the notion that an FCC licensing process can render a broadcaster immune from the will of the community.

This case presents the important question of whether federal law and regulation preempts states and local governments from regulating radiofrequency interference.

### "Occupying The Field"

FM broadcast station licensees are required by the FCC to respond to all reasonable complaints of "blanketing" interference (interference with nearby electronic devices caused by a strong FM signal) within the first year of their operation. Starting in 1985, the FCC (at 47 C.F.R. Sec. 73.318(b)) extended this same one-year response requirement to alterations of a licensed broadcast site or system. Yet the Charlotte example shows that RFI can and does persist well past that first year (the WIZN tower was erected in 1987).

Licensees often respond to these complaints by asserting the Supremacy Clause of the U.S. Constitution, which provides that the "Constitution and the Laws of the United States which shall be made in Pursuance thereof . . . shall be the supreme Law of the Land..." Thus, they claim, federal law preempts state and local power of RFI occurrences, and any requests for relief must be filed with the FCC. In some circumstances, it is the licensee itself that brings the action to the FCC, claiming an adverse local zoning regulation or decision, or a permit condition, should be preempted by federal law. Historically, the FCC has been a more favorable forum for licensees than courts or local regulatory boards.

Ultimately, the ruling body - whether a local, state, or federal court, or the FCC - must determine whether the local regulation or permit condition is preempted.

For that issue, the touchstone is a U.S. Supreme Court

ruling in a smoking-related case, *Cipollone v. Liggett Group Inc.* The high court determined that a state or local action may be preempted in the following circumstances:

- when Congress, in enacting a federal statute, expressed a clear intent to preempt relevant state laws;
- when it is clear, despite the absence of explicit preemptive language, that Congress intended to "occupy an entire field of regulation," and has thereby "left no room for the states to supplement federal law";
- when state and federal laws contradict, so that compliance with both is impossible, or when state law "stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress."

This doctrine of preemption entered into the Charlotte case when the town Zoning Board of Adjustment, with conspicuous regret, rescinded conditions attached to WIZN's permit by the zoning administrator. First, the board correctly recognized there was no explicit preemption of its zoning authority in any federal statute, and that it therefore had to decide whether federal regulation preempts the field. Then, relying on case law, the zoning board agreed with the licensees' contention that because the Communications Act of 1934 comprehensively regulates interference, Congress intended federal regulation to completely "occupy the field."

The citizens group appealed, and the licensees petitioned to remove the case to the U.S. Federal District Court in Burlington, based on the federal jurisdiction question. The citizens assert that Section 704 of the Telecommunications Act allows for state and local control over telecommunications facilities within specified limitations; those limitations, they argue, do not prevent the town from regulating towers based on RFI. (The argument is complicated by the presence on WIZN's tower of a licensed BANM facility for personal wireless services. As described earlier in this report, federal preemptions exist for those facilities that do not apply to broadcast towers.)

The Charlotte complaints also dispute any contention that FCC rules on radiofrequency interference, written to prevent conflicts between broadcast signals, can be applied to other manifestations of RFI, such as those experienced regularly in their homes, churches, schools and offices. In that realm, they contend, local authority survives.

Another avenue for exploring potential local control over RFI lies in the distinction between interference with electronic equipment used in the home and interference with business and institutional equipment.

Federal law (47 C.F.R. Sec. 302a(a)) empowers the FCC to "establish minimum performance standards for home electronic equipment and systems to reduce their susceptibility to interference from radiofrequency energy." In a sense, then, the commission regulates RFI not at the broadcast tower, but by putting the onus on manufacturers of home-use equipment to produce machines less vulnerable to interference. Arguably, at least, that rule "occupies the field" and reduces opportunities for municipal governments

to intercede.

But by being explicit about "home electronic equipment" the law leaves an opening for a local regulatory role over projects that could produce RFI to the detriment of business and institutional equipment. This isn't just a theoretical opening; the distinction has been formally recognized in a 1982 Congressional report, which stated that "the [FCC's authority applies] only to . . . electronic equipment . . . likely to be found in a private residence . . . as distinguished from devices intended for office and business use."

In Charlotte, for example, such protected uses might logically include the businessman's answering machines and the veterinarian's heart monitor.

A related argument pertains to interference with medical and institutional equipment from broadcast transmissions. Federal courts have asserted that states and localities retain authority to protect the health, safety and welfare of their citizens. The Telecommunications Act preempts that authority in regard to the placement of personal wireless facilities, which cannot be regulated at the local level on the basis of "environmental" (that is, health) effects. But the principle has not been abrogated in regard to broadcast transmission facilities. The authority of state and local councils, then, might be employed to prevent installation of facilities that pose the threat of interference with medical and institutional equipment. As with many aspects of the Telecommunications Act, this is an avenue waiting to be developed through challenge and, perhaps, litigation.

Here again there is irony in the Charlotte case, as the WIZN tower also hosts communications equipment employed by the town's emergency service. Certainly, though, a resolution of the interference problem need not result in the utter loss of the rescue service equipment.

In many municipalities where RFI has become pervasive, citizens and local governments have attempted to control it through the filing of a nuisance claim in court or by regulating based on the traditional doctrine of nuisance.

Courts, however, have consistently held that state-law nuisance claims based on RFI are preempted in the same manner as the direct state and local regulation of RFI discussed above.

### Opportunity Knocks

Congress and the Clinton Administration crafted the Telecommunications Act of 1996 to encourage the dissemination of modern communications technology, particularly personal wireless service. But despite the efforts

of some proponents to provide the industry blanket protection from local authority, the only absolute statement of preemption is the section that forbids states and municipalities to regulate the placement of personal wireless facilities out of concern for radiofrequency radiation (RFR).

Subject to procedural strictures enunciated in the Act (and surviving aspects of the 1934 Communications Act that came before), and to such wrinkles as the distinction drawn between business and residential electronic equipment, considerable power remains in the hands of local governments. It is true, however, that the nuances of the Act are as yet undetermined.

