COUNTY OF HENRICO, VIRGINIA

Wireless Communication Technology Element
Henrico 2010 Land Use Plan

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WIRELESS COMMUNICATION TECHNOLOGY ELEMENT
HENRICO 2010 LAND USE PLAN

The future development of personal wireless communications services in the County calls for careful planning. The citizens and businesses of the County will want and need wireless communications services which will be vital to the quality of life and economic development of the community. However, the manner in which these services are provided must be sensitive to the aesthetic, health, safety and property values of the community. Striking a balance between the desire for state-of-the-art, cost-effective communications infrastructure while being sensitive to our residential and commercial areas is the objective of the County's Goals, Objectives, and Policies for Wireless Communications Technology.

The Goals for Wireless Communications Technology focus on ensuring the adequate provision of telecommunications infrastructure in the County that will meet industry needs while minimizing impacts on adjacent and surrounding land uses, especially existing and planned residential communities. The Goals also ensure the adequate provision of telecommunications infrastructure in the County that will support economic growth and public safety. Wireless communication will provide a valued service to Henrico residents but we need to have a continuing sensitivity to its physical impacts on the landscape. The Goals, Objectives and Policies for Wireless Communications Technology are intended to provide a framework for evaluating telecommunications proposals under the County's development review process as set forth in the Henrico County Zoning Ordinance.

Proliferation of Tower Requests

Over the past several years, the convergence of several factors have resulted in an unprecedented growth in the number of wireless communication facilities.

1. The recent development of new devices and services for voice, data and multi-media communication have generated a demand for more and better wireless communications services.

2. In 1995 & 1996, the FCC auctioned licenses for unused portions of the available radio spectrum. This resulted in seven new wireless communications service providers in Henrico County immediately seeking to develop a network of cell sites in a short time period.

3. Increased demand and competition among wireless communication service providers prompted them to seek additional facilities in order to expand the capacities of their systems and to upgrade to digital technology.

4. In 1996, Congress passed the Telecommunications Act which further deregulated the telecommunications industry and sought to promote competition. Although the Act preserved the authority of local governments to control land use and zoning, it forbade regulations that would prohibit or have the effect of prohibiting wireless services or would unreasonably discriminate between providers of functionally equivalent services.

5. The original strategy of the wireless providers was to provide coverage to a mobile market. New providers are now seeking to replace the conventional landline phone in residential developments. Facilities now are being located closer to residential development which results in increased sensitivity to the impacts created by the facility.

At present, there are six companies that provide wireless telephone communications service in the Richmond region. Industry sources indicate there are three additional (total of nine) wireless telephone communications companies with franchise agreements for the Richmond region. There also are ten companies with franchises to provide special mobile radio service. Every new company needs to establish a network of antenna sites. These new antennas may be co-located on existing towers or other structures or may require the placement of new towers.

As of September 1999, there are 75 communication towers for wireless service in the County. Because of the number of providers in the area, many of the older communications towers are filled with antennas and cannot support additional weight. The oldest of these towers were not designed for the collocation of many additional antenna sites. Space that may be available on existing towers often is at the lowest level and does not meet the coverage goals of the service providers.

The Technology of Wireless Services

Most personal wireless services operate in a similar fashion. A portable communication device receives from, and, in the case of a portable telephone, sends radio signals to, an elected antenna or antenna set. The area covered by an antenna set is commonly referred to as a "cell." The signal is routed to switching equipment that selects the channel and monitors the signal strength. In telephone applications, the signal normally is connected to the conventional or "land line" public telephone system. If the communication device is moving, the signal is passed on to an antenna in an adjoining cell and the call continues uninterrupted.

For services which require more than one antenna to serve a large area, such as wireless telephone service, an effective system requires a more-or-less uniform grid or network of antennas mounted on towers or other structures in a pattern somewhat resembling a honeycomb. Depending on the technology used, the

height of the tower, the position of the antenna, topography, vegetation and other factors, the cell size can vary from less than a mile to several miles across. The PCS provider seeks to locate antennas spaced just far enough apart to provide the coverage needed. If the antennas are too close, the signal overlap can cause interference problems and the capacity of the system suffers. If the antennas are too far apart, gaps or holes are created in the coverage pattern which can result in calls being "dropped" as a traveler moves beyond the range of the antenna handling the call. Also, each cell can handle only a finite number of conversations at one time. As the signal traffic becomes too congested, additional cells are required to provide additional system capacity. The grid of cells just described constitutes the signal coverage pattern for only one PCS provider. However, there are multiple providers already operating or preparing to operate in the Henrico County area with more expected.

