

DOCKET NO. 56

AN APPLICATION OF METRO MOBILE CTS OF : CONNECTICUT SITING
NEW HAVEN, INC., FOR A CERTIFICATE OF :
ENVIRONMENTAL COMPATIBILITY AND PUBLIC : COUNCIL
NEED FOR THE CONSTRUCTION, MAINTENANCE, :
AND OPERATION OF FACILITIES TO PROVIDE :
CELLULAR SERVICE IN NEW HAVEN COUNTY. : April 14, 1986

F I N D I N G S O F F A C T

1. Metro Mobile CTS of New Haven, Inc. (Metro Mobile), in accordance with provisions of sections 16-50g to 16-50z of the Connecticut General Statutes (CGS), applied to the Connecticut Siting Council (Council) on October 30, 1985, for a certificate of environmental compatibility and public need (certificate) for the construction, maintenance, and operation of telecommunication towers and associated equipment buildings to provide Domestic Public Cellular Radio Telecommunication Service (cellular service) in the New Haven New England County Metropolitan Area (New Haven NECMA). (Record)
2. Cellular tower sites were proposed for the towns of Beacon Falls, Guilford, Hamden, Milford, Naugatuck, North Branford, Wallingford, West Haven, and Wolcott. (Metro Mobile 1, p. 1)
3. The application was accompanied by proof of service as required by section 16-501 of the CGS. (Record)
4. The fee as prescribed by section 16-50v-1 of the Regulations of State Agencies (RSA) accompanied the application. (Record)
5. Affidavits of newspaper notice as required by section 16-501 of the CGS were published by the applicant twice in the New Haven Journal Courier and twice in the Waterbury Republican. (Metro Mobile 1, p. 4)

6. The Council and its staff made an inspection of the proposed tower sites in the towns of Beacon Falls, Hamden, Milford, Naugatuck, West Haven, and Wolcott on January 13, 1986, and of the proposed tower sites in the towns of North Branford, Guilford, and Wallingford on February 6, 1986. (Record)
7. Pursuant to section 16-50m of the CGS, the Council, after giving due notice thereof, held public hearings on January 15, 1986, at 2:00 P.M. in the West Haven Town Hall in West Haven, and at 7:00 P.M. at the Laurel Ledge School in Beacon Falls; on February 6, 1986, at 7:00 P.M. in North Branford Intermediate School; on February 20, 1986, at 7:00 P.M. in Wallingford at the Moran Middle School, and on March 13, 1986, at 1:00 P.M. and 7:00 P.M. in Milford at the Milford Public Library. (Record)
8. The parties to the proceeding are the applicant and those persons and organizations whose names are listed in the Decision and Order which accompanies these Findings. (Record)
9. The following state agencies filed written comments with the Council pursuant to section 16-50j of the CGS: the Department of Environmental Protection (DEP), and the Council on Environmental Quality.
10. The Council took administrative notice of its record in Docket 44, which is the Southern New England Telephone Company (SNET) application for the New Haven NECMA. (Record)
11. Cellular service consists of small overlapping broadcast regions, two to ten miles in diameter, known as cells. Each cell is served by a transmitter limited by the Federal Communications Commission (FCC) to no more than 100 watts effective radiated power per

channel. Each cell has a central switching point containing electronic apparatus uniting the cells into a system. Mobile units are limited to a maximum of seven watts of transmitted power by the FCC. (Metro Mobile 2, Q. 34, Exhibit 5; Metro Mobile 5, Q. 5; Metro Mobile 12, Q. 74; Docket 44, Finding 11)

12. For the purposes of cellular service construction permit applications, the FCC has defined a New England NECMA consisting of New Haven County. (Metro Mobile 1, p. 8; Docket 44, Finding 22)
13. The FCC requires that a licensee serve at least 75% of its licensed service area within three years of obtaining an operating license or risk losing the license. The originally proposed Metro Mobile system would cover at least 90% of the New Haven NECMA. (Metro Mobile 1, pp. 8, 18; Docket 44, Finding 25)
14. Cellular service is an improved mobile telephone service. To date, mobile telephone service has been regulated by the Connecticut Department of Public Utility Control (DPUC). In DPUC Docket No. 85-0716, the DPUC is considering regulations developed pursuant to Section 7 of Public Act No. 85-552 to determine the extent of state regulation of cellular service providers licensed by the FCC. Eventually, cellular service could replace the existing simplex mobile service. Cellular service has been classified by the FCC as a form of basic local exchange service, which would also be subject to DPUC regulation. (Metro Mobile 1, p. 26; Docket 44, Finding 26)
15. The FCC has determined that a national public need exists to improve the present mobile telephone service, due to the current system's limited capacity, long waiting lists nationally, and poor

- quality service, which have created congested channels and long waiting times. (Metro Mobile 1, pp. 5, 11; Docket 44, Finding 29)
16. The FCC has established the technical standards for cellular service to insure the efficient use of the allotted frequency spectrum and to insure nationwide compatibility. (Metro Mobile 3, p. 67, Exhibit 8; Docket 44, Finding 36)
 17. The FCC has pre-empted the state's regulation of cellular service in three major areas: technical standards, market structure, and state certification prior to federal application for a construction permit. (Metro Mobile 3, Q. 67, Exhibit 8; Metro Mobile 2, Q. 34, Exhibit 5; Docket 44, Finding 37)
 18. Applicants for FCC cellular system authorizations are not required to demonstrate a public need for cellular service, because the FCC has exercised its primary jurisdiction to determine that there is a need for cellular service generally and to encourage the development of cellular service nationwide. (Metro Mobile 1, p. 7)
 19. The FCC has reserved to the states jurisdiction with respect to charges, classifications, practices, services, facilities, and regulation of service by licensed carriers. (Docket 44, Finding 38)
 20. According to FCC rules, there must be two licenses awarded in each NECMA to provide competition. One is awarded to a wireline company, the other to a non-wireline applicant. (Metro Mobile 1, pp. 6, 11; Docket 44, Finding 39)
 21. The FCC defines a Reliable Service Contour as an area having a signal quality greater than or equal to 39 dbu. The FCC requires

