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Community Reaction in other states to Placing a Wireless Infrastructure in the Right-of-Way

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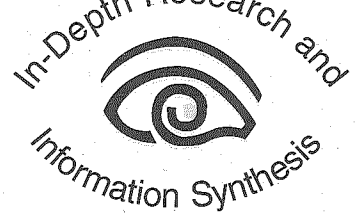

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Digital phone service, also known as Personal Communication Systems (PCS), is becoming the preferred choice in wireless phone systems. PCS requires a communications transmittal network, which involves the placement of antennae about one mile apart. This report provides information about community reaction in other states to placing a wireless infrastructure in the right-of-way. It provides a general summary of the industry, a general summary of community reaction to wireless infrastructure placed in rights-of-way, and a summary of issues and topics related to community reaction to wireless infrastructure.

The report includes a three-part bibliography that includes essential reading on the topic, items specific to the economic aspects, collocation, and aesthetics of wireless infrastructure, and other selected items that provide background information.

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A Report on Community Reaction in Other States to Placing a Wireless Infrastructure in the Right-Of-Way

Final Report

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Chapter 1: Summary of Findings

The topic of this report deals with determining community reaction in other states to placing a wireless infrastructure in the right-of-way. Community is defined as members of cities and counties. Wireless infrastructure is defined as an above-ground structure, possibly a tower, or an attachment to a structure already located in the right-of-way, such a pole.

General Summary of the Industry

The personal or cellular phone industry currently serves over 40 million Americans, and the number is expected to grow to more than 100 million by the year 2000. Personal phones are popular for a number of reasons: 1) safety - car phones provide access to emergency services - nationwide nearly 18 million emergency calls are made each year, 2) convenience - personal and business calls may be conducted while in transit, and 3) childcare - parents are packing phones with pre-programmed numbers in their kid's lunchboxes. Cellular phones are lightweight, compact, and relatively inexpensive; customers may select from a variety of packages offered by service providers.

The "Information Age" is affecting the personal phone industry as it has many other areas of life. A new type of personal phone service - personal communication systems (PCS) - is now available to regions that can support its infrastructure. Personal communication systems are cheaper, clearer, and offer more options than cellular systems. Because of the way data is transmitted, PCS customers are provided alphanumeric paging, call waiting, message waiting, longer battery life, and caller ID, in addition to uninterrupted phone service. They will also benefit from greater security; eavesdropping will be more difficult as will cloning – the ability for thieves to make calls and transfer the costs to other customers. Future plans include computer networking, faxing capabilities, and wireless Internet access.

There is a caveat to these cheaper and better services; while cellular phones use conventional analog data transmission, PCS uses digital data transmission. PCS operate at higher frequencies than cellular phone service and use lower power transmitters, thus requiring more antenna sites.

The growth of this industry, which became operational in 1996, has out-paced local communities' ability to understand the impacts of additional antennae and to effectively deal with issues such as siting towers and regulating them.

The Telecommunications Act of 1996 mandated that open competition will prevail for PCS, and that local governments may not deny PCS service providers access to their communities. This has resulted in better service at a cheaper price for the consumer; however, communities must work with PCS providers to facilitate construction of the wireless infrastructure - the towers and antennae needed to carry the transmissions.

Antennae for PCS may be required from 1/2 mile apart (minimum) to two miles apart (maximum) depending on topography and population density. Issues and concerns are arising as communities are approached by PCS providers and must, by law, respond to applications for development of the PCS infrastructure within a reasonable time frame.

In addition to better and cheaper service, PCS providers are also making monetary contributions, i.e. "paying rent" to communities and organizations that site towers or antennae. Compensations are ranging from $24,000 - $800,000 per year.

General Summary of Community Reaction to Wireless Infrastructure Placed in Rights-of-Way

The irony of all this is that citizens want the PCS service, in fact demand it, while at the same time protest the development of the wireless infrastructure needed to support it.

Regarding the question I posted on the AASHTO Bulletin Board (see Appendix A, item 3), and the Leagues of Cities I contacted (see Appendix A, item 4), most of the replies indicated that either wireless infrastructure in rights-of-way is not being pursued in their state, or that the issue is so new that they, too are in the information gathering stage.