Cell Site Opportunity

The Telecommunications Act established a role for three parties in the future development of wireless communications services, the communications industry, the FCC, and local government. Within the confines of FCC licensing and administration and local government regulation of land use and zoning, each provider is free to design its own network or system. Wireless communications services providers are not treated as public utilities or franchises but rather are competitors in an open market. Although the free market approach is intended to result in the best communications services for the least cost, it will also result in an increase in the number of wireless communications antennas and towers.

As each provider develops its own system independently, there is the potential for multiple antenna systems. To the extent that the antennas can be located on existing conforming structures, this is not a concern. However, where suitable structures do not currently exist, the deployment of these systems will involve requests for a very limited number of potential sites for wireless communications towers. This must be balanced with the interests of the public health, safety and welfare, community aesthetics and promoting the integrity of the County's residential neighborhoods. Preserving the residential character of the community is especially crucial in the County. Large areas consist of low-rise residential uses, with limited non-residential and commercial uses which can serve as potential locations for new tower sites.

Demand for wireless communication technology is increasing, while appropriate locations for such facilities are increasingly becoming more difficult to find. Telecommunication towers have special land use implications. The placement of towers impact surrounding land uses and creates a visual impact on everyone who can see these facilities. With clear standards the wireless service providers will be able to select locations which have the least impact, thereby increasing the likelihood of approval.

The following is a general category of sites that could be used for tower locations provided the location, siting, and design standards of the Goals, Objectives, and Policies are met.

Existing Communication Towers
There are 75 communication towers in the Henrico County area today. Collocation opportunities may exist on some of these sites.

Virginia Power
Virginia Power Company has several large power transmission corridors which cross the County. These corridors consist of easements and rights-of-way between 150 - 300 feet in width and combined are over 80 miles in length. These corridors offer many opportunities for collocation of transmission towers and communications antennas. Virginia Power has worked closely with the telecommunications industry in facilitating collocation within its rights-of-way. There are currently 15 towers within Virginia Power rights-of-ways.

Buildings
PCS antennas can be mounted on the roofs or sides of buildings. While most buildings in the County are less than 35' tall, there are some structures that are taller and could be used for collocation opportunities.

Churches
Many churches in the County present the PCS provider with the potential for locating antennas inside of existing steeples or of building a steeple for a church that does not presently have one.

Public sites
The governmental sites within the County that may be appropriate for siting commercial wireless communications facilities include selected fire stations, libraries, parks, post offices, water tanks and other public facilities. These facilities are often large enough to allow sufficient separation from surrounding residential uses or are located adjacent to industrial land uses. Even on these sites, steps must still be taken to minimize impacts on surrounding properties. These steps may include camouflaging such as attachments to the existing light poles and stealth mounts.

Private Land
Although the use of existing facilities is to be preferred to the construction of new ground-mounted facilities, there are opportunities for the development of freestanding mounts on private land. In particular, there are over 3,046 acres of land zoned for industrial use that could be used for new tower locations.

Public Safety

It is within the purview of local government to regulate the manner in which structures are located and constructed in order to protect the safety of its citizens. As used in the Goals for Wireless Communication Technology, safety means physical hazards that can be measured and protected against. The following are safety issues related to PCS facilities.

Radio Frequency Emissions

At high levels, certain kinds of radio frequency radiation (RFR) are known to be associated with certain environmental health risk factors. However, the power used by PCS technologies is relatively low and is not of the type normally associated with these health risks. The Telecommunications Act took steps to remove radio frequency emissions as a basis for regulating or prohibiting PCS facilities, as long specific standards are met. The Act states:

> No State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of environmental effects of radio frequency emission to the extent that such facilities comply with the Commission's regulations concerning such emissions.

Because the FCC does not review each cell site, it is incumbent upon local government to assure that RF standards are being met. At a minimum, this should involve certification by the carrier that the proposed cell site meets the FCC Guidelines.

Structural Hazards

The structural hazards associated with PCS facilities include the potential collapse of the antenna mount and the potential of equipment or debris falling from the structure. Tower structures are constructed to BOCA National Building Code standards, and can withstand hurricane force winds up to 110 mph. Structures are also designed to collapse into themselves if there is a failure. In response to potential hazards, some local governments designate a "fall zone" around the base of the antenna mount. These are generally expressed as distance-to-height ratios. The County of Henrico's Zoning Regulations currently require fall zone setbacks. The basis for these setbacks is to prevent damage from ice or other falling debris from the antenna platform.

Goals, Objectives, and Policies

The goals, objectives, and policies of the Wireless Communications Technology Element of the Comprehensive Plan are designed to seek a balance between providing wireless communication service to County residents and businesses while being sensitive to the location and appearance of these facilities.

GOALS

I. To encourage managed development of wireless communications infrastructure, while at the same time not unreasonably interfering with the development of the competitive wireless communications marketplace.

