

BEFORE THE BOARD OF COUNTY COMMISSIONERS  
OF MULTNOMAH COUNTY, OREGON

ORDINANCE NO. 330

An Ordinance amending the Zoning Ordinance regarding radio and television transmission towers.

SECTION 1. FINDINGS

- A. Radio and television transmission installations facilitate the communication of sound and visual images across public airwaves. The primary types of transmission include AM, FM, two-way (land mobile) radio, television, and fixed point microwave. Reasonable standards for structures and uses providing access to the public airwaves are necessary for the health, safety, enjoyment and economic well-being of the citizens of Multnomah County.
- B. Transmission towers and related structures have unique needs and impacts not common to other land uses or other zoning districts. Therefore, these facilities are classified as Community Service uses in the Comprehensive Framework Plan and Zoning Ordinance. As such, they are permitted in any zoning district, except the Exclusive Farm Use district, as a kind of conditional use. However, because free-standing towers remove very little land from farm use, and because locating such towers in farm districts reduces the need to locate them in residential districts where significantly more people are affected, they should be allowed in the EFU district, subject to ORS 215.213.
- C. Despite the special impacts of these facilities upon nearby land uses, particularly in residential areas, no specific criteria have been established by which the County can evaluate applications for placement of transmission towers.
- D. Nearly all radio frequencies require a line-of-sight pathway between transmitter and receiver; therefore, transmission facilities must be elevated sufficiently, either by placement on a tower or other structure, to beam signals over the surrounding terrain. (Reference: Section II, Revised Technical Memorandum #1, April 16, 1982, Cogan & Associates, hereinafter referred to as C&A report, and adopted by reference.)
- E. Transmission facilities, such as FM radio, television, and most two-way radio systems which serve the Portland metropolitan region, require a high elevation. A limited number of areas are of sufficient elevation, considering technical and regulatory factors. (Section III, C&A Report)

- F. Low-powered television transmitters, two-way radio systems with limited range, some microwave facilities, and satellite ground stations can be located on buildings or small hills in low-lying areas. Furthermore, lowland sites are preferable for AM radio facilities. All of these facilities should be confined to non-residential areas after due consideration of structural safety, health and aesthetic factors. (Section III, C&A report)
- G. Of the six high elevation areas in the region, only three are in unincorporated Multnomah County; these three areas are all in the West Hills corridor and are referred to as the Skyline, North Skyline, and Northwest County areas.
- (1) The Skyline area is developed with residential uses at a density of less than 1 to 4 units per acre and has additional residential development potential. It also has significant Community Service uses including a large cemetery and four high power television and numerous other RF broadcast antennas. This area is within the regional Urban Growth Boundary.
- (a) Because of the height of this area and its location near the south end of the West Hills, line-of-sight transmissions originating there are not blocked by the southerly end of the West Hills; there is less "shadow", therefore, there is less need to overcome shadow problems by building more antennas (such as "repeaters") or requiring consumers to install special devices. Because repeaters are limited by FCC regulations to a power of 10 watts, additional antennas will not ensure coverage in all shadow areas if RF transmissions do not originate from the Skyline area for those uses requiring line-of-sight transmission.
- (b) Major towers have been located in the Skyline area for twenty-five years. They are clustered within a mile of each other. Air traffic to and from the Portland, Hillsboro and Clark County airports have adjusted flight paths to avoid these towers. Locating additional new major towers in this area will not require flight path changes. This increases air safety and reduces fuel and time consumption that would result from changes. The airports, Port, pilots, OSAD, and FAA prefer any new towers be located in the Skyline area for these reasons.
- (c) However, because of the relatively higher residential density in this area and the structural and aesthetic incompatibility of residential and major power uses, tower development in this area should be minimized. This ordinance accomplishes this by requiring sharing of new towers so that not more than two new major towers will be necessary to accommodate all foreseeable major tower users.
- (2) The North Skyline area is developed with residential uses at a density of less than 1 to over 6 units per acre, and more, higher density development will occur in the Forest Park Estates area.

There are no major towers in this area. Because this area is further north than Skyline, transmissions from towers located there would be blocked more by the south end of the West Hills than would transmissions from a tower of equal height in Skyline. Placing new towers there will require flight altitude changes and would create a new hazard for VFR flights.

- (3) The Northwest County area is developed with rural residential, forestry, and other resource uses. It is outside the Urban Growth Boundary. Therefore, new towers in this area will not conflict with residential uses. Their transmissions would be blocked by the south end of the West Hills, creating a need for auxiliary antennas to the south. A new tower in Northwest County would create an air hazard, based on testimony of FAA Airspace and RF Specialists, because any high power transmissions in this area would cause interference with aircraft transmissions which cannot be overcome by filtering or other existing technology.
- H. In the 1982-87 period, significant demand for new transmission towers and a critical shortage of sites are anticipated. In the Portland region, land for at least two AM radio antennas as well as tower space for one new FM radio station will be required; relocation of some existing FM transmitters also is anticipated. Tower space for five UHF television stations assigned to the region by the FCC also will be needed in the next few years; in addition, public television station KOAP hopes to move its transmitter from Healy Heights. Increased demand for more two-way radio and microwave facilities as well as satellite ground stations is likely. (Section III, C&A report)
- I. A single major transmission tower can accommodate many antennas. However, to do so requires that it be constructed of sufficient structural strength. Existing towers were not constructed to accommodate multiple uses. They cannot be reinforced to do so; they would have to be reconstructed from the foundation up, to support more users. There is no financial mechanism to pay for such reconstruction. There is no authority for the County or federal agencies to force such reconstruction. Because the existing towers operate under federal licenses, the County has no authority to require their relocation, based on the testimony of the FCC Broadcast Bureau Chief. The existing tower owners do not support shared use of existing towers and cannot or will not rebuild voluntarily to allow sharing. Therefore, existing towers do not constitute a useful resource to meet new antenna demands.

The County has significantly more control over new towers than over existing towers. Approval of new towers can be made subject to whatever conditions are necessary to implement the Comprehensive Plan, to fulfill a public need created by the use, or to protect the public from deleterious effects of the use, under MCC 11.15.8240. In the case of major radio and television transmission towers, sharing is necessary to comply with Framework Plan Policies 2 (Off-Site Effects) and 19 (Community Design) as described

below. It is also necessary to prevent the deleterious aesthetic effects caused when towers proliferate, and to prevent the deleterious loss of land for other uses due to the land extensive nature of major towers. By requiring maximum sharing, the County provides for transmissions in such a way as to minimize the number of aesthetically obtrusive towers and to minimize the loss of land for other permitted uses. Shared use also minimizes the creation of new potential airspace hazards.

- J. Emerging technology which improves the efficiency and effectiveness of radio transmission facilities may lessen the demand for new tower space. Nevertheless, some increased need for new facilities is anticipated. (Section III, C&A report)
- K. Due to a significant increase in demand in the 1982-87 period, lack of suitable locations, and the hazards to aircraft posed by isolated structures, clustering transmission facilities is unavoidable.
- L. Because of the public apprehension of all radiation sources and the anticipated increase in NIER sources related to the broadcast industry, it is prudent to review the NIER impact of new and existing sources of NIER and to ensure that safe levels are not exceeded by a considerable safety factor.