Through zoning laws and planning documents, crafted to ensure that wireless and broadcast companies get a fair shake, Vermont's towns, villages, and planning regions can influence the siting and operations of transmission facilities and protect their citizens from radiofrequency interference.

It only remains for them to develop the skills and understanding to do so.

*Through zoning laws and planning documents, crafted to ensure that wireless and broadcast companies get a fair shake, Vermont's towns, villages, and planning regions can influence the siting and operations of transmission facilities and protect their citizens from radiofrequency interference.*



# Public Health: The Limits Of Authority

While the public has responded with interest to the convenience offered by wireless, microwave communication, two areas of abiding concern about the technology remain: siting and safety. Although siting raises questions of land use and aesthetics, on another level the two issues are the same: At the heart of both is the fear that radiofrequency radiation (RFR) is a threat to public health.

Those concerns extend as well to radiofrequency interference (RFI), because interference is seen as a byproduct of radiation. Particularly, people whose homes or offices are in close proximity to broadcast facilities fear, in the words of one whose electronic devices were subject to repeated episodes of interference, that "what's going on with this electrical equipment is an indication of what's going on in our bodies."

## Understanding The Spectrum

The electromagnetic spectrum is quantified in hertz, a measurement so-called after nineteenth-century German physics professor Heinrich Hertz, who demonstrated that energy moves in distinguishable wavelengths and can be directed without a connecting wire. "Frequency" describes (in hertz) the oscillation, or up-and-down movement, of a wave. The electric power conducted in transmission lines, for example, moves in the extremely low frequency (ELF) range of the spectrum, at 60 hertz (Hz), with a long, relatively flat wavelength.

Radiofrequency radiation (RFR) includes all frequencies in the electromagnetic spectrum between about three kilohertz (kHz), and 300 gigahertz (GHz); "kilo" means thousands of hertz, "mega," denoted with a capital M, means million, and "giga" (G) means billion. For reference, microwave ovens produce an energy field at frequencies in excess of 1 GHz to excite the molecules in food and make it hot. Devices operating within this spectrum include but are not limited to: cellular phones, FM radio, AM radio, VHF and UHF TV, police and fire radios, CB radios, commercial satellites, and some personal communications services.

In addition, the electromagnetic spectrum consists of both ionizing and non-ionizing radiation. Ionizing forms of radiation include ultraviolet rays, X- and Gamma rays, and Cosmic rays from the sun. Their harmful effects, particularly their potential to cause cancer, are well known. One effect is that they break molecular bonds - a process called ionization, which damages DNA.

Radiofrequency fields, including microwaves, are within the non-ionizing spectrum, but that doesn't mean they're completely safe. Their known danger is that under some circumstances - for example, at the transmission point for FM radio signals - they can produce enough energy to cause heating in conductive materials, including human tissue. The heating, or "thermal," effects of high-frequency, non-ionizing forms of radiation are understood; to prevent them, owners of broadcast towers are required to erect fencing and/or post signs to keep the public at a distance from the facilities.

Where the opinion of science is divided, however, is in regard to exposure to non-thermal (or athermal) energy waves, which do not heat body tissue. Is there a danger from long-term, non-thermal exposure? Some experts believe non-thermal rays may be more harmful than thermal rays because the penetrating radiation bypasses the body's normal pain mechanisms; we don't feel the heat and pull away from it, so the radiation is absorbed, perhaps for extended periods.

While proof of danger from exposure to non-thermal RFR thus far has remained elusive, theories of negative effects include that such exposure indirectly damages DNA and, perhaps, the electrical transmissions involved in the nervous system. (In this context it serves to remember that the human body is alive with electrical interactions.) Another indirect - and, it must be emphasized, hypothetical - connection is to breast cancer, which, theory states, could result from an increase in production of estrogen due to interference with the function of the pineal gland.

These theories are disputed by other scientists, who believe there is no danger from long-term, non-thermal exposure. Thus far, science has not proved them wrong, nor shown those scientists to be unduly callous to public-health concerns. But *The Cancer Journal* (Vol. 8, No. 5) provides a cautious voice, stating: "Epidemiology has seen a large number of examples where health hazards were initially described with unconvincing and sometimes inadequate experiments which demonstrated a weak association with a given environmental influence. Such associations were found between cholera and drinking water containing fecal contaminants, between smoking and lung cancer or between exposure to vinyl chloride and certain forms of liver cancer. All these associations were highly questioned in the past and are now well recognized."

This much is known: Under some circumstances, radiofrequency radiation operating at the higher end of the

spectrum, can present thermal risks to human health. Whether non-thermal RFR poses health risks remains a subject of debate and speculation.

Of less dispute is the danger RFI poses to the functioning of certain medical equipment, such as infusion pumps and sleep apnea monitors (used as a precaution against SIDS - Sudden Infant Death Syndrome). These were documented in a 1996 study conducted by Montreal's McGill University. To prevent equipment malfunction, hospitals can adopt policies to prohibit police radios, cellular phones, and paging systems in areas where sensitive electrical equipment is used.

No such protections exist outside the hospital environment, where there has been ongoing concern whether microwaves associated with cellular telephones affect the normal functioning of the pacemakers implanted under the skin of heart patients. Also of concern are electronic defibrillators, which are surgically placed in the abdomen to shock a fluttering or inactive heart so that it resumes a strong beat.

Most studies indicate that a greater risk is posed by digital cell-phones than by analog phones (see Chapter 1, "Deployment In Vermont"). A May 1996 study found that digital phones caused interference with heart pacemakers in more than half of the 975 patients tested. As the digital, or PCS, technology finds greater use in the United States, the problem of cellular phones quickening the heartbeat or disabling the pacemaker conceivably could become more widespread.