75% coverage of the cellular geographic service area. (Metro Mobile 2, Q, 30; Metro Mobile 3, Q. 45, Exhibit 1; Docket 44, Finding 40)

22. Cell-splitting is a technique for accommodating the future growth of demand for cellular mobile service. It consists of adding a cell between existing cells, thus increasing the number of calls which can be handled in an area. Cell-splitting can be achieved by the addition of cell sites containing lower power omnidirectional antennas, the conversion to directional antennas, or both. (Metro Mobile 1, pp. 19-20; Docket 44, Finding 41)
23. Each new cell achieved by cell-splitting would require additional towers and/or associated equipment. (Docket 44, Finding 42)
24. An omnidirectional antenna is designed to radiate in 360 degrees, but may be blocked by part of the tower itself, thus causing an effect on its radio pattern known as shadowing. Terrain and buildings can also cause shadowing. (Docket 44, Finding 43)
25. Shadowing in urban areas can be reduced by overlapping coverage from two cell sites. Such overlapping of coverage fills in holes from shadowing and increases the possible number of simultaneous conversations. (Docket 44, Finding 44)
26. The potential for intermodulation interference and shadowing may be significant when antennas broadcasting independent radio signals are located on the same tower. (Docket 44, Finding 45)
27. Metro Mobile is a wholly-owned subsidiary of Metro Mobile CTS, Inc., a corporation organized in the State of Delaware, with principal business offices at 110 East 59th Street, New York, New York. (Metro Mobile 1, p. 2)

28. Metro Mobile currently has cellular systems operational in the cities of Albuquerque and Tucson and expected to have systems in Phoenix and Charlotte on line in March, 1986. (Tr. 2/20/86, pp. 107-108)
29. Metro Mobile is authorized by the FCC to construct cell sites in the New Haven NECMA. The original non-wireline construction permit for the New Haven NECMA was issued by the FCC to the New Haven Cellular Company. Metro Mobile subsequently acquired 100% ownership of this company. Metro Mobile will seek FCC authorization to assign the construction permit to Metro Mobile. (Metro Mobile 1, pp. 2, 8, Exhibit F)
30. All of the proposed cell sites in this application differ from those in the original FCC authorization. None of the original cell sites were determined by Metro Mobile to be satisfactory or reasonably available. (Metro Mobile 2, Q. 30, Q. 34)
31. Contingent upon Council approval, Metro Mobile need only notify the FCC of a modified configuration of cell sites, and the FCC could then issue a new construction authorization for the cell sites. (Metro Mobile 2, Q. 34)
32. The FCC has authorized Metro Mobile to construct cellular systems in the New Haven, Hartford, and Bridgeport NECMA's in Connecticut as well as the Springfield NECMA in Massachusetts. (Metro Mobile 1, p. 7)
33. The proposed New Haven NECMA would operate in conjunction with the planned Hartford, Bridgeport, and Springfield NECMA's. A mobile telephone switching office would be located in Norwalk, Connecticut, to serve as the central control for the system and for

interconnection with SNETS's public switched landline telephone network. A second Mobile telephone switching office is planned for the Hartford-Springfield area. (Metro Mobile 1, p. 17)

34. The process Metro Mobile used in its search for potential cellular tower sites began with the development of a cellular grid for the area to be served. This grid consists of a continuous hexagonal pattern with the center of each hexagon representing a primary cell site location. Where necessary due to uneven terrain, secondary cell sites were considered. (Metro Mobile 1, pp. 22-23)
35. The cellular grid is placed over a state map to determine equal cell spacings. Primary and secondary site designations indicate the degree of coarseness of the grid and have no bearing on their function in the system. (Tr. 2/6/86, p. 79)
36. Primary cell site search areas have a radius of 1.2 miles, and secondary search areas have a 0.6 mile radius. (Metro Mobile 1, pp. 22-23)
37. Metro Mobile based its site selections on such factors as the location of existing towers; elevation; impacts on residential, historic, scenic, or environmentally sensitive areas; possible interference from airports, transmission lines, or broadcast facilities; ease of access; and utility service. Computer modeling was used in the process of site selection. (Metro Mobile 1, pp. 22-23; Metro Mobile 2, Q. 12)
38. The system as originally designed included a 10-20% overlap between cells to assure proper coverage. (Metro Mobile 1, pp. 22-23)

39. Each typical proposed cell site would contain a tower and an associated equipment building. Towers would be of the Rohn SSV heavy series self-supporting lattice type, with surfaces of weathering galvanized steel. (Metro Mobile 1, pp. 9-10)
40. A typical 180' tower as originally proposed would be 22' 9 3/8" wide at the base, tapering to 4' 6 1/4" in width at the top. A 160' tower would be expected to be 4' 6 1/4" at the top and 2' narrower at the base. (Tr. 2/20/86, pp. 102-104; Metro Mobile LF 18)
41. Monopole structures could be used to provide cellular service but would not accommodate future expansion or tower sharing. (Tr. 3/13/86, pp. 251-252; Metro Mobile 2, Q. 18, Q. 25)
42. Metro Mobile approached SNET regarding the possible sharing of SNET's existing cellular and telecommunications towers. SNET would only lease such tower space on condition of owning any cellular equipment used and locating Metro Mobile's antennas at some level below SNET's antenna structure. Therefore Metro Mobile decided not to enter into such arrangements. (Metro Mobile 2, Q. 36)
43. Metro Mobile has offered the use of towers it constructs for use at no charge by local police and fire departments. (Tr. 3/13/86, p. 252)
44. Attached to the top of the proposed towers would be two 11' whip type antennas with 2' mountings on 3' sidearms, thus adding 13' to the total height of the tower structures. Three dual 8' reflectorized antennas with 2' mountings on 6' sidearms would be mounted below the top of the tower. The fiberglass whip antennas would be 2 3/4" in diameter at the base, tapering to 1" in diameter at the top. The whip antennas would be omnidirectional transmit antennas,

while the reflectorized antennas would be receive-only antennas.

