# STATE OF CONNECTICUT

*CONNECTICUT SITING COUNCIL*

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
Web Site: www.state.ct.us/csc/index.htm


September 26, 2002

Stephen J. Humes
LeBoeuf, Lamb, Greene & MacRae
Goodwin Square
225 Asylum Street
Hartford, CT 06103

RE: **EM-T-MOBILE-"UNIVERSAL"-020830** - Omnipoint Facilities Network 2., L.L.C. and Omnipoint Communications, Inc., subsidiaries of T-Mobile USA, Inc. notice of intent to modify existing telecommunications facilities throughout Connecticut.

Dear Attorney Humes:

At a public meeting held on September 25, 2002, the Connecticut Siting Council (Council) acknowledged your notice to modify existing telecommunications facilities throughout Connecticut, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated August 30, 2002. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility sites that would not increase tower heights, extend the boundaries of the tower site, increase noise levels at the tower site boundaries by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundaries to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. These facilities have also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on these towers.

This decision is under the exclusive jurisdiction of the Council. Any additional change to these facilities will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/DM/laf

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# LeBoeuf, Lamb, Greene & MacRae
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A LIMITED LIABILITY PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS

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August 30, 2002

Mortimer A. Gelston, Chairman
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: Notice of Universal Exempt Modification for Enhanced 911 Installations

Dear Chairman Gelston and Members of the Council:

Please be advised that LeBoeuf, Lamb, Greene & MacRae, L.L.P. represents Omnipoint Facilities Network 2, L.L.C., and Omnipoint Communications, Inc., subsidiaries of T-Mobile USA, Inc.(hereinafter T-Mobile) in the above-referenced matter.[1] T-Mobile is the successor to VoiceStream Wireless Corp. by virtue of a recent corporate name change and nationwide re-branding strategy.

Pursuant to the Connecticut Siting Council's determination in Petition No. 533 (see attached as Exhibit A) approving VoiceStream's request for authorization to file a universal exempt modification for the proposed installation of equipment for an Enhanced 911 System at existing facilities, T-Mobile respectfully submits this notice of universal exempt modification. T-Mobile is preparing to install the necessary equipment that would integrate the PCS system with the State of Connecticut's public safety communication control system as required by regulations and orders of the Federal Communications Commission.

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[1] Omnipoint Facilities Network 2, L.L.C. is the T-Mobile subsidiary responsible for wireless infrastructure in Fairfield County and Omnipoint Communications, Inc. is the T-Mobile subsidiary responsible for wireless infrastructure in the rest of Connecticut. This application includes sites in both of these T-Mobile regions.

Please accept this letter as notification, pursuant to R.C.S.A. § 16-50j-73, of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2) of each of the wireless sites identified in the list of sites attached as Exhibit B.

**Background**

T-Mobile operates the "A block" "Wideband PCS" license for the 2-$Gh_z$ PCS frequencies for the Greater New York City area, including the entire State of Connecticut. Widely known until recently as VoiceStream, the T-Mobile wireless service is a voice-data system that is capable of providing to the consumer state-of-the-art communications service with privacy to users, and the convenience of a pager, answering machine, and modem in one phone, and the proposed modification is in support of T-Mobile's PCS network.[2] The public need for "Wideband PCS" facilities has been determined by the FCC to be sufficient to allow the operation of up to six competing companies with overlapping coverage areas.

On June 12, 1996, the FCC adopted a Report and Order that created rules to govern the availability of basic 911 services and the implementation of Enhanced 911 for wireless services. This order and the subsequent rulemaking and regulations established the requirements for carriers to implement various degrees of 911 service over time, including "Phase II" of the process, which will include requirements to phase in technology able to provide the location of 911 callers by latitude and longitude, eventually to within 50 meters. The theory, in simple terms, is that when a wireless caller dials 911 to report an emergency, the response to the caller's emergency and public safety would be enhanced if wireless technology could automatically identify for police, fire and medical personnel the caller's location.

As technology has changed so rapidly since the 1996 Order, the FCC has recognized the need to modify deadlines and requirements through a series of orders. Many factors have delayed the anticipated dates for deployment of the new E911 technologies throughout the wireless industry. Economic problems and vendors' inabilities to supply the necessary components to the technology within the timeframes as well as the complexity of integrating new nodes and vendors into an established network and the lack of standardization have all led to delays. The FCC has accepted revised implementation plans of the major carriers. Each of these carriers, including T-Mobile, "...will be subject to clear, detailed and enforceable plans to phase-in location capability. Taken together, these carriers serve more than 75 percent of wireless subscribers in the United States."[3] The requirements for wireless carriers are spelled out in the Code of Federal Regulations at 47 CFR 20.18 - 911 Service (attached as Exhibit D). While both the FCC and the major wireless carriers realize that many of the deadlines imposed by the regulations are unattainable, provisions are being made to implement systems and upgrade technology as quickly as possible and T-Mobile has made significant progress.[4] The FCC has also recognized that to make the system work, Public Safety Answering Points ("PSAP"s) must

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[2] T-Mobile is the sixth largest national wireless provider in the U.S. with licenses covering approximately 96 percent of the U.S. population and currently serving over seven million customers. T-Mobile is a wholly-owned subsidiary of Duetsche Telekom, AG.

[3] Testimony of Thomas J. Sugrue, hearing on Wireless E911 before the Subcommittee on Communications Committee on Commerce, Science and Transportation, U.S. Senate, October 16, 2001 (attached as Exhibit C).

[4] For more detail on T-Mobile's nationwide E911 Phase II Implementation Plan, please see the fourth semi-annual report filed with the FCC in April, 2002 (attached as Exhibit E).

have the means of covering their costs of receiving and utilizing the 911 information. The FCC rules do not mandate any specific state action nor do they specify how the PSAPs are to establish the proper funding or technology to enable them to do so.

**The T-Mobile Application**

Enhanced Observed Time Difference ("E-OTD") is the only available solution for the Global System for Mobile ("GSM") standard used by T-Mobile's system. E-OTD calculates handset location by comparing when base station signals arrive at the handset and surrounding Location Measurement Units ("LMUs"). For an overview of the T-Mobile E911 system operation, see attached Exhibit F. LMU's are installed at the base stations to measure the time of signal transmission. Arrival times are transferred to a new network mode, the location center, which calculates where the handset had to be located to produce the arrival times. T-Mobile will also install Global Positioning System ("GPS") timing devices on an antenna on the tower at each of its LMUs that will provide timing accuracy and additional network stability.

T-Mobile currently has telecommunication equipment at over 331 wireless antenna sites in Connecticut, including both facilities within the Council's jurisdiction and sites subject only to local municipal zoning. In the interest of public safety and with the intent of establishing a reliable and effective E911 system, T-Mobile believes it benefits everyone involved to expedite the permitting process. The installation of the E911 equipment is a relatively simple task for T-Mobile and creates only minor changes to existing equipment. The external LMU units will be approximately 12" x 9" x 4" in size and can be located within each existing site. Internal LMU units will be mounted on small racks within the existing site enclosures and have no impact on overall site dimensions. (See attached Exhibit G for the description and specifications of the E911 equipment.) The GPS antennas, which synchronize the LMU timing with the GPS satellites, are approximately six inches in diameter and three inches high. They can be magnetically mounted on most existing equipment structures. Engineering will determine the necessary placement of GPS antennas. For antenna sites, special E-OTD measuring antennas, approximately 8 inches high and 1 inch in diameter are required to receive radio transmissions from surrounding BTS sites. Initially, T-Mobile anticipates that each site will need one LMU and one GPS antenna. (See attached Exhibit H for examples of typical E911 antenna installations.) T-Mobile is hopeful that as the technology matures this deployment ratio can be reduced to one E-OTD installation in three or one in five BTS sites. Until then, deployment on each site is required to meet the FCC accuracy requirements.

The planned modifications to T-Mobile's Connecticut facilities fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2) for the following reasons.

1. These proposed modifications will not increase the height of the tower and will not extend the boundaries of the existing compound area. In fact, this equipment is small, minimally intrusive and easily mounted in conjunction with existing equipment. Some of it is applied magnetically.

2. The installation of T-Mobile E911 equipment will not require an extension of the site boundaries.

3. The proposed modification to the facility will not increase the noise levels at the existing facility by six decibels or more. T-Mobile's equipment is self-contained and requires no additional heating, ventilation or cooling equipment.

4. The operation of the additional antennas will not increase the total radio frequency (RF) power density, measured at the site boundary, to a level at or above the applicable standard. As the letter from Adolfo Sanchez, New England RF Engineering Manager for T-Mobile, shows, the impact of the E911 equipment on the cumulative power density for each tower site would be so negligible as to be termed background emission levels.

For the foregoing reasons, T-Mobile respectfully submits that the installation of the E911 equipment described herein at the sites listed in Exhibit B constitutes exempt modifications under R.C.S.A. § 16-50j-72(b)(2) and, therefore, this universal exempt modification should be approved.

Thank you for your consideration of this matter.

Respectfully submitted,

T-MOBILE USA, INC.

By: _____
Its Counsel
Stephen J. Humes
Diane W. Whitney

# Exhibit A

# CSC Decision and Staff Report For Petition No. 533

# STATE OF CONNECTICUT

*CONNECTICUT SITING COUNCIL*

Ten Franklin Square
New Britain, Connecticut 06051
Phone: (860) 827-2935
Fax: (860) 827-2950


**CERTIFIED MAIL**
**RETURN RECEIPT REQUESTED**

December 12, 2001

Stephen J. Humes, Esq.
LeBoeuf, Lamb, Greene & MacRae L.L.P.
Goodwin Square
225 Asylum Street
Hartford, Connecticut 06103

RE: **PETITION NO. 533** - VoiceStream Wireless Corporation petition for a declaratory ruling that the proposed installation of an Enhanced 911 System qualifies as an exempt modification to VoiceStream's existing telecommunications facilities under the Council's jurisdiction.

Dear Attorney Humes:

At a public meeting held on December 11, 2001, the Connecticut Siting Council (Council) considered and ruled that a universal exempt modification request would be appropriate for the proposed installation of equipment for an Enhanced 911 System at existing facilities under the Council's jurisdiction.

Consistent with the petition dated November 29, 2001, any universal exempt modification request filed with the Council should include an exhibit listing each telecommunications site subject to the Council's jurisdiction, and technical drawings and specifications on the specific E911 equipment VoiceStream proposes to install at each site. The proposed modifications must also be consistent with the exception criteria of the Regulations of Connecticut State Agencies Section 16-50j-72 (b).

Enclosed for your information is a copy of the staff report on this project.

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/laf

Enclosure: Staff Report dated December 11, 2001

c: Council Members

# STATE OF CONNECTICUT

*CONNECTICUT SITING COUNCIL*

Ten Franklin Square
New Britain, Connecticut 06051
Phone: (860) 827-2935
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**VoiceStream Wireless Corporation**
**Petition No. 533**
**December 11, 2001**
**Staff Report**

VoiceStream seeks a declaratory ruling from the Council that a universal exempt modification filing is appropriate for the proposed installation of an Enhanced 911 System for existing telecommunications facilities under the Council's jurisdiction. VoiceStream currently has telecommunications equipment at 331 wireless antenna sites in Connecticut.

VoiceStream is not seeking approval to place equipment at any site at this time. If the Council grants VoiceStream's request for declaratory ruling, VoiceStream would file a universal exempt modification request to place an external Location Measurement Unit (LMU), an internal LMU, a GPS antenna, and/or an Enhanced Observed Time Difference (E-OTD) antenna within each existing site, or mounted on the existing structures. The universal exempt modification request would contain an exhibit listing each of the cell sites subject to the Council's jurisdiction, and the proposed equipment to be used at each site with technical drawings and specifications.

VoiceStream contends that the proposed installation of the E-911 equipment would not increase the height of the tower, would not require extension of the site boundaries, would not increase noise levels at the facility by six decibels or more; and would not increase the total radiofrequency power density to a level at or above the applicable standard.

# Exhibit B

## Site List

E - 911 Tower Listing - Connecticut Site Council

| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carriers | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CT01 | x | CT11502A | Andover | Monopole | 104 Bunker Hill Rd | Andover | | 41 | 44 | 16 | 72 | 20 | 59 | 180 | 148 | Y | Nextel | |
| CT01 | x | CT11353C | Ashford/ I-84_1 | Self Support Tower | 36 Janowski Road | Ashford | 6278 | 41 | 57 | 7 | 72 | 11 | 43 | 192 | 151.8 | N | Sprint | 160 |
| CT01 | x | CT11376A | FARMINGTON1/RT10 | Utly Lattice Tower | 376 Deercliff Road | Avon | 6001 | 41 | 46 | 29.9 | 72 | 48 | 2.7 | 560 | 250 | Y | Pinnacle Towers, Inc. | 560 |
| CT01 | x | CT11380C | AVON/RT 177 | Monopole | Farmington Woods Condominium Complex /Redwood Lane | Avon | 6032 | 41 | 46 | 21 | 72 | 52 | 48 | 150 | 106 | N | Paul McGinn | 110 |
| CT01 | x | CT11299D | Beacon Falls/Rt 8 | Self Support Tower | 60 Rice Lane | Beacon Falls | 6403 | 41 | 27 | 20.6 | 73 | 2 | 23.1 | 150 | 140 | N | SBA | |
| CT01 | x | CT11604B | Berlin | Monopole | 1684 Chamberlin Highway | Berlin | | 41 | 35 | 23 | 72 | 48 | 20 | 125 | 105 | Y | Sprint | |
| NY11 | x | CT11110C | Danbury/I-84/X8 | Utly Lattice Tower | 8 Chimney Drive CL&P P# 321 L#1770 | Bethel | 6801 | 41 | 24 | 37.6 | 73 | 24 | 1.22 | 105 | 169 | N | CL&P | 100 |

E - 911 Tower Listing - Connecticut Site Council

| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carrie rs | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CT01 | x | CT11162B | Bluehills/ Jn of Rt-187_1 | Self Support Tower | 1021 Blue Hills Avenue | Bloomfield | 6002 | 41 | 49 | 12.5 | 72 | 41 | 47.3 | 130 | 127 | N | SBA, Charles Laurette | |
| CT01 | x | CT11278A | Bloomfield/Dtwn | Self Support Tower | 28 Brewer Street | Bloomfield | 6002 | 41 | 50 | 6.56 | 72 | 44 | 28.3 | 120 | 107 | N | SPRINT | 110 |
| CT01 | x | CT11313A | Bozrah-2/ Rt 2 | Monopole | 131 Gifford Lane | Bozrah | 6334 | 41 | 33 | 9.32 | 72 | 9 | 3 | 193 | 193 | N | SBA | 191 |
| NY11 | x | CT11014B | Fairfield/ I-95/ X24/ Bla | Self Support Tower | 623 Pine Street | Bridgeport | 6516 | 41 | 9 | 58 | 73 | 13 | 3 | 250 | 180 | N | Radio Communicatio ns | |
| NY11 | x | CT11424B | Trumbull/MP/X49 | Utly Lattice Tower | 280 Oxbrook Dr, CLP #859 | Bridgeport | 6610 | 41 | 13 | 23 | 73 | 13 | 21 | 86 | 92.5 | N | CL&P | 90 |
| NY11 | x | CT11452A | Bridgeport/Connecticut Av | Self Support Tower | 1069 Connecticut Avenue | Bridgeport | 6605 | 41 | 11 | 1 | 73 | 9 | 29 | 130 | 120 | Y | SpectraSite Communicatio ns | 120 |
| CT01 | x | CT11270C | Bristol-1/Rt6 | Utility Lattice Towe | 2 Willis Street | Bristol | 6010 | 41 | 38 | 55 | 72 | 56 | 50 | 160 | 123 | N | CL&P | 158 |