However, the danger appears to come from telephones that are carried in a breast pocket by the patient, rather than from random signals to which he or she may be exposed in the streets or neighborhoods. Scientists say that doctors should advise their patients to use analog phones rather than digital ones, not to carry the phone near the pacemaker, and when using the phone to hold it to the ear on the opposite side of the body from where the pacemaker is positioned.

Hearing aids can also be effected by electronic interference from digital cellular phones. In this case, the culprit can be phones used by someone standing near the hearing-impaired person. The unpleasant effect is said to be a loud buzz in both devices.

The Cellular Telephone Industry Association contributes to studies on the health effects of radiofrequency radiation through a blind trust (which may ensure the neutrality of the research but not necessarily the public relations spin applied to the results). An industry representative said in late 1996 that the CTIA had put \$25 million into the trust.

The numerous public health implications of radiofrequency radiation thus present a regulatory role for government. Who has the authority to regulate RFR, the federal government or state and local government agencies? And what standards are in place controlling radiofrequency emissions?

## Federal vs. State/Local Control of RFR

The first question returns us again to the 1996 Telecommunications Act. Section 704 preserves local zoning authority in this realm, with certain limitations - i.e., that no state or local government body may regulate the "placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radiofrequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions."

While preserving that localized authority, Section 704 also calls upon the federal body, the FCC, to adopt standards governing the environmental effects of radiofrequency emissions. That duty parallels the commission's long-standing responsibility under the 1969 National Environmental Protection Act (NEPA), which requires agencies of the federal government to evaluate the effects of their actions on the quality of the human environment.

Unfortunately, the FCC has never claimed expertise in health and safety matters, and other federal agencies to which such matters might logically be assumed to fall - specifically, OSHA (Occupational Safety and Health Administration)

and the EPA (Environmental Protection Agency) - have operated under funding restrictions since the Reagan Administration initiated the trend of downsizing government in the 1980s.

Without funds to support studies that could yield objective government standards, the FCC has relied upon organizations that some observers distrust because they are linked to commercial and/or military interests. For years, the EPA considered standards provided by ANSI (American National Standards Institute) and IEEE (International Electricians and Electronics Engineers) to be seriously flawed.

On August 1, 1996, responding to the Congressional mandate as enunciated in the TCA, the FCC adopted new health and safety regulations for exposure. These are based on standards established by the National Council on Radiation Protection and Measurement (NCRP), a congressionally chartered organization. The new rules were to have taken effect January 1, 1997, but implementation was delayed. They are now scheduled to become effective September 1, 1997. Licensees will be held to these standards when they reapply for their FCC permits - which could be a decade or more in the future for companies that recently renewed, or were awarded, their federal licenses.

The new limits are generally more stringent than the

*This much is known: Under some circumstances, radiofrequency radiation operating at the higher end of the spectrum, can present thermal risks to human health. Whether non-thermal RFR poses health risks remains a subject of debate and speculation.*

*It is important to note that the FCC addresses health concerns by controlling for exposure - not emissions. A licensee might simply be required to post signs or erect fences around a microwave transmission facility to keep the public at a distance.*

This two-tier standard reflects one of the main criticisms of earlier guidelines, which specified only one set of exposure limits for workers and the general public despite a vast difference in exposure experiences.

It is important to note that the FCC addresses health concerns by controlling for exposure - not emissions. A licensee might simply be required to post signs or erect fences around a microwave transmission facility to keep the public at a distance. And the new NCRP standards, like the ANSI/IEEE standards before, calculate only for thermal exposure. Questions about long-term, low-level exposure remain unaddressed.

The September date already has caused a ripple in Vermont. On Mt. Mansfield, the state's highest peak, Vermont Public Radio leases space for its transmitters on a tower owned by ETV. The FM transmitters are mounted fairly low to the ground. When the new FCC's exposure regulations take effect, VPR's equipment will be pose a legally verifiable threat to hikers on one of the most popular trails on the summit. (Interestingly, it will not be the emissions, nor the proximity to hikers, that will have changed - only the words on a page that define when an existing circumstance presents a health threat.) Until such time as Mt. Mansfield's diverse assortment of towers is reconfigured the remedial alternatives for the VPR transmitters, presuming that the station continues broadcasting, are to post warnings to hikers not to linger in the area, or to close the portion of the Triangle Trail where exposure occurs. (VPR's federal license expires in December 1997.)

### **The Limits Of Preemption**

On the sensitive subject of federal preemption of laws structured to protect the public health, the new FCC guidelines preserve local authority in some important ways. They observe - it bears repeating - that the TCA does not preempt state or local regulations pertaining to RF emissions from broadcast facilities; and they explicitly reject industry lobbying efforts to extend preemption to cover all transmitting sources.

In short, then, concern about the health effects of emissions from a cellular tower is not a permissible basis for making local zoning decisions if the tower is in compliance with FCC standards; it is, however, a permissible basis for regulating radio and television towers, and from

1992 ANSI/IEEE exposure standards. They incorporate a distinction formalized in the previous ANSI/IEEE standard, by setting two-tier exposure criteria - one tier for workers (referred to as "controlled environments") and another for the general public (referred to as "uncontrolled environments").

other facilities that do not fall within the definition of "personal wireless services." Moreover, local authorities may regulate "personal wireless service facilities" to the extent they do not comply with the FCC guidelines.

Yet on that score, states and local governments should recognize that if they choose to regulate or base their decision regarding the placement, construction, and modification of personal wireless service facilities on the environmental effects of radio frequency emissions, the adversely affected party may petition the FCC for relief. (47 U.S.C. S 332 ( C )) But while citizens and public-interest groups generally view the FCC as, 1) a somewhat leaden and unresponsive bureaucracy, and 2) predisposed to protect the interests of industry, the commission's official position is that it shares jurisdiction with state and local governments. "We have traditionally been reluctant to preempt state or local regulations enacted to promote bona fide health and safety objectives," the commission avers (Paragraph 167) in presenting its new exposure guidelines.