Of the twelve states and eight Leagues of Cities that replied, five supplied information related to my question. Oregon stated that though their interstate highways are littered with towers, they are sited on private land that abuts the highway, and are out of the control of all government except the counties, which do not seem interested in controlling or regulating the sites. New Jersey shared an experience of lack of communication and the ensuing uproar (recounted in Bibliography A, Hatchell), and Maryland talked about holding public meetings and only a few attending. Those who attended were tentative about the installation and requested a balloon test to determine its visual impact on the neighborhood. New York State mentioned a few towers in remote areas that no one notices anyway, and their state Department of Transportation is using the approach of installing in rights-of-way to avoid invading the neighborhoods. It is too early to tell if that strategy is working.

There is however, a plethora of information on community reaction to wireless infrastructure within communities, and this is the kind of information I collected for this report. I believe the concerns will be similar, whether the towers and antennae are located in the rights-of-way or within their communities.

These issues are addressed in the part of this report entitled Summary of Issues and Topics Related to Community Reaction to Wireless Infrastructure (page 5). Issues common to most communities include safety, aesthetics, interference with other signals, abandonment and degrading property values. While the Telecommunications Act does give PCS providers the right to locate in communities, it also dictates that issues such as these must be resolved in a manner acceptable to the community and the service provider.

The bottom line, as indicated by my research, is that the community wants to be informed. They want to know what is going to happen before it happens, and they want a voice in the decision making. They need to be assured that their fears and concerns will be constructively dealt with by government, and that government will make every effort to minimize or eliminate "antenna blight."

The governing body should address all issues of concern to citizens. These items should be explicitly covered in the Request for Proposals. Service providers will know what is expected of them and citizens may feel more comfortable knowing that their concerns are being heard and addressed.

One community has made arrangements with its service provider that any work being done in regard to the towers or antennae first be reported to city hall, so that as citizens raise questions, a responsible person in city government will be able to answer their question. Recommendations have also been made to have annual open meetings with the service provider(s) so that a dialog may take place between interested parties.

In the case of Personal Communications Systems, the information highway has brought with it its own roadside clutter. PCS will not go away; in fact people are looking forward to the advanced features and superior transmission it will provide. It is up to communities and government working together to make it a win-win situation.

Chapter 2: Summary of Issues and Topics Related to Community Reaction to Wireless Infrastructure

Abandonment

Include in the lease agreement a provision for the owner of the antenna or tower to remove it within a specific time period when the tower or antenna is no longer functional or when it becomes damaged. Include a provision that the property owner may remove the antenna/tower and assess the owner for cost removal.

Aesthetics/Signage

Towers may be hidden within trees of the same or taller height. Monopoles may be camouflaged to look like trees Towers may be set back so that they are not within the sight line of scenic views or historic sites. Landscaping may be used to screen or conceal the base and storage buildings that accompany towers. Stealth towers are structures that effectively hide towers so that they blend into the surroundings and go unnoticed. Use of such alternative structures such as bell towers or church steeples is recommended by many local governments. Antennae should be hidden whenever possible. Towers should be painted the color that matches existing poles and towers. Signage should be prohibited.

Antennae

There are three types of antennae: *omni-directional*, a.k.a. whip antennae which cover 360 degrees; *directional*, a.k.a. panel antennae or rectangular antennae which are used to achieve transmission or reception in a specific direction; and *microwave*, which link different types of telecommunications

facilities such as portable phones calling a conventional phone. Antennae are placed on rooftops, silos, water tanks/towers, windmills, smokestacks and church steeples.

Collocation

Require applicants to exhaust all possible avenues for sharing space on existing towers. Factors that determine feasibility include available space on existing towers, tower owner's ability to lease space, tower's structural capacity, radio frequency interference, geographic service area requirements, mechanical or electrical compatibilities, comparative costs of collocation and new construction, and FCC limitations on tower siting. In some communities preference is given to proposals that accommodate at least two providers from the completion of construction onward. Some require proof that the existing site cannot be used.

Degrading Property Values

Property owners are concerned about the negative effects of towers and antennae on their property values. Towers, when reaching a certain height, may need to be lighted or painted to comply with Federal Aviation Administration requirements. Some communities are worried about high intensity white light pouring into their yards and neighborhoods

Environment

Localities are concerned about the effects of antennae/towers on wilderness areas, wildlife preserves, endangered species, and historical sites.