(Metro Mobile 1, p. 10; Metro Mobile 2, Q. 32; Tr. 3/13/86, p. 254)

45. With the antennas in place, the proposed towers are designed for Zone A wind loading with $\frac{1}{2}$ " radial icing under Electronic Industries Association (EIA) Standard RS-222-C. All of Connecticut is within EIA wind loading Zone A, requiring towers to withstand 30 P.S.F. wind pressure and average extreme velocities of 87 mph at a minimum. (Metro Mobile 1, p. 10, p. 27; Metro Mobile 1, Exhibit P)
46. At the base of a typical proposed tower would be a single-story electronics building. The exact dimensions on these buildings may vary, but they would not exceed 350 S.F. at any proposed site. These buildings would house receiving, transmitting, switching, processing, performance, and climate control equipment and be a source of stand-by power. (Metro Mobile 2, pp. 1-2; Metro Mobile 1, pp. 10-11)
47. The proposed equipment buildings would be unmanned. Typical tower site buildings would have a 12' wide crushed stone driveway and be surrounded by an 8' chain link fence with 12" security wire on top of the fence. Metro Mobile would plant evergreens to screen the buildings at the proposed sites as necessary. (Metro Mobile 1, p. 11)
48. Underground installation of utility service is not planned at any proposed site. (Metro Mobile 2, Q. 9)
49. The proposed towers at all cell sites would include at least 100 S.F. of reserve load capacity. Metro Mobile plans this reserve

capacity for growth and for future changes in system configuration and cellular equipment. Such extra loading capacity could also be used to accommodate non-cellular uses. Elimination of this loading capacity would reduce the width of a typical tower by two feet on a side, but would not reduce tower height. (Metro Mobile 2, Q. 20; Metro Mobile 3, Q. 57; Metro Mobile LF 16)

50. The FCC requires cellular frequency coordination to avoid interference. With correct frequency selection, antenna placement, shielding, and filtering, no interference problems with the existing SNET system would be expected. (Metro Mobile 1, p. 18; Metro Mobile 2, Q. 35)
51. No interference problem with existing radio or television signals would be expected, although it is possible. (Tr. 3/13/86, pp. 256-257)
52. No microwave uses or microwave transmitting dish antennas are planned for the proposed Metro Mobile cell system. (Tr. 2/6/86, pp. 51-52; p. 76)
53. The United States safety standard for the proposed frequency range of 870-890 Mhz is 2.9 mW/cm^2 , according to State of Connecticut and American National Standards Institute standards. The electromagnetic radio frequency power densities at all proposed sites would be several orders of magnitude below these standards. (Metro Mobile 1, Exhibit Q.)
54. The proposed Beacon Falls tower site is a 100'x100' leased parcel owned by the Naugatuck Valley Beagle Club and located on Rimmon Hill Road. The proposed site is zoned R-2 Residential and is 440' above mean sea level (AMSL). (Metro Mobile 1, Exhibit 1, pp. 4-5)

55. The proposed tower would be 160' with a 13' antenna for a total structure height of 173'. The base of the proposed tower would be 35' east of Rimmon Hill Road. A 15'x22' electronics building would be located within the parcel, which would be surrounded by an 8' security fence. (Metro Mobile 1, Exhibit 1, p. 13; Metro Mobile 2, Q. 37; Metro Mobile 20, Q. 23)
56. The proposed site contains sparse vegetation and is located on the crest of a ridge with a bedrock surface. (Metro Mobile 1, pp. 14-15)
57. The proposed site is located directly across Rimmon Hill Road from 325 acres of Town of Beacon Falls park property, which the town maintains as open space. The proposed tower might limit the options of the Town in its planning for future uses of its property. (Town of Beacon Falls letter, December 17, 1985)
58. Metro Mobile does not know what future uses the Town of Beacon Falls has planned for its park property on Rimmon Hill Road. No representative of Metro Mobile contacted Town of Beacon Falls officials regarding the future use of the Town Park property. (Tr. 1/15/86, 7:00 P.M., pp. 109-110; D'Amico 1)
59. The upper portion of the proposed Beacon Falls tower would be visible from the intersection of Rimmon Hill Road and West Road, as well as from points along Rimmon Hill Road south of the proposed site. The top of the proposed tower would be visible from Briarwood Drive. About 70% to 80% of the tower would be visible from points along West Road west of Rimmon Hill Road. The upper half of the tower would be visible from the area of town property

located around Carrington Pond. (Metro Mobile 20, Exhibit 1; Tr. 3/13/86 pp. 305-308)

60. The proposed site could be relocated 100' further to the east of the presently planned site, but might then require a 180' tower because of a steep slope. The proposed site could be located as much as 400' in a northwesterly direction along Rimmon Hill Road and easterly 100' without an unacceptable loss of elevation, but could result in more visibility from residences. The same would be true of a 200' southerly relocation. (Tr. 3/13/86, p. 8; Metro Mobile 17, Q. 83)
61. Metro Mobile investigated and rejected several other potential tower sites in the Beacon Falls area. An industrial park on Silvermine Road in Seymour was rejected because of poor signal coverage, especially along Route 8, and a lack of available property at the park. The Suwinski property adjacent to the Silvermine Industrial Park was also rejected because of poor signal coverage. A Valley Cable Vision tower in Seymour was rejected due to improper interface with adjacent cells. The William Weed Farm on Rimmon Hill Road was rejected due to excessive distance from the road, a lack of screening, and difficult access. (Metro Mobile 1, Exhibit 1, p. 23; Metro Mobile 19, Q. 97; Tr. 3/13/86, pp. 293-294; Bialecki 5)
62. A Silvermine Road Industrial Park site, using a 180' tower, would leave a gap in coverage of approximately two miles along Route 8 north towards Naugatuck. The coverage from this site would also jeopardize coverage to the northwest along portions of Route 67 and Route 188. (Tr. 3/13/86, 7:00 P.M., pp. 292-294)