E - 911 Tower Listing - Connecticut Site Council

| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carrie rs | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NY11 | x | CT11201A | Brookfield/ Business Area | Utility Monopole | 20 Vale Road Tower #10247 | Brookfield | 6804 | 41 | 26 | 12 | 73 | 24 | 9 | 100 | 125'8"; 132'4" | N | CL&P | |
| CT01 | O | | Brooklyn | SSL | Valentine Rd | Brooklyn | | 41 | 48 | 57 | 71 | 58 | 37 | 180 | 157 | | DPS | |
| CT01 | X | CT11275C | Simsbury-1/Rt 10 | Monopole | Canton Springs Rd. | Canton | 6019 | 41 | 49 | 22 | 72 | 53 | 42.7 | 140 | 100 | N | Canton Fire Department | 100 |
| CT01 | x | CT11220A | Cheshire/ Rt -10 | Self Support Tower | 751 Higgins Road | Cheshire | 6410 | 41 | 29 | 14.8 | 72 | 55 | 45.3 | 260 | 211 | N | AT&T Long Lines | |
| CT01 | x | CT11236A | Chester/Rt9 | Self Support Tower | 39 Wig Hill Road | Chester | 6412 | 41 | 24 | 14.1 | 72 | 28 | 20.3 | 150 | 108 | N | Crown Atlantic | 108 |
| CT01 | x | CT11249A | Colchester-2-State PD_1 | Self Support Tower | 15 Old Hartford Rd | Colchester | 6415 | 41 | 34 | 44.4 | 72 | 20 | 19.3 | 100 | 97 | N | CTSP | 95 |
| CT01 | O | | Cornwall | SSL | Mohawk Mtn | Cornwall | | 41 | 49 | 16 | 73 | 17 | 52 | 180 | 140 | | DPS | |

E - 911 Tower Listing - Connecticut Site Council

| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carriers | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CT01 | x | CT11059C | RockyHill/ I-91/ X23 | Self Support Tower | 179 Shunpike Road | Cromwell | 6416 | 41 | 37 | 23.8 | 72 | 40 | 44.4 | 170 | 125 | Y | Cromwell | |
| CT01 | x | CT11315C | Plainfield/I-395_1 | Monopole | 246 East Franklin Street | Danielson | 6239 | 41 | 47 | 44 | 71 | 52 | 13 | 157 | 137 | N | SBA | 131 |
| NY11 | x | CT11019B | Darien/ I-95/ Hollow Tree | Utility Lattice Towe | Heights Rd. (CL&P pole) Noroton Heights RR Station | Darien | 6820 | 41 | 4 | 8 | 73 | 29 | 51 | 105 | | N | CL&P Pole 1041 | 17 |
| NY11 | x | CT11290C | Darien/ Dtwn & Rt-1 | Utly Lattice Tower | 3 Mechanic Street | Darien | 6820 | 41 | 4 | 38 | 73 | 28 | 1 | 80 | 125 | N | CL&P | |
| CT01 | x | CT11408A | Deep River / Winthrop Rd | Self Support Tower | 220 Winthrop Road | Deep River | 6417 | 41 | 21 | 57 | 72 | 28 | 29.8 | 180 | 160 | Y | Nextel Communications | 160 |
| CT01 | x | CT11037B | Niantic/ I-95/ Rt 156_1 | Self Support Tower | 93 Roxbury Rd. | East Lyme | 6357 | 41 | 20 | 9 | 72 | 13 | 19 | 170 | 103 | Y | BAM | 100 |
| CT01 | x | CT11039D | EastLyme/ I-95/ X72/ At_1 | Utly Lattice Tower | 269 Flanders Rd.(CL&P tower #1605) | East Lyme | 6333 | 41 | 21 | 43.6 | 72 | 12 | 25.2 | 100 | 97 | N | Northeast Utilities CL&P tower16 | 33 |

E - 911 Tower Listing - Connecticut Site Council

| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carriers | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CT01 | x | CT11330A | East Lyme/ Rt 1_1 | Self Support Tower | 6 Stone Ranch Rd | East Lyme | 6333 | 41 | 21 | 57.1 | 72 | 15 | 58.2 | 140 | 113 | Y | CTSP | 113 |
| NY11 | | CT11243A | Easton-2/Rt59 | Self Support Tower | 275 North St. | Easton | 6612 | 41 | 18 | 59.1 | 73 | 18 | 50.5 | | | N | SBA | |
| CT01 | | CT11292A | Ellington / Rt 30 | Self Support Tower | 101 Burbank Road | Ellington | 6029 | 41 | 56 | 10.5 | 72 | 23 | 7.38 | 180 | | N | Wayne Kemp | |
| CT01 | x | CT11066A | Enfield/ Oliver Rd_1 | Self Support Tower | 4 Oliver Rd | Enfield | 6082 | 41 | 57 | 36 | 72 | 35 | 32.1 | 150 | 115 | N | BANM | |
| NY11 | x | CT11317B | Fairfield/MP/X44&X42 | Utly Lattice Tower | 280 Morehouse Drive (Tower 876 Line 1730) | Fairfield | 6430 | 41 | 12 | 37 | 73 | 15 | 43 | 80 | 95 | Y | CL&P | |
| CT01 | x | CT11135J | West Hartford/ I-84 X42/M | Utility Monopole | 40 Maple Ridge Drive | Farmington | 6032 | 41 | 43 | 5.15 | 72 | 46 | 4.56 | 62 | 77.5 | N | CL&P | 70 |
| CT01 | x | CT11189E | Glastonbury/ Rt-94 & Fern | Self Support Tower | 115 Birch Mountain Road | Glastonbury | 6033 | 41 | 42 | 32.1 | 72 | 28 | 24.4 | 180 | 177.5 | Y | | |

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| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carriers | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CT01 | x | CT11248A | Glastonbury | Monopole | 366 South Three Mile Road | Glastonbury | 6033 | 41 | 41 | 36.9 | 72 | 32 | 50.5 | 150 | 115 | N | BAM | 116 |
| CT01 | x | CT11336A | RT 2/GLASTONBURY/SBA | Self Support Tower | Dickinson Road | Glastonbury | 6025 | 41 | 39 | 21.2 | 72 | 31 | 23.8 | 180 | 177 | Y | SBA Towers, Inc. | 180 |
| CT01 | x | CT11281B | Granby/Rt 20 | Self Support Tower | 15 North Granby Road (Rt. 20) | Granby | 6035 | 41 | 57 | 12.8 | 72 | 47 | 37.7 | 150 | 120 | N | Spectrasite | 120 |
| NY11 | O | | Greenwich | Monopole | Sound View Rd | Greenwich | 6831 | 41 | 1 | 59 | 73 | 34 | 5 | 95 | 107.5 | | CL&P | |
| NY11 | x | CT11070B | CT State Police_2 | Self Support Tower | 150 Butternut Hollow Road (CT State Police Tower) | Greenwich | 6830 | 41 | 5 | 49 | 73 | 38 | 19 | 150 | 130 | Y | CTSP Prop.ID 111142 | 108 |
| NY11 | x | CT11091A | Greenwich - North_2 | Self Support Tower | 1081 North Street | Greenwich | 6831 | 41 | 8 | 22 | 73 | 38 | 32 | 180 | 145 | Y | BAM | 145 |
| CT01 | x | CT11152C | Griswold/ I-395 X85/ BMW | Self Support Tower | 257 Norman Road | Griswold | 6351 | 41 | 36 | 4.62 | 71 | 57 | 14 | 160 | 150 | N | Wayne Kemp | 148 |

E - 911 Tower Listing - Connecticut Site Council

| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carriers | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CT01 | x | CT11233A | Higganum_1 | Monopole | 65 Maple Avenue West | Haddam | 6441 | 41 | 29 | 4.51 | 72 | 34 | 21 | 120 | 100 | N | BANM | |
| CT01 | x/O | CT11404A | Haddam | | Porkorny Rd | Haddam | 6438 | 41 | 26 | 36 | 72 | 34 | 3 | 280 | 125 | | CL&P | |
| CT01 | X | CT11219B | Hamden/ RT 10 | Utly Lattice Tower | 4145 Whitney Avenue T# ST2461, L# 1690 | Hamden | 6518 | 41 | 26 | 54.8 | 72 | 54 | 35.3 | 80 | | N | CL&P | |
| CT01 | x | CT11161D | Hartford/ Jn of Albany_1 | Monopole | 439 Homestead Avenue | Hartford | 6112 | 41 | 47 | 1.39 | 72 | 42 | 13.5 | 140 | 124 | N | Bell Atlantic | 18 |
| CT01 | x | CT11661A | Hartford South2/Frnkln Av | Monopole | 123 Meadow Street | Hartford | 6114 | 41 | 44 | 35.5 | 72 | 40 | 3.22 | 150 | 123 | N | SpectraSite Communicatio ns, Inc. | |
| CT01 | x | CT11358A | Harwinton SNET_1 | Self Support Tower | Wildcat Hill Rd | Harwinton | 6791 | 41 | 45 | 24.9 | 73 | 5 | 42.8 | 100 | 99 | Y | SNET LL | |
| CT01 | O | | Lebanon | SSL | Gates Rd | Lebanon | | 41 | 40 | 58 | 72 | 13 | 2 | 120 | 99.5 | | SNET/SCLP | |

E - 911 Tower Listing - Connecticut Site Council

| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carriers | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CT01 | O | | Ledyard | SSL | 136 Vinegar Hill Rd | Ledyard | | 41 | 25 | 32 | 72 | 3 | 25 | 180 | 127 | | DPS | |
| CT01 | x | CT11150D | Norwich/ I-395 X83 | Self Support Tower | 26 Mell Road | Lisbon | 6351 | 41 | 35 | 28.6 | 72 | 1 | 1.11 | 198 | 197.33 | Y | SBA Towers, Inc. | 195 |
| CT01 | O | | Litchfield | SSL | 452 Bantam Rd | Litchfield | | 41 | 44 | 10 | 73 | 13 | 7 | 180 | 165 | | DPS | |
| CT01 | x | CT11029I | Madison/ I-95/ X61/ Jct_1 | Guyed Tower | 135 New Road | Madison | 6443 | 41 | 17 | 36.4 | 72 | 34 | 42.3 | 190 | 162 | Y | CL&P | |
| CT01 | x | CT11167A | Madison South / Rt 1 | Self Support Tower | 8 Old Route 79 | Madison | 6443 | 41 | 17 | 8.25 | 72 | 36 | 4.72 | 150 | 120 | Y | SpectraSite | 120 |
| CT01 | x | CT11394A | North Madison | Self Support Tower | 864 Opening Hill Road | Madison | 6443 | 41 | 21 | 26.6 | 72 | 38 | 19.6 | 180 | 130 | N | Madison Volunteer Fire Dept. | |
| CT01 | X | CT11377C | Manchester | Monopole | 55 Slater St. | Manchester | 6040 | 41 | 48 | 18 | 72 | 32 | 1 | 155 | 133 | Y | Sprint | |

E - 911 Tower Listing - Connecticut Site Council

| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carrie rs | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CT01 | O | | Mansfield | SSI | NortheaglevilleRd | Mansfield | | 41 | 48 | 48 | 72 | 15 | 34 | 80 | 66.5 | | SNET/SCLP | |
| CT01 | x | CT11251A | East Hampton-2_1 | Monopole | 61-77 North Main St | Marlborough | 6447 | 41 | 37 | 47.2 | 72 | 27 | 59.6 | 180 | 100 | N | BANM | |
| CT01 | x | CT11132B | Meriden/ Jn Rt-691& Ma_1 | Self Support Tower | 11 West Peak Dr | Meriden | 6450 | 41 | 33 | 40.1 | 72 | 50 | 38.9 | 143 | 125 | N | SNET LL | 125 |
| CT01 | x | CT11052E | Middlebury I84 X16&17_1 | Self Support Tower | 100' w of 50 South St, Map 6-6 Parcel 73,Pole23571 | Middlebury | 6762 | 41 | 30 | 48.7 | 73 | 7 | 27.3 | 160 | 125 | N | Department of Public Safety | 120 |
| CT01 | x | CT11309A | Middlefield/Rt 66 | Monopole | 238 Meridan Rd. | Middlefield | 6455 | 41 | 32 | 45.4 | 72 | 42 | 53.7 | 122 | 100 | N | SPRINT | 100 |
| CT01 | x | CT11056J | Middletown/ I-91/ X20/ Pr | Monopole | 290 Preston Avenue | Middletown | 6457 | 41 | 33 | 8 | 72 | 44 | 45 | 150 | 140 | Y | | |
| CT01 | x | CT11057C | Middletown | Rawland | 90 Industrial Park Road | Middletown | 6457 | 41 | 35 | 8.13 | 72 | 42 | 49.9 | 185 | 185 | N | | 185 |

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| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carrie rs | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CT01 | x | CT11234C | Middletown/Rt9 | Monopole | 1969 Old Saybrook Rd. | Middletown | 6457 | 41 | 30 | 41 | 72 | 35 | 36 | 150 | 110 | N | SPRINT | 110 |
| CT01 | x | CT11247E | Middletown | Self Support Tower | 1825 South Main Street | Middletown | 6457 | 41 | 30 | 40.4 | 72 | 40 | 14.6 | 160 | 137 | Y | SBA Towers, Inc. | |
| CT01 | x | CT11018F | Milford/ I-95/ X37/ Jct. | Self Support Tower | 434 Boston Post Road | Milford | 6460 | 41 | 13 | 42.8 | 73 | 4 | 12.5 | 150 | 110 | Y | AT&T Wireless Services | 150 |
| CT01 | x | CT11020D | Milford/ I-95/ X40/ Qua_1 | Monopole | 185 Research Drive | Milford | 6460 | 41 | 14 | 25.4 | 73 | 0 | 42.8 | 185 | 145 | Y | SpectraSite Communicatio ns, Inc. | 27 |
| CT01 | x | CT11082E | Stratford/ MP X 53/ Main | Monopole | 528- Wheelers Farms Road | Milford | 6460 | 41 | 14 | 54.5 | 73 | 4 | 44.6 | 120 | 110 | Y | SPRINT | 125 |
| CT01 | x | CT11229A | Stratford/ Rt 1/ Rt 162 | Monopole | 111 Schoolhouse Rd. | Milford | 6460 | 41 | 12 | 46.3 | 73 | 5 | 5.68 | 150 | 100 | N | SPRINT | |
| CT01 | x | CT11355B | Montville/I-395 | Self Support Tower | 92 Monteville Hill Road - State Police | Montville | 6353 | 41 | 28 | 26.2 | 72 | 6 | 56.8 | 260 | 235 | N | State Police | 200 |

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| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carriers | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CT01 | x | CT11423B | I-84/New Britain | Monopole | North Mountain Road | New Britain | 6053 | 41 | 40 | 35.2 | 72 | 49 | 17.4 | 120 | 108 | N | Sprint | 120 |
| NY11 | X | CT11106A | New Fairfield (AT&T) | Self Support Tower | 37 Titicus Mountain Rd. | New Fairfield | 6812 | 41 | 27 | 3 | 73 | 30 | 58 | 200 | 191.5 | Y | ATC | |
| CT01 | X | CT11086B | New Haven/ WC X59 | Monopole | 240 Baldwin Dive (West Rock state Park) | New Haven | 6578 | 41 | 20 | 43.6 | 72 | 58 | 14.6 | 120 | 95 | N | State of CT | |
| CT01 | X | CT11362B | New Milford/Rt 7/Rt202 | Utility Lattice Towe | 139 Parklane Road, Pole #2069 Line 1813 | New Milford | 6776 | 41 | 36 | 38.2 | 73 | 24 | 16 | 66 | 83'; 76'4" | N | CL&P | 0 |
| NY11 | x | CT11111A | Newtown/ I-84 X9 | Utility Lattice Towe | Newtown Service Center. 20 Barnabus Rd. | Newtown | 6470 | 41 | 25 | 40 | 73 | 20 | 39 | 180 | 150 | Y | Northeast Utilities/ CL&P | |
| NY11 | x | CT11123A | Newtown/ I-84 ex 10 11 | Monopole | 21-23 Berkshire Rd. | Newtown | 6470 | 41 | 24 | 46 | 73 | 16 | 15 | 185 | 145 | N | BAM | |
| NY11 | x | CT11216B | Monroe-2/RT-25 | Self Support Tower | 352 S Main Street (Monroe Landscaping) | Newtown | 6470 | 41 | 21 | 24 | 73 | 15 | 52 | 150 | 140 | Y | SPRINT | |