In fact, many states and local governments have adopted or at least contemplated standards for RFR exposure that take population and/or occupational factors into consideration. Such standards have been established or proposed in Connecticut, Illinois, Massachusetts, Kentucky, New York, New Jersey, Oregon, and Washington, among others. The city of Portland, Oregon, adopted standards stricter than those recommended by the International Radiation Protection Association (IRPA), zoning regulations, and monitoring requirements.

The Vermont Department of Public Service, in its recently published study, *Radiofrequency Radiation: Health Effects and Interference*, observes that "for the time being states and localities are not prohibited from considering health effects in the siting of broadcast facilities on the basis of environmental effects of RFR emissions. Regulators and policy makers, however, must use caution not to invite a preemptive response from the FCC, Congress or both."

Then, insightfully, the report adds that Section 704 does not preempt states and localities from regulating the operation or maintenance - as opposed to the "placement, construction and modification" - of broadcast or even of wireless communications facilities because of the environmental effects of RFR. But the DPS adds that an attempt at the local level to so regulate might not succeed.

### **Vermont's Regulation of Radio Frequency Radiation**

Mirroring the expansion of cellular communication in Vermont, the state's Senate and House of Representatives in 1996 saw an influx of legislative proposals relevant to the environmental effects of radiofrequency radiation. Three bills were proposed.

The first, S.329, would have provided that, "for purposes of Act 250, radio waves emanating from radio towers will not be considered air pollution." The administrator for the Environmental Board opposed such a sweeping exclusion, observing that review under the Act of projects related to

broadcasting "is consistent with the FCC's policy that local and state authorities share a role in ensuring a community's health, safety and welfare." The bill passed in the Senate, but was never addressed seriously in the House.

A second unsuccessful Senate bill, S.209 (see Chapter 2, on "Local/Municipal Law") proposed to override municipal zoning laws and require towns whose regulations were silent on microwave transmission facilities to permit them as a conditional use in any district.

The third bill was H.795. This bill passed both chambers and became law with the governor's signature in May 1996.

H.795 promotes the use of state-owned property (lands and buildings) for siting wireless communications facilities, much as the TCA opens up federal lands for the same purpose. The secretary of state is empowered to negotiate leases and contracts with industry representatives, subject to review by a representative group drawn from the public and private sectors, including consumers.

H.795 also called upon the Commissioner of Public Service to prepare a comprehensive report to the Legislature, providing the most current information on public-health and interference issues related to non-ionizing electromagnetic radiation. The report, cited above, was submitted in December 1996.

It is also interesting to note the existence of a law that has been on Vermont's books, little remarked, for 20 years. Title 18, Chapter 32, titled "Ionizing and Non-ionizing Radiation Control," provides the state health commissioner authority to instruct the director of occupational health, "for the protection of the occupational and public health and safety, [to] develop programs for the control of ionizing and non-ionizing radiation compatible with federal programs for regulation of byproduct, source and special nuclear materials." (Sec. 1651-1657, emphasis added)

The 1967 statute was written with the transport and control of contaminated waste products foremost in mind, but in amendments a decade later lawmakers repeatedly included reference to non-ionizing sources of radiation, e.g., "The [Department of Health] shall advise, consult and cooperate with other agencies of the state, the federal government, other states, and interstate agencies, political

subdivisions, industries, and with groups concerned with control of sources of non-ionizing radiation." (Sec 1652(d)).

It seems fair to say that the potential applications of this law, by state and local authorities or by citizens groups, have been little explored.

And finally, Vermont's Environmental Board has considered whether to regulate the environmental effects of RF/MW emissions using the new FCC standards. VNRC submitted comments suggesting that before the Board chooses to adopt the recommendations of the telecommunications industry or the district coordinators - both groups advocate adoption of those standards - it should consider the substantial research suggesting that stricter standards may be appropriate.

### The Hand That's Offered

In sum, based on a review of the relevant provisions of the Telecommunications Act of 1996 - 47 U.S.C. 5332 (c), more specifically section 704, and FCC Docket No. 93-62, Guidelines for Evaluating the Environmental Effects of Radio Frequency Radiation, adopted August 1, 1996 - it is clear that Vermont's state and local governments have the authority to regulate the environmental effects of radiofrequency and microwave radiation when the source is broadcast facilities such as radio and television towers.

It is also clear that our state and local governments may regulate "personal wireless services" if those facilities do not comply with FCC guidelines. But first it must be determined that they are out of compliance. Spot inspections by the FCC are not routine, and long periods of time separate a facility's relicensing procedure, when such an evaluation might be done. Thus it would seem an appropriate investment for Vermont's state government, or for regions or towns, somehow to see to it that municipalities were equipped and enabled to periodically determine the compliance status of the towers and transmission facilities within their borders.

Otherwise, the authority the FCC has left municipalities to regulate these proliferating facilities for interference or excessive radiation is only a hollow promise.

# An Environmental Perspective; Act 250: Planning and Aesthetics

The expansion of telecommunications technology in Vermont brings to mind the children's stories about the city mouse and the country mouse - kindred souls with many similarities, but whose ways of life seem odd to each other. In the matter of telecommunications, Vermont, the country mouse, is hosting its city cousin.

Vermont is one of the most rural states in the union, in terms of the percentage of its citizens who live in communities with scattered, small populations. Yet its rural spaces are in demand from a conceptually urban telecommunications technology that caters to clusters, or cells, of customers. The 1996 Telecommunications Act adds the government's impetus to the industry's goal of providing blanket cellular service.

The question is, how can Vermont accommodate this growing industry without sacrificing its own values of preserving land and safeguarding the environment?

First, one must identify land-use and environmental issues presented by the proliferation of telecommunications and broadcast towers. Primarily, in the rural areas, they are aesthetics and habitat.