- (1) As a result of extensive studies, the National Institute of Occupational Health & Safety has issued a voluntary standard on RF exposure -- new ANSI C95 Standards. Exposure levels for the general population should be below those for occupational. To ensure an adequate safety factor, the ordinance incorporates a general population exposure limit at a level one-fifth of the new ANSI C95 standards, with the averaging period increased to 1/2 hour to provide greater long-term protection for the general population from known harmful effects from long and short term exposure.

The Multnomah County ordinance directs the County Health Officer to periodically review NIER standards and effects and to report to the Board for consideration of needed future amendments of the radiation standards.

- (2) Based on measurements of existing sources and analysis, the recommended levels of general population exposure are not exceeded by existing sources in unincorporated Multnomah County, and will provide adequate protection to the general population consistent with the need for communications and other uses of NIER sources.
- (3) To adequately gauge the impact of new NIER sources, to establish an NIER baseline, and to identify potential shared use facilities, it is necessary to inventory existing NIER sources. The ordinance contains the requirements for this inventory.
- (4) Because of the highly technical nature of the calculations and measurements and the resultant impact on the public health and safety, it is

required that these calculations and measurements be made by or under the direct supervision of a technical expert of readily ascertainable credentials. Further, ORS 67.002(ff) defines and requires that such work be performed by a registered professional engineer.

(5) To require the registration and monitoring of all non-ionizing radiation sources could, if overly-restrictive, impose an unnecessary and costly regulatory burden. The aim of this ordinance, to protect the public health and safety by ensuring that the maximum levels of non-ionizing radiation exposure for the general population are not exceeded, does not require extensive regulation of:

- (a) Hand-held and citizen band transmitters, because they are low power units with intermittent broadcast characteristics and are often mobile, so NIER effects are not localized.
- (b) Amateur service transmitters, because they are low power units with intermittent broadcast characteristics, and because they are experimental and undergo frequent modification under F.C.C. control. The question of their compliance with a minimum separation requirement to ensure NIER levels are appropriate and not exceeded is left for further evaluation.
- (c) Other non-broadcast emissions, such as but not limited to industrial, medical and scientific machinery, lower power consumer products, products in shipment or storage, and other similar equipment.
- (d) Sole source intermittent transmitters operated for amateur or non-profit uses do not need to undergo the community service review because of their generally low level of impacts. However, they do generate NIER. Non-amateur transmitters should register as a radiation source. However, testing of radiation emissions from these sources is not necessary if antennas associated with them are separated from habitable structures by a minimum distance that ensures protection.

M. Tower sites need to be large enough to allow for visual buffering of the tower and supporting features, particularly in the urban area where such towers dominate the field of view due to their height. Reductions in site size may be appropriate when the purpose of the larger site size, i.e., to allow visual buffering, is served with a more intensive buffer program in a lesser area, or where existing significant vegetation to be retained accomplishes that purpose. Towers should be lighted and painted to blend into their surroundings to the extent possible, to mitigate visual impacts further. Specific landscaping requirements should be imposed to minimize the potential for abuse as a result of allowing unlimited discretion in the matter of buffer composition; however, some discretion should be allowed where the purpose of achieving a visual buffer is served equally by requirements other than those specifically described in the ordinance.

Site size, setback, and landscaping requirements should be most strict in urban residential districts where towers cause the most incompatibility with surrounding land uses. However, in non-residential areas, these standards may be reduced, and in non-urban areas, they may be waived because of the lesser potential visual incompatibility and 24-hour population density.

- N. Existing towers are operating under federal licenses which preempt local actions which are inconsistent with those licenses. Accordingly, the ordinance exempts existing towers from all its requirements except the registration of equipment. Furthermore, any change or modification of those towers that requires a new or modified federal license, would be required to comply with this ordinance to the extent applicable. Also, because existing tower owners have repeatedly testified that their towers and sites are used to capacity, it is not necessary for applicants for new towers to attempt to find space for a proposed antenna on any of those towers existing prior to adoption of this ordinance.
- O. Approval criteria for radio and transmission facilities comply with Goals 1 through 9 and 11, of Oregon's Statewide Planning Goals and Guidelines, as follows:
- (1) Goal 1 (Citizen Involvement) and Goal 2 (Land Use Planning). The public hearing process adopted by the County to amend the Comprehensive Plan and Zoning Ordinance fulfill these requirements and the agency coordination required by the ordinance.

Notices were published prior to each of the Planning Commission and Board of County Commissioners hearings in this matter. Notices of the first Planning Commission hearing and first Board hearing were mailed to over 200 individuals and organizations who have been involved in reviewing tower applications in recent years, who were in health sciences fields related to the issue of radiation impacts, and who were in the business of regulating or providing broadcast services. Interviews were held with twenty-nine individuals who have an interest in the subject, including the President of the NW Skyline Neighborhood Assn., U.S. Forest Service, Federal Aviation Administration (FAA), State Aeronautics Division (OSAD), representatives of the cities of Happy Valley and Portland, and TV, radio and related industry representatives. Finally, meetings were held with representatives of the FAA, OSAD, and the Port of Portland to try to identify a non-urban tower site that would not pose a hazard to air navigation.

To develop the ordinance, an interactive information collection and analysis and option identification and selection process was used. To begin the process, an assessment was made of the impacts and siting needs of various kinds of broadcast industry antennas and of the ability of those needs to be met on land in the region. Constraints to locating new antennas on existing towers and tower sites

and in six areas of the region were identified. Expected industry growth was quantified. Specific sites were not allocated to meet that growth; rather, the ordinance continues the practice of allowing such towers as Community Service uses anywhere in the County, although constraints are incorporated to minimize such uses in urban residential areas. The potential health effects of radiation associated with transmission uses were identified by reviewing and abstracting scientific literature on the subject, and one specific research report was assessed by a task force of epidemiologists. Existing radiation standards of other countries and jurisdictions were mentioned and assessed for local applicability. Based on these inventories, assessments, and evaluation of options in light of the applicable planning goals and policies, the ordinance was drafted, reviewed and revised as necessary at twelve public hearings, before adoption.

- (2) Goal 3 (Agricultural Lands). Generally, community service uses are permitted in all areas of the County. In the past, radio and television towers have not been permitted in the EFU district. However, where towers are free-standing, they have no appreciable impact on the agricultural capability of the site on which they are located because practically no land is removed from agricultural use. Based on Oregon Attorney General Opinion No. 8056 (Aug. 19, 1981), a transmission tower is a "utility facility necessary for public service" and is a permitted non-farm use under ORS 215.213(1)(d) in the EFU. Given these facts, the ordinance allows such free-standing towers in the EFU district, provided accessory uses are banned, except those inherently necessary for the transmission use at the tower site.
- (3) Goal 4 (Forest Lands). The setback, tower design and landscaping requirements will mitigate any potential adverse impacts in forest zones. Furthermore, all but necessary accessory uses are banned in these zones.
- (4) Goal 5 (Open Spaces, Scenic and Historical Areas, and Natural Resources):
  - (a) Transmission towers can engender significant adverse visual impacts because of their size and configuration. To mitigate these to the greatest extent possible, stringent setback, tower design and landscaping requirements are established.
  - (b) The ordinance requires that applicants comply with Comprehensive Plan Policy No. 16 (Natural Resources) by demonstrating that the development will not limit nor impair long range availability and use of the County's natural resources.
- (5) Goal 6 (Air, Water and Land Resources Quality) and Goal 7 (Areas Subject to Natural Disasters and Hazards). These goals are met by requiring applicants to comply with Comprehensive Plan Policies

No. 13 (Air and Water Quality and Noise Level), and No. 14 (Development Limitations).