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| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carrie rs | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CT01 | x | CT11349A | Norfolk SNET_1 | Self Support Tower | 453 Loon Meadow Road | Norfolk | 6058 | 42 | 0 | 32.7 | 73 | 10 | 51.4 | 160 | 123.5 | N | SNET LL | |
| CT01 | x | CT11224A | Guilford-1_1 | Self Support Tower | Bldg 8 Young's Apple Orchard Road | North Branford | 6472 | 41 | 25 | 15.7 | 72 | 44 | 58 | 130 | 138 | N | SNET LL | |
| CT01 | x | CT11398A | North Haven MP X63/64 | Self Support Tower | 2 Dwight Street | North Haven | 6492 | 41 | 25 | 19.1 | 72 | 50 | 50.4 | 150 | 130 | Y | NEXTEL COMMUNICATIONS | 130 |
| CT01 | x | CT11266A | North Stonington-3_1 | Self Support Tower | 118 Wintechog Hill Road | North Stonington | 6359 | 41 | 27 | 35.4 | 71 | 55 | 38.4 | 190 | 120.5 | Y | American Tower Systems | |
| NY11 | X | CT11114D | Norwalk/ South Norwalk | Self Support Tower | 50 Rockland Road | Norwalk | 6854 | 41 | 4 | 55 | 73 | 25 | 51 | 184 | 170 | Y | BAM | 2 |
| NY11 | x | CT11011D | Westport-SNET LL | Utility Monopole | 10 Willard Road (SNET LL) | Norwalk(Westport) | 6855 | 41 | 7 | 42 | 73 | 23 | 26 | 373 | 262 | Y | SNET LL | |
| CT01 | x | CT11263A | Preston-2 SNET_1 | Self Support Tower | 1 Chestnut Street | Norwich | 6360 | 41 | 31 | 32.4 | 72 | 4 | 30.5 | 93 | 80 | N | SNET LL | |

E - 911 Tower Listing - Connecticut Site Council

| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carriers | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CT01 | x | CT11335B | Old Saybrook/RT 9 | Self Support Tower | 156 Bokum Road | Old Saybrook | 6475 | 41 | 19 | 41.2 | 72 | 23 | 19.6 | 200 | | N | Crossroads Communications of Old | 0 |
| CT01 | x | CT11366A | THOMASTON3/RT 8 | Self Support Tower | 297 North Street | Plymouth | 6787 | 41 | 41 | 35.9 | 73 | 3 | 13.3 | 195 | 175 | Y | SBA Towers Inc. | 195 |
| CT01 | x | CT11122B | Prospect/Jct Rt 68 & 69 | Self Support Tower | 15 Kluge Road | Prospect | 6712 | 41 | 28 | 16.4 | 72 | 58 | 18.8 | 190 | 180 | Y | Sprint | |
| CT01 | x | CT11159E | Thomson/ I-395 X98/ | Monopole | 154 Sayle Ave. | Putnam | 6260 | 41 | 55 | 46.1 | 71 | 53 | 10.7 | 180 | | Y | SBA Towers, Inc. | |
| NY11 | x | CT11104A | Redding / Rt 107 | Utly Lattice Tower | 32 Peaceable Street - pole#3261 - line#1470 | Redding | 6896 | 41 | 16 | 7 | 73 | 25 | 51 | 60 | 85'; 78' | N | CL&P | 60 |
| NY11 | x | CT11348A | Ridgefield / Rt 102 | Utility Monopole | 24 Cooperhill Rd CL& P Pole #3294 Line #1470 | Ridgefield | 6977 | 41 | 16 | 30 | 73 | 27 | 56 | 100 | 97 | N | CL&P | 105 |
| CT01 | x | CT11332C | Derby / Rt 34 | Self Support Tower | 2 Progress Avenue | Seymour | 6483 | 41 | 23 | 30.1 | 73 | 3 | 10.3 | 280 | 250 | N | EMAC Communications | 250 |

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| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carrie rs | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NY11 | x | CT11199A | Shelton/ Buddington Rd_1 | Self Support Tower | 219 Nells Rock Road (S.N.E.T) | Shelton | 6484 | 41 | 18 | 15 | 73 | 7 | 6 | 180 | 140 | Y | SNET LL | |
| CT01 | x | CT11124H | Southbury-W/ I-84 | Self Support Tower | 214 Russion Village Road | Southbury | 6488 | 41 | 27 | 7.82 | 73 | 15 | 0.98 | 120 | 100 | N | Sprint | |
| CT01 | x | CT11125B | SouthBury/ I-84 X14 | Self Support Tower | 90 Lakeside Road | Southbury | 6488 | 41 | 27 | 25.9 | 73 | 14 | 2.84 | 180 | 157 | Y | State of Connecticut | |
| CT01 | x | CT11127A | Middlebury/ I-84 X16 | Self Support Tower | 1432 Old Waterbury Rd | Southbury | 6488 | 41 | 29 | 36.8 | 73 | 9 | 54.9 | 230 | 200 | Y | BAM | 180 |
| NY11 | x | CT11007A | Stamford AT&T | Monopole | 168 Catoona Lane | Stamford | 6902 | 41 | 3 | 6 | 73 | 33 | 47 | 300 | 267 | Y | ATT | 29 |
| NY11 | x | CT11334A | Stamford-3/Hope St | Watertank | 652 Glenbrook Road | Stamford | 6907 | 41 | 4 | 31.7 | 73 | 31 | 9.2 | 100 | 93 | N | | |
| NY11 | x | CT11373A | Stamford/MP Exit 35-36 | Self Support Tower | 1590 Newfield Ave. | Stamford | 6905 | 41 | 6 | 46 | 73 | 32 | 20 | 150 | 160 | Y | SpectraSite Communicatio ns, Inc. | 68 |

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| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carriers | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NY11 | x | CT11410A | Stamford / Dwtn | Self Support Tower | 555 Main St. | Stamford | 6901 | 41 | 3 | 13 | 73 | 32 | 6 | 245 | 211.5 | Y | SNET LL | 113 |
| CT01 | O | | Sterling | SSL | Ekonk Hill Rd | Sterling | | 41 | 39 | 49 | 71 | 50 | 58 | 140 | 110 | | DPS | |
| CT01 | x | CT11045D | Stonington/ I-95/ X90/ Je | Self Support Tower | 72 Jerry Brown Road | Stonington | | 41 | 22 | 31.8 | 71 | 57 | 12.2 | 160 | 135 | Y | SBA | |
| CT01 | x | CT11310A | STONINGTON/Rt 1 | Self Support Tower | 811 Stonington Road | Stonington | 6378 | 41 | 21 | 12.3 | 71 | 53 | 13.2 | 150 | 134 | Y | SBA | |
| CT01 | x | CT11442A | Stonington Rt 1 | Self Support Tower | 173 South Broad Street | Stonington | 6489 | 41 | 22 | 8.7 | 71 | 51 | 44.3 | 180 | 140 | N | SBA Towers, Inc. | 140 |
| NY11 | x | CT11426A | Stratford/MP/James Farm | Utly Lattice Tower | 670 Chapel St, CL&P Pole 1321 | Stratford | 6497 | 41 | 14 | 17 | 73 | 7 | 20 | 81 | | N | CL AND P | 0 |
| CT01 | O | | Thompson | SSL | 97 Mt. Hill Rd | Thompson | | 41 | 59 | 11 | 71 | 54 | 52 | 180 | 122 | | DPS | |

E - 911 Tower Listing - Connecticut Site Council

| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carriers | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CT01 | x | CT11536A | Torrington/Rt 202/Rt 183 | Monopole | 1925-1931 East Main Street | Torrington | 6790 | 41 | 49 | 23.7 | 73 | 4 | 36.2 | 153 | 133 | N | SBA | |
| NY11 | x | CT11080B | CL&P at MP | Utly Lattice Tower | Rocky Hill Road (Pole 845) | Trumbull | 6611 | 41 | 13 | 53 | 73 | 11 | 22 | 130 | 136 | N | CL&P Pole 845 | 0 |
| NY11 | x | CT11203B | Trumbull/Rt 108 | Self Support Tower | 637 Video Lane | Trumbull | 6484 | 41 | 16 | 45 | 73 | 11 | 6 | 487 | 242 | N | Hi Ho Tower | |
| CT01 | x | CT11143C | Union/ I-84 X72_1 | Utility Lattice Towe | Bald Hill Road | Union | 6076 | 41 | 58 | 27.2 | 72 | 11 | 55.7 | 180 | 120 | Y | C L & P | 119 |
| CT01 | x | CT11054A | Wallingford/ I-91/ X15/ G | Monopole | 992 Northrop Rd. | Wallingford | 6492 | 41 | 29 | 21.8 | 72 | 46 | 5.79 | 150 | 137.5 | Y | SpetraSite | 130 |
| CT01 | x | CT11287A | Durham/Rt 68 | Self Support Tower | 1605 Durham Road (Rt. 68) | Wallingford | 6492 | 41 | 28 | 10.4 | 72 | 44 | 32 | 160 | 154 | Y | Elizabeth Klein | 0 |
| CT01 | x | CT11654A | Wallingford/Rt5/Rt15 | Monopole | 90 N. Plains Industrial Road | Wallingford | 6492 | 41 | 28 | 50.6 | 72 | 49 | 4.05 | 180 | 148 | N | | |

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| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carrie rs | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CT01 | x | CT11269B | Waterbury/I-84/Mattatuck | Monopole | 150 Mattatuck Heights | Waterbury | 6701 | 41 | 32 | 16.2 | 72 | 59 | 5.94 | 133 | 100'8" | N | Sprint | |
| CT01 | x | CT11392B | Waterbury/ Hill St. | Self Support Tower | 181 Garden Circle | Waterbury | 6704 | 41 | 34 | 11 | 73 | 1 | 1.59 | 280 | 180 | Y | EMAC Communicatio ns, Inc. | 280 |
| CT01 | x | CT11041D | Waterford/ I-95/ X82 | Self Support Tower | 53 Dayton Road | Waterford | 6385 | 41 | 22 | 39.9 | 72 | 8 | 21.9 | 170 | 165 | Y | Bell Atlantic Mobile | |
| CT01 | x | CT11381C | WATERFORD SOUTH/RT 1 | Watertank | 41 Rockridge Road | Waterford | 6385 | 41 | 21 | 16.9 | 72 | 9 | 1.59 | 137 | 117 | Y | Sprint | 120 |
| CT01 | x | CT11473A | Waterford/ Rt 85 /Douglas | Self Support Tower | 45 Fargo Road | Waterford | 6385 | 41 | 23 | 21.6 | 72 | 10 | 17 | 180 | 151 | N | SBA Towers, Inc. | 153 |
| CT01 | O | | West Hartford | SSL | 1030 New Britain Ave | West Hartford | 6107 | 41 | 43 | 52 | 72 | 43 | 29 | 180 | 165 | | ten thirty tower | |
| CT01 | x | CT11735A | West Hartford-1/Ridgwd Dr | Monopole | 7 Berkshire Road | West Hartford | 6107 | 41 | 43 | 51 | 72 | 45 | 13 | 125 | 105 | N | Sprint | |

E - 911 Tower Listing - Connecticut Site Council

| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carrie rs | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CT01 | x | CT11193A | Orange/ Rt-1 | Self Support Tower | 24 Rockdale Road | West Haven | 6516 | 41 | 17 | 26.5 | 72 | 58 | 3.39 | 191 | 110 | Y | NECTEL | |
| CT01 | x | CT11032D | Westbrook/ I-95/ X64/ Ch1 | Monopole | 782 Old Clinton Road, Westbrook, CT 06498 | Westbrook | 6498 | 41 | 17 | 25.8 | 72 | 28 | 7.83 | 160 | 145 | Y | SPRINT | |
| CT01 | x | CT11033E | CT State Police_1 | Monopole | 315 Spencer Plains Rd. | Westbrook | 6498 | 41 | 17 | 32.8 | 72 | 25 | 49.6 | 180 | 135 | N | State of Connecticut | |
| NY11 | x | CT11012B | Westport/ I-95/ X18/ Sher | Monopole | 20 Post Office Lane | Westport | 6880 | 41 | 7 | 24 | 73 | 18 | 49 | 130 | 90 | Y | SNET Mobility | 40 |
| NY11 | x/O | CT11075 | Westport | Monopole | 2 Sunny Lane | Westport | 6880 | 41 | 9 | 46 | 73 | 22 | 24 | 130 | 110 | | BAM | |
| NY11 | x | CT11120C | Westport/I 95 & Rt 33 | Utly Lattice Tower | 45 Ferry Lane (Westport R.R. Station) | Westport | 6880 | 41 | 7 | 8.37 | 73 | 22 | 12.5 | 250 | 168 | N | CL&P | 200 |
| NY11 | x | CT11040D | Wilton /state police | Monopole | 46 Fenwood Lane | Wilton | 6897 | 41 | 10 | 21 | 73 | 26 | 5 | 180 | 120 | Y | Wilton State Police | |

E - 911 Tower Listing - Connecticut Site Council

| region | CSC | Site ID | Site Name | Class | Address | City | Zip | Lat Deg | Lat Min | Lat Sec | Lon Deg | Lon Min | Lon Sec | Struct-ure Height | antenna height | Other Carriers | Owner Name | AGL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NY11 | x | CT11101B | CL & P in Wilton DTWN | Utly Lattice Tower | 15 Old Danbury Rd. Pole #997 Wilton Train Station | Wilton | 6897 | 41 | 11 | 48 | 73 | 25 | 56 | 90 | 98.66 | N | North East Utility/ CL&P | |
| NY11 | x | CT11296A | Wilton/Rt 33 | Utly Lattice Tower | 144 Chestnut Hill Road (Rte-53) | Wilton | | 41 | 10 | 52.6 | 73 | 23 | 35.8 | 100 | 107 | N | CL&P | |
| NY11 | x | CT11414A | Wilton/Cannondale St. | Utly Lattice Tower | Pimpewaug Rd. Pole #21795 Map 46 Lot 21 | Wilton | 6897 | 41 | 12 | 44 | 73 | 25 | 41 | 105 | 112 | N | CL & P (Pole # 21795) | 0 |
| CT01 | x | CT11227D | Windsor I91/ X38 | Self Support Tower | 482 Pigeon Hill Road | Windsor | 6095 | 41 | 51 | 59.9 | 72 | 40 | 29.3 | 162 | 145 | Y | Verizon Wireless | |
| CT01 | x | CT11280A | Windsor Locks/Airport | Monopole | 440 Hayden Station Road | Windsor | 6095 | 0 | 0 | 0 | 0 | 0 | 0 | 85 | 75 | N | | 75 |
| CT01 | x | CT11403A | Wolcott | Self Support Tower | Andrews Rd | Wolcott | 6716 | 41 | 37 | 2 | 73 | 1 | 18 | 80 | 73 | | SNET | |
| CT01 | x | CT11085C | Woodbridge/ WC X58/ Raceb | Utly Lattice Tower | 1114 Johnson Rd, Map 30-03, Block 890 | Woodbridge | 6524 | 41 | 19 | 4.85 | 73 | 0 | 31.6 | 81 | 88 | N | CLP | |

# Exhibit C

# Thomas Sugrue Statement

**TESTIMONY**

**of**

**Thomas J. Sugrue**

**Hearing**

**on**

**Wireless E911**

**Before the**
**Subcommittee on Communications**
**Committee on Commerce, Science, and Transportation**
**United States Senate**

**October 16, 2001**
**10 a.m.**
**253 Dirksen Senate Office Building**
**Washington, D.C.**

## I. Introduction

Good morning, Mr. Chairman and Members of the Subcommittee. Since it was first designated as "9-1-1 Emergency Number Day" in 1987, September 11th has come to symbolize our national reliance on the 911 infrastructure as a lifeline for help in emergencies. That symbol is now more meaningful than ever. The tragic events of September 11, 2001 may have delayed this hearing. But they also forcefully reminded us of the importance of this nation's emergency response system, and of the men and women of our police, fire and medical teams who go into emergencies to bring the rest of us out.

The Commission's wireless Enhanced 911 program ("E911") is one effort to help public safety and other emergency response personnel do their jobs faster and more effectively. I thank you for this opportunity to report to you on the Commission's policies and rules aimed at improving wireless E911 services throughout the Nation and, in particular, at implementing wireless E911. Let me emphasize for the record that the Commission is serious about ensuring the deployment of wireless E911. We recognize all too well that every second delayed in responding to an emergency call is a second lost in critical life-saving efforts. For that reason, the Commission has issued orders with very specific benchmarks and milestones, and we will be keeping a close and watchful eye on compliance with these requirements. We have put the carriers on notice that if they fail to adhere to the orders, they certainly will be subject to our enforcement authority.