63. Sites in Beacon Falls on Wire Hill Road and along an electric transmission line near Naugatuck State Forest, at 550' and 650' elevations respectively, were studied for signal coverage. Coverage at the latter site appeared equivalent to that from the proposed site. No further analysis of these alternate sites was conducted. (Metro Mobile 4, Q. 15, Exhibit 3; Metro Mobile 3, Q. 60, Exhibit 5; Tr. 1/15/86, p. 102; Tr. 3/13/86, p. 232)
64. Metro Mobile proposed an alternate Beacon Falls site at 339 Rimmon Hill Road on property owned by John McGeever. This 100'x100' leased parcel would be 170' west of Rimmon Hill Road. The site is presently in agricultural use. A 15'x21' electronics building would be located on the parcel, which would be surrounded by an 8' security fence. (Metro Mobile 1, Exhibit 2, pp. 5, 14)
65. The visibility of a tower at the alternate McGeever site would be substantially greater because of considerable residential development in the surrounding area. This alternate site is zoned R-2 Residential and is 420' AMSL. The proposed tower height is 160'. Underground installation of utilities at this alternate site would increase site development costs substantially. (Metro Mobile 1, Exhibit 2, pp. 6-8; Metro Mobile 20, Q. 23)
66. The power densities for the proposed and alternate Beacon Falls sites would be $0.0034664 \text{ mW/cm}^2$ for eight channels at 100 watts at the base of the proposed tower, based on conservative assumptions. (Metro Mobile 1, Exhibit Q. p. 2)
67. The proposed Guilford site is a 70'x70' leased parcel located at the south end of Manor Road within an apple orchard owned by B.W. Bishop and Sons, Inc. The proposed site is near a 65' water tank,

- and is zoned Residential. (Metro Mobile 1, Exhibit 3, pp. 7, 18; Metro Mobile 21, Q. 101)
68. Elevation at the proposed Guilford site is 265' AMSL. (Metro Mobile 1, Exhibit 3, p. 10)
69. The proposed Guilford site was located outside of the search area to maximize coverage easterly along Route I-95. This eliminates the need for building another tower along the New Haven NECMA border. (Metro Mobile 3, Q. 59; Tr. 2/6/86, p. 73)
70. On March 10, 1986, Metro Mobile amended its application with a revised Guilford site plan. The northern boundary of the proposed tower site has been relocated 250' further south from nearby residences, and 95' further to the west than originally proposed. Metro Mobile evaluated its coverage from this proposed site, and determined that a shorter tower could provide acceptable coverage. Metro Mobile therefore reduced the height of its proposed Guilford tower from 180' to 140', thus resulting in an overall structure of 153' including antennas. (Metro Mobile 21; Metro Mobile 19, Q. 101)
71. A second water tower, approximately the same height and size as the existing water tower, is planned but not yet scheduled. This water tower may be constructed directly north of the existing water tower, and west of the proposed cellular tower site. (Metro Mobile 12, Q. 100; Tr. 3/13/86, pp. 261-262)
72. Property immediately to the west of the existing water tower is scheduled for future residential development. If the proposed cellular tower site were moved further in that direction, it would

put these homes within the drop-zone radius of the proposed tower.
(Tr. 3/13/86, pp. 261-263)

73. The proposed 140' Guilford tower would not be visible from the intersection of Shore Drive and Woodland Road, the intersection of Shore Drive and Long Hill Road, the intersection of Hahn Road and Long Hill Road, or from points southeast of the proposed site along the west side of Long Hill Road. The proposed tower would be visible from Long Hill Road at a point 1200' south of the intersection of Hahn Road and Long Hill Road. (Metro Mobile 19, Q. 23)
74. The power densities for the proposed Guilford site would be 0.004333 mW/cm^2 for 10 channels at 100w at the base of the proposed tower, based on conservative assumptions. (Metro Mobile 1, Exhibit Q, p. 2)
75. A 15'x21' electronics building would be built north of the proposed Guilford tower within the leased parcel. The entire parcel would be surrounded by an eight foot security fence. Access to the proposed site would be from Manor Road. (Metro Mobile 21, Q. 101)
76. In Hamden Metro Mobile originally proposed to construct a new 180' tower on West Rock Ridge. On February 19, 1986, Metro Mobile revised its application to propose the shared use of an existing 250' tower owned by Henry M. Zachs. An engineering analysis of this tower indicates that with structural modifications it would be capable of supporting the proposed antennas. This existing tower presently supports 19 antennas from the 90' to 244' level. (Metro Mobile 17, Q. 79; Tr. 3/13/86, p. 9)

77. Metro Mobile would strengthen the existing tower at a cost of \$16,200 to support three dual reflectorized receive antennas at the 180' level of the tower, and two whip type transmit antennas at the 170' level. This proposed modification would maintain the present Zone C EIA standard RS-222-C rating for 50 PSF of wind loading with no radial icing, thus exceeding the Connecticut Zone A standard. (Metro Mobile 17, Q. 79)
78. Metro Mobile would construct a single story 15'x21' equipment building at the base of the existing tower, which is already fenced in. (Metro Mobile 17, Q. 79)
79. The site of the existing tower is 450' AMSL, zoned R-1, and contains an equipment building and five existing towers, ranging in height from 80' to 250'. The site is within West Rock Ridge State Park. The permission to build the existing 250' tower was granted in 1978 by the Hamden Zoning Board of Appeals. The Hamden Zoning Board of Appeals placed no restrictions on any future additions to this tower. (Metro Mobile 1, Exhibit 4, p. 14; Metro Mobile 3, Q. 55; Tr. 1/15/86, 2:00 P.M., p. 41; DEP letter of 1/6/86; Town of Hamden LF 1)
80. The DEP opposed the construction of a new tower on West Rock Ridge and asked the Council to consider the use of the existing tower as the most acceptable alternative. (DEP letter of 1/6/86)
81. The power densities at the proposed Hamden site would be 0.0051996 mW/cm² for 12 channels at 100w at the base of the existing tower, based on conservative assumptions. (Metro Mobile 1, Exhibit Q; Tr. 3/13/86, p. 265)