- (6) Goal 8 (Recreational Needs). In the ordinance, public parks and areas with public access are considered sensitive uses subject to more stringent setback and landscape requirements. In addition, they must comply with general tower design requirements to mitigate visual impacts to the greatest extent possible. The broadcast industry provides a passive recreational resource, public access to which is facilitated by this ordinance.
- (7) Goal 9 (Economy of the State). By designating transmission facilities as community service uses, the County recognizes the importance of communications to the local and state economies. Reasonable regulations to mitigate potential adverse impacts on surrounding property owners will not unduly constrain development of these facilities.
- (8) Goal 11 (Public Facilities and Services).
  - (a) Broadcast facilities are necessary for dissemination of educational and public interest information to the public, and for energy-conserving communications by users and providers of a wide range of consumer, public safety, and recreational services.
  - (b) By establishing clear and detailed approval criteria, the ordinance complies with the requirements of this goal to provide public services in a timely and orderly fashion. Unnecessary expenditures and costly time delays will be avoided if applicants are aware of exactly what is required for approval.
  - (c) By prohibiting transmission facilities from exceeding specified non-ionizing electromagnetic radiation standards (NIER) and by requiring testing and monitoring of NIER impacts, the ordinance protects the public from potential health effects of NIER associated with these public service facilities.

P. Approval criteria for radio and television transmission facilities comply with the applicable policies of the Comprehensive Plan, as follows:

- (1) Policy 2 (Off-Site Effects). Potential visual impacts and danger from tower collapse and falling ice are minimized by the setback, tower design and landscaping requirements. Possible health hazards associated with exposure to non-ionizing electromagnetic radiation (NIER) are mitigated by the radiation emission standards. By requiring maximum use of existing towers and tower sites and required sharing of any new, permitted towers, the ordinance minimizes the need for new towers and thereby mitigates the inevitable visual impacts of new towers. Because these impacts are more severe in urban residential districts, the ordinance reduces threshold and setback requirements in districts other than urban residential districts to induce the industry to locate in those areas.

- (2) Policy 13 (Air and Water Quality and Noise Level). While there are few adverse air quality or noise impacts associated with transmission tower operation, erosion and drainage problems are possible at the sites. Therefore, the applicant must demonstrate compliance with Policy 13 in each case.
- (3) Policy 14 (Development Limitations). Development is prohibited on sites with steep slopes or hazardous soil conditions unless the applicant can demonstrate that special design and construction techniques mitigate these potential hazards.
- (4) Policy 16 (Natural Resources). An applicant must comply with this policy by demonstrating that development of the site will not limit nor impair the availability and use of the County's natural resources.
- (5) Policy 19 (Community Design). The County is required to evaluate proposed developments in terms of scale and related community effects. To minimize potential adverse visual impacts, the criteria include the special setback, tower design and landscape requirements. In addition, parking, access and accessory use requirements minimize impacts on surrounding property owners. Design review is required in all cases where the use is permitted. Although major towers are obtrusive and out-of-scale with residential neighborhoods because of their sheer size, locations in these areas are necessary, given technical needs and constraints. This balances the design policy with other applicable policies.
- (6) Policy 31 (Community Facilities and Uses Location). Radio and television transmission facilities are considered a "community service foundation." The approval criteria specifically address the locational requirements for this type of facility.
  - (a) To reduce traffic and congestion, the ordinance requires that equipment of transmission facilities in residential zones be automated to the greatest extent possible. Accessory uses are limited to those necessary for the transmission function, thus reducing the need for on-site personnel.
  - (b) With regard to impacts on adjacent properties, setback, tower design and landscape requirements previously noted will minimize adverse visual impacts and potential damage from tower failure and falling ice.
- (7) Policy 37 (Utilities). This policy requires the availability of communications facilities. To mitigate potential impacts on surrounding property owners, the approval criteria constitute reasonable regulation without undue restriction of the development of such facilities.

SECTION 2. AMENDMENT

A. MCC 11.15.7015 is amended to read:

"In approving a Community Service use, the approval authority shall find that the proposal meets the following approval criteria, except for transmission towers, which shall meet the approval criteria of MCC .7035."

B. MCC 11.15.7020(15) is amended to read:

"(15) Radio and television transmission towers."

- (a) VHF and UHF television towers, FM radio towers, two-way radio, common carrier, and cellular telephone towers, and fixed point microwave towers are permitted in any district, provided only self-supporting structures are permitted in the Exclusive Farm Use district.
- (b) Low-power television towers, satellite ground stations, AM radio towers, and building-mounted towers are permitted in any district except urban residential districts, provided only self-supporting structures are permitted in the Exclusive Farm Use district.
- (c) Ham radio, amateur sole source emitters, Citizen Band transmitters, and structures to support them are permitted in any district as an accessory use and do not require a Community Service use designation if used for non-commercial purposes only. Any such tower shall comply with the regulations of the district in which it is located. Non-amateur sole source emitters shall also comply with the registration requirements of MCC .7035(F)(2).
- (d) Receive-only facilities in conjunction with a permitted use are exempt from the provisions of this section, but shall comply with all other requirements of this ordinance.

C. MCC 11.15 is amended to add:

"11.15.7035 Radio and Television Transmission Towers.

- (A) Purposes. The purposes of this Section are to:
  - (1) Minimize visual impacts of towers through careful design, siting, and vegetative screening.
  - (2) Avoid potential damage to adjacent properties from tower failure and falling ice, through engineering and careful siting of tower structures.

- (3) Lessen traffic impacts on surrounding residential areas.
  - (4) Maximize use of any new transmission tower so as to minimize the need to construct new towers. Assuming a need to accommodate six high power television antennas in the 1982-87 period, this Section requires sharing so that all six can be located on either of two new towers. All other tower users create much less structural loads; a majority can also be accommodated on these two new towers.
  - (5) Ensure that the amount of non-ionizing electromagnetic radiation emitted by antennas does not exceed the amount at which human health has been found to be affected and is the minimum necessary to provide adequate access to the area's broadcasters by requiring compliance with stated emission standards and required separation standards.
  - (6) Allow new transmission towers in urban residential areas only when necessary to meet functional requirements of the broadcast industry.
- (B) Approval criteria for new transmission towers in urban residential districts. New transmission towers in urban residential districts permitted under MCC .7020(15)(a) may be allowed, based on findings by the approval authority that the following approval criteria are met.
- (1) Shared use of existing towers. A new transmission tower shall not be permitted in an urban residential district unless the applicant makes a good faith effort to substantially demonstrate that no existing or planned tower approved after the effective date of this ordinance can accommodate the applicant's proposed antenna/transmitter as described below.
    - (a) The applicant shall contact the owners of all existing or planned towers approved after the effective date of this ordinance, of a height roughly equal to or greater than the height of the tower proposed by the applicant. A list shall be provided of all owners contacted, the date of such contact, and the form and content of such contact.
    - (b) Such contact shall be made in a timely manner; that is, sufficiently before the filing of an application for a hearing to include a response into the application when filed.