## II. Importance of Wireless Enhanced 911 Service

Five years ago, the FCC set October 1, 2001 as the date for wireless carriers to begin the process of deploying a new and vital technology -- the technology to accurately report the location of wireless 911 calls. That process was based on a Consensus Agreement reached in 1996 between the wireless carrier community and the public safety community. The five-year development period, the specified accuracy standards, and the October 1, 2001 start date represented the parties' best estimate of an appropriate timetable and performance standards for development and initial deployment of Enhanced 911. In this regard, I think it is important to note that it was never contemplated that deployment would be a flash-cut process. Under the Commission's rules, it will take four or so years for Phase II to be ubiquitously deployed. For example, with handset-based technologies, the rules require carriers to hit progressively higher penetration levels for location capable handsets, until they achieve 95 percent penetration by the end of 2005. Similarly, with network-based solutions, a carrier is not required to deploy its network-based solution in a particular area until six months after it receives a valid request from the PSAP serving that area, or to complete that deployment until 18 months after such a request. Since the pace of PSAP requests and readiness for Phase II will vary substantially in different communities across the country, deployment on a nationwide basis will be on a graduated, incremental basis.

Since the original schedule was set, both Congress and the Commission have continued to focus on wireless 911 issues and, in my view, taken important steps towards the goal of a nationwide, ubiquitous, reliable E911 system. One of the cornerstones of this progress was the passage in October 1999 of S. 800, the Wireless Communications

and Public Safety Act of 1999. That Act mandated 911 as the universal number for emergency calling and cleared the way for full implementation of wireless E911 by, for example, addressing carrier liability protection and privacy issues. It also directed the Commission to work with all of the stakeholders in their efforts to make wireless 911 a reality.

On the FCC side, we have been actively engaged on E911 matters, particularly in encouraging new location technologies, addressing questions that have arisen in the course of deployment, and removing obstacles to implementation of E911. Among other things, we have:

- Increased the range of options available to carriers by permitting the use of new handset-based technologies, such as network-assisted GPS; and a "so-called" hybrid technology – one that combines elements of both handset- and network-based approaches.
- Adjusted and clarified our rules concerning certain operational issues affecting E911 implementation, for example, by eliminating a requirement that public safety agencies must pay wireless carriers for their costs of complying with the E911 mandate, and instead requiring that each party – carrier and PSAP – pay its own costs for implementation.
- Convened several multi-party meetings – including wireless carriers, technology vendors, equipment manufacturers, and members of the public safety community – to review the state of wireless location technology development.

- Performed extensive outreach, speaking at dozens of conferences and other events aimed at informing and educating interested parties, including state and local public safety agencies and carriers on our E911 rules and policies.

Today, there are more than 120 million wireless subscribers, and most PSAPs now receive about 30 to 50 percent of their 911 calls from wireless phones. This situation places increasing burdens on call takers at 911 call centers, particularly since accurate location information is not now provided for those calls. E911 Phase II is needed more than ever to help police, fire and emergency medical teams locate emergencies more quickly and do their life-saving work more effectively and efficiently.

## III. Current Status of Wireless E911

With the deployment of Phase II E911 now beginning, it is appropriate to ask how far have we come – and how far we have to go?

Frankly, we are disappointed that the process of making wireless E911 a reality is not further along. It goes without saying that there is a new sense of urgency around using mobile phones as important safety devices. There are always challenges involved in deploying any major new technology on a mass market basis for the first time, and wireless location technologies are no different, but we must push forward aggressively with a renewed commitment. To make the promise of wireless E911 a reality, much work remains to be done by PSAPs, equipment vendors, carriers, and government to meet the challenges involved in deploying these lifesaving technologies.

While we at the Commission are dissatisfied with the progress we have made thus far, we should recognize that some progress has been made. On the technology and

manufacturing front, location technologies have been developed and, while none is perfect, a number are now available or on the way that will locate wireless 911 calls accurately and reliably, consistent with the goals of the Commission's E911 rules. Under Phase II, the location of 911 calls will be reported in most instances with an accuracy of 100 meters or less. Network equipment and handsets with location capability are now being manufactured and sold to meet and exceed this benchmark. Although the development and delivery of some of this equipment lags behind what we originally contemplated, the equipment is now in production. We expect near-term delays in E911 equipment and technology needed by wireless carriers to be resolved soon in most cases.

On the public safety front, this community also has made substantial strides toward being able to receive and use wireless E911 location information. Many states have adopted legislation to provide funds to upgrade 911 dispatcher work stations with new technology, such as mapping software. Although relatively few 911 PSAPs apparently are currently ready to receive Phase II data, or have requested Phase II from carriers, they serve communities that would benefit from E911. In addition, many PSAPs and other public safety organizations have been active in developing and testing upgraded systems needed for Phase II. APCO's Project Locate is one example of the public safety community's efforts to solve the problems of integrating Phase II with existing E911 systems.

And on the carrier front, substantial progress in deploying Phase II has been made, though, again, efforts to reach full compliance must be redoubled. In short, carriers have made strides but not quickly enough. On October 5, the Commission announced decisions addressing requests from national wireless carriers and one public

safety agency regarding the deployment of Phase II. The Commission accepted, with conditions and certain modifications, the revised implementation plans of five major national wireless carriers – Nextel, Sprint, Verizon and the GSM portion of the AT&T Wireless and Cingular networks. Each of those carriers, in addition to the sixth national wireless carrier, VoiceStream, the subject of a Commission order last year, will be subject to clear, detailed, and enforceable plans to phase-in location capability. Taken together, these carriers serve more than 75 percent of wireless subscribers in the United States.

It bears emphasizing that these plans permit only limited, temporary departures from the Phase II rules. All carriers are required to achieve full compliance with the accuracy and reliability requirements in the rules. The compliance plans involve only modifications of the deployment schedule or temporary delays in meeting the accuracy standard, rather than any kind of a wholesale lifting of the rules. Under the plans, with limited exceptions, these major carriers will be required to be providing Phase II information to public safety answering points next year and to honor all valid PSAP requests by the end of the year. Under the plans, these carriers will achieve complete deployment of Phase II, in full compliance with the Commission's accuracy standards. This will occur in all areas across the nation where 911 call centers are ready and able to use this information, by the end dates in the existing Commission rules, that is, no later than December 31, 2005.

While accepting the plans means carriers will not be required to meet our previous October 1, 2001 benchmark, the Commission believes that these plans are the best way to move rapidly to full implementation of accurate and reliable location

capability for E911 calling. We examined each carrier request carefully, with the continuing objective of implementing Phase II as soon as possible and granting relief only when justified and necessary, and only to the extent the carrier presented a specific, focused, limited plan leading to full compliance.

Specifically, the Commission has taken the following actions, approving plans to implement E911 Phase II for five nationwide wireless carriers:

- With respect to three companies (Nextel, Sprint, and Verizon) that had met FCC requirements to provide a clear, detailed and enforceable plan to phase-in its ALI capabilities, the Commission agreed to take into account the companies' showings about equipment availability, and allow them to implement Phase II E911 according to a modified schedule for some of the initial 2001 and 2002 deployment milestones. It said it would strictly adhere to enforcement of these modified plans for meeting these alternative intermediate milestones and for completing E911 deployment by 2005.

- With respect to two companies, (AT&T and Cingular) that submitted E911 compliance plans for the GSM portion of their wireless networks, the Commission provided similar relief, also conditioned on strict FCC enforcement of their new schedules.

- The Commission noted that while AT&T and Cingular had submitted compliance plans for the TDMA portion of their networks, the timing of those submissions did not permit Commission consideration. Accordingly, discussions have been initiated between these carriers and FCC Enforcement

Bureau staff concerning possible consent decrees with the Commission to resolve this compliance issue.

The Commission stated that it expects wireless carriers to make E911 a corporate priority and to work aggressively to implement Phase II and to achieve full compliance as soon as possible. To monitor and enforce the compliance plans, the Commission required that each carrier file Quarterly Reports on its E911 deployment beginning February 1, 2002 through February 1, 2006, including reporting whether the carrier has met the terms of its compliance plan. The Commission indicated that any carrier failing to comply with its plan, or applicable provisions of the E911 rules, will be referred to the Commission's Enforcement Bureau.

We know that smaller and rural carriers may face special challenges in deploying Phase II location technology. We have received many waiver requests from smaller wireless carriers, and it is likely that others of the 1000 or so local and regional carriers face similar questions and difficulties. However, it is also clear that wireless E911 has great potential to save lives in rural areas and simply giving smaller or rural carriers a "pass" or indefinite extension for deploying these technologies would not serve the public interest. For these reasons, the Commission established a brief additional period, until November 30, for those smaller carriers to file requests for relief, if they have not already done so. The FCC will evaluate these filings to decide how best to address E911 implementation by these carriers as soon as possible. During this extended filing and evaluation period, the Commission will not initiate enforcement action under the Phase II rules against these carriers.

We at the FCC recognize the importance of Phase II deployment to public safety. I want to assure the Subcommittee that we are committed to taking whatever steps are necessary to ensure that Phase II proceeds to full compliance as soon as possible. To that end, the Commission took other steps to help clear the way for Phase II deployment:

- In response to a request by the City of Richardson, Texas, the Commission amended its rules to clarify the steps that 911 call centers should take to make a valid request for E911 service; and
- The Commission indicated it would conduct an ongoing inquiry on E911 technical issues, including technology standards issues, development of hardware and software, and supply conditions.

What, then is the bottom line for wireless E911? In important ways, Phase II will be deployed largely according to the schedule we had planned. Sprint announced on October 1 the offering of handsets with Assisted-GPS location technology. Other wireless carriers will also begin providing location-capable handsets and network equipment soon, and I expect customers, in many areas where PSAPs are ready to use this location information, will begin to shop for carriers and handsets that include this important safety feature. Under the approved plans, all the nationwide carriers will have completed implementation of Phase II by the end of the year 2005, as our rules provide. By that time, I also expect that public safety organizations will have made substantial progress in actually using wireless E911 location information to find people in emergencies in communities across America.

Because of the localized nature of 911 service, the number of different transmission standards in the U.S., and the number of parties who must all do their part,

this implementation process will be complex. It will, for example, involve several location technologies that are deployed on schedules that vary for different carriers and different communities. Small, rural carriers may face circumstances that warrant special consideration. Successful deployment will certainly require continued FCC oversight to ensure that carriers live up to their responsibilities and achieve full compliance with the Phase II requirements.

I am reassured by factual information indicating that wireless location technology is available, is being deployed in networks and handsets, and is capable of accurately locating 911 callers. As deployment proceeds, I expect that technology and system-wide performance will improve. I also expect that, as customers increasingly understand how location capability makes their lives safer, they will insist on having it available. They will come to rely on automatic wireless location in the same way that they rely on air bags and seatbelts in their cars. I am confident that the future of this technology is strong, once it is actually deployed and this "virtuous cycle" begins to kick in. But to get to that future, all of us involved in this process will have to redouble our efforts to see that the promise of this life-saving technology is fulfilled.

## IV. Conclusion

To sum up, the beginning of E911 Phase II deployment is now underway. Working with the public safety community, the carriers, their suppliers, Congress and other governmental agencies, the FCC will continue its efforts to ensure that the E911 rollout process continues as rapidly as possible, so that by "9-1-1 Day" in the year 2005

we will be able to report that full deployment, as required by the Phase II rules, has been achieved on the scale envisioned by the Commission and by the Congress.

I would like to thank the Subcommittee for this opportunity to provide information on the Commission's wireless E911 program. I look forward to updating this information as wireless E911 advances and to answering any of your questions.

# Exhibit D

# FCC's E911 Regulations

U.S.C. 201, 202, 206, 207, 208, 209, 216, 217, 223, 225, 226, 227, 228; part 68 of this chapter, 47 CFR part 68; and §§1.701–1.748, and 1.815 of this chapter, 47 CFR 1.701–1.748, 1.815.

(b) Commercial mobile radio service providers are not required to:

(1) File with the Commission copies of contracts entered into with other carriers or comply with other reporting requirements, or with §§1.781 through 1.814 and 43.21 of this chapter; except that commercial radio service providers that offer broadband service, as described in §1.7001(a) or mobile telephony are required to file reports pursuant to §§1.7000 and 43.11 of this chapter to the extent that they meet the thresholds as set out in §§1.7001(b) and 43.11(a) of this chapter. For purposes of this section *mobile, telephony* is defined as real-time, two-way switched voice service that is interconnected with the public switched network utilizing an in-network switching facility that enables the provider to reuse frequencies and accomplish seamless handoff of subscriber calls.

(2) Seek authority for interlocking directors (section 212 of the Communications Act);

(3) Submit applications for new facilities or discontinuance of existing facilities (section 214 of the Communications Act).

(c) Commercial mobile radio service providers shall not file tariffs for international and interstate service to their customers, interstate access service, or international and interstate operator service. Sections 1.771 through 1.773 and part 61 of this chapter are not applicable to international and interstate services provided by commercial mobile radio service providers. Commercial mobile radio service providers shall cancel tariffs for international and interstate service to their customers, interstate access service, and international and interstate operator service.

(d) Except as specified as in paragraphs (d)(1) and (2), nothing in this section shall be construed to modify the Commission's rules and policies on the provision of international service under part 63 of this chapter.

(1) Notwithstanding the provisions of §63.21(c) of this chapter, a commercial mobile radio service provider is not required to comply with §42.10 of this chapter.

(2) A commercial mobile radio service (CMRS) provider that is classified as dominant under §63.10 of this chapter due to an affiliation with a foreign carrier is required to comply with §42.11 of this chapter if the affiliated foreign carrier collects settlement payments from U.S. carriers for terminating U.S. international switched traffic at the foreign end of the route. Such a CMRS provider is not required to comply with §42.11, however, if it provides service on the affiliated route solely through the resale of an unaffiliated facilities-based provider's international switched services.

(3) For purposes of paragraphs (d)(1) and (2) of this section, *affiliated* and *foreign carrier* are defined in §63.09 of this Chapter.

(e) For obligations of commercial mobile radio service providers to provide local number portability, see §52.1 of this chapter.

[59 FR 18495, Apr. 19, 1994, as amended at 61 FR 38637, July 25, 1996; 63 FR 43040, Aug. 11, 1998; 65 FR 19685, Apr. 12, 2000; 65 FR 24654, Apr. 27, 2000; 66 FR 16879, Mar. 28, 2001]

### §20.18 911 Service.

(a) *Scope of section.* The following requirements are only applicable to Broadband Personal Communications Services (part 24, subpart E of this chapter), Cellular Radio Telephone Service (part 22, subpart H of this chapter), and Geographic Area Specialized Mobile Radio Services and Incumbent Wide Area SMR Licensees in the 800 MHz and 900 MHz bands (included in part 90, subpart S of this chapter). In addition, service providers in these enumerated services are subject to the following requirements solely to the extent that they offer real-time, two way switched voice service that is interconnected with the public switched network and utilize an in-network switching facility which enables the provider to reuse frequencies and accomplish seamless hand-offs of subscriber calls.

(b) *Basic 911 Service.* Licensees subject to this section must transmit all wireless 911 calls without respect to their call validation process to a Public

Safety Answering Point, provided that "all wireless 911 calls" is defined as "any call initiated by a wireless user dialing 911 on a phone using a compliant radio frequency protocol of the serving carrier."

(c) *TTY Access to 911 Services.* Licensees subject to this section must be capable of transmitting 911 calls from individuals with speech or hearing disabilities through means other than mobile radio handsets, *e.g.*, through the use of Text Telephone Devices (TTY).

NOTE TO PARAGRAPH (c): Operators of digital wireless systems must begin complying with the provisions of this paragraph on or before June 30, 2002.

(d) *Phase I enhanced 911 services.* (1) As of April 1, 1998, or within six months of a request by the designated Public Safety Answering Point as set forth in paragraph (j) of this section, whichever is later, licensees subject to this section must provide the telephone number of the originator of a 911 call and the location of the cell site or base station receiving a 911 call from any mobile handset accessing their systems to the designated Public Safety Answering Point through the use of ANI and Pseudo-ANI.

(2) When the directory number of the handset used to originate a 911 call is not available to the serving carrier, such carrier's obligations under the paragraph (d)(1) extend only to delivering 911 calls and available calling party information to the designated Public Safety Answering Point.