82. Metro Mobile did not investigate any other sites, including any of the tall buildings in New Haven, as an alternative to the proposed consolidation on the 250' existing tower in Hamden. (Tr. 3/13/86, pp. 276-277)
83. Cell splitting could be an alternative to the proposed Hamden cell site. Depending on cell site locations and coverages, cell splitting may allow the use of shorter towers, but as many as three cell sites and three towers might be necessary to provide the same coverage. (Metro Mobile 12, Q. 82)
84. The proposed Milford site is a 118'x180'x140' leased parcel located 900' east of Oronoque Road within an area zoned R-30 Residential. The owner of the proposed site is Clifford T. Guernsey. (Metro Mobile 1, Exhibit 5, pp. 1-3; Tr. 3/13/86, p. 214)
85. The proposed Milford site is 170' AMSL. Access would be from Oronoque Road via an existing farm road. (Metro Mobile 1, Exhibit 5, p. 6; p. 21)
86. Properties adjacent to the proposed Milford site are zoned residential. Milford zoning regulations restrict structures of the height proposed. (Tr. 3/13/86, pp. 170-175, p. 214)
87. The Federal Aviation Administration (FAA) has advised Metro Mobile that the overall structure height of the proposed Milford tower would be limited to 109', including antennas, pending further review. This would mean a tower height of 96'. (Metro Mobile 12, Q. 84; Tr. 3/13/86, pp. 9-10)

88. Because the actual tower height limitation has not been finally decided by the FAA, Metro Mobile has asked the Council for certification of a tower of up to 160' in height, subject to final FAA approval. (Tr. 3/13/86, pp. 9-10, p. 255)
89. If the proposed Milford tower were limited to a total height of 109', it would be visible from many of the homes on Oronoque Road. About half of the time, 50% or less of the tower would be visible. About 20%-30% of the tower would be visible from the entire length Yankee Hollow Road. About 10%-20% of the tower would be visible from 30% of West Rutland Road. (Tr. 3/13/86, pp. 257-258)
90. Metro Mobile considered and rejected several potential tower sites in the Milford area. At Christ the Redeemer Church property on Rutland Road, the applicant was unable to obtain a lease due to prior restrictions on church property. Metro Mobile was unable to negotiate a lease on DiTullio and Sons property located adjacent to the proposed site. The Johnson property adjacent to the proposed site had insufficient land available. (Metro Mobile 1, Exhibit 5, p. 22)
91. Power densities at the proposed Milford site would be 0.0051996 mW/cm² for 12 channels at 100w at the base of the proposed tower, based on conservative assumptions. (Metro Mobile 1, Exhibit Q)
92. The proposed Naugatuck site is a 100'x100' leased parcel owned by Franklin B. Andrew on Andrew Mountain. The proposed site, 870' AMSL, is zoned R-30 and located 700' east of Andrew Mountain Road. (Metro Mobile 1, Exhibit 6, pp. 4-7)
93. The proposed site would be located between two existing towers. One tower, 150' in height, is owned by Richard Morrissey and is

used for amateur radio. The other tower is 110' in height, owned by the lessor of the proposed site, and is inoperative. The proposed cellular tower should not interfere in any way with the amateur radio tower operation. Shared use with amateur radio operators could present access, liability, and compatibility problems. Use of either of these two existing towers by the applicant would not be feasible due to height and structural limitations. Metro Mobile would be willing to remove the existing 110' tower if given the permission of the owner. (Metro Mobile 2, Q. 39; Metro Mobile 12, Q. 87)

94. The proposed Naugatuck tower would be limited by the FAA to a height of 160', a 173' total structure height including antennas. Obstruction marking and lighting would also be required. (Metro Mobile 12, Q. 84; Tr. 3/13/86, p. 10)
95. A 15'x21' equipment building would be located on the proposed site, and the entire parcel would be surrounded by an 8' security fence. (Metro Mobile 1, Exhibit 6, p. 13)
96. The proposed Naugatuck tower would not be visible from the residential area north of the proposed site on Andrew Mountain Road, from the residential area southwest of the proposed site, or the residential area northwest of the proposed site. It would be visible from some houses along Andrew Mountain Road. (Metro Mobile 19, Q. 23)
97. Metro Mobile investigated and rejected several potential tower sites in the Naugatuck area. The WTX television tower in Prospect was rejected due to inadequate signal coverage. The WNVR

tower in Naugatuck was rejected due to low elevation and insufficient signal coverage. The Huntington Hill landfill was rejected because of poor signal coverage and the inability to reach a lease agreement. A location on Krodel Road in Naugatuck was rejected due to inadequate signal coverage and poor adjacent cell site interface. (Metro Mobile 1, Exhibit 6, p. 23)

98. Power densities at the proposed Naugatuck site would be $0.0025998 \text{ mW/cm}^2$ for 6 channels at 100w at the base of the proposed tower, based on conservative assumptions. (Metro Mobile 1, Exhibit Q)
99. In North Branford, Metro Mobile proposed a 180' tower on a leased 70'x70' parcel owned by B.W. Bishop and Sons, Inc., 750' north of Route 17. This proposed site is zoned R-40 Residential, and is 410' AMSL. (Metro Mobile 1, Exhibit 7, pp. 1,5,8)
100. The nearest residence would be located 300' from the proposed North Branford site. This proposed tower could jeopardize the Flynn Pick Your Own Apples operation on adjacent property. There are approximately 500 homes in the vicinity of the proposed North Branford tower. (Metro Mobile 12, Q. 92; Town of North Branford, Exhibit 2; Tr. 2/6/86, pp. 151-152)
101. On March 5, 1986, Metro Mobile amended its application and reduced the height of the proposed Bishop's Orchard North Branford tower to 160'. (Metro Mobile 19, Q. 101)
102. On March 10, 1986, Metro Mobile amended its application and proposed an alternate site on 83 East Reeds Gap Road, North Branford, on property owned by Ronald B. Liska. This alternate site is a 70'x70' leased parcel located 1 mile south of Route 17. (Metro Mobile 19, Q. 101; Metro Mobile 22, Exhibit 7A, pp. 1-3)