## Intrusions Upon Habitat

Vermont is a state much concerned with preserving its native animal and plant species. Yet they are already under siege. On our subalpine peaks, acid precipitation and cloudwater pollution produced by industrial emissions from

other states have corrupted the soil and stunted the red spruce and balsam fir. At slightly lower elevations, the ski industry has cut wide trails through the forest and built chairlift and gondola terminals, lodges and restaurants near the once-remote summits. Even activities with more benign environmental purposes, such as wind-power installations and backpacking trails and shelters, have encroached upon

Vermont's lofty heights - and the flora and fauna thereof.

Burlington's WCAX built its first TV tower on Mt. Mansfield, Vermont's highest peak, in 1953. Since then, broadcast towers have multiplied. Television stations WVNY and Vermont ETV have facilities there, along with radio stations WEZF and VPR. (For a discussion of radiofrequency radiation associated with VPR's transmission facilities, see Chapter 4, "Public Health.") The University of Vermont,

the Mt. Mansfield Corporation, and the state police are also represented with installations on the mountaintop. As TV stations gear up for the coming age of digital, high-definition television, they will duplicate their transmission facilities during a transition period until the earlier equipment is rendered obsolete. Even then, some of the present TV towers may remain.

Now add telecommunications towers to this mix of alpine effacements. (Actually, wireless communications towers began appearing in small numbers in the 1950s, deployed for two-way radio contact between dispatchers and truckers, the towers usually assembled on accessible peaks of modest altitude.)

The issue does not appear to be that telecommunications towers hold any greater environmental threat than humanity's other uses and abuses of the high mountain terrain; it is the cumulative impact of these factors that concerns environmentalists. The Vermont Institute of Natural Sciences (VINS), which is conducting a long-running study of the threatened Bicknell's thrush, lists the towers as just one of several infringements that contribute to fragmentation of wildlife habitat.

The principle holds even at lower elevations. Humanity's relentless expansion, manifested in technological and recreational facilities, disrupts habitat. When such disruption is quantifiable - as in the loss of deer yards or bear habitat through ski area development - the environment can receive protection through Vermont's Act 250 (discussed below). As yet, the issue does not seem to have surfaced in a case directly related to tower siting.

## Aesthetic Impacts

The second major land-use issue relevant to telecommunications towers is their visual impact upon the landscape. The inherent aesthetic problem is that towers need altitude to transmit their signals to customers within a cell and to relay signals to towers serving adjacent cells. Particularly when construction upon an otherwise unspoiled ridgeline results in a tower's stark appearance against the horizon, it poses a visual blight that violates Vermont's trademark scenery. The blight is compounded by utility company rights-of-way, which carve wide swaths up the forested slope to run power lines for the equipment at the top.

In contrast to habitat fragmentation, the aesthetic impact of telecommunications towers has been specifically addressed both through cases and policymaking under

*The question is, how can Vermont accommodate this growing industry without sacrificing its own values of preserving land and safeguarding the environment?*

Act 250, which leads to a discussion of that important law, one of Vermont's vital institutions.

## How Act 250 Applies

Act 250 is Vermont's premiere development control law. It enables citizens to participate in the shaping of projects that will affect their communities. (For a thorough review of the Act's history and purpose, see Cindy Corlett Argentine, Vermont Act 250 Handbook: A Guide to State and Regional Land Use Regulation, 1993.)

There are nine district environmental commissions in the state, which evaluate applications for land-use permits under Act 250. Each commission includes three volunteer members who are appointed by the governor; they are supported by a full-time district coordinator. Hearings before the district commission on permit applications, or on applications to alter existing developments, are public, and the structure of Act 250 provides opportunities for certain citizens (for example, abutting landowners), state and local government agencies, and public-interest organizations to participate by testifying or calling expert witnesses to testify in a quasi-judicial setting. Generally, the projects required to obtain Act 250 ("land use") permits are those that involve 10 acres or more of land. In towns or municipalities without zoning and subdivision laws, the threshold is one acre.

The Act 250 process evaluates proposals under 10 criteria that measure the anticipated impact of a development upon a community's environmental and economic resources. Permits frequently include conditions the developer must meet in order to mitigate potential detrimental effects caused by the construction or operation of the project. Decisions of the district commissions can be appealed to the state Environmental Board and/or to the Vermont Supreme Court. (Litigation related to violations of permit conditions is heard in Vermont's Environmental Court, a branch of the Superior Court.)

Until very recently, it was determined on a case-by-case basis whether proposals to construct communications facilities would have to face Act 250 review. The same threshold factors that applied to other developments - particularly, the amount of involved land - pertained to communications towers as well.

But in 1997 the Vermont Legislature passed Senate Bill 194, which swept virtually all communications towers - whether for radio, television or cellular telecommunication - into the domain of the Act. The bill amended Act 250's statutory definition of jurisdiction by stating: "Any support structure . . . which will extend vertically 20 feet or more in order to transmit or receive communications signals for commercial, industrial, municipal, county or state purposes shall be [classified] development under this chapter,

independent of acreage involved." In addition, the storage buildings and sheds commonly constructed near the base of such towers are also to be reviewed under the law.

This successful legislation, enhancing Act 250's authority in tower projects, actually followed attempts in previous sessions to abridge local review (discussed below). Still, there is precedence for bequeathing the Act specific jurisdiction regarding some forms of development. Mindful of the fragility of high-altitude ecosystems, Act 250 claims automatic review authority over any construction proposal at or above 2,500 feet elevation. The Act is also invoked by any gas or oil drilling venture, regardless of involved land.

(footnote 5)

Responding to a petition for rulemaking filed by Edward H. Stokes (Stokes Communications Corp.) in October 1996, the Environmental Board has published a "Guide To Requesting A Jurisdictional Opinion For Communications Facilities," which is available at the district commission offices. It assists potential developers, or parties seeking permission to amend a

permit, in identifying the Act 250 criteria that generally pertain to such facilities. The guide also instructs applicants how they can prepare a complete application - more efficient than submitting information and details piecemeal.