NOTE TO PARAGRAPH (d): With respect to 911 calls accessing their systems through the use of TTYs, licensees subject to this section must comply with the requirements in paragraphs (d)(1) and (d)(2) of this section, as to calls made using a digital wireless system, as of October 1, 1998.

(e) *Phase II enhanced 911 service.* Licensees subject to this section must provide to the designated Public Safety Answering Point Phase II enhanced 911 service, *i.e.*, the location of all 911 calls by longitude and latitude in conformance with Phase II accuracy requirements (*see* paragraph (h) of this section).

(f) *Phase-in for network-based location technologies.* Licensees subject to this section who employ a network-based location technology shall provide Phase II 911 enhanced service to at least 50 percent of their coverage area or 50 percent of their population beginning October 1, 2001, or within 6 months of a PSAP request, whichever is later; and to 100 percent of their coverage area or 100 percent of their population within 18 months of such a request or by October 1, 2002, whichever is later.

(g) *Phase-in for handset-based location technologies.* Licensees subject to this section who employ a handset-based location technology may phase in deployment of Phase II enhanced 911 service, subject to the following requirements:

(1) Without respect to any PSAP request for deployment of Phase II 911 enhanced service, the licensee shall:

(i) Begin selling and activating location-capable handsets no later than October 1, 2001;

(ii) Ensure that at least 25 percent of all new handsets activated are location-capable no later than December 31, 2001;

(iii) Ensure that at least 50 percent of all new handsets activated are location-capable no later than June 30, 2002; and

(iv) Ensure that 100 percent of all new digital handsets activated are location-capable no later than December 31, 2002, and thereafter.

(v) By December 31, 2005, achieve 95 percent penetration of location-capable handsets among its subscribers.

(2) Once a PSAP request is received, the licensee shall, in the area served by the PSAP, within six months or by October 1, 2001, whichever is later:

(i) Install any hardware and/or software in the CMRS network and/or other fixed infrastructure, as needed, to enable the provision of Phase II enhanced 911 service; and

(ii) Begin delivering Phase II enhanced 911 service to the PSAP.

(3) For all 911 calls from portable or mobile phones that do not contain the hardware and/or software needed to enable the licensee to provide Phase II enhanced 911 service, the licensee shall, after a PSAP request is received, support, in the area served by the PSAP, Phase I location for 911 calls or other

available best practice method of providing the location of the portable or mobile phone to the PSAP.

(4) Licensees employing handset-based location technologies shall ensure that location-capable portable or mobile phones shall conform to industry interoperability standards designed to enable the location of such phones by multiple licensees.

(h) *Phase II accuracy.* Licensees subject to this section shall comply with the following standards for Phase II location accuracy and reliability:

(1) For network-based technologies: 100 meters for 67 percent of calls, 300 meters for 95 percent of calls;

(2) For handset-based technologies: 50 meters for 67 percent of calls, 150 meters for 95 percent of calls.

(3) For the remaining 5 percent of calls, location attempts must be made and a location estimate for each call must be provided to the appropriate PSAP.

(i) *Reports on Phase II plans.* Licensees subject to this section shall report to the Commission their plans for implementing Phase II enhanced 911 service, including the location-determination technology they plan to employ and the procedure they intend to use to verify conformance with the Phase II accuracy requirements by November 9, 2000. Licensees are required to update these plans within thirty days of the adoption of any change. These reports and updates may be filed electronically in a manner to be designated by the Commission.

(j) *Conditions for enhanced 911 services.* The requirements set forth in paragraphs (d) through (h) of this section shall be applicable only if the administrator of the designated Public Safety Answering Point has requested the services required under those paragraphs and is capable of receiving and utilizing the data elements associated with the service, and a mechanism for recovering the Public Safety Answering Point's costs of the enhanced 911 service is in place.

(k) *Dispatch service.* A service provider covered by this section who offers dispatch service to customers may meet the requirements of this section with respect to customers who utilize dispatch service either by complying with the requirements set forth in paragraphs (b) through (e) of this section, or by routing the customer's emergency calls through a dispatcher. If the service provider chooses the latter alternative, it must make every reasonable effort to explicitly notify its current and potential dispatch customers and their users that they are not able to directly reach a PSAP by calling 911 and that, in the event of an emergency, the dispatcher should be contacted.

[63 FR 2637, Jan. 16, 1998, as amended at 64 FR 60130, Nov. 4, 1999; 64 FR 72956, Dec. 29, 1999; 65 FR 58661, Oct. 2, 2000; 65 FR 82295, Dec. 28, 2000]

### § 20.20 Conditions applicable to provision of CMRS service by incumbent Local Exchange Carriers.

(a) *Separate affiliate.* An incumbent LEC providing in-region broadband CMRS shall provide such services through an affiliate that satisfies the following requirements:

(1) The affiliate shall maintain separate books of account from its affiliated incumbent LEC. Nothing in this section requires the affiliate to maintain separate books of account that comply with part 32 of this chapter;

(2) The affiliate shall not jointly own transmission or switching facilities with its affiliated incumbent LEC that the affiliated incumbent LEC uses for the provision of local exchange service in the same in-region market. Nothing in this section prohibits the affiliate from sharing personnel or other resources or assets with its affiliated incumbent LEC; and

(3) The affiliate shall acquire any services from its affiliated incumbent LEC for which the affiliated incumbent LEC is required to file a tariff at tariffed rates, terms, and conditions. Other transactions between the affiliate and the incumbent LEC for services that are not acquired pursuant to tariff must be reduced to writing and must be made on a compensatory, arm's length basis. All transactions between the incumbent LEC and the affiliate are subject to part 32 of this chapter, including the affiliate transaction rules. Nothing in this section shall prohibit the affiliate from acquiring any

# Exhibit E

# T-Mobile's Latest Semi-Annual Report to the FCC

**Before the**
**FEDERAL COMMUNICATIONS COMMISSION**
**Washington, D.C. 20554**

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| In the Matter of | ) | |
| | ) | |
| Revision of the Commission's | ) | CC Docket No. 94-102 |
| Rules To Ensure Compatibility | ) | |
| With Enhanced 911 Emergency | ) | |
| Calling Systems | ) | |

# VOICESTREAM WIRELESS CORPORATION APRIL 2002 SEMI-ANNUAL REPORT ON E911 PHASE II IMPLEMENTATION PLAN


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*April 1, 2002*

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# VOICESTREAM WIRELESS CORPORATION FOURTH SEMI-ANNUAL REPORT ON E911 PHASE II IMPLEMENTATION PLAN

VoiceStream Wireless Corporation (VoiceStream),[1] pursuant to the *Fourth Memorandum Opinion and Order* issued in this proceeding,[2] submits this Fourth Semi-Annual Report regarding its deployment of Enhanced 911 (E911), including Network Software Solution (NSS) and Enhanced Observed Time Difference of arrival (E-OTD) technologies.

## I. SUMMARY

VoiceStream has begun actual deployment of Phase II location identification, having installed the necessary hardware and software for its Phase II NSS solution in its

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1 VoiceStream, combined with PowerTel, Inc., is the sixth largest national wireless provider in the U.S. with licenses covering approximately 96 percent of the U.S. population and currently serving over seven million customers. VoiceStream and PowerTel are wholly-owned subsidiaries of Deutsche Telekom, AG and are part of its T-Mobile wireless division. Both VoiceStream and PowerTel are, however, operated together and are referred to in this request as "VoiceStream."

2 *See Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, Fourth Memorandum Opinion and Order, 15 FCC Rcd 17442, 17464 (¶ 67) (2000) ("*Fourth Memorandum Opinion & Order*").

Ericsson switches in Rhode Island.[3] VoiceStream is currently also in the process of installing the necessary hardware and software for its Phase II NSS solution in its Dallas, TX (Denton County) area Nortel switches and its Rhode Island Ericsson switches. VoiceStream's first office applications (FOA) of its Phase II NSS solution for its Nortel and Ericsson switches will begin in mid-April. The FOA for Phase II NSS for Nokia, which will take place in Harris County (Houston) Texas, should begin by the end of May. Full-scale commercial deployments of Phase II NSS for VoiceStream's Ericsson switches should be underway by mid-June, for its Nortel switches by the end of June, and for its Nokia systems by mid-July. VoiceStream's nationwide roll-out of Phase II NSS is on schedule to be completed by the end of July 2002 for all but two of its markets, without regard to a valid PSAP request, and will provide Phase II location identification, for all handsets, accurate to within 1000 meters, 67 percent of the time, as VoiceStream stated in its *Amended Request for Limited Modification* of its E911 Waiver.[4]

With respect to the E-OTD portion of its Phase II implementation, that continues to progress toward actual deployment as well, although this progress continues to be slower than VoiceStream would like. Much of the equipment used and installed for the NSS solution will also be used for E-OTD. Of the additional equipment necessary for E-OTD, VoiceStream has received in its lab one of two pieces of Ericsson equipment, with

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[3] For the reasons stated at n.39, *infra,* VoiceStream has decided to deploy its Ericsson first office application (FOA) in Rhode Island, not Washington, DC as had been previously reported to the Commission.

[4] VoiceStream Wireless Corporation Amended Request for Limited Modification of E911 Phase II Implementation Plan, CC Docket No. 94-102 (filed Feb. 28, 2002) ("*Amended Request for Limited Modification*"). As VoiceStream described therein, portions of the New York and Philadelphia MTAs require an NSS interworking solution that will be available by the end of 2002. *See also, infra,* p. 22.

the second piece due later this month. The commercial version of Nokia's remaining software is due in mid-April, and Nortel's remaining commercial equipment should arrive in May and June 2002. E-OTD FOAs will begin in early June for its Nokia switches, and by the end of June for its Nortel and Ericsson switches. VoiceStream currently expects to have completed its E-OTD FOAs and begun its commercial deployments for other PSAPs with valid requests in July 2002 for Nokia, and in August 2002 for Ericsson and Nortel.

VoiceStream is deploying its network infrastructure for NSS and E-OTD and will be approving E-OTD-capable handsets for commercial distribution as quickly as the commercial technology is made available by VoiceStream's infrastructure and handset vendors. In the case of the network infrastructure, VoiceStream's situation is not significantly different from the rest of the U.S. GSM operators, all of whom are relying on the same infrastructure vendors to produce network equipment. Moreover, the entire GSM platform has made substantial advances in developing its Phase II E911 solution over the past eighteen months, and it is substantially closing the gap that developed because, as the Commission has recognized, equipment manufacturers focused initially on developing Phase II E911 for the other air interfaces that were more commonly used in the United States.

Further, VoiceStream's handset vendors Motorola and Nokia have delivered E-OTD capable handsets for testing to VoiceStream. These handsets must be tested on live E-OTD networks before they can be approved for commercial distribution, in order to ensure that they perform as intended. Assuming the required E-OTD network elements are delivered on a timely basis, VoiceStream anticipates approving for

commercial release its first E-OTD-capable handset by September 1, 2002, and to approve two additional handset models by October 2, 2002.

In addition, the results of VoiceStream's E-OTD trial in Washington, DC show that the GSM carriers are on the right track with their E-OTD solution. VoiceStream's trial results indicate that the performance over the greater Washington area will be within the Commission's applicable standard of 100 meters, 67 percent of the time. Moreover, the trial has provided VoiceStream and its vendors with valuable lessons on how overall E-OTD accuracy can continue to be improved. These test results are particularly important to VoiceStream because the location algorithms tested in the D.C. trial are the same as those that will be utilized by Nortel and Ericsson, and thus give VoiceStream confidence that, with appropriate field engineering adjustments as necessary, it can meet the Commission's accuracy requirements. In addition, VoiceStream's Bellevue, WA trial has produced results for NSS well within the Commission's 1000 meter accuracy requirement.

Moreover, worldwide commitment to the E-OTD solution continues to increase, which by itself creates a virtuous investment cycle that will help fuel continued improvements. Manufacturers such as Mitsubishi, NEC, Quanta, RIM, Samsung, Sendo, and Siemens, in addition to Motorola, Nokia and Sony/Ericsson Ericsson, are all integrating E-OTD into handset products that are expected to be available for operator testing within 2002. In addition, companies such as Intel, Infineon, Texas Instruments and TTPCom are integrating E-OTD technology into their GSM chips and technology products.

With respect to its Phase I E911 requests, out of 764 PSAPs within VoiceStream's coverage area requesting Phase I E911, VoiceStream has fully implemented 252 requests, and is in the process of actively deploying Phase I E911 in 445 PSAPs. Sixty-seven PSAP requests are on hold for a variety of reasons, including lack of necessary PSAP or LEC upgrades, or protections against disclosure of proprietary information.

## II. BACKGROUND

In a series of orders since 1996, the Commission has sought to improve the quality and reliability of 911 emergency services for users of interconnected wireless telephones by regulating the availability of basic 911 services and the implementation of E911 services. The implementation of E911 services was split into two phases. Under Phase I, as of April 1, 1998, or within six months of a request by the designated Public Safety Answering Point (PSAP), whichever is later, wireless carriers must provide the telephone number of the originator of a 911 call and the location of the cell site or base station receiving the call to the PSAP through the use of Automatic Number Identification (ANI) and Pseudo-ANI.[5] Under Phase II, carriers are required to provide the PSAP with the latitude and longitude of a handset making a 911 call.[6]

VoiceStream (via its acquisition of Aerial Communications, Inc.) began to focus on the development of E-OTD as an Automatic Location Identification (ALI) solution for GSM in early 1999, when it became apparent that no other solution would likely satisfy the Commission's requirements for ALI. VoiceStream (through the acquisition of Aerial

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[5] 47 C.F.R. § 20.18(d)(1). When the number is not available, the carrier need only deliver the 911 call and available calling party information to the PSAP. 47 C.F.R. § 20.18(d)(2).

[6] 47 C.F.R. § 20.18(e).

as well as the acquisition of Omnipoint Corporation) had participated in GSM standards development for ALI since 1998. One of VoiceStream's infrastructure vendors, Nokia, also began focusing in earnest on E-OTD in 1999. VoiceStream and one of its location technology partners, Cambridge Positioning Systems (CPS), conducted field tests in early 2000 to demonstrate that E-OTD was a solution *potentially* capable of meeting the Commission's regulatory requirements, including the fifty-meter handset accuracy requirement that the Commission announced in October 1999.[7] VoiceStream has been the leading carrier in the development of Phase II location technology for the GSM air interface.

The Commission has recognized that development of ALI solutions for the GSM air interface lagged development for CDMA platforms, because GSM has held only a small portion of the U.S. market. Just 18 months ago, the Commission found that although GSM "is the standard air interface in most countries worldwide, GSM is used by carriers serving only a small percentage of U.S. wireless subscribers" and "there is evidence to suggest that the development of ALI capabilities for use by GSM carriers has lagged behind that for carriers using other interfaces that are more widely used in the United States, such as AMPS, CDMA, and TDMA."[8] At that time, VoiceStream was the only nationwide or near-nationwide carrier fully utilizing GSM, and VoiceStream served only 3.5 percent of national subscribership in 2000 (and substantially less than 1 percent of the global subscribership). It is therefore not surprising that manufacturers dedicated

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[7] *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems,* Third Report and Order, 14 FCC Rcd. 17388, 17392 (¶ 9) (1999) ("*Third Report and Order*").

[8] *Fourth Memorandum Report & Order,* 15 FCC Rcd at 17461-62 (¶ 56).

greater resources to other solutions.[9] GSM today is still used by only a fraction of the U.S. market, although three nationwide carriers are committed to GSM going forward, and all three of those carriers will be implementing the same ALI solutions as they are made available by manufacturers.[10]

### A. Waiver & Conditions

In September 2000, the Commission approved VoiceStream's plan to adopt a hybrid network/handset-based solution for meeting its Phase II obligations[11]. This plan had two components. First: the implementation of a network-based NSS solution covering all network users, to be accurate within 1000 meters. Second: the introduction of E-OTD-capable handsets combined with an upgrade of network infrastructure technology, based upon requests from PSAPs, in order to use E-OTD to provide more precise estimates of the location of the 911 caller. VoiceStream was concerned that its E-OTD solution would not immediately meet the requirements for handset-based solutions. Based on these concerns, VoiceStream sought a waiver of Section 20.18(h). VoiceStream requested that the Commission impose the network-based standard, rather than the more stringent handset-based standard, on its E-OTD system for the first two years of handset activations (*i.e.*, requiring the E-OTD system to be accurate to 100

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[9] As of December 31, 2001, VoiceStream had approximately 7 million subscribers of a total of 131 million nationwide. This renders it the sixth in size, following Verizon Wireless (29.4 million), Cingular Wireless LLC (21.6 million), AT&T Wireless Services (20.8 million), Sprint PCS (15.8 million) and Nextel (8.7 million).