103. Metro Mobile would construct a 160' tower, totaling 173' with antennas, on the alternate Liska site, which has an elevation of 590' AMSL. This alternate site is zoned R-80 Residential. Access to this alternate site would be from East Reeds Gap Road via an existing private road. (Metro Mobile 22, Exhibit 7A, pp. 1-3, p. 14)
104. The only residential development in the area of the alternate Liska North Branford site on East Reeds Gap Road is located more than 2000' to the north. (Metro Mobile 22, Exhibit 7A, p. 20)
105. The alternate Liska North Branford site, on East Reeds Gap Road, is Metro Mobile's preferred site for North Branford. (Tr. 3/13/86, p. 10, p. 183)
106. Metro Mobile has filed notice with the FAA regarding the alternate Liska North Branford site. The alternate site is one mile further away from the nearest airport runway than the originally proposed North Branford site. The applicant does not expect the FAA to require this alternate tower to be obstruction marked or lighted. (Metro Mobile 22, p. 5)
107. Metro Mobile evaluated and rejected several other potential tower sites in the North Branford area. The Lowe property adjacent to the Washington Trail was rejected due to proximity to this trail and to Tri Mountain State Park, as well as questionable signal coverage. The New Haven Raccoon Club property off of Route 17 was found to have inadequate signal coverage and insufficient interface with adjacent cells. (Metro Mobile 1, Exhibit 7, p. 24)

108. The proposed Bishops Orchard North Branford site would not be visible from Youngs Apple Orchard Road, Acorn Lane, or from the intersection of Reeds Gap Road West and Route 17. The proposed tower would be visible from certain points along Route 17 in the immediate area. Many homes and some businesses would have a view of the tower. (Metro Mobile 1, Exhibit 7, p. 6; Metro Mobile 19, Q. 23)
109. The alternate Liska North Branford on East Reeds Gap Road site would be visible from Lane Pond Road, but would not be visible from East Reeds Gap Road northeast of the alternate site, or from the intersection of Walnut Lane and Acorn Lane. (Metro Mobile 22, Exhibit 7A, p. 20)
110. Metro Mobile has proposed 15'x21' equipment buildings for both the proposed Bishops Orchard and alternate Liska North Branford sites. Each would be surrounded by an 8' security fence. (Metro Mobile 1, Exhibit 7, p. 14; Metro Mobile 22, Exhibit 7A, p. 12)
111. Power densities at the proposed Bishop Orchard and alternate Liska North Branford site would be $0.0034664 \text{ mW/cm}^2$ for eight channels at 100w at the base of the proposed tower, based on conservative assumptions. (Metro Mobile 1, Exhibit Q)
112. Metro Mobile proposed a tower site in Wallingford in its original application of October 30, 1985. On March 10, 1986, Metro Mobile amended its application by adding two alternate tower sites in Wallingford. On March 13, 1986, Metro Mobile withdrew its original Wallingford site and two alternate Wallingford sites. (Metro Mobile 1, Exhibit 8, p. 1; Metro Mobile 22, p. 6; Tr. 3/13/86, p. 12)

113. The proposed West Haven tower site is an existing 180' self-supporting lattice tower at 24 Rockdale Drive. The proposed site is 150' AMSL. (Metro Mobile 1, Exhibit 9, p. 6)
114. Metro Mobile proposes to lease space on this existing tower, which is located in an area zoned for commercial use. The tower is owned by the Radio Communications Corporation, and is similar to other towers proposed for the Metro Mobile system. (Metro Mobile 1, Exhibit 9, p. 6; Metro Mobile 2, Q. 42)
115. Metro Mobile would lease equipment building space at the proposed West Haven site and therefore would not have to construct its own equipment building. (Metro Mobile 1, Exhibit 9, p. 14)
116. Metro Mobile would place its transmit antennas at the 180' level of the existing tower, creating an overall structure height of 193'. (Metro Mobile 1, Exhibit 9, p. 4A)
117. Utilities are already present at the proposed West Haven site, and access would be via an existing parking lot near the base of the tower. (Metro Mobile 1, Exhibit 9, p. 7)
118. Power densities at the proposed West Haven site would be 0.0038997 mW/cm² for nine channels at 100w at the base of the existing tower, based on conservative assumptions. (Metro Mobile 1, Exhibit Q)
119. The proposed Wolcott tower site would be a 70'x40' leased parcel located 150' northeast of the intersection of East Street and Meriden Road. (Metro Mobile 1, Exhibit 10, p. 4)
120. The proposed site is zoned R-30, contains three single family dwellings and a two car garage, and is owned by Agostinhos Rodrigues. A 120' Department of Transportation (DOT) tower is

located 50' from the proposed site. (Metro Mobile 1, Exhibit 10, p. 4, p. 6; Metro Mobile 2, Q. 44)

121. Metro Mobile proposes to construct a 180' tower, 193' total height with antennas, on the proposed site, which has an elevation of 750' AMSL. (Metro Mobile 1, Exhibit 10, p. 7)
122. There is an 8.3% chance that the proposed tower could fall onto the closest dwelling on the proposed site, which would be 75' from the proposed tower's base. Extra safety factors built into the proposed Wolcott tower would exceed EIA Zone B wind loading and probably Zone C as well. The proposed tower would be designed for $\frac{1}{2}$ " radial icing, but could be redesigned for 1" radial icing at an added cost of approximately \$10,000.00. (Metro Mobile 19, Q. 85)
123. The proposed Wolcott tower would not interfere with the nearby existing DOT tower. Metro Mobile would consider the feasibility of sharing a proposed site with DOT, if requested by that agency in the future. Such consolidation is not now possible, according to the DOT. (Metro Mobile 19, Q. 86)
124. Metro Mobile investigated and rejected several other potential tower sites in the Wolcott area. The owners of the Lake Drive-In on Meriden Road and the Stanley property on Hitchcock Road were not interested in leasing a site. There was no space available at the Kulman Brothers Garage on Meriden Road. The applicant was unable to reach a lease agreement with the owners of property at the Sheet Metal Manufacturing Company on Meriden Road. The DOT notified the applicant that their existing tower is not available for private use. (Metro Mobile, Exhibit 10, p. 24)