(i) Failure of a listed owner to respond shall not be relevant to the approval authority if a timely, good faith effort was made to obtain one. However, where an existing or planned tower approved after the effective date of this ordinance is known to have capacity for additional antennas of the sort proposed, based on the decision regarding such tower, the application for a new tower shall not be complete until the owner of the existing or planned tower responds. Such response is to be required as a condition of approval.

(ii) The Planning Director shall maintain and provide, on request, records of responses from each owner.

(iii) Once an owner demonstrates an antenna of the sort proposed by the applicant cannot be accommodated on the owner's tower as described below, the owner need not be contacted by future applicants for antennas of the sort proposed.

(c) The applicant shall request the following information from each owner contacted:

(i) Identification of the site by location, tax lot number, existing uses, and tower height.

(ii) Whether each such tower could structurally accommodate the antenna proposed by the applicant without requiring structural changes be made to the tower. To enable the owner to respond, the applicant shall provide each such owner with the height, length, weight, and other relevant data about the proposed antenna contained in the statement required in MCC .7035(F)(2)(e) through (1).

(iii) Whether each such tower could structurally accommodate the proposed antenna if structural changes were made, not including totally rebuilding the tower. If so, the owner shall specify in general terms what structural changes would be required.

(iv) If structurally able, would shared use by such existing tower be precluded for reasons related to RF interference. If so, the owner shall describe in

general terms what changes in either the existing or proposed antenna would be required to accommodate the proposed tower, if at all.

(v) If shared use is possible based on (iii) and (iv) above, the fee an owner of an existing tower would charge for such shared use.

(d) Shared use is not precluded simply because a reasonable fee for shared use is charged, or because of reasonable costs necessary to adapt the existing and proposed uses to a shared tower. The approval authority may consider expert testimony to determine whether the fee and costs are reasonable. Costs exceeding new tower development are presumed unreasonable.

(2) Shared use of existing tower sites. A new transmission tower shall not be approved on a lot in an urban residential district where no similar tower exists unless the applicant makes a good faith effort to substantially demonstrate that the proposed tower cannot be located on the site of an existing or planned tower approved after the effective date of this ordinance as described below.

(a) The applicant shall contact the owners of all existing or planned tower sites approved after the effective date of this ordinance, containing sufficient area to accommodate the proposed tower and support elements. A list shall be provided of all owners contacted, the date of such contact, and the form and content of such contact.

(b) Such contact shall be timely, as described in MCC .7035(B)(1)(b) above, and shall be considered, recorded, and reconsidered as described therein.

(c) The applicant shall request the following information from each owner contacted:

(i) Identification of the site by location, tax lot number, area, existing uses, and topographic, forest and other significant natural features.

(ii) Whether each such site could accommodate the tower proposed by the applicant without changing the existing or proposed structure. To enable the owner to respond, the applicant shall provide each owner with the dimensional characteristics of the proposed tower and other relevant data about the tower contained in the statement required by MCC .7035(D)(3).

(iii) Whether each such site could accommodate the tower proposed by the applicant if either or both the existing or proposed tower was structurally or otherwise changed. If changes due to structural or RF interference would be required, the owner shall specify in general terms what those changes are.

(iv) If shared use is possible based on (ii) and (iii) above, the fee an owner would charge for such shared use.

(d) Shared use is not precluded simply because a reasonable fee for shared use is charged, or because of reasonable costs necessary to adapt the existing and proposed uses to a shared site. The approval authority may consider expert testimony to determine whether the fee and costs are reasonable.

Exception: The provisions of subsections .7035(B)(1) and (2) shall not apply to any application approved by the Board on or before July 30, 1982.

(3) Non-urban sites. The Planning Director shall consult with the Federal Aviation Administration, Federal Communications Commission, Oregon State Aeronautics Division, and Port of Portland to identify sites for towers in unincorporated Multnomah County outside the Urban Growth Boundary, which:

(a) Will contain sufficient area and be topographically capable of supporting major transmission towers in accordance with MCC .7035(B)(4),

(b) Will not create a hazard to aircraft, and

(c) Will provide substantially similar coverage for transmissions with currently available technology.

If such sites can be identified, no new transmission tower shall be permitted in an urban residential district until such non-urban sites are used to capacity.

(4) Site size and tower setbacks.

(a) The site shall be of a size and shape sufficient to provide an adequate setback from the base of the tower to any property line abutting an urban residential district, public property, or public street. Such setback shall be sufficient to:

- (i) Provide for an adequate vegetative, topographic or other buffer, as provided in MCC .7035(B)(7) and (11),
  - (ii) Preserve the privacy of adjoining residential property,
  - (iii) Protect adjoining property from the potential impact of tower failure and ice falling from the tower by being large enough to accommodate such failure and ice on the site, based on the engineer's analysis required in MCC .7035(D)(3)(d) and (e), and
  - (iv) Protect the public from NIER in excess of the standard of MCC .7035(F)(1).
- (b) A site is presumed to be of sufficient size when it:
- (i) Meets the requirements of (a)(iii) and (iv) above,
  - (ii) Provides a setback equal to 20 percent of the height of the tower above grade between the base of the tower to any property line abutting an urban residential district, public property, or public street, and
  - (iii) Provides a setback equal to or exceeding the rear yard setback required for the adjoining property where the adjoining property is not in an urban residential district nor a public property or a public street.
- (c) Placement of more than one tower on a lot shall be permitted, provided all setback, design and landscape requirements are met as to each tower. Structures may be located as close to each other as technically feasible, provided tower failure characteristics of the towers on the site described in MCC .7035(D)(3)(d) will not lead to multiple failures in the event that one fails.
- (d) Structures and uses associated with the transmission use other than the transmission tower shall be located to meet the setbacks required in MCC .7025.

(5) Guy setback.

(a) For a guyed structure, the site shall be of a size and shape sufficient to provide an adequate setback from a guy anchor to any property line abutting an urban residential district, public property or public street in addition to the size required to comply with (4) above. Such setback shall be adequate to provide a vegetative, topographic or other buffer sufficient to obscure view of the anchor from such adjoining properties.

(b) A site is presumed to be of sufficient size when it provides:

(i) A setback of at least 25 feet between a guy anchor and any property line abutting an urban residential district or public property or street, and

(ii) A setback equal to or exceeding the rear yard setback required for the adjoining property where the adjoining property is not a public property or street nor in an urban residential district.

(c) A guy anchor may be located on an adjoining property when:

(i) The owner of the adjoining property on which it is to be placed authorizes it in writing, and

(ii) The guy anchor meets the requirements of (a) or (b) above as to all other adjoining property lines.

(d) Guy anchors may be located within required landscape areas.

A guy from a tower which was previously approved under any ordinance may be extended to an adjacent site if the guy anchor will comply with (B)(5)(c) as determined by the Planning Director.

(6) Required sharing of new towers. All new towers shall be designed to structurally accommodate the maximum number of additional users technically practicable, but in no case less than the following:

(a) For television antenna towers, at least three high power television antennas and one microwave facility or two FM antennas, and at least one two-way radio antenna for every ten feet of the tower over 200 feet.