Once Act 250 jurisdiction commences, the next step is to evaluate the project under the 10 substantive criteria. Primarily, however, the commissions apply three of those criteria to cellular services projects. They are: Criteria 1 (air pollution), 8 (aesthetics), and 10 (conformance with town and regional plans). Opponents of an existing radio tower in Charlotte that has caused radiofrequency interference problems in their community (see Chapter 3, "Radiofrequency Interference") have added other criteria to this list, pertaining principally to the town's wish to protect its investment in educational technology at the Charlotte Central School.

Microwave towers have fared well under Act 250. The administrator of the Environmental Board reported in January 1996 that 32 Act 250 permits had been issued for broadcast and communications towers in the preceding five years.

Criterion 1, relating to water and air pollution, provides in relevant part: "Before granting a permit, the board or district commission shall find that the subdivision or development . . . [w]ill not result in undue water or air pollution." 10 V.S.A. Sec. 6085 (a)(1).

In wireless communications and broadcast tower projects reviewed under Act 250, the forms of "air pollution" under consideration are radiofrequency radiation (RFR) - inevitably, and purposefully, since it is radiation that carries the signals to their destinations, an emission from broadcast

*The issue does not appear to be that telecommunications towers hold any greater environmental threat than humanity's other uses and abuses of the high mountain terrain; it is the cumulative impact of these factors that concerns environmentalists.*

and microwave towers - and radiofrequency interference (RFI), which can result from facility operation. The industry has argued that since Act 250 does not define air pollution and Vermont's Agency of Natural Resources includes neither RFR nor RFI in its regulations, there is no basis for examining projects under this criterion. Attempting to

*It was a telecommunications tower proposal that set a precedent by being the first major project ever turned down for an Act 250 permit solely on aesthetic considerations.*

provide legislative sanction for that view, the Vermont Senate in 1996 passed S.329, amending 10 V.S.A. Sec. 6086 (a) (1) to read that for Act 250 purposes, "radio waves emanating from broadcast towers will not be considered to be air pollution."

However, the bill, which effectively would have removed towers from review under Criterion 1, died in committee in the House.

Cindy Corlett Argentine's Vermont Act 250 Handbook (supra) states that "[n]othing in Act 250 specifically defines 'undue air pollution'," but the district commissions and the Environmental Board have found air pollutants to include: "dust, smoke offensive odors, radiation, vibrations, . . . car and truck emissions, . . . paint fumes, fly ash, saw dust, and chemical vapors." (emphasis added); Argentine, at 63.

Furthermore, the federal EPA, guided by the Clean Air Act, has stated in the context of occupational exposure that RFR is a form of air pollution. On this point, Vermont's public planning law concurs.

Criterion 8, addressing the issue of aesthetics, requires that before issuing a permit the district commission or Environmental Board must find that the project "will not have an undue adverse effect on the scenic or natural beauty of the area . . . [and will not compromise] historic sites or rare or irreplaceable natural areas." 10 V.S.A. 6086 (a) (8).

The aesthetic component of criterion 8 is its most applicable aspect in relation to tower siting.

Confronted by an application with aesthetic implications, the district commission and the Environmental Board are guided by a two-prong test that was established in a 1985 case, *In re Quechee Lakes, Land Use Permit # 3W0411* (Vt. Env'tl Bd.); see also Argentine book, supra, at 127-8. The test was designed in an effort to impart definition and consistency to a criterion at risk of being too subjective to provide guidance.

The principles established in the Quechee decision require the commission or board first to determine whether the proposed project will have an *adverse* aesthetic effect, and if so, whether that adverse effect is *undue*. *Id.* (emphasis added) (footnote 6)

The accepted measure, after Quechee, for determining whether a proposed development is "adverse," is to decide whether it would be in harmony with its surroundings. A

tower on the horizon is clearly not in harmony and is therefore, by definition, "adverse." But is its adverse impact so detrimental to the aesthetic virtues of its surroundings as to be judged "undue?" To determine the answer, the reviewing panel poses three questions:

1. Does the project violate a clear, written community standard intended to preserve scenic beauty?
2. Would the project's impact be shocking and offensive to the average person? (For purposes of this determination, the district commissioners or Environmental Board members are deemed to be "average people," and the verdict rests on their sensibilities);
3. Has the applicant taken steps to mitigate the adverse impact? If not, that can be reason enough to reject.

The aesthetic criteria of Act 250 may be the most elusive and subjective of the environmental standards protected by the law, but they have played a role in a number of cases involving transmission towers. In fact, it was a telecommunications tower proposal that set a precedent by being the first major project ever turned down for an Act 250 permit solely on aesthetic considerations. The District 7 Environmental Commission in 1984 - a year before the Quechee Lakes ruling established a process for quantifying aesthetic impacts - rejected by a vote of 2-1 a tower proposed by the Vermont Electric Power Co. (VELCO), to be located in the northeastern town of Sheffield. The 105-foot tower, rising 60 feet above the treeline and sporting a pair of metal dishes variously 10 feet and eight feet in diameter, would have been visible to thousands of people who attend the famed Bread and Puppet Resurrection Circus held in nearby Glover every summer. VELCO wanted to develop the Sheffield site to monitor and control power flows over the new transmission-line corridor carrying electricity from Hydro Quebec to the grid that supplies power for New England.

VELCO appealed the decision to the Environmental Board, and was awarded a land use permit in return for reducing the height of the tower from 105 feet to 76 feet, and scaling down the dishes from 10 and eight feet in diameter to eight and six feet.

Aesthetics have been a determining factor in other tower projects, as well. *In re Thomas*, No. 2W0644 (Vt. Env'tl Bd.), the Environmental Board refused to grant a permit for the construction of a radio tower, concluding that the tower would create an undue adverse impact. The basis for this finding was that the tower would be the first man-made break in an undisturbed ridgeline.