[10] In addition to VoiceStream, both Cingular and AT&T Wireless have announced plans to use GSM going-forward.

[11] *Fourth Memorandum Opinion & Order*, 15 FCC Rcd at 17461-64 (¶¶ 55-68).

meters 67 percent of the time and 300 meters 95 percent of the time), and stated that it would deploy NSS throughout its coverage area without need for a PSAP request.

The Commission granted the waiver in September 2000. Scrutinizing technological development to date, the Commission recognized that, as the only major U.S. carrier then committed to a GSM platform, VoiceStream "faced special circumstances."[12] The Commission found that the "NSS/E-OTD approach may be the only method available to GSM carriers for compliance with Phase II for some time."[13]

The Commission imposed several conditions on the waiver. With respect to NSS, the Commission imposed an accuracy requirement of 1000 meters, or better, for 67 percent of calls, and required that NSS deployment be completed by December 31, 2001.[14] With respect to E-OTD, the Commission required that VoiceStream achieve 95 percent penetration of ALI-capable handsets among its subscribers no later than December 31, 2005, the same date as required of carriers using other air interfaces.[15] The Commission also required that all new E-OTD handsets activated on or after October 1, 2003, comply with an accuracy requirement of 50 meters for 67 percent of calls, and 150 meters for 95 percent of calls.[16] The standard was relaxed for the first two years of deployment to an accuracy level of 100 meters, 67 percent of the time and 300 meters, 95 percent of the time.[17]

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[12] *Id.* at 17461-2 (¶ 56).

[13] *Id.*

[14] *Id.* at 17463 (¶ 61).

[15] *Id.* at 17464 (¶ 66).

[16] *Id.* (¶ 64).

[17] *Id.* at 17463 (¶ 63).

A set of waiver requirements was keyed to the Commission's expectation that carriers would begin Phase II service by October 1, 2001. The Commission's rules require VoiceStream, like other carriers, in the absence of a waiver to implement the necessary network or infrastructure upgrades and begin providing Phase II location information by October 1, 2001, or within six months of a PSAP request, whichever is later. They also require carriers to begin selling ALI-capable handsets by October 1, 2001, so that they would be available to consumers when the first PSAPs could receive and use Phase II information. Pursuant to its waiver, however, VoiceStream was required to ensure that 50 percent of its handsets newly activated as of October 1, 2001, and 100 percent by March 31, 2002, are ALI capable-requirements greater than those imposed by rule.[18]

### B. Request for Limited Modification

Although VoiceStream worked diligently after its waiver was issued in September 2000, the challenges of developing, procuring, testing and implementing both NSS and E-OTD proved to be more difficult and time consuming than VoiceStream had initially anticipated. VoiceStream updated the Commission with respect to these difficulties in July 2001,[19] and in its October 2001 Semi-Annual Report, which provided details on its

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[18] *Id.* at 17463 (¶ 62). The general rule for handset-based solutions requires the following: introduction of one entry-level handset with ALI capability by October 1, 2001; 25 percent of handset activations with ALI capability by December 31, 2001; 50 percent of activations by June 30, 2002; and 100 percent of activations by December 31, 2002. 47 C.F.R. § 20.18(g)(1).

[19] *Ex Parte* Presentation of VoiceStream Wireless, CC Docket No. 94-102 (filed Jul. 6, 2001).

revised deployment plans.[20] Finally, on December 21, 2001, VoiceStream filed a request for modification of its waiver to reflect the fact that NSS infrastructure equipment was not anticipated to be ready for commercial deployment prior to the December 31, 2001 deadline, E-OTD infrastructure equipment would not be ready for commercial deployment until spring of 2002, and E-OTD handsets could not be tested and approved for commercial distribution until a live E-OTD network was operating using actual commercial equipment.[21] Subsequently, on February 28, 2002, VoiceStream amended its request for modification of its waiver to reflect a further intervening delay with respect to critical infrastructure software and to address technical issues caused by a unique configuration of network equipment in portions of the Philadelphia and New York MTAs.[22] VoiceStream's proposed modifications would make the following specific, focused and limited modifications to the deployment benchmarks set in September 2000:

- VoiceStream will deploy NSS throughout its network, without necessity for a PSAP request, by July 31, 2002 (except for those portions of the New York and Philadelphia MTAs that currently are being served by a combination of Nortel Base Station Controller (BSC) and Ericsson Mobile Switching Center (MSC) equipment); in those portions of the New York and Philadelphia, VoiceStream will deploy NSS by December 31, 2002, without necessity for a PSAP request;

- By December 31, 2002, VoiceStream will implement E-OTD for all valid PSAP requests pending as of June 30, 2002, and, after June 30, 2002, will satisfy valid PSAP requests for Phase II service within six months of receipt, in full compliance with Commission rules; and

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[20] Third Semi-Annual Report of VoiceStream Wireless Corporation on Its E911 Implementation Plan, CC Docket No. 94-102 (filed Oct. 1, 2002) ("*Third Semi-Annual Report*").

[21] VoiceStream Wireless Corporation Request for Limited Modification of E911 Phase II Implementation Plan, CC Docket No. 94-102 (filed Dec. 21, 2001).

[22] *Amended Request for Limited Modification.*

- By September 1, 2002, VoiceStream will approve at least one model of E-OTD handsets for commercial distribution. VoiceStream will ensure that 50 percent of new handsets activated after February 28, 2003, and 100 percent of new handsets activated after June 30, 2003, will be E-OTD capable.[23]

VoiceStream did not request any other changes to the interim waiver benchmarks in its *Amended Request for Limited Modification.*

Although VoiceStream's *Amended Request for Limited Modification* of its September 2000 waiver remains pending, because VoiceStream's proposed deployment dates are the most instructive (and non-discriminatory) yardstick against which to compare VoiceStream's progress toward implementing Phase II E911 requirements, we will report compliance with respect to those proposed deployment benchmarks.[24]

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[23] *Id.* at 3.

[24] It would be wholly arbitrary and capricious for the Commission to refuse to grant VoiceStream's request for modification of its waiver. Many of the proposed modifications are identical to conditions of a waiver already granted to Cingular for the GSM portions of its networks. There is no basis for treating one GSM carrier differently than another GSM carrier when both are implementing the same technical solutions, and the delays stem from platform-wide technical issues. Moreover, the Commission cannot impose technologically or economically infeasible requirements without Congress enacting a specific, technology-forcing statute. *Compare Bunker Hill Co. v. EPA,* 572 F.2d 1286, 1293-1301 (1977) (reversing and remanding EPA Clean Air Act regulations because "the EPA cannot require ... technology that is technologically and economically infeasible") *with Edison Electric Institute, et al. v. EPA*, 996 F.2d 326, 335-336 (D.C. 1993) (upholding EPA Resource Conservation and Recovery Act regulations "even though it may have been impossible" for companies to comply where Congress spoke directly to the precise question at issue in "a highly prescriptive, technology-forcing statute" intended to be "draconian"). In this case, Congress has enacted no such statute requiring wireless carriers to meet the E911 Phase II benchmarks set by the Commission regardless of technical or economic feasibility. Instead, the Commission has relied principally on its general regulatory authority under section 303(r) of the Communications Act in its adopting E911 rules. Needless to say, Congress's basic grant of regulatory power in 1934 did not mandate the adoption of the E911 benchmarks or even its final deadlines. In the *Fourth Memorandum Opinion & Order*, the Commission again cited its authority under section 303(r) and asserted that Congress had ratified the Commission's E911 decisions by enacting the 1999 Wireless Communications and Public Safety Act.

## III. PHASE II E911 DEPLOYMENT

Over the last six months, VoiceStream has continued to move its advanced hybrid network/handset solution from engineering theory to operational reality. However, developing and testing this complex system, which requires coordination among multiple parties and technologies, has been and continues to be an iterative process. Because many components, both in the network and in handsets, must work together seamlessly, delays in the development and delivery of key network software or hardware have cascaded through the entire deployment plan. Despite these delays, the light at the end of the tunnel is near. VoiceStream has received in its laboratories at least beta, and in most cases commercial, versions of all the hardware and software necessary to implement NSS, and most of the hardware and software necessary to implement E-OTD.

VoiceStream will soon begin its FOA of NSS for its systems that use Ericsson and Nortel switches. VoiceStream anticipates that during this next quarter, it will have substantially deployed its NSS solution nationwide, and begun the FOA for at least its Nokia E-OTD systems. VoiceStream expects that during the third quarter of 2002, it will complete its nationwide NSS deployment (by July 31, 2002, except for portions of the New York City and Philadelphia markets, as previously described), complete the

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*Fourth Memorandum Opinion & Order*, 15 FCC Rcd at 17445 (¶ 6). The Wireless Communications and Public Safety Act, however, merely directs the FCC to "encourage and support" E911 development. 47 U.S.C. § 615. Moreover, in that Act, Congress expressly disclaimed any intent to authorize the Commission to adopt a technology-forcing regulation, stating that "[n]othing in this subsection shall be construed to authorize or require the Commission to impose obligations or costs on any person." *Id.* Thus, any assertion that the Commission can enforce its E911 Phase II benchmarks regardless of technological or economic infeasibility would not survive judicial review.

remaining E-OTD FOAs, begin nationwide deployment of E-OTD for PSAPs with valid requests and approve one handset for commercial distribution.

### A. Description of VoiceStream's NSS/E-OTD Network Infrastructure

The NSS and E-OTD Phase II solutions use the same basic data delivery infrastructure. In order to implement both NSS and E-OTD, new software is required in two major elements of VoiceStream's existing network, the Mobile Switching Center (MSC), which provides the systems switching functions, and the Base Station Controller (BSC), which provides the control and supervisory functions for the base stations. In addition to software upgrades for existing MSCs and BSCs, both NSS and E-OTD require the addition of two entirely new network elements, the Serving Mobile Location Center (SMLC) and the Gateway Mobile Location Center (GMLC). The SMLC performs location calculations for both NSS and E-OTD. The SMLC captures data from the handset and the relevant network elements (MSC, BSC, and Location Measurement Unit) and computes positional information during E911 calls. The GMLC acts as the interface between VoiceStream's network and the PSAPs. It initially triggers the request for positional information from the SMLC and subsequently presents the calculated latitude/longitude location to the PSAP.

For E-OTD, the SMLC must be upgraded beyond the level necessary to provide NSS and a new piece of equipment, the Location Measurement Unit (LMU) must be ready for deployment. The LMU is a small measurement receiver located at each base station to measure the relative time differences among base stations.[25] Delays in

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[25] When a signal from at least three base stations is received by an E-OTD capable handset and the LMU, the time differences between arrival of the signal from each

providing any of the basic elements necessary for NSS, or in providing an upgraded SMLC or the LMU, will delay deployment of E-OTD.

As a legacy of the merger of four different companies (*i.e.*, Aerial, Omnipoint, PowerTel, and VoiceStream), each with unique infrastructure configurations, VoiceStream's network infrastructure is comprised of equipment from three different manufacturers—Ericsson, Nortel, and Nokia. Each manufacturer must independently develop different MSC, BSC, SMLC and LMU hardware and software upgrades for use with its own existing equipment. The successful development of upgrades for one type of equipment for one manufacturer does not mean that those components can be ported to the corresponding equipment of another manufacturer.

### B. Network Infrastructure Equipment Testing and Deployment

VoiceStream is following the same testing and deployment process for its ALI functionalities as for all other new features and functionalities introduced into its wireless networks. First, equipment is shipped to VoiceStream's laboratory, where it is subjected to preliminary tests. After preliminary testing is completed, the equipment is deployed in

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base station at the handset and at the LMUs at each base station are calculated. The time difference between transmissions from the base stations to the handset and between the base stations themselves are then combined with the coordinates of the base stations to produce intersecting hyperbolic lines from which the location of the handset is estimated.

a FOA, which is a commercial field installation where the actual commercial-grade equipment can be evaluated and tested. Once FOA is completed for the relevant system (NSS or E-OTD), VoiceStream can begin full-scale deployment of the system throughout its network.

VoiceStream has issued over $44 million in purchase orders for ALI capable network equipment to date, and has approved a budget of approximately $80 million for FY2002 for Phase II E911 implementation.

*1. Receipt of Commercial Equipment*

Table 1 shows the progression, over the past six months, in the estimated availability dates of VoiceStream's infrastructure vendors for those critical network software and hardware components discussed above. Except as otherwise noted, these dates represent when the components are to be delivered to VoiceStream's laboratory for testing.

**Table 1 – Laboratory Delivery Dates and Status**

| Manufacturer | Estimated Delivery Dates | | |
|---|---|---|---|
| | May 2001[26] | October 2001 | April 2002 |
| **Ericsson** | | | |
| R9.0 MSC/VLR | 10/01/01 | 10/01/01 | Delivered |
| R9.0 BSC | 11/01/01 | 11/01/01 | Delivered |
| SMLC/MPS 4.0 (NSS) | 10/01/01 | 01/01/02 | Received, under test |
| LMU Type A (E-OTD) | 2/28/02 | 12/15/01 | Received, under test |
| SMLC/MPS 5.0 (E-OTD) | 2/28/02 | 07/31/02[27] | 4/22/02 |
| | | | |
| **Nortel** | | | |
| MSC –GSM13 | 09/01 | 09/01/01 | Delivered |
| BSC-V12.4+ | 06/01 | 12/10/01 | Delivered |
| SMLC-NSS | ½ | 02/21/02 | Received, under test |
| SMLC-E-OTD | 04/02 | 07/20/02 | 5/10/02[28] |
| LMU-A (E-OTD) | 05/02 | 06/01/02 | 6/12/02[29] |
| | | | |
| **Nokia** | | | |
| S.10– BSC/SMLC combined | 12/15/01 | 01/15/02 | Received, under test[30] |
| MSC | Delivered (M10) | 11/15/01 (M11) | Delivered |
| LMU B (E-OTD) | 11/15/01 | 11/15/01 | Received, under test |

As indicated in Table 1, VoiceStream and its vendors have made significant progress in the development and testing of Phase II-capable network infrastructure components since VoiceStream filed its *Third Semi-Annual Report*, and is on schedule

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[26] These dates were General Availability dates only.

[27] This was a General Availability date from Ericsson.

[28] As discussed below, VoiceStream will begin its deployment in the FOA market with a CPS SMLC. The listed date is the date by which VoiceStream anticipates receiving the commercial Nortel SMLC in its lab.

[29] As discussed below, VoiceStream will begin its deployment in the FOA market with CPS LMUs. The listed date is the date by which VoiceStream anticipates receiving Nortel's commercial LMU at its lab.

[30] Nokia provided a beta version of the S.10 software for its BSC/SMLC on March 15, 2002, and is scheduled to deliver the commercial version to VoiceStream's laboratory on or about April 15, 2002.

with the benchmarks proposed in its *Amended Request for Limited Modification.* VoiceStream has received a commercial version of all but four Phase II-capable components—Ericsson, SMLC/MPS 5.0 (E-OTD); Nortel, SMLC (E-OTD) and LMU; and Nokia, S.10– BSC/SMLC. The final piece of Ericsson equipment is expected in the lab within the next month. Although the final Nortel versions of the SMLC and LMU will not be delivered to VoiceStream's labs until May and June, respectively, to allow for early E-OTD algorithm confirmation, VoiceStream will initially install an SMLC and LMUs provided by CPS.[31] The Nortel SMLC and LMU can then be substituted for the CPS equipment without significantly delaying the deployment schedule. This allows VoiceStream to move ahead with E-OTD for its Nortel systems more quickly than was anticipated in October 2001. Nokia's S.10 software (used in its combined BSC/SMLC unit) did not ship in accordance with either VoiceStream's or Nokia's October 2001 expectations.[32] However, as an accommodation to VoiceStream in order to accelerate testing, Nokia provided a beta version of the S.10 software on March 15, 2002, and is scheduled to deliver the commercial version to VoiceStream's laboratory on or about April 15, 2002.