- (b) For any other towers, at least one two-way radio antenna for every ten feet of the tower, or at least one two-way radio antenna for every 20 feet of the tower and at least one microwave facility.
- (c) Such other combination as found by the approval authority to provide the maximum possible number of foreseeable users.
  - (i) Such requirements may be reduced if the Federal Communications Commission provides a written statement that no more licenses for those broadcast frequencies that could use the tower will be available in the foreseeable future.
  - (ii) Such requirements may be reduced if the size of the tower required significantly exceeds the size of existing towers in the area and would therefore create an unusually onerous, visual impact that would dominate and alter the visual character of the area when compared to the impact of other existing towers. This provision is only to be applied in unusual circumstances not resulting from the applicant's action or site selection unless no other site is possible.
- (d) Once a new tower is approved, additional antennas and accessory uses to permitted antennas may be added to it in accordance with the approved sharing plan if the Planning Director finds that the standards of MCC .7035(B)(7) through (9), (12), (14) and (15) are met.
  - (i) A request for additional antennas or accessory uses shall be processed under MCC .7835 through .7845, provided the standards of MCC .7850 may only be applied in direct proportion to the extent of the proposed change.
  - (ii) If the proposed change results in an increase in the extent to which the existing use violates the setback and landscape standards of MCC .7035(B)(4)(b) through (d), (B)(5)(b) through (d), and (B)(11)(a), the application for approval shall be considered as an action proceeding by the Hearings Officer, who may approve the change based on the applicable standard of MCC .7035(B)(4)(a), (B)(5)(a), and (B)(11)(a).
- (e) The antennas sharing a tower will generally be arranged as follows, provided changes may be allowed by the

approval authority when necessary to accommodate RF interference, topographic circumstances, or tower structure characteristics:

(i) Towers in excess of 200 feet shall be guyed towers with one top-mounted high power television (HPTV) antenna and two side-mounted HPTV antennas. In the alternative, one HPTV antenna may be top-mounted, the second HPTV antenna located below it, and a third HPTV antenna side-mounted.

(ii) No candelabras shall be permitted. No triangular platforms larger than 10 feet on a side shall be permitted. Triangular and T-bar platforms shall not be permitted if mounting of required antennas can be accomplished without such platforms.

(iii) The required microwave facilities, FM antennas, and two-way radio antennas may be located anywhere on the tower above a height of eighty feet above grade, provided the other requirements of this section are met.

(f) If a new tower is approved, the applicant shall be required as conditions of approval, to:

(i) Record the letter of intent required in MCC .7035(D)(5) in Miscellaneous Deed Records of the Office of the County Recorder,

(ii) Respond in a timely, comprehensive manner to a request for information from a potential shared use applicant required under MCC .7035(B)(1) and (2),

(iii) Negotiate in good faith for shared use by third parties, and

(iv) Allow shared use where the third party seeking such use agrees in writing to pay reasonable, pro rata charges for sharing, including all charges necessary to modify the tower and transmitters to accommodate shared use, but not total tower reconstruction, and to observe whatever technical requirements are necessary to allow shared use without creating interference,

(v) Willful, knowing failure of an owner whose tower was approved after the effective date of this ordinance, to comply with the requirements of (i) through (iv) above shall be grounds for suspension or revocation of

the Community Service designation. Following report of such failure, the Planning Director shall schedule a public hearing in the manner provided in MCC .8290 and .8295 to determine whether the CS designation should be suspended or revoked.

Such conditions shall run with the land and be binding on subsequent purchasers of the tower site.

- (7) Visual impact. The applicant shall demonstrate that the tower can be expected to have the least visual impact on the environment, taking into consideration technical, engineering, economic and other pertinent factors. Towers clustered on the same site shall be of similar height and design, whenever possible. Towers shall be painted and lighted as follows:
  - (a) Towers 200 feet or less in height shall have a galvanized finish or be painted silver. If there is heavy vegetation in the immediate area, such towers shall be painted green from base to treeline, with the remainder painted silver or given a galvanized finish.
  - (b) Towers more than 200 feet in height shall be painted in accordance with regulations of the Oregon State Aeronautics Division.
  - (c) Towers shall be illuminated as required by the Oregon State Aeronautics Division. However, no lighting shall be incorporated if not required by the Aeronautics Division or other responsible agency.
  - (d) Towers shall be the minimum height necessary to provide parity with existing similar tower supported antenna, and shall be freestanding where the negative visual effect is less than would be created by use of a guyed tower.
- (8) Maintenance impacts. Equipment at a transmission facility shall be automated to the greatest extent possible to reduce traffic and congestion. The applicant shall describe anticipated maintenance needs, including frequency of service, personnel needs, equipment needs, and traffic, noise or safety impacts of such maintenance. Where the site abuts or has access to a collector and local street, access for maintenance vehicles shall be exclusively by means of the collector street.

- (9) Parking. A minimum of two parking spaces shall be provided on each site; an additional parking space for each two employees shall be provided at facilities which require on-site personnel.
- (10) Vegetation. Native vegetation on the site shall be preserved to the greatest practical extent. The applicant shall provide a site plan showing existing significant vegetation to be removed, and vegetation to be replanted to replace that lost.
- (11) Landscaping. Landscaping at the perimeter of the property which abuts streets, residences, public parks or areas with access to the general public other than the owner of such adjoining property shall be required, as follows:
- (a) For towers 200 feet tall or less, a buffer area no less than 25 feet wide shall commence at the property line. At least one row of evergreen shrubs shall be spaced not more than five feet apart. Materials should be of a variety which can be expected to grow to form a continuous hedge at least five feet in height within two years of planting. At least one row of evergreen trees or shrubs, not less than four feet high at the time of planting, and spaced not more than 15 feet apart, also shall be provided. Trees and shrubs in the vicinity of guy wires shall be of a kind that would not exceed 20 feet in height or would not affect the stability of the guys, should they be uprooted, and shall not obscure visibility of the anchor from the transmission building or security facilities and staff.
- (b) For towers more than 200 feet tall, a buffer area not less than 40 feet wide shall be provided at the property line with at least one row of evergreen shrubs spaced not more than five feet apart which will grow to form a continuous hedge at least five feet in height within two years of planting; one row of deciduous trees, not less than 1-1/2 inch caliper measured three feet from the ground at the time of planting, and spaced not more than 20 feet apart; and at least one row of evergreen trees, not less than four feet at the time of planting, and spaced not more than 15 feet apart. Trees and shrubs in the vicinity of guy wires shall be of a kind that would not exceed 20 feet in height or would not affect the stability of the guys, should they be uprooted, and shall not obscure visibility of the anchor from the transmission building or security facilities and staff.

(c) In lieu of these standards, the approval authority may allow use of an alternate detailed plan and specifications for landscape and screening, including plantings, fences, walls and other features designed to screen and buffer towers and accessory uses. The plan shall accomplish the same degree of screening achieved in (a) and (b) above, except as lesser requirements are desirable for adequate visibility for security purposes and for continued operation of existing bona fide agricultural or forest uses, including but not limited to produce farms, nurseries, and tree farms.

(12) Accessory uses. Accessory uses shall include only such buildings and facilities necessary for transmission function and satellite ground stations associated with them, but shall not include broadcast studios, offices, vehicle storage areas, nor other similar uses not necessary for the transmission function.

Accessory uses may include studio facilities for emergency broadcast purposes or for other special, limited purposes found by the approval authority not to create significant additional impacts nor to require construction of additional buildings or facilities exceeding 25 percent of the floor area of other permitted buildings.