Interference

a) PCS phones have been shown to cause interference with pacemakers when held to the chest.

b) Hearing air groups have reported interference from digital PCS phones.

Safety

a) Electromagnetic fields -The City of Liberty, Missouri provides an explanation of EMF in its report Wireless Communications Facilities Plan (cited in Appendix A):

"The most common safety concern expressed in connection with wireless communication systems is the possible danger from radio-frequency radiation (RFR). Electromagnetic energy exists in a variety of forms as radio and television waves, microwaves, and electrical currents passing through wires. Whenever that energy moves through wires, it creates electric and magnetic fields or electromagnetic fields (EMF's). When that energy moves through the air in the form of waves, the movement is accompanied by RFR. We are constantly exposed to numerous forms of radiated electromagnetic energy in the form of sunlight, microwaves, radio waves, and even electrical waves from the earth itself. The power radiated from each antenna at a cell site (50 to 200 watts) is less than or equivalent to the power of a household light bulb. In comparison, the radiated power from a commercial FM radio or television station can be up to five million watts (3)."

A vehement opponent of cellular towers is the EMR (electromagnetic radiation) Alliance, a non-profit organization based in New York. They publish a quarterly newsletter , "Network News," and are committed to educating and informing the public about biological effects and environmental concerns associated with EMR.

b) Toppling – Establish safety-oriented setbacks – a clear zone for falling tower debris or in the worst case scenario, the tower's collapse. Many towers are designed to collapse downward toward their base. Towers 100 feet or more in height should be located so that the base of the tower to any

other supporting structure or adjoining property line be a minimum of 100% of the proposed tower's height. Towers should be certified to withstand winds of 100 miles per hour.

c) Icing – The Kreines' found in their study Siting Criteria for Personal Wireless Services Facilities (cited in Bibliography Part B): "One of the strongest arguments for fall zones is the risk of ice loading. When ice builds up on tall structures, its effects are hazardous; ice can increase the top-loading weight of a structure substantially, thereby contributing to wind load and challenging the mount's structural integrity, and ice can fall from the mount or antenna array."

d) Water supply – Protection of the city's water supply is of prime importance to the city. Where a tower or antenna is located on or near a water tower which supplies the city's clean water needs, requirements should be set to eliminate risks of contaminating the city's water supply, and maintenance costs for the water tower should not increase. The city may wish to send a city official to accompany the service provider during maintenance trips.

Towers

There are three types of towers - freestanding (monopole), guyed towers (towers anchored with guy wires, which increase the amount of land affected by the physical structure), and lattice or self-support towers. Towers may range in height from 50 to 200 feet, and in some remote areas up to 500 feet. Higher towers generally cover a larger geographic area but have a lower service demand. They are known in the industry as "coverage sites" or "tower creep." Shorter towers known as "capacity sites" or "tower farming" cover smaller areas with a more concentrated demand.

Chapter 3: Bibliography
Part A: Essential Reading

Barry, Jan. "Cell Towers, Spewing Funds, Tug at Towns." The Record 29 Aug. 1997: The Region. The Record Online. Online: Bergen Record Corp. http://www.bergen.com/region/towersjb8.htm 25 Nov.1997.
Community residents throughout New Jersey are in an uproar over a Department of Transportation plan – created without community review – to lease more than 120 highway sites in dozens of towns to mobile phone carriers. Concerns include aesthetics, potential health hazards, and home rule. Compensation to communities ranges from $24,000 - $800,000 per year.

Barton, Mary Ann. "Hearing Aid Groups Protest Digital Phones: Interference Could Become Issue When Granting Permits for Cellular Towers." National Association of Counties Archive 1 Apr. 1996. National Association of Counties Archive Online. Online http://www.naco.org/archive/cnews/96-04-01/27towers.htm 25 Nov. 1997.
The San Diego City Council was bombarded by protests from hearing aid groups in February 1996 who say the new digital PCS phones cause interference. The FCC says the interference problem is not something that should stop the growth of a new sector of commerce, and that it's really just an inconvenience.