125. The proposed Wolcott tower would be visible from points on East Street 300' north of Central Avenue, from Meriden Road approximately midway between Oak Street and Musso View Avenue, from the intersection of Maple Avenue and Lake Drive, and from Central Avenue near the intersection of Pratte Lane. It would not be visible from Meriden Road approximately 500' west of the intersection of Old Mountain Road. (Metro Mobile 19, Q. 23)
126. Access to the proposed Wolcott tower would be from East Street via an improved driveway. A 15'x21' equipment building would be constructed west of the proposed tower. An 8' security fence would surround the proposed site. (Metro Mobile 1, Exhibit 10, p. 13)
127. Power densities at the proposed Wolcott site would be 0.0034664 mW/cm² for eight channels at 100w at the base of the proposed tower, based on conservative assumptions. (Metro Mobile 1, Exhibit Q)
128. The State Historic Preservation Officer indicates that the proposed sites would have no effect on historical, architectural, or archaeological resources listed on or eligible for the National Register of Historic Places. (Metro Mobile 1, Exhibit L)
129. Results of a search of the Natural Diversity Data Base of DEP indicates that except for the originally proposed Hamden site, the proposed tower sites do not present any known conflict to critical natural resources. (Metro Mobile 1, Exhibit K)
130. The overall effects of the various revisions and amendments made by Metro Mobile since the original application would have a small effect on coverage. There would be some changes in some of the internal coverage gaps within the coverage contours. Even without

- a Wallingford site, Metro Mobile would still expect to cover 85%-90% of the total New Haven NECMA. (Tr. 3/13/86, pp. 13-14)
131. Metro Mobile CTS of New Haven, Inc. was assigned the FCC non-wireline authorization for the New Haven NECMA on November 19, 1985, after obtaining the controlling interest in the New Haven Cellular Company, a partnership that initially had been granted FCC permission to construct the system on February 14, 1985. (Metro Mobile 1, Exhibit F, Metro Mobile 2, Q. 30)
132. The parent company of Metro Mobile CTS Inc., is a Texas limited partnership, Metro Mobile CTS. (Tr. 3/13/86, p. 276)
133. Metro Mobile estimates the New Haven NECMA mobile cellular market population for 1980 at 761,337. (Metro Mobile 1, Exhibit D)
134. In 1982, Metro Mobile projected the first year's operation would produce 2,711 customers. Customer numbers were projected to increase to 11,520 customers in 1990 after four years of operation. (Metro Mobile 2, Q. 1)
135. Metro Mobile estimates portable service could comprise 10 percent or more of the present cellular service market. This service is expected to increase as the cost of units decreases, smaller units become commercially available, and public awareness increases. (Metro Mobile 3, Q. 52)
136. All Metro Mobile systems in the United States were designed by Motorola. (Tr. 3/13/86, p. 270)
137. Motorola portable equipment has an effective radiated power of 0.6 watt. Vehicular units of the class one type have a nominal power output of three watts. They use a gain antenna which is in the six to seven watt range. (Tr. 3/13/86, 1:00 P.M., pp. 142-143)

138. Metro Mobile, in testing the signal quality of its operational systems, would place one to two thousand sample telephone calls from various randomly selected points throughout the system. Actual operating experience with cellular systems is limited. Coverage projections have been close to actual coverage. (Tr. 3/13/86, p. 271)
139. When a particular cell's allotted frequencies are filled to capacity, additional antennas cannot be added to the existing tower due to restrictions regarding the number of frequencies used at a particular cell site. (Tr. 3/13/86, pp. 272-273)
140. It is unlikely that an alternate cellular technology, the CD 900 system developed in Germany, would be adopted for use in the United States. (Tr. 3/13/86, pp. 273-274)
141. Metro Mobile projects a \$3 billion aggregate annual service market for the national cellular service industry by 1990, based on 1.2 million subscribers. (Metro Mobile 1, p. 12)
142. Metro Mobile projects its average annual revenue from Connecticut customer service charges by 1990 would be approximately \$20 million. (Metro Mobile 2, Q. 4)
143. Metro Mobile projects its economic breakeven point, based on the experience of nationwide cellular systems similar to the one proposed, could be attained after 2-3 years of initial operation. (Metro Mobile 2, Q. 2)
144. The construction and operation of the proposed cellular system is not expected to incur any public costs and should generate public benefits. (Metro Mobile 1, p. 14)

145. The original estimated total construction cost for the New Haven NECMA includes:

- | | |
|--|-----------------|
| 1) Radio and electronic equipment | \$2,194,000; |
| 2) Tower and antenna | \$ 738,000; |
| 3) Utility service | \$ 61,000; |
| 4) Buildings | \$ 600,000; and |
| 5) Miscellaneous including engineering, design, site preparation, fencing. | \$ 670,000. |

Total construction and equipment \$4,263,000.

(Metro Mobile 1, pp. 24-25)

146. Due to the revisions in several cell sites cost estimates, the total estimated cost to construct the New Haven NECMA has been reduced by \$546,100.00, leaving an estimated total cost of \$3,716.900 excluding the Norwalk M.T.S.O. costs. (Metro Mobile 1, p. 4; Metro Mobile LF 28, Exhibit B)

147. The total cost to equip and construct the Norwalk M.T.S.O. facility is estimated at \$1.2 million to \$1.5 million. (Tr. 3/13/86, pp. 282-283)

148. Withdrawing the Wallingford site from the application reduces the estimated total cost of equipment and construction of the new Haven NECMA system by an estimated \$423,600. (Metro Mobile 28, Exhibit B)

149. The original estimated construction costs for the proposed Beacon Falls (GM) site, included:

- | | |
|---|----------------|
| Radio Equipment | \$327,129; |
| Tower and Antenna | \$ 85,198; |
| Utilities | \$ 6,800; |
| Shelter | \$ 75,000; and |
| Miscellaneous (including site preparation and construction) | \$ 77,050. |

Total equipment and construction \$571,177.

(Metro Mobile 1, Exhibit 1, p. 10)

150. Reducing the Beacon Falls proposed tower height from 180' to 160' would lower the cost of the proposed facility by \$9,000. The total revised cost to construct and equip the facility is estimated at \$562,177.00. (Metro Mobile 28, Exhibit B)
151. The estimated construction cost for the alternative Beacon Falls (GM/A) site, totals \$571,177 and is the same as those listed for the Beacon Falls (GM) primary site. (Metro Mobile 1, Exhibit 2, p. 11)
152. The original estimated construction costs for the proposed

Guilford (HI) site, included:

Radio equipment	\$196,691;
Tower and antenna	\$ 85,198;
Utilities	\$ 6,800;
Shelter	\$ 75,000; and
Miscellaneous (including site preparation and construction)	\$ 77,050.