(13) Comprehensive Plan. The proposed use shall comply with Policies No. 13 (Air and Water Quality and Noise Level), No. 14 (Development Limitations), No. 16 (Natural Resources), No. 19 (Community Design), No. 31 (Community Facilities), and other plan policies identified as applicable by the approval authority.

(14) Agency Coordination. The applicant shall provide the following information in writing from the appropriate responsible official:

- (a) A statement from the Federal Aviation Administration that the application has not been found to be a hazard to air navigation under Part 77, Federal Aviation Regulations, or a statement that no compliance with Part 77 is required.
- (b) A statement from the Oregon State Aeronautics Division that the application has been found to comply with the applicable regulations of the Division, or a statement that no such compliance is required.
- (c) A statement from the Federal Communications Commission that the application complies with the regulations of the Commission or a statement that no such compliance is necessary.

(d) The statements in (a) through (c) may be waived when the applicant demonstrates that a good faith, timely effort was made to obtain such responses but that no such response was forthcoming, provided the applicant conveys any response received; and further provided any subsequent response that is received is conveyed to the approval authority as soon as possible.

(15) Emission of non-ionizing electromagnetic radiation. The NIER requirements of (F) are met.

(C) Approval criteria for new transmission towers in districts other than urban residential districts. New transmission towers in non-residential districts permitted under MCC .7020(5)(a) or (b) may be allowed, based on findings by the approval authority that the following criteria are met.

- (1) The site is of a size and shape sufficient to provide the following setbacks:
  - (a) For a tower located on a lot abutting an urban residential district or a public property or street, except a building-mounted tower, the site size standards of MCC .7035(B)(4) and (5) are met as to those portions of the property abutting the residential or public uses.
  - (b) For all other towers, the site shall be of sufficient size to provide the setback required in the underlying district between the base of the tower, accessory structures and uses, and guy anchors, if any, to all abutting property lines.
- (2) The required setbacks shall be improved to meet the landscaping standard of MCC .7035(B)(11) to the extent possible within the area provided.
- (3) The visual impact standard of MCC .7035(B)(7) is met.
- (4) The parking requirement of MCC .7035(B)(9) is met, provided additional parking may be required in accordance with MCC .6100 to .6148 if the site serves multiple purposes.
- (5) The applicable policies of the Comprehensive Plan are met.
- (6) The NIER standards of (F) are met.
- (7) The agency coordination standards of MCC .7035(B)(14) are met.
- (8) Accessory uses. For a proposed tower in the EFU, MUF, CFU, MUA, and UF districts, the restrictions on accessory uses in MCC .7035 (B)(12) shall be met.

(D) Requirements for an application. An application for approval of a Community Service designation for a radio or television transmission tower shall contain at least the following information before it is complete:

- (1) Site plan or plans to scale specifying the location of tower(s), guy anchors (if any), transmission building and/or other accessory uses, access, parking, fences, landscaped areas, and adjacent land uses. Such plan shall also demonstrate compliance with MCC .7035(B)(4) and (5).
- (2) Landscape plan to scale indicating size, spacing and type of plantings required in MCC .7035(B)(11).
- (3) Report from a professional engineer licensed in the State of Oregon, documenting the following:
  - (a) Tower height and design, including technical, engineering, economic, and other pertinent factors governing selection of the proposed design. A cross-section of the tower structure shall be included.
  - (b) Total anticipated capacity of the structure, including number and types of antennas which can be accommodated.
  - (c) Evidence of structural integrity of the tower structure as required by the Building Official.
  - (d) Failure characteristics of the tower and demonstration that site and setbacks are of adequate size to contain debris.
  - (e) Ice hazards and mitigation measures which have been employed, including increased setbacks and/or de-icing equipment.
  - (f) Specific design and reconstruction plans indicating the means by which the shared use provisions of this ordinance will be met. This submission is required only in the event that the applicant intends to meet the shared use requirements of this ordinance by subsequent reinforcement and reconstruction of the tower.
  - (g) The requirements of subpart (f) above may be deferred, subject to the provisions of subsection (D)(3)(f), above, if:
    - (i) At the time the building permit for the tower is issued, there are no applications before the FCC that could use the tower, or

(ii) The applications which are before the FCC have contractual arrangements for the use of other towers.

- (4) Statements from the F.A.A., O.S.A.D., and F.C.C., that the standards of MCC .7035(B)(14) are met or the required good faith, timely effort to achieve such responses.
- (5) Letter of intent to lease excess space on the tower structure and to lease additional excess land on the tower site when the shared use potential of the tower is absorbed, if structurally and technically possible.

A reasonable pro rata charge may be made for shared use, consistent with an appropriate sharing of construction, financing and maintenance costs. Fees may also be charged for any structural or RF changes necessitated by such shared use. Such sharing shall be a condition of approval if approval is granted.

- (a) The applicant shall describe what range of charges are reasonably expected to be assessed against HPTV shared users, FM shared users, land based mobile and common carriers, and microwave shared users.
  - (b) The applicant shall base charges on generally accepted accounting principles and shall explain the elements included in the charge, including but not limited to a pro rata share of actual site selection and processing costs, land costs, site design, construction and maintenance costs, finance costs, return on equity, and depreciation.
- (6) The applicant shall quantify the additional tower capacity anticipated, including the approximate number and types of antennas. The applicant shall also describe any limitations on the ability of the tower to accommodate other uses, e.g., radio frequency interference, mass, height, frequency or other characteristics. The applicant shall describe the technical options available to overcome those limitations and reasons why the technical options considered were not chosen to be incorporated. The approval authority shall approve those limitations if they cannot be overcome by reasonable technical means.
  - (7) Studies and reports by a professional engineer licensed in the State of Oregon to establish compliance with the NIER emission standard of MCC .7035(F), except as exempted therein.
  - (8) Evidence of the lack of space on all suitable existing towers to locate the proposed antenna and of the lack of space on existing tower sites to construct a tower for the proposed antenna.

- (9) Written authorization from adjoining property owners if needed, under MCC .7035(B)(5).
  - (10) Written evidence from the Federal Communications Commission related to a request for approval of a reduction in the capacity of the proposed tower under MCC .7035(B)(6)(c), if needed.
  - (11) Maintenance impacts as described in MCC .7035(B)(8).
  - (12) Responses to the applicable Comprehensive Plan Policies.
- (E) Design Review. The use shall comply with the design review provisions of MCC .7805 to .7865. This may be implemented as a condition of approval.
- (F) Non-ionizing electromagnetic radiation standards.
- (1) No source of non-ionizing electromagnetic radiation shall hereinafter be operating, which causes the general population to be exposed to radiation levels exceeding the mean squared electric ( $E^2$ ) or mean squared magnetic ( $H^2$ ) field strengths, or their equivalent plane wave free space power density, as specified in Table 1.

For near field exposures, measurements of the mean squared electric and magnetic field strengths are especially important to determine compliance with the standards in columns 2 and 3 of Table 1. For convenience, mean squared electric or magnetic field strengths may be specified as the equivalent plane-wave power density.

At higher frequencies (e.g., above 30-300 MHz), measurement of mean-squared magnetic field strength may not be necessary if it can be reliably inferred from measurements of either mean squared electric field strength or equivalent plane-wave power density.

- (a) In the event the federal government promulgates mandatory or advisory standards more stringent than those described herein, the more stringent standards shall apply.
- (b) These standards are adapted from the American National Standards Institute's American National Standard C95.1-1982, Safety Levels With Respect to Human Exposure to Electromagnetic Fields (300 kHz to 100 GHz). This ANSI standard's documentation should be consulted to help resolve any future questions about the basis or interpretation of the standards in this ordinance.