Diaz, Kevin. "Kenwood Neighbors Fight Plan to Put Antennas on Tower." Star Tribune 14 Nov. 1996: Metro 1B. Star Tribune Online. Online: Dow Jones News/Retrieval. 4 Oct. 1997.
A Romanesque water tower in the Kenwood neighborhood of Minneapolis is being sought as the base for a bank of antennas in a new regional wireless telephone system called personal communication services (PCS). Some residents in the exclusive residential district fear that the historic structure built in 1910 will be reduced to an "antenna farm."

Draper, Norman. "Towers are Technology's Unsightly Addition to Suburbs." Star Tribune 29 Apr. 1996: Metro 1B. Star Tribune Online. Online: Dow Jones News/Retrieval. 4 Oct. 1997.
The primary objection is appearance. A tower taller than the highest trees with a cluster of antennas on top is not something a lot of suburban homeowners want to see. Another concern is safety and the possibility of towers toppling over. Burnsville has a water tower covered with 50 antennas. It looks like the top of a pincushion.

Ginsberg, Thomas. "N.J. Halts Cell-Phone Towers' Rise: Whitman, Citing Local Veto Power, Temporarily Barred Their Being Built." The Philadelphia Inquirer 19 Aug. 1997: Suburban North. The Philadelphia Inquirer Online. Online.
http://www.primarynews.com/inquirer/97/Aug/19/pa_north/NCELL19.htm 25 Nov. 1997.
Local officials were enraged when work of tower construction on state-owned land began without complying with the DOT's own policy of notifying the town first. Governor Whitman ordered the commission that oversees property held by state agencies to suspend all tower construction for four months, and gave municipalities "veto power over the construction of cellular-phone towers."

Gregory, Michelle and Douglas Martin. "Cellular Facilities: A Survey of Current Zoning Practices." Zoning News Apr. 1996:1-6.
Presents a summary of the results of a survey conducted by the American Planning Association in cooperation with the National League of Cities, the U.S. Conference of Mayors, the National Association of Counties, and the National Organization of Telecommunications Officers and Advisors. The survey was broadcast-faxed to APA chapter leadership, who were asked to fax it to at least five jurisdictions within their local chapters. 230 responses were received. Questions pertained to siting location, health risks, aesthetics, structural soundness, and included the open-ended question, "How would you describe the feasibility of cellular tower siting within your community?"

Gribble, Jim. "Coming to a Nearby Stadium – or Cemetery: Cell Towers Pop up Everywhere as Firms Scramble for Sites." The Business Journal of Milwaukee The Business Journal of Milwaukee Online. Online:
http://www.amcity/milwaukee/stories/081897/focus1.html 25 Nov. 1997.
Relations between cellular firms and suburban municipalities in the Greater Milwaukee Area are smoother because the companies have become good to work with. Companies disguise antennas by using cross shapes and hanging them on a poles in cemeteries, on darkened windows of a water filtration plant, on church belfries, and on existing light and flag poles.

Hatchell, Sheila, compiler. "Compilation of Replies and Comments From Electronic Communication via the AASHTO Bulletin Board and Electronic Mail Requests for Information to Leagues of Cities Where Wireless Infrastructure has Been or is Being Implemented." Oct./Nov.
1997.
Replies indicate that there is not much information on community reaction to placing wireless infrastructure in highway rights-of-way. The New Jersey State League of Municipalities states that wireless cell sites on DOT ROW is a hornet's nest. A lack of communications the summer of '97 led to a cell site being erected on DOT property across the street from a municipal building. The mayor came out to investigate, and a media frenzy ensued with the tone "state government has secret plan to put up hated antennas." N.Y. State DOT plans to work with local communities and hopes to sell the theory that by placing wireless infrastructure in public rights-of-way, that it will save neighborhoods from being invaded by towers. Mostly, people asked me to share whatever I received from my posting.

Information Ventures, Inc. "Cellular Towers – Exposure Levels and Public Health Background RF Exposures." EMF Health Report Mar./Apr. 1995. EMF Health Report Online. Online:
http://godcomm.net/~living/v3n2a.htm 25 Nov. 1997.