II. To maintain and preserve the residential character of the County and its neighborhoods and to promote the creation of an attractive and harmonious community.

III. To ensure that wireless communications towers and related wireless communications facilities are compatible with surrounding land uses.

IV. To provide a uniform and comprehensive set of standards for the development and installation of wireless communications towers, antennas and related facilities.

V. To promote public safety and to avoid risk of damage to adjacent properties by ensuring that wireless communications towers and related wireless communications facilities are properly designed, constructed, modified and maintained.

OBJECTIVES

A. Minimize the adverse visual impacts of wireless communications towers and related facilities through careful design, siting, landscape screening and innovative camouflaging techniques.

B. Horizontally separate wireless communication towers from residential neighborhoods and other visually sensitive areas to the extent necessary to minimize visual obtrusion.

C. Encourage the use of alternative support structures, collocation of new antennas on existing wireless communications towers, camouflaged towers, and construction of towers with the ability to maximize additional providers.

D. Ensure that collocation opportunities are fully met before permitting new wireless communications towers.

E. Ensure that the development of PCS facilities is done in a manner that meets all minimum requirements and standards of the Federal Aviation Administration, the Federal Communications Commission and the Uniform Statewide Building Code.

F. Ensure the timely removal of obsolete or abandoned equipment at no cost to County residents.

G. Ensure that telecommunication providers implement any reasonably available technology that may reduce the number or height of towers.

POLICIES

1. General Policies

a. Encourage the placement of antennas on existing structures (including, but not limited to, existing towers, utility poles, water tanks, building rooftops, and other tall structures).

b. Encourage when appropriate the upgrade or replacement of lower towers with taller towers designed to maximize collocation opportunities.

c. Expedite the permitting of wireless communication towers that have minimal visual impacts and meet all regulatory standards.

d. Maintain an inventory of tower sites and all existing telecommunication facilities. This information shall be used to determine collocation opportunities.

e. Coordinate with adjoining localities when a tower request is proposed near the County boundaries.

f. Encourage providers to provide their "build out" coverage grid for the entire County.

g. Obtain industry and citizen input in the future development of local wireless communications regulations.

2. Siting Policies

a. Towers in areas zoned or planned for residential uses are strongly discouraged. Towers in public or private cemeteries are strongly discouraged.

b. Non-stealth towers adjacent to or in close proximity to existing residential areas or areas recommended for residential use in the adopted Land Use Plan are discouraged.

c. New towers should be considered only when collocation or replacement of existing towers is not feasible. The order of preference for land use categories when considering a new site is industrial, commercial, or agricultural not utilized for residential purposes.

d. County-owned, state-owned, or federal properties and facilities should be considered to encourage proper siting of wireless communications towers provided:

- the use and character of public properties and adjacent properties are not adversely impacted;
- the proposed telecommunications facilities are consistent with other elements of the land use plan and the zoning ordinance; and
- appropriate approvals and agreements are reached with the public agencies, boards, or authorities.

e. New telecommunications sites in areas zoned or planned for industrial, commercial, or agricultural properties with no residences should be initially constructed or designed to be extended to a height of 199'. Reduced tower height may be more appropriate in sensitive locations.

f. If collocation opportunities are not possible, siting of towers should be encouraged at locations within wooded areas or remote sites away from residential structures. While such locations may not obscure from view the entirety of the tower, they may reduce the visual impact.

g. Towers should be located at the lowest possible point along ridgelines.

h. New towers or antenna structures shall not block the County's microwave paths or interfere with the County's public safety radio system.

i. No tower shall be located within 1,400 feet of Route 5 unless an acceptable stealth tower design is utilized.

3. Design Policies

a. Stealth tower designs should be considered for all applications.

b. Monopoles are preferred over lattice towers.

c. Limited clearing of the site is recommended. Existing mature vegetation should remain.

d. Security fencing and visible tower locations should be screened from public view. A row of evergreen trees a minimum of 8 feet tall and a maximum of 10 feet apart planted around the perimeter of the fence and a continuous hedge at least 30 inches high in front of the tree line are recommended.

e. Lighting and painting of a tower are discouraged unless required by the Federal Aviation Administration. Towers should be constructed at reduced height to eliminate lighting requirements. However, when lighting is required it should be shielded and oriented inward so as to not project on surrounding properties. Flashing strobe lights should be limited to requirements by the FAA.

f. Earth tone colors for equipment shelters are recommended.

g. When antennas are attached to an existing building they should be made to blend with the existing structure.

h. Access to the site should meet all requirements of the Department of Public Works.

i. In visible or sensitive locations, antenna mounts should be flush mounted.