*2. Field Trials*

a. Washington, DC

VoiceStream, with the cooperation of E-OTD technology vendor CPS and Ericsson, which is purchasing E-OTD from CPS for inclusion in its SMLC and LMU products, has been conducting field trials in Washington, DC of the latest CPS

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[31] CPS is supplying the underlying technology to Nortel.

technology. Washington, DC, was selected because its varied terrain and urban character make it a more difficult RF test environment than Houston, Texas, the site of the previous trials.

In Washington, DC, VoiceStream installed CPS LMUs at 32 cell sites covering an area of approximately 75 square kilometers. This allowed for testing to be conducted throughout an area that included both downtown D.C. and Capitol Hill. The Capitol Hill areas tested are topographically similar to the suburban, predominantly residential, areas that comprise the bulk of the areas inside the Capital Beltway.

The results have been heartening. Most significantly, based on these test results, VoiceStream projects that the performance of the E-OTD technology within the Capital Beltway, in accordance with OET-71, will be 81 meters, 67 percent of the time, and 167 meters, 95 percent of the time. This would be substantially better than the current standard of 100 meters, 67 percent of the time and 300 meters, 95 percent of the time.

Moreover, VoiceStream and CPS are achieving these results even though performance within the central core of Washington, DC is operating at 160 meters, 67 percent of the time.[33] This lower performance in the downtown area appears to be due to poor site distribution which results in radio signals propogating along the downtown urban canyons. These propogation effects are expected to be resolved by the availability of assistance data to the handset, which is currently being implemented into the CPS E-OTD systems. This assistance data will direct the handset to measure specific base

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[32] Nokia informed VoiceStream in late January 2002 that S.10 would not ship in February 2002, as had been previously expected.

stations to improve the geometry, and therefore to increase the accuracy of the location estimate. Additionally it should be noted that these results are for instantaneous location requests, that is, the performance expected immediately when a 911 call is made. OET 71 allows the use of additional information collected within the first 30 seconds of the call in order to refine the location estimate. This additional capability is expected further to improve the performance, and will be available in the commercial E-OTD implementations.

The Washington DC trial continues to illustrate that operators currently have only preliminary experience with implementing E-OTD. Moreover, the trial points out the extent to which E-OTD deployments, especially in the early stages, will be experimental and may reveal idiosyncratic issues that take some time to address in order to refine accuracy.

b. Bellevue, WA

VoiceStream and Nokia are conducting trials in Bellevue, Washington, of both the Nokia NSS and E-OTD Phase II solutions. For E-OTD, Nokia uses its own algorithms and designs for the underlying location identification technology, in contrast to Nortel and Ericsson, which are licensing the underlying technology from CPS.

VoiceStream and Nokia carried out NSS tests in March 2002. Testing was performed by driving a large portion of the Bellevue area, including a variety of topographical areas, including urban areas of downtown Bellevue with significant office buildings and suburban areas. Nokia was able to take live measurements from

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[33] The "central core" area of Washington, DC includes the national Mall, adjacent areas,

VoiceStream's GSM network and compute the location using NSS for over 100,000 measurement points. Although this was not intended to be a definitive test of the NSS calculation methodology, the software uses the same algorithms as those used in the Nokia SMLC.

The results show that the NSS Phase II solution achieved an accuracy of 512 meters, 67 percent of the time. This is a substantial improvement in accuracy over Phase I cell identification and more than meets the waiver requirement that NSS be accurate to within 1000 meters, 67 percent of the time.

VoiceStream and Nokia have also begun conducting E-OTD tests in the same area. For the E-OTD tests, 25 cell sites have been fitted with Nokia developmental LMUs, with a developmental network overlaid over the existing VoiceStream 1900 MHz network. For these tests, the handset used is an actual E-OTD capable handset. Because of problems associated with converting the Nokia developmental overlay system to operate at 1900 MHz, and because of LMU and handset algorithm software problems, the trial has not yet produced meaningful results. Performance, however, continues to improve, and Nokia believes that it will be able to meet the Commission's accuracy requirements. VoiceStream and Nokia expect that meaningful results will begin to be produced in the near future.

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and the downtown portion of Washington, DC.

c. Other Field Trials

In addition to trials being conducted in the United States, E-OTD trials are also currently taking place in Finland, France, the United Kingdom, Hong Kong and Singapore. These trials, in addition to the VoiceStream/CPS trial concluded in Houston last year, are providing evidence that E-OTD can achieve the Commission's 50 meter accuracy standard. [34]

*3. First Office Applications and Full-Scale Deployment*

Table 2 summarizes the approximate dates on which VoiceStream expects to begin FOA installation and full-scale deployment of NSS and E-OTD, assuming there are

[34] Specifically, in the United Kingdom, an E-OTD system in Cambridge operates at an accuracy level of 48 meters, 67 percent of the time and 96 meters, 95 percent of the time. Further, the Houston trial, conducted by CPS and VoiceStream, reached accuracy levels of 40 meters, 67 percent of the time and 99 meters, 95 percent of the time within about 30 percent of that trial area.

no further changes in equipment availability or unanticipated developments during testing.

**Table 2 – First Office Applications and Nationwide Deployment**

| | Nortel | Nokia | Ericsson |
|---|---|---|---|
| **NSS** | | | |
| FOA Start Date[35] | 4/12/02 | 05/30/02 | 4/18/02 |
| Nationwide Deployment Complete | 06/21/02 | 07/12/02 | 06/10/02 |
| **E-OTD** | | | |
| FOA Start Date[36] | 06/30/02[37] | 06/05/02 | 06/30/02 |
| Begin Deployment of Other Valid PSAPs[38] | 08/14/02 | 07/20/02 | 08/14/02 |

a. NSS Deployment

VoiceStream is on track to meet the NSS deployment benchmarks proposed in its *Amended Request for Limited Modification*. VoiceStream will shortly begin its FOAs of

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[35] VoiceStream installs equipment in the FOA markets prior to the start of the FOA, as equipment completes laboratory testing, and has begun installation of some Nokia NSS components.

[36] These projected FOA start dates depend upon timely equipment delivery and completion of laboratory testing. These dates could also be affected if deficiencies are discovered during VoiceStream's ongoing Washington, DC (Ericsson/CPS) and Bellevue, WA (Nokia) trials.

[37] This FOA will begin with a CPS SMLC and LMUs on April 15, 2002, to allow for early E-OTD algorithm confirmation. VoiceStream will substitute the Nortel SMLC and LMUs as those are delivered. For consistency, the FOA start date listed here is the date after which VoiceStream expects the Nortel SMLC to be installed and operating.

[38] *See* n.36, *supra*.

NSS for its Nortel and Ericsson systems in Denton County, Texas, and Rhode Island, respectively.[39] With the exception of portions of the New York, Philadelphia, and Washington DC MTAs, VoiceStream expects to finish installation of NSS in all Nortel and Ericsson systems nationwide in June 2002. In portions of the New York and Philadelphia MTAs, a unique solution must be developed because of a combination of Nortel BSC and Ericsson MSC equipment. VoiceStream anticipates that these unique NSS systems will be deployed in the New York and Philadelphia MTAs by the end of December 2002. A portion of the Washington DC MTA (western Virginia) is also served by a combination of Nortel BSC and Ericsson MSC equipment. VoiceStream currently anticipates replacing that equipment with NSS-capable equipment from a single equipment vendor by the end of July. NSS FOA deployment for Nokia systems should begin in June 2002, with deployment completed in all Nokia systems in July 2002.

b. E-OTD Deployment

All three vendors expect to begin FOA tests of E-OTD in June or early July 2002. Nortel will begin to deploy in its FOA market in late April or early May 2002 using CPS-provided SMLC and LMUs. Nortel SMLC and LMUs will be substituted later, with the Nortel SMLC in place and operating in June or early July 2002. These projected FOA start dates depend upon timely equipment delivery and completion of laboratory testing,

[39] Because of concerns regarding the readiness of the Washington, DC PSAP, VoiceStream has decided to conduct is FOA for its Ericsson systems in Rhode Island. Washington DC will still have its NSS installed in June 2002, and VoiceStream will be ready to install E-OTD within six months of Washington, DC resolving its readiness issues.

and could also be affected by any deficiencies discovered during VoiceStream's ongoing Washington, DC (Ericsson/CPS) and Bellevue, WA (Nokia) trials.[40]

Should the E-OTD FOA tests progress successfully, VoiceStream will proceed with E-OTD rollout on a PSAP-by-PSAP basis, working with APCO's Project LOCATE Guidelines. In accordance with the milestones proposed in the *Amended Request for Limited Modification* and the Commission's rules, all PSAP markets with valid requests as of June 30, 2002 should have E-OTD available by December 31, 2002,[41] and all other PSAPs should have E-OTD available within 6 months of receipt of a valid request for Phase II service.

As VoiceStream has always cautioned, once nationwide deployment of E-OTD begins, there may still be location specific roadblocks to full E-OTD deployment. E-OTD deployment currently requires placing a small second antenna on towers to capture incoming positioning signals for the LMU. In some instances, adding these small (7 inch) antennas requires either landlord or zoning approval. In at least one instance (Salt Lake City), a locality has denied VoiceStream the zoning authorization necessary to implement E-OTD. VoiceStream is working with that locality to try to educate them and address their concerns, but until this situation is addressed, E-OTD cannot be implemented in that locality.

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[40] *See* n. 36, *supra*.

[41] See Part III.D below for a discussion of PSAP requests and readiness.

### C. Handset Development and Deployment

Handset vendors Motorola and Nokia have already delivered E-OTD capable handsets for testing with VoiceStream.[42] Both manufacturers have committed to commence volume shipments of E-OTD capable handsets once approved for commercial distribution. In order to approve an E-OTD capable handset for commercial distribution, it must be tested both in the lab and on the live commercial network of at least one vendor. VoiceStream had initially anticipated that Nokia's E-OTD FOA would begin in March 2002, and would provide the live network for handset testing. Late delivery of Nokia's S.10 software has delayed the date on which VoiceStream can begin handset interoperability testing on a live network. VoiceStream now anticipates that it will be able to approve for commercial release the first E-OTD-capable handset by September 1, 2002, contingent upon receipt of network equipment and completion of the FOAs on the schedule indicated above. Two additional handset models are expected to be approved by October 2, 2002. Pushing handsets through distribution channels and into the hands of consumers may take up to eight weeks after approval for commercial release. VoiceStream intends to push that process along as fast as possible, and, to the extent possible, to direct initial E-OTD capable handsets to markets with E-OTD capable networks. Based on its experience, VoiceStream has confidence that it will achieve 50 percent new activations of handsets with E-OTD capability by February 28, 2003, and 100 percent by June 30, 2003.

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[42] Motorola and Nokia have committed that after April 1, 2002 *only* E-OTD capable handsets will be submitted for VoiceStream's approval.

Table 3 summarizes VoiceStream's anticipated schedule for testing, approval, and activation of E-OTD capable handsets.

**Table 3 – Handsets**

| E-OTD Capable Handsets | Estimated Start Dates |
|---|---|
| Testing[43] | 06/05/02 |
| Commercial Approval, first handset model | 09/01/02 |
| Commercial Approval, second and third models | 10/02/02 |
| 50% New Activations | 02/28/03 |
| 100% New Activations | 06/30/03 |

In addition, worldwide commitment to the E-OTD solution continues to increase among CPE vendors and their suppliers, which by itself creates a virtuous investment cycle that will help fuel continued improvements. Manufacturers such as Mitsubishi, NEC, Quanta, RIM, Samsung, Sendo, and Siemens, in addition to Motorola, Nokia and Sony/Ericsson, all are integrating E-OTD into handset products that are expected to be available for operator testing within 2002. A number of manufacturers are implementing E-OTD in tri-band globally capable handsets for worldwide sale. In addition, companies such as Intel, Infineon, Texas Instruments and TTPCom are integrating E-OTD technology into their chips and technology products.

[43] Handset testing is contingent upon start of an E-OTD FOA, as are all other dates (because testing is prerequisite to subsequent activities).

### D. PSAP Phase II Requests and Readiness

There are a total of 2168 PSAPs in VoiceStream's current service area. Excluding requests from PSAPs outside its service area,[44] 249 PSAPs have requested Phase II service, representing about 11.5 percent of the PSAPs within VoiceStream's coverage area. In accordance with Section 20.18(j) of the Commission's rules, as amended by the *Richardson Order*,[45] VoiceStream has requested PSAP documentation that demonstrates its Phase II readiness from all but four PSAPs.[46] To date, only one PSAP from which VoiceStream has requested *Richardson* documentation has provided complete documentation that it is capable of receiving and utilizing the data elements associated with the service. VoiceStream has suggested to the Association of Public Safety Communications Officials (APCO) and the National Emergency Number Association (NENA) that they work together to create guidance on documentation that PSAPs can provide to meet the *Richardson* verification requirements. It would be helpful, for example, if PSAP equipment vendors could develop a standard vendor letter verifying Phase II customer premises equipment readiness, which those vendors could then provide to the PSAPs. Similarly, it would be helpful if local exchange carriers (LECs) and other major PSAP vendors could develop such letters so that the verification

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[44] VoiceStream has received 6 requests for Phase II service from PSAPs outside its coverage area.

[45] *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Petition of City of Richardson, Texas*, Order, FCC 01-293, 16 FCC Rcd 18982 (2001) ("*Richardson Order*").

[46] VoiceStream is treating four PSAPs as if they have met *Richardson* requirements, although it reserves the right to investigate whether these PSAPs in fact have met *Richardson*.

process can proceed quickly, accurately and smoothly. The following table summarizes PSAP requests for Phase II E911 service received by VoiceStream.

**Table 4 – Phase II PSAP Requests**

| | |
|---|---|
| Total PSAPs in Coverage Area | 2168 |
| Requesting PSAPs in Coverage Area | 249 |
| Percentage of Requesting PSAPs in Coverage Area | 11.5% |
| Requesting PSAPs Out of Coverage Area | 6 |
| In-Area PSAPs Verified as Ready for Phase II or Treated as If Verified | 5 |
| In-Area PSAPs on Hold at PSAP Request | 2 |
| In-Area Unverified PSAPs | 242 |

VoiceStream is participating in wireless forums organized by APCO and NENA and is communicating directly with PSAPs in order to keep them apprised of VoiceStream's plans and to suggest improvements to the Phase II request process. In the fourth quarter of 2001 and again in the first quarter of 2002, VoiceStream sent letters to all PSAPs that have requested Phase II service to keep them informed of its progress in implementing Phase II.

VoiceStream has also taken steps in-house to facilitate E911 deployment at the PSAP level. It is currently traveling to its major markets, concentrating on those with valid Phase II requests, to brief its personnel on the details of its Phase II deployment plan and its policies regarding E911 implementation. Upon receiving a valid E911

request from a PSAP, VoiceStream's policy is to provide the PSAP with site data so that routing determinations and ALI database upgrades can be done at the earliest opportunity and implementation delays avoided.

VoiceStream has also purchased equipment to enable the J-STD-036 E-2 interface for PSAPs to get Phase II location data after call set up and to update the handset location during the E911 call, if needed and if the PSAP is equipped to do so.

## IV. PHASE I E911 DEPLOYMENT

VoiceStream has received Phase I requests from 764 PSAPs within its coverage area, as of March 12, 2002, representing 35 percent of PSAPs in its coverage area.[47] VoiceStream has implemented Phase I capability for 252 PSAPs. Four hundred forty-five Phase I requests are currently in the process of being deployed. Sixty-seven Phase I requests are on hold for various reasons (*i.e.*, awaiting PSAP or LEC upgrades, lack of either a non-disclosure agreement or state legal authority protecting proprietary information against public disclosure). Table 5 provides a summary of Phase I PSAP requests and implementation.

[47] VoiceStream has received 69 Phase I requests from PSAPs outside its coverage area.

**Table 5 – Phase I PSAP Requests and Implementation**

| | |
|---|---|
| Total PSAPs in Coverage Area | 2168 |
| Requesting PSAPs in Coverage Area | 764 |
| Percentage of Requesting PSAPs in Coverage Area | 35% |
| Requesting PSAPs Out of Coverage Area | 69 |
| In-Area PSAPs Implemented | 252 |
| In-Area PSAPs Being Deployed | 445 |
| In-Area PSAPs on Hold | 67 |

VoiceStream has purchased and installed (currently in testing) equipment to allow Phase I delivery via NCAS to accommodate PSAPs who can only accept this solution.