Another example of the role of aesthetics in shaping projects through Act 250 was *In re Stokes*, No. 3R0703 (Vt. Env'tl Bd.), which went all the way to the state Supreme Court. Stokes Communications Corporation appealed an order by the district commission that (1) permitted the company to replace its 120-foot radio broadcasting tower in Randolph with a tower more than twice that height, but

(2) required Stokes to install shields on the 303-foot tower to prevent the red airplane-warning lights mandated by the FAA from being seen from the ground. The company protested that the commission had no authority to order the shields. The Environmental Board upheld the condition imposed by the district commission (Dec. 13, 1993), as did the Supreme Court in a decision handed down in July 1995.

Criterion 10 of Act 250 deals with local and regional plans.

This criterion requires that tower-siting proposals comply with both local and regional plans, or with capital programs adopted by the citizenry. Municipalities have the authority to compose comprehensive plans and planning programs. 24 V.S.A. Sec. 4341. Moreover, regional plans can be established by regional commissions. 24 V.S.A. Sec. 4348. If a town does not have a local plan, the regional plan applies. See Argentine book, *supra*, at 194 (citing *Re: Didace and Susan LaCroix*, No. 3W0485-1, Vt. Env'tl Bd.).

Criterion 10 was the basis for the board's rejection of a proposed 110-foot communications tower on Bemis Hill in Rockingham. In *Re Gary Savoie d/b/d/ WLPL and Eleanor Bemis* No. 2W0991 (Vt. Env'tl Bd.) The decision turned on the regional plan's specific instruction that developers first seek to co-locate new facilities at existing transmission and receiving stations. Interestingly, the plan also "encourage(s) the siting and design of . . . radio towers, antennae, and other transmission and receiving equipment [so as] to minimize negative impacts on natural and scenic resources." On this count, the board found the *Savoie* project in compliance. The proposal to build the communications tower 90 feet below the tallest summit on an undeveloped ridge, it concluded, did not constitute an undue adverse affect.

The Environmental Board has not promoted co-location as its official antidote to tower proliferation. In the *Savoie* case it was the regional plan's clear language calling for co-location at least to be considered that persuaded the board to reject the proposal as introduced.

Thus, although it is Criterion 8 that is regarded as the provision that defines and protects aesthetic values under Act 250, it can be seen that Criterion 10 may serve the same purpose - if those values are enunciated in town or regional plans. And because there are sometimes inconsistencies between those planning documents and local zoning ordinances - confronting would-be developers with contradictory requirements - some recent cases have applied the zoning laws to determine what the community's wishes and intentions are in respect to land use, and on that basis have determined a project's merits under Act 250.

There are, then, alternative routes in Act 250 for addressing the sometimes overlapping issues of aesthetic

impacts and conformance with adopted plans and ordinances. In light of the 1996 Telecommunications Act, however, boards of jurisdiction must keep foremost in their minds that the environmental impact - in the federal interpretation, the question of public exposure to radiofrequency radiation - is off limits for zoning boards, planning bodies, and Act 250 arbitrators in evaluating applications related to personal wireless services.

Additional Act 250 criteria: Although Criteria 1, 8 and 10, as discussed above, have been the touchstones commonly applied to land use applications for tower projects, in certain circumstance other Act 250 criteria could conceivably apply. In the complex case of the WIZN-FM radio tower in the Chittenden County town of Charlotte - where Burlington Broadcasters Inc. applied in 1996 for an Act 250 permit for an existent, multiple-use tower on Pease Mountain - a citizens group raised concerns under Criteria 4 (soil erosion), 5 (transportation), 6 (impact on public schools), and 9 (K) (development affecting public investments), as well.

Particularly relevant is Criterion 6, which requires proof that a project "(w)ill not cause an unreasonable burden on the ability of a municipality to provide educational services." The Charlotte Central School, a K-8 facility situated to the east of Pease Mountain and out of the line of sight of the WIZN tower, contains an investment by the community of some \$400,000 in computers and other educational technology. The school board says the equipment is plagued by malfunctions and down time caused by radiofrequency interference, belaboring the school's curriculum. The board, the citizens group, and other town officials blame the interference on WIZN's broadcasting tower.

While the Charlotte case poses very specific circumstances, the principle it raises could apply more broadly in Act 250 deliberations, for the technology exists to measure and predict the RFI impact of prospective broadcast and telecommunications facilities.

The criteria pertaining to soil erosion and traffic congestion typically apply in tower projects the same way they do in other developments involving excavation and land disturbance: in the construction stage. They are commonly addressed in permit conditions. Criterion 9 (K) overlaps to some degree with Criterion 6, in that it pertains to public investments. Its sweep is broader - running from highways to landfills, from schools to prisons to fire stations, from natural gas pipelines to hiking trails - yet its scope is limited to projects planned for adjacent land. However, given the wide descriptive net justifiably thrown around the concept of public investments, this criterion could conceivably be applied in more tower applications. It was that concept of a public interest in the fate of the commonly held environment that gave rise to Act 250 in the first place.