This is somewhat technical, and discusses health risks (i.e. radiation) from ambient RF (RadioFrequency) levels, EMF (ElectroMagnetic Fields) fields and cellular towers. Their conclusion is that if we do not consider frequency, the exposure from cell-site antennas is much lower than the daily exposure from other EMF sources in the home or office.

Millard, Candice S. "Mending Fences." Cellular Business Dec. 1996: 40-46.
Carriers and vendors in the wireless industry are forced to deal with the not-in-my-back-yard syndrome. One tactic being used to win over communities is camouflaging towers. Allied Towers has responded to the need for towers that do not look like towers by introducing its palm tree.

See, Larry. "The Monroe Guardian's Series on Cell Communications Towers in Monroe County, Michigan – Parts 1-4." The Monroe Guardian. The Monroe Guardian Online. Online: http://monroe.lib.mi.us/cwis/guardian.htm 20 Nov. 1997.
This is a four part series on cell communications towers in Monroe County, Michigan. The segments provide background information on communications towers in Monroe County, health and safety issues, zoning and local siting issues, and closing commentary.

Chapter 4: Bibliography

Part B: Items Specific to Economic Aspects, Collocation, and Aesthetics of Wireless Infrastructures

Alexander, Steve. "U.S. West, AT&T Wireless Buy Licenses to Offer PCS Service: 2 Firms are Paying $14 Million to Enter the New Market of Wireless Phone Service that Will Compete with Cellular." Star Tribune 18 Jan. 1997. Star Tribune Online. Online: Dow Jones News/Retrieval. 4 Oct. 1997.

This article provides some dollar figures demonstrating how big this market is. For example, the cost of building all of the PCS systems in Minnesota is expected to be about $100 million. U.S. West will pay $1.06 million for a PCS license in Rochester, $836,000 for a license in St. Cloud, and $91,000 for a license in Willmar. AT&T will pay $1.4 million for a PCS license in Mankato, $837,000 in St. Cloud, $271,000 in Duluth, and $180,000 in Fergus Falls.

City of Bloomington. Request for Proposals. Bloomington, Minn: City of Bloomington, 1997.

This is an actual request for proposal and provides a good example of items to be included in the RFP. Addressed are issues of lighting, style and color, maximum height, fencing and screening, landscaping, associated ground facilities, utility lines and construction. The attached appendix includes special requirements for water tower or reservoir sites and parks, and how the revenue received by the city may be used.

Georgia Municipal Association. Gwinnett County Telecommunications Tower and Antenna Ordinance. Atlanta: Georgia Municipal Association, July 1997. Online: http://www.gmanet.com/legal.htm *18 Oct. 1997*

This ordinance provides guidelines for the siting of wireless, cellular, television, and radio telecommunications towers and antennas. Issues important to the community are explained in detail:

aesthetics, height, finish (galvanized, steel, concrete paint), lighting, landscaping, locating near an airport, collocation, and safety issues such as security fencing and anti-climbing devices.

Kaszuba, Mike. "For Suburbs, Antennas are Hard to Resist: Telecommunications Law Favors Tower Construction." Star Tribune 1 Oct. 1996. Star Tribune Online. Online: Dow Jone News/Retrieval. 4 Oct. 1997.

Economic benefits to local community Columbia Heights includes $15,000 per year plus annual cost-of-living increases for one antenna located atop a city water tower.

Snyder, David L. "A Means to an End: Collocation in the Wireless Service Industry." Telephony 25 Mar. 1996. Telephony Online. Online: Dialog File 148: IAC Trade & Industry Database. 4 Oct. 1997.

Collocation refers to the joint use and occupancy of a single communications tower (or monopole) by two or more wireless service providers. Two factors are driving collocation in the wireless arena: 1) Economics – construction costs are reduced, and 2) local zoning boards have made collocation an integral part of the antenna siting equation. Other aspects of collocation are presented.

Chapter 5: Bibliography
Part C: Other Selected Items to Provide Background Information

Federal Communications Commission. Antenna Structure Registration. Federal Communications Commission. Online. http://www.fcc.gov/wtb/antstruc.html. 18 Oct. 1997.
Provides information and answers questions that relate to the FCC's policies and rules pertaining to antenna structures. Specifically addresses which antennas must be registered and why, and changes in the tower that must be reported (such as a changes in height, color and lighting).