- (c) Similarly, the latest revision of ANSI's American National Standard C95.3, Techniques and Instrumentation for the Measurement of Potentially Hazardous Electromagnetic Radiation at Microwave Frequencies, is incorporated here by reference as one source of acceptable methods for measuring non-ionizing radiation levels in determining compliance with this standard.

For all measurements made to ensure compliance with this section, evidence shall be submitted showing that the instrument or instruments used were calibrated within the manufacturer's suggested periodic calibration interval; that the calibration is by methods traceable to the National Bureau of Standards; a statement that the measurements were made in accordance with good engineering practice; and a statement or statements as to the accuracy of the results of the measurements.

- (d) The standards adopted herein shall be periodically reviewed by the Multnomah County Health Officer, in light of any new scientific knowledge as to the effects on the general population of non-ionizing electromagnetic radiation; and these standards may hereafter be raised, lowered or otherwise changed as the County shall require by amendment of this ordinance. The first such reports shall be delivered on or before January 1, 1984.
- (e) For average times less than 0.5 hour, the allowed power density  $P$  in  $\text{uw}/\text{cm}^2$  as a function of averaging time  $\tau$  in hours is given by

$$P = k/\tau$$

where in turn  $K$  is equal to 1/2 times the allowed power density for averaging times of 0.5 hour and greater.

- (2) All existing sources of non-ionizing electromagnetic radiation in the frequency spectrum, 100 kHz to 300 GHz, except those exempted below, are within 120 days of the enactment of this ordinance, hereby required to register with the County and provide the following information for each individual source on forms provided by the Planning Director.
- (a) Name and address of owner of transmitter and/or antenna.
  - (b) Name and address of owner of property on which the transmitter and/or antenna is located.
  - (c) Location of transmitter.
  - (d) Location of antenna by geographic coordinates by either latitude and longitude or state plan coordinates.

TABLE 1. Non-Ionizing Electromagnetic Radiation Standards

Frequency (MHz)	Mean Squared Electric (E) <sup>1</sup> Field Strength <sup>1</sup> (V <sup>2</sup> /m <sup>2</sup> ) <sup>2</sup>	Mean Squared Magnetic (H) <sup>1</sup> Field Strength <sup>3</sup> (A <sup>2</sup> /m <sup>2</sup> )	Equivalent Plane-Wave Power Density <sup>1</sup> (mW/cm <sup>2</sup> )
100 KHZ - 3 MHz	80,000	0.5	20
3 MHz - 30 MHz	4,000 (180/f <sup>2</sup> )	0.025 (180/f <sup>2</sup> )	180/f <sup>2</sup>
30 MHz - 300 MHz	800	0.005	0.2
300 MHz - 1500 MHz	4,000 (f/1500)	0.025 (f/1500)	f/1500
1500 MHz - 300 GHz	4,000	0.025	1.0

1 All standards refer to root mean square (rms) measurements averaged over 0.5 hour (30 minutes).

2 V<sup>2</sup>/m<sup>2</sup> = Volts squared per meter squared.

3 A<sup>2</sup>/m<sup>2</sup> = Amperes squared per meter squared.

Note: f = frequency in megahertz (MHz)

- (e) Output frequency of transmitter.
- (f) Type of modulation and class of service.
- (g) Power output of transmitter (average and peak).
- (h) Power input to antenna.
- (i) Manufacturer, type, manufacturer's model number of antenna and a copy of the antenna radiation patterns.
- (j) Gain of antenna with respect to an isotropic radiator.
- (k) Polarization of radiation from antenna.
- (l) Height of antenna above ground.
- (m) Horizontal and radial distance of antenna to nearest point on property line and to nearest habitable space regularly occupied by others than immediate family or employees of transmitter and/or antenna owner and/or operator.
- (n) Elevation above mean sea level of ground at the antenna location and the points specified in (2)(m).
- (o) The call letters assigned to the source.
- (p) Date of installation of present transmitter, and date of installation of the associated antenna, date of installation of the structure, if any, on which the antenna is located.

Any sources not so registered shall be regarded as a new source and any registered source with different essential technical characteristics than those of (2)(c) through (2)(m) above as a changed existing source.

- (3) After the date of enactment of this ordinance, no installation of a new source of non-ionizing electromagnetic radiation or changes in an existing source which in any way causes increases in the NIER or radiation pattern of the NIER source shall occur without first obtaining a Community Service use designation or modification thereof, unless otherwise provided herein.
- (4) The application for the use shall be on forms provided by the Planning Director, and shall show:
  - (a) The information required under (a) through (p) of subpart (2) above.

- (b) The measured existing non-ionizing radiation levels at the nearest point on the property line, the point on the property lines of the predicted maximum radiation from the source, and the nearest point regularly occupied by other than the immediate family and/or employees of the transmitter owner and/or operator.
- (i) These measurements shall be made at a height of 1.5 meters above the ground or at the greater height if habitation occurs at a greater height with lesser radial distance to the source.
- (ii) If the measured level is equal to or less than 1/5 of the limits, the measurement shall be made for the continuous period 6 a.m., to 6 p.m., on a regular business day.
- (iii) If the measured level is greater than 1/5 of the limits, the measurement shall be made for a continuous period of 168 hours.
- (iv) If there exists an operational situation which would cause higher levels to occur at some other time than the intervals of (ii) or (iii) above, the measurement shall be made during that time.
- (v) These measurements may be made by whatever means the registered professional engineer under whose direction and supervision they are made deems appropriate. The effects of contributing sources of frequency below the lower frequency limit of broadband instruments may be included by appropriate separate single instant measurements of the contribution due to these sources. Further, levels below 20 microwatts/cm<sup>2</sup> or the minimum sensitivity of the instruments used, whichever is lesser, shall be deemed zero for further computational purposes.
- (c) The calculated average levels at the three points specified in (4)(b) after installation of the new source, including both the background and the new source.
- (d) The calculated levels at the boundaries of other sources at which the new source may cause a detectable increase in level.
- (e) The calculated level at the predicted point of maximum radiation off of the property on which the new source is located caused by the new source along with the measured background NIER at this point. This measurement shall meet the requirements of (4)(b).

(f) The geographic coordinates (latitude and longitude or state plane coordinates) of each point of measurement and/or calculation shall be furnished.

(5) A Community Service use designation or modification thereof may be granted if the levels calculated in (F)(4), including the existing measured background, do not exceed the limits set forth in (F)(1), and if a new tower is required, the siting standards of this ordinance are met. However, if the calculated levels, including existing measured background at any point specified in (F)(4) exceed one-third of the maximum levels of (F)(1), then, the approval shall be conditional upon measurements made after the new source is installed showing that the maximum levels of (F)(1) are not exceeded. If the calculated levels exceed the maximum level of (F)(1), the application shall be denied.

(6) All commercial intermittent sole source emitters of less than 1 KW average output are exempt from the measurement requirements of MCC .7035(F)(4) if they comply with the separation requirement of MCC .7035(F)(6) and all other requirements of this section. Prior to issuance of a building permit for a tower to support an antenna associated with one of these uses, the Planning Director shall determine that the antenna meets the following requirements:

(a) For an effective radiated power (ERP) of less than 100 watts the highest current point of the antenna is located at least ten feet and all portions of the antenna three feet from the external surface of any habitable structure not located on the property containing the source and from habitable space on the same property normally occupied on a regular basis by others than the immediate family and/or employees of the owner and/or operator of the source.