Total equipment and construction \$440,739.

(Metro Mobile 1, Exhibit 3, p. 13)

153. Reducing the Guilford proposed tower height from 180' to 140' would lower the cost of the proposed facility by \$14,000.00. The total revised cost to construct and equip the facility, excluding marginal additional site development relocation costs, is estimated at \$426,739.00. (Metro Mobile 28, Exhibit B)

154. The original estimated construction cost for the proposed Hamden (G) site included:

Radio equipment	\$271,435;
Tower and antenna	\$115,464;
Utilities	\$ 6,800;
Shelter	\$ 75,000; and
Miscellaneous (including site preparation and construction)	\$ 77,050.

Total equipment and construction \$545,749.

(Metro Mobile 1, Exhibit 4, p. 9)

155. Relocating the facility on the 250' tower adjacent to the original proposed site would require \$16,200 to strengthen the existing tower. The relocation would lower the total costs of the facility by \$73,000. This produces a revised total cost estimate for the proposed facility at \$472,749. (Metro Mobile 28, Exhibit 28)

156. The original estimated construction costs for the proposed Milford (F) site, includes:

Radio equipment	\$333,176;
Tower and antenna	\$ 85,198;
Utilities	\$ 6,800;
Shelter	\$ 75,000; and
Miscellaneous (including site preparation and installation)	\$ 77,050;
Total equipment and construction	\$577,224.

(Metro Mobile 1, Exhibit 5, p. 9)

157. Reducing the Milford proposed tower height from 180' to 160', subject to FAA approval and excluding costs for obstruction marking and lighting, would lower the cost of the proposed facility by \$9,000. The total revised cost to construct and equip the facility is estimated at \$568,224. (Metro Mobile 28, Exhibit B)

158. The original estimated construction cost for the proposed Naugatuck (MN) site, included:

Radio equipment	\$196,691;
Tower and antenna	\$ 85,198;
Utilities	\$ 6,800;
Shelter	\$ 75,000; and
Miscellaneous costs (including site preparation and installation)	\$ 79,050.
Total equipment and construction	\$442,739.

(Metro Mobile 1, Exhibit 6, p. 10)

159. Reducing the Naugatuck proposed tower height from 180' to 160', exclusive of additional cost for obstruction marking and lighting, would lower the costs of the proposed facility by \$8,000. (Metro Mobile 28, Exhibit B)

160. The original estimated construction cost for the proposed primary site located in the Bishop Orchard property in North Branford

(I) included:

Radio equipment	\$178,550;
Tower and antenna	\$ 85,198;
Utilities	\$ 6,800;
Shelter	\$ 75,000; and
Miscellaneous (including site preparation and construction)	\$ 77,050.

Total equipment and construction \$422,598.

(Metro Mobile 1, Exhibit 7, p. 11)

161. Moving the site of the proposed North Branford facility from the Bishop's Orchard property to the East Reeds Gap Road location would reduce the total estimated equipment and construction costs by \$9,000.00.

(Metro Mobile 28, Exhibit B)

162. The estimated construction cost for the proposed West Haven (FG) site, includes:

Radio equipment	\$333,176;
Tower and antenna	\$ 25,900;
Utilities	\$ 6,800; and
Miscellaneous (including site preparation and installation)	\$ 50,000.

Total equipment and construction \$415,876.

(Metro Mobile 1, Exhibit 9, p. 40)

163. The original estimated construction costs for the proposed Wolcott (N) site, include:

Radio equipment	\$178,550;
Tower antenna	\$ 85,198;
Utilities	\$ 6,800;
Shelter	\$ 75,000; and
Miscellaneous (including site preparation and installation)	\$ 77,050.
Total equipment and installation	\$422,598.

(Metro Mobile 1, Exhibit 10, p. 10; Metro Mobile 2, Q. 6)

164. Redesigning the proposed Wolcott tower to withstand 1" radial ice would increase the cost by an estimated \$10,000. (Metro Mobile 19, Exhibit 7, p. 2)

165. The installed costs for monopole and lattice tower structures at 180, 150, and 100 feet are as follows:

	<u>Monopole</u>	<u>Lattice</u>
180'	\$71,000	\$49,000
150'	\$52,000	\$39,000
100'	\$44,000	\$26,000

(Metro Mobile 2, Q. 25)

166. After a lattice tower is initially installed, adding an extension to its height would involve an overall cost exceeding the initial expenditure. (Metro Mobile 3, Q. 68)

167. The total cost for the antenna packages for all nine of the proposed cell sites is \$233,000, an average of \$25,900 each. (Metro Mobile 2, Q. 5)

168. Metro Mobile proposes that lattice towers remain unpainted, thereby presenting a weathered, galvanized steel appearance. Painting the tower at all proposed sites would cost an additional estimated \$18,400. Routine annual maintenance for all sites is estimated at

- \$7,200. Periodic repainting would cost an estimated \$2,400 at each site. (Metro Mobile 2, Q. 7)
169. Estimated costs to underground utility service could range from \$325 for 100' at Naugatuck to \$3,415 for 1050' at Milford. (Metro Mobile 2, Q. 9)
170. The estimated cost of available in-vehicle equipment is approximately \$1,100.00-\$1,500.00 with an additional \$200.00 charged for installation and including the cost of the antenna and cable. The basic monthly service charge, including access and airtime but excluding toll calls, is estimated at start-up at \$150.00. (Metro Mobile 2, Q. 3; Tr. 2/6/86, pp. 166-167)
171. Metro Mobile does not intend to sell equipment at the retail level. (Tr. 3/13/86, pp. 275-276)
172. Metro Mobile would dismantle and remove all of the proposed towers if the proposed cellular service is not provided or ceases to be provided after completion of construction and there is no appropriate application for approval of any new use. (Metro Mobile 2, Q. 31; Tr. 2/6/86, p. 141)
173. Metro Mobile has no legal or verbal agreements, other than those involving the West Haven and Hamden tower sites, with any person or company for the placing of additional antennas on any particular tower. (Tr. 3/13/86, p. 283)