Federal Communications Commission. Fact Sheet #2: National Wireless Facilities Siting Policies. Federal Communications Commission. Online. http://www.fcc.gov/ 18 Oct. 1997.
Part I is a compilation of 29 frequently asked questions (and their answers) providing general background information and information pertaining to radiofrequency emissions. Part II is a summary of the commission's revised radiofrequency emissions guidelines. Concerns of citizens related to radiofrequency emissions have appeared in the literature.

Intelligent Transportation Systems. Shared Resource Projects: An Action Guide : Telecommunications Infrastructure in Transportation Right-of Way. Washington, D.C.: ITS America, 1997.
A concise report on placing privately developed telecommunications networks along publicly controlled land. Provides case studies.

Kreines, Ted and Susan Kreines. Siting Criteria for Personal Wireless Service Facilities. Tiburon, CA: Kreines & Kreines, Inc., June 1997.
Discusses the impact of 35 to over 300 feet towers constructed on Cape Cod in recent years, and their powerful impact on the visual character of the relatively flat, low topography of Cape Cod.

Includes a five page glossary that defines terms commonly used in the wireless communications industry. Illustrated with charts and designs.

Appendix A:
Sources Consulted

Appendix A: Sources Consulted

1) Literature search

I began by performing a literature search. Using the terms in Appendix B on page 18, I searched in the following Dialog files:

9	Business & Industry Index. Beachwood, OH: Responsive Database Services, Inc.
636	IAC Newsletter Database. Foster City, CA: Information Access Co.
149	Trade & Industry Database. Foster City, CA: Information Access Co.
15	ABI/Inform. Louisville, KY: UMI Data Courrier

I also performed the same search in Dow Jones News/Retrieval searching in the Star Tribune and Pioneer Press. All searches were limited to the current two years, i.e. 1996-1997. I searched in the two local newspapers hoping to determine if wireless infrastructures have been implemented anywhere in Minnesota.

2) On October 17th I attended a meeting at the League of Minnesota Cities. Also attending were Mary Helbach, my client, Adeel Lari, her supervisor, Ann Higgins, League of Minnesota Cities, Glen Markegard, Planner, City of Bloomington, and John Rask, Planner, City of Plymouth. The city planners shared their experiences of having already installed some wireless infrastructures. I was able to ask questions, and was referred to the Planning Advisory Service of the American Planning Association (more on this later). One important consideration that came out of this meeting was the fact that the PCS units that reside on the wireless infrastructure need weekly maintenance; thus if several providers were collocating, each would make a weekly service trip to the site. Lari expressed his concern that Mn/DOT does not want anything or anyone on the right of way as a safety precaution.

3) The AASHTO (American Association of State Highways and Transportation Officials) Bulletin Board Service is actually a broadcast e-mail system. When one posts to the BBS, it is electronically transferred to the designated person in each state highway or transportation department, theoretically reaching the other 49 states. Upon consulting with Mary I developed the query to be posted, and posted it on October 15. The query read as follows:

> "The Minnesota Dept. of Transportation is exploring potential approaches to implementing a wireless infrastructure on state-owned rights-of-way. We are very interested in other states' experiences with this process. We would appreciate any help in this endeavor and request that the appropriate person in your agecny respond to the following questions:
>
> 1 What was/is your approach to implementation?
> 2 What was/is community (city and county) reaction to proposals of implementation?
> 3 Have you worked with community representatives? If so, how?
> 4 Please add anything else you would like to share about your experience.
>
> Please reply by November 7th in any format to ..."

I began receiving replies the next day, and received ten in all. Unfortunately, only two replies related to my question, the rest either stating they were not far enough along in the process or that they were

not implementing a wireless infrastructure. I did receive three useful documents - two RFPs, and the other a copy of Resource Sharing State by State Status Report published by the Federal Highway Administration. This publication was helpful because it gave individual state information as to where they are in the process (more on this later).The following states replied to my question: Iowa, New York, Wyoming, North Dakota, Maine, Kansas, Nebraska, Ohio, Missouri, and Pennsylvania. I received requests from several of the states to share any information I received with them.

4) My next mode of discovery was Internet searching. Following is a list of World Wide Web pages that were helpful and provided documents, links to documents, or helpful e-mail addresses.