## FOOTNOTES

1. An oft-cited example of FCC preemption of state and local controls is in the area of satellite receiving and transmitting stations. In 1986, the FCC promulgated 47 C.F.R. Sec.25.104, pursuant to the Communications Satellite Act of 1962 and Titles I-III of the Communications Act of 1934, partially exempting local control of satellite receiving and transmitting stations. The FCC issued this regulation to protect providers of satellite TV systems against rules imposed by local governments which the agency believed gave an unfair advantage to local cable television franchises. Regulations such as 47 C.F.R. Sec.25.104 remain unaffected by Section 704 of the TCA because the Act preserves state and local control only over personal wireless facilities.
2. This principle was upheld in a case brought in Washington State (*Sprint Spectrum v. City of Medina*) a month after the Telecommunications Act of 1996 was signed into law. The suit challenged the legality of certain aspects of Medina's six-month moratorium on the issuance of new permits for wireless telecommunications facilities. The court ruled that the moratorium did not violate Section 704's requirement of fair and timely response to permit applications. Thus, the first court to review Section 704 recognized Congressional intent preserving state and local control over personal wireless services facilities rather than resting all authority with the FCC.
3. 47 C.F.R. Sec 17.23.
4. Another pertinent piece of state legislation is H. 795, which amends 30 V.S.A. Sec. 227(b) and was signed into law by the governor on May 15, 1996. See, Act No. 168. Section 1 of H. 795 encourages the development of statewide competitive, wireless telecommunication systems through the use of state-owned buildings and properties for facility siting. The Secretary of Administration, as the exclusive agent for the state, is charged with ensuring that appropriate benefits accrue to the public through a standardized contracting procedure. The statute also requires that the sites, as they are developed for facility use, comply with applicable regulations, including: Act 250 permit requirements, local planning, zoning, legislative approvals under 29 V.S.A. Sec. 104 (sale or long-term lease of state lands), and legislative approvals under 10 V.S.A. Sec. 2606 (exchange or lease of state forests and parks). Finally, contracting procedures are to encourage "the use of advanced technology, and the [co-location] of facilities whenever feasible, in order that the number of wireless telecommunications facilities can be minimized or reduced." *Id.* In sum, Section 1 encourages the use of state-owned properties for siting purposes and expedites the contracting procedure for the lease of those lands, without explicitly overriding applicable zoning and Act 250 controls. (Section 2 of H. 795 pertains to the environmental effects of radio frequency radiation and is discussed in Chapter 4.)
5. Prior to the passage of S. 194, jurisdiction was sometimes a contested issue. Some relevant cases contributing to the determination of jurisdiction included: *Savoie*, 1995 WL 717182 at \*2 (Vt. Env'tl Bd.) (finding that Act 250 applied to a 110-foot communications tower "because the project consist[ed] of the construction of improvements for commercial purposes involving more than 10 acres"); *Vermont Electric Power Company*, 1984 WL 42396 at \*1 (Vt. Env'tl Bd.) (declaring a 76-foot tower with two microwave dish antennae, a 12-foot by 20-foot by 10-foot building to house microwave equipment, and the installation of an access road 746 feet in length a "development," therefore requiring a permit); and *In re Stokes*, 1995 WL 7879951 at \*1 (Vt. Env'tl Bd.) (requiring a permit for construction of a 300-foot radio broadcast tower and installation of a light shield upon the tower because it is a "development").
6. See "Vermont's Scenic Landscape: A Guide for Growth and Protection," published in 1991 by the Vermont Agency of Natural Resources. An 80-page book complete with photographs, maps and designs, it was created for the purpose of putting clear language and concepts around the challenge of defining our aesthetic resources in Vermont, the better to preserve them. Author and Project Director Elizabeth Courtney (who later served as chair of the Environmental Board and has been appointed VNRC's new Executive Director) produced the book under the guidance of the Design Issues Study Committee, chaired by the late Norman Williams, with assistance from agency personnel. The book was created to assist local boards and committees seeking tools to help them define and protect the characteristics of their communities most important to them.

## FOR FURTHER STUDY

For additional reading on subjects related to the electromagnetic spectrum, the Telecommunications Act of 1996, wireless telecommunications and broadcasting facilities, radiofrequency radiation and radiofrequency interference - generally and with reference to siting such facilities in Vermont - the Vermont Natural Resources Council recommends the following books and materials.

Federal Communications Commission. "Fact Sheet: New National Wireless Tower Siting Policies." April 23, 1996

Levitt, B. Blake. *Electromagnetic Fields; A Consumer's Guide to the Issues and How To Protect Ourselves*. Harcourt Brace & Company. 1995

Lindner, Will. "Siege On Our Summits: Technologies Push Debates on Land Use and Community Health." Published in the *Vermont Environmental Report*, March 1997, by the Vermont Natural Resources Council

National League of Cities. *The Telecommunications Act of 1996: What It Means To Local Governments*. 1996

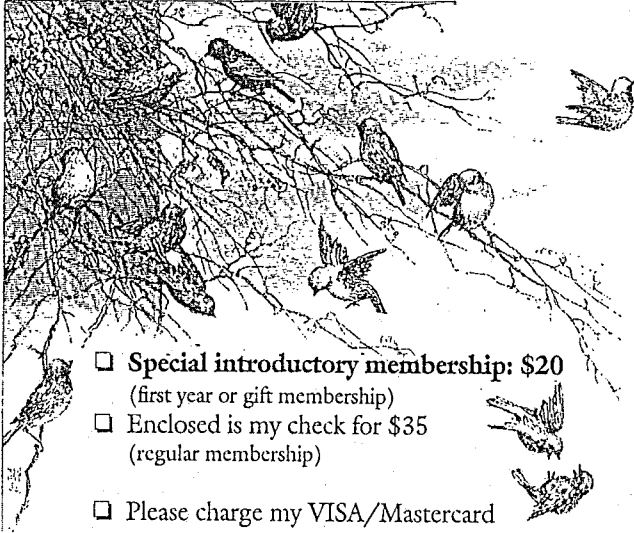
Vermont Agency of Natural Resources. *Vermont's Scenic Landscapes: A Guide for Growth and Protection*. Based largely on the work of the Design Issues Study Committee, Norman Williams, et. al. April 1991

Vermont Department of Public Service. *Radiofrequency Radiation: Health Effects And Interference*. December 1996

Vermont Environmental Board. "Guide To Requesting A Jurisdictional Opinion For Communications Facilities." September 25, 1996

Verschaeve, L.; Flemish Institute for Technological Research (VITO). "Can Non-Ionizing Radiation Induce Cancer?"; published in *The Cancer Journal*, Volume 8, Number 5

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