(b) For an ERP greater than 100 watts, but less than 1,000 watts, the highest current point of the antenna is at least 15 feet and all portions of the antenna at least six feet from the external surface of any habitable structure not located on the property containing the source and from habitable space on the same property normally occupied on a regular basis by others than the immediate family and/or employees of the owner and/or operator of the source.

(c) For an ERP equal to or greater than 1,000 watts, but less than 10 kW, the antenna meets the following separation criteria from the external surface of any habitable structure

not located on the property containing the source and from habitable space on the same property normally occupied on a regular basis by others than the immediate family and/or employees of the owner and/or operator of the source.

<u>Frequency</u>	<u>Minimum Distance from Highest Current Portion</u>	<u>Minimum Distance from Any Portion</u>
< 7 MHz	11 feet	5 feet
7 - 30 MHz	$f/0.67$ feet	$f/1.5$ feet
30-300 MHz	45 feet	20 feet
300-1500 MHz	$780/\sqrt{f}$ feet	$364/\sqrt{f}$ feet
> 1500 MHz	20 feet	10 feet

Where f is frequency in megahertz.

- (d) For an ERP equal to or greater than 10 kW, but less than 30 kW, the antenna meets the following separation criteria from the external surface of any habitable structure not located on the property containing the source, and from habitable space on the same property normally occupied on a regular basis by others than the immediate family and/or employees of the owner and/or operator of the source.

<u>Frequency</u>	<u>Minimum Distance from Highest Current Portion</u>	<u>Minimum Distance from Any Portion</u>
< 7 MHz	17.5 feet	8 feet
7 - 30 MHz	$f/0.4$ feet	$f/0.91$ feet
30 - 300 MHz	75 feet	33 feet
300 - 1500 MHz	$1300/\sqrt{f}$ feet	$572/\sqrt{f}$ feet
> 1500 MHz	34 feet	15 feet

- (7) The following uses are exempt from all requirements of this ordinance:

- (a) All portable, hand-held and vehicular transmission sources.
- (b) Industrial, scientific, and medical equipment operating at frequencies designated for that purpose by the FCC.
- (c) Radio frequency machines:
- (i) which have an effective radiated power of seven watts or less;
  - (ii) which are designated and marketed as consumer products, such as microwave ovens, citizen band radios, and remote control toys, or

(iii) which are in storage, shipment or on display for sale, provided such machines are not operated.

(d) Amateur intermittent sole source emitters of less than 1 KW average output.

(G) Definitions. The following definitions shall apply to this section:

- (1) Sole Source Emitter: An individual piece of property containing one or more radio transmitters, only one of which is normally transmitting at a given instant in time.
- (2) Intermittent Operation: An operation where the radio transmitter does not normally continually operate for a period of 15 minutes or more at one time and generally, the transmitter operation is random in time.
- (3) Vehicular Sources: Transmitters located in vehicles which normally move about.
- (4) Hand-Held Source: Transmitters normally held in the hand of, or on the person of, the person operating the transmitter.
- (5) Portable Sources: Transmitters and associated antenna which are capable of being moved from one point to another and operated from a given location for a period of less than one month.
- (6) Regularly Occupied: Occupied by a given individual on an ongoing regular basis and excluding occasional visitors, passersby, etc.
- (7) Source of Non-ionizing Electromagnetic Radiation: Any source of electromagnetic radiation emitting emissions between 100 kHz and 300 GHz with an effective radiated power greater than 1 watt.
- (8) Height of Antenna Above Ground: The vertical distance between the highest current point of the antenna and the ground directly below this point.
- (9) General Population: That segment of the population which is not a member of the immediate family or employee of the owner or operator of source of NIER or, because of occupation, is required to work with sources of NIER.
- (10) Urban residential district: Those zoning districts described in MCC 11.15.2472 through .2900 except a lot currently used for a radio or television transmission tower established legally.

(11) The effective radiated power (ERP) is the power input to the antenna, times the numerical power gain of the antenna relative to an isotropic radiator."

(12) Point on property line of highest radiation means for sites with more than one source, the point on the property line where the radiation is predicted to be maximum with all sources of NIER operating.

D. MCC 11.15 is amended to add:

"11.15.7040 Pre-Existing Communication Facilities.

Communication facilities, including radio and television transmission towers, common carrier and cellular telephone towers, microwave towers, satellite ground stations and accessories thereto (the "Facilities") which were legally established prior to the effective date of this ordinance, or any addition to, reconstruction or modification of the facilities shall be deemed conforming and not subject to the provisions of MCC .8805 or MCC .7010-.7035, provided that:

- (a) The use shall comply with the NIER standard of MCC .7035(F)(1); and
- (b) The use shall comply with MCC .7035(B)(9), (12), and (14); and
- (c) Any addition to or modification of the facilities shall not create an unusually onerous visual impact that would dominate and alter the visual character of the area when compared to the impact of other existing towers."

E. MCC 11.15 is amended to add:

"11.15.7041 Pending Applications.

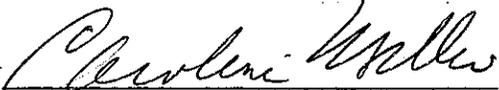
The provisions of this ordinance shall apply as a condition of approval of any radio or television transmission tower for which application was made and final action was pending prior to the ordinance adoption."

ADOPTION

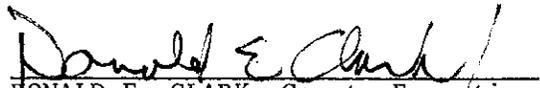
This ordinance being necessary for the health, safety and general welfare of the people of Multnomah County, shall take effect on August 19, 1982, according to Section 5.50 of the Charter of Multnomah County.

ADOPTED this 20th day of July, 1982, being the date of its 2nd reading before the Board of County Commissioners of Multnomah County, Oregon.

BOARD OF COUNTY COMMISSIONERS  
OF MULTNOMAH COUNTY, OREGON

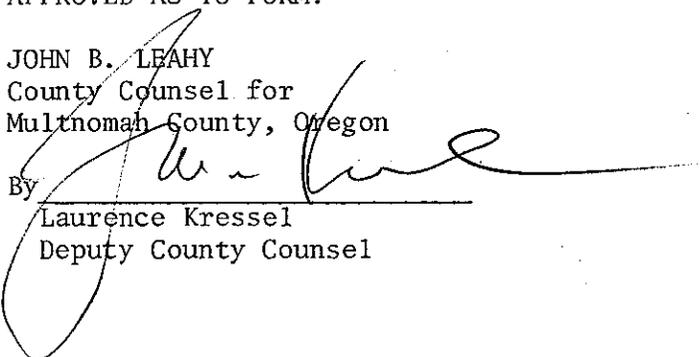
By   
Presiding Officer

Authenticated by the County Executive on the 23rd day of July,  
1982.

  
DONALD E. CLARK, County Executive

APPROVED AS TO FORM:

JOHN B. LEAHY  
County Counsel for  
Multnomah County, Oregon

By   
Laurence Kressel  
Deputy County Counsel