Federal Communications Commission http://www.fcc.gov/state/local
(18 Oct. 1997).
This site provided a link to the site from which I downloaded "Fact Sheet #2: Wireless Facilities Siting Policies." This site has other related information, but it appeared to duplicate items I already had. I did link to another site:

Wireless Telecommunications Bureau homepage http://www.fcc.gov/wtb/
(18 Oct. 1997).
This site is loaded with documents related to antennas and towers. I printed out several for Mary, but chose to exclude them from this report because they were not specific to my topic.

Public Technology Inc. http://pti.nw.dc.us/trends.htm#cell
(18 Oct. 1997)
There were several good documents available at this site and I downloaded two of them: Department of Transportation [California] Telecommunications Master License Agreement Cellular and PCS Carriers, and Gwinnett County [Georgia] Telecommunications Tower and Antenna Ordinance.

National Association of Counties *http://www.naco.org/archive/cnews*
(18 Oct. 1997).
There was nothing relevant to my topic at this site.

National League of Cities *http://www.cais.com/nlc/nlc*
(18 Oct. 1997).
From this page I landed on a list of Leagues of Cities for individual States. Using information from the Jakubiak report (located under item 7 in this appendix) which Mary had given me for background information, plus the Federal Highway Administration's Resource Sharing State by State Status Report I received as a result of the AASHTO BBS inquiry, I was able to target Leagues of Cities in states that I knew were using wireless infrastructure. I e-mailed the following Leagues of Cities:

League of California Cities,
Florida League of Cities,
Maryland Municipal League,
Michigan Municipal League,
New Jersey State League of Municipalities,
New York State Conference of Mayors & Municipal Officials,
League of Oregon Cities, and
Municipal Association of South Carolina.

I received replies from all of the Leagues, and am still awaiting three publications from California.

5) While moving in and out of web pages, I came across a publication that I thought would be of use to Mary:

Fidelman, Miles. Telecommunications Strategies for Local Government -A Practical Guide. Sacramento, CA: Government Technology Press, 1997.
Book reviews and a table of contents may be found at
http://civic.net/telecom/handbook/index.html
(9 Nov. 1997)

This is actually a handbook for local officials wrestling with telecommunications issues. It is expensive to purchase ($495.00/yr.) which includes updates to the handbook, new case studies, and discussions of newly emerging issues. I notified Mary about this publication. I did contact the author and he sent me a helpful reply:

Fidelman, Miles. "Community reaction to wireless infrastructure issues." Personal e-mail (10 Nov. 1997).

"I have no direct information other than that everybody – citizens, government, carriers – are all concerned about 'antenna blight.' What with PCS requiring antennas on _ mile centers, and a lot of communities having multiple carriers, the potential for chaos is enormous. Many communities are busily rewriting antenna siting ordinances and zoning codes to force collocation and other measures to minimize antenna impact. As a state agency, highway departments are exempt from local regulations – which is a source of considerable friction. Community members, and local governments don't have a lot of recourse for managing antenna blight along highway right of ways, even though those are the first places to get antennas (so drivers passing through don't have their calls dropped). If you're referring to a private infrastructure for the highway department, I'd make two suggestions: 1) try to find a way to share towers with everybody else who's putting up antennas (cellular, pcs, microwave, broadcast, etc.) – either by selling space on your towers or using theirs – that way you'll minimize the highway department's contribution to blight; 2) find a way to coordinate the process with local governments."

6) American Planning Association
http://www.planning.org/switchbd/apadirec.html
(25 Oct. 1997).
On this homepage I found an e-mail directory with a listing for Planning Advisory Service. This group had been recommended to me by Glen Markegard, so I sent them a request for information on my topic. This turned out to be a gold mine. My contact there mailed me copies of 20 articles and clippings that are very specific to community reaction to wireless infrastructures. They don't specifically pertain to placement in right of way, but I was just happy to receive articles on community reaction. He also loaned me three documents from their library.

7) Other Sources Consulted to Prepare this Report

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Appendix B:
Subject Terms Used

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Personal communication system(s)

PCS

Tower(s)

Antenna(s)

Wireless infrastructure

Community reaction

Community opinion

Public opinion