## V. CONCLUSION

VoiceStream continues to make strong progress in implementing Phase II E911. Over the next four months, VoiceStream will start and complete its nationwide deployment of the Phase II NSS location identification, which will provide a means of locating any handset to within 1000 meters, 67 percent of the time. During the same period, VoiceStream expects to begin its First Office Applications for its E-OTD solution for each of its major network vendors. One handset should be approved for commercial distribution by September 1, 2002. This progress continues to be on track with the revised benchmarks set forth in VoiceStream's *Amended Request for Limited*

*Modification.* Moreover, VoiceStream has conducted tests that continue to suggest that both NSS and E-OTD will be able to meet Commission accuracy requirements.

VoiceStream is continuing to work with PSAPs with respect to both Phase I and, as it starts to roll out, Phase II E911 service.

Respectfully submitted,

**VOICESTREAM WIRELESS CORPORATION**

/s/
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/s/
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*Counsel to VoiceStream Wireless Corporation*

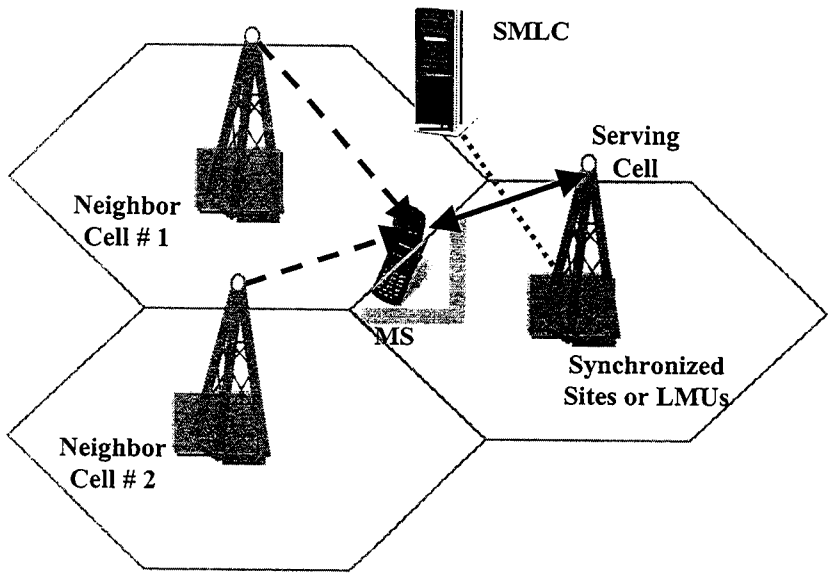
# Exhibit F

# Overview of T-Mobile's E911 System

# OVERVIEW OF E-911 SYSTEM OPERATION

VoiceStream, Wireless, Corp.

# EOTD Operation – How does it work?




E-OTD: Enhanced Observed Time Difference

- EOTD solution in handset
- Arrival time of transmissions from a minimum of 3 sites
- Location solution based on apparent arrival time differences from different sites

1. LMUs measure surrounding BCCH constantly, transmit RTDs back to SMLC via LLP
2. When prompted, MS measures surrounding BCCH and transmits OTDs back to SMLC via RRLP (MS may be performing ongoing timing measurements and storing)
3. At SMLC, distance from at least 3 sites is obtained by GTD = OTD – RTD, and solution is calculated to generate Lat/Long
4. Lat/Long is pushed out to the GMLC, then to the LCS client

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VoiceStream WIRELESS

# Cell ID + TA (NSS) Operation

1. **Position request received by SMLC**
2. **SMLC requests serving cell and timing advance from serving BSC**
3. **SMLC calculates position of mobile based on:**
    1. Lat/Long of serving BTS antenna
    2. Azimuth of serving BTS antenna
    3. Timing Advance (1 TA = 550m)
4. **SMLC returns position fix to the MSC**
5. **MSC delivers position to GMLC**

# Exhibit G

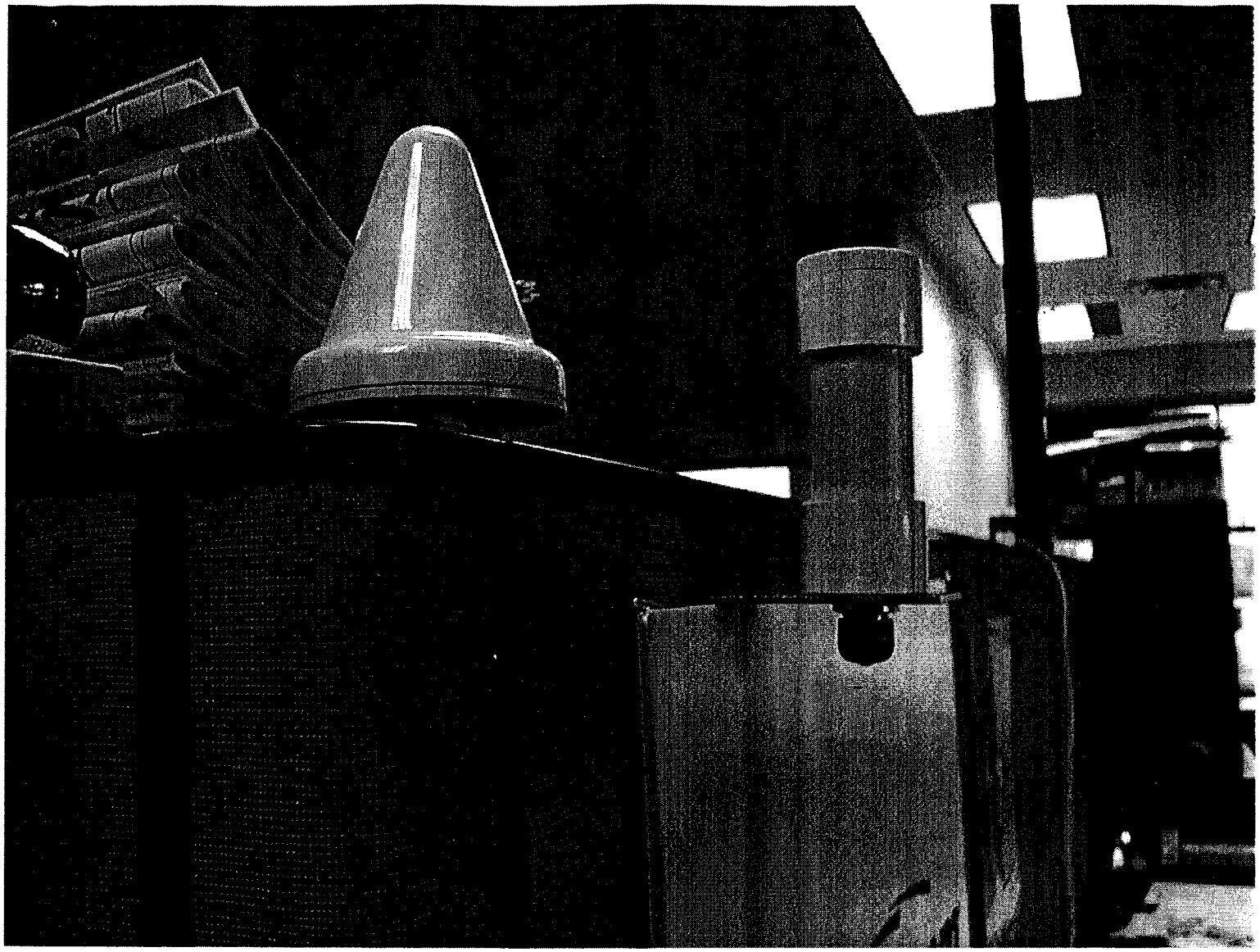
# Description and Specifications of E911 Equipment

E – 911

# ANTENNA ATTACHMENTS

## DESCRIPTION AND SPECIFICATIONS

VoiceStream Wireless, Corp.



Close-up E 9-11 Antenna Equipment

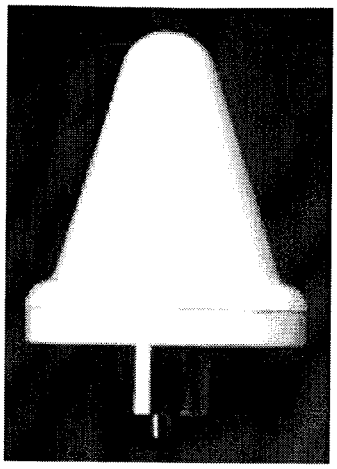
GPS Antenna

Positioning / Timing Information
One Installed Per Facility

Omni GSM Antenna

Adjoining Site Linking Antenna [Send/Receive]
Two Installed Per Facility

NAiS



# VIC-100
# GPS
# Antenna
**(Timing Application)**

**Technical Specification of Standard Type:**

**Performance Characteristics:**

| | |
|---|---|
| Operating Frequency | L1 1575.42 ± 1.023 MHz (typ) |
| Input Impedance | 50 Ohm |
| VSWR | 1.5 (typ.) |
| Polarization | Right hand circular |
| Azimuth Coverage | 360 degrees |
| Elevation Coverage | 0 degree to 90 degrees |
| Gain Characteristics of Antenna Element | Gain: 3.0 dBi (typ.)<br>-10 dBi min. at 0 degrees elevation<br>Axial ratio: 3 dB (typ.) |
| Filtering | -60dB(1625MHz)(typ.)<br>-60dB(1525MHz)(typ.) |
| Total Gain | 38 dBi (typ.) |
| Noise Figure | 1.8 dB (typ.) |

**Electrical Characteristics:**

| | |
|---|---|
| Power Requirements | 5 ± 0.5 VDC |
| Power Consumption | 20 mA (typ.) |

**Physical Characteristics:**

| | |
|---|---|
| Dimensions | Dia. 90x 98.4 H mm |
| Weight | 300 g. |
| Mounting Method | Pole for 1.0-14UNS-2A |
| Connectors | N, TNC |
| Color | White |

**Environmental Characteristics:**

| | |
|---|---|
| Temperature | Operational: -40°C to +85°C<br>Storage: -45°C to +90°C |
| Humidity | 40 to 95% RH (Below Dew Point) |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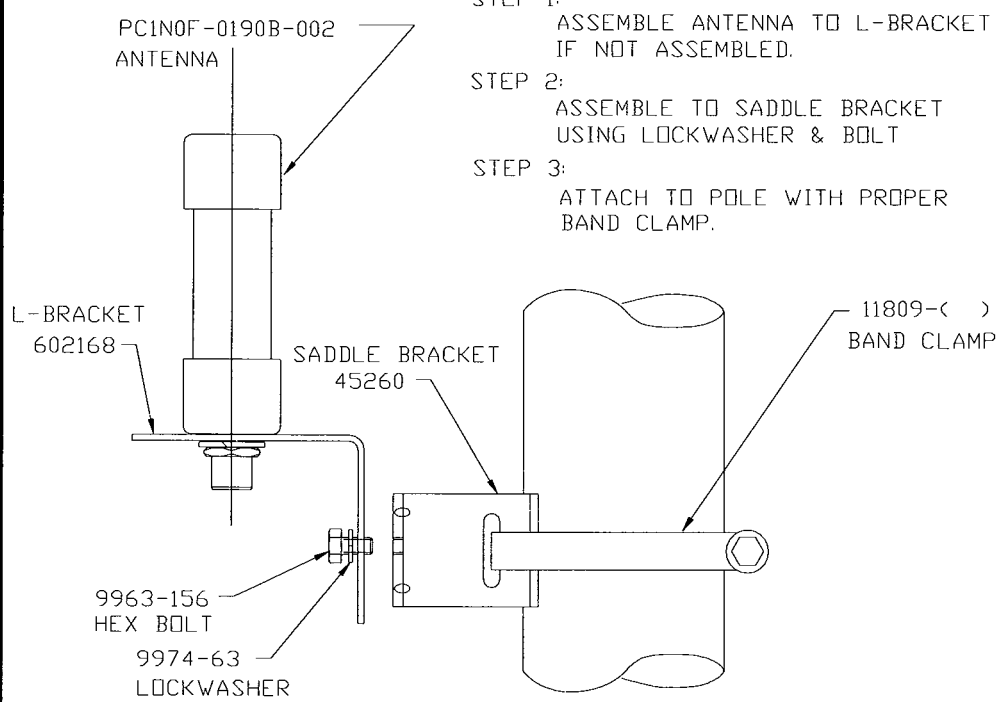
**NOTICE**

'THE INSTALLATION, MAINTENANCE OR REMOVAL OF AN ANTENNA REQUIRES QUALIFIED, EXPERIENCED PERSONNEL. ANDREW INSTALLATION INSTRUCTIONS HAVE BEEN WRITTEN AND ILLUSTRATED FOR SUCH INSTALLATION PERSONNEL. ANTENNA SYSTEMS SHOULD BE INSPECTED ONCE A YEAR BY QUALIFIED PERSONNEL TO VERIFY PROPER INSTALLATION, MAINTENANCE AND CONDITION OF EQUIPMENT. ANDREW DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR THE RESULTS OF IMPROPER OR UNSAFE INSTALLATION OR MAINTENANCE PRACTICES.'

STEP 1:
ASSEMBLE ANTENNA TO L-BRACKET IF NOT ASSEMBLED.

STEP 2:
ASSEMBLE TO SADDLE BRACKET USING LOCKWASHER & BOLT

STEP 3:
ATTACH TO POLE WITH PROPER BAND CLAMP.




| PART # | BAND CLAMP POLE DIAMETER RANGE |
|---|---|
| 11809-17 | 26.97mm [1.06"] TO 50.80mm [2.00"] |
| 11809-18 | 52.37mm [2.06"] TO 76.20mm [3.00"] |
| 11809-19 | 77.77mm [3.06"] TO 101.60mm [4.00"] |

ANDREW

| SIZE | FSCM NO. | 639070 |
|---|---|---|
| A | 84147 | |
| SCALE NONE | | SHEET 1 OF 1 |

CAD FILE NO. 639070.1

# Base Station Antennas

ANDREW

PerforMax™

## ANTENNA SPECIFICATIONS

**ANTENNA TYPE:** **PC1N0F-0190B-002M**

Description: 1850-1990 MHz, single polarized, 2 dBi gain omni antenna with 0 degrees of electrical downtilt, mount included

### Electrical Specifications

| | |
|---|---|
| Frequency Band, MHz | 1850-1990 |
| Gain, dBd (dBi) | 0.0 (2.2) |
| Elevation Beamwidth, degrees | 78 |
| Polarization Type | Single/Vertical |
| Electrical Downtilt, degrees | 0 |
| Return Loss, dB (VSWR) | >14.0 (<1.5) |
| Impedance, ohms | 50 |
| Maximum Input Power, watts | 125 |
| Lightning Protection | DC Ground |
| Connector Type | Type N Female |
| Connector Position | Bottom |

### Mechanical Specifications

| | |
|---|---|
| Antenna Dimensions - L x Dia., mm (in) | 100.2 (3.9) x 41.3 (1.6) |
| Antenna Weight, kg (lb) | 0.4 (0.8) |
| Radome Color | White |
| Radome Material | UV Protected PVC |

### Environmental Specifications

| | |
|---|---|
| Survival Wind Speed, km/h (mph) | 201 (125) |
| Wind Load, N (lbf)* | 11 (2.5) |
| Bending Moment, N (ft-lb) | 1.36 (1) |
| Flate Plate Area, sq. cm (sq. in) | 45 (7) |
| Temperature Range, degrees C | -40 to +65 |
| Humidity, % | Up to 100 |

* Based on 100 mph (161 km/h)

### Shipping Specifications

| | |
|---|---|
| Shipping Dimensions - L x Diam., mm (in) | See below |
| Shipping Weight, kg (lb) | See below |

### Mounting Hardware Specifications

| | |
|---|---|
| Mounting Bracket Part Number | 602170 |
| Mount Weight, kg (lb) | 0.2 (6.4) |
| Mount Description | Fixed Mount |
| To include mounting hardware with antenna, order part number: | **PC1N0F-0190B-002M** |
| Shipping Dimensions of mount carton - L x W x D, mm (in) | 203.2 (8.0) x 76.2 (3.0) x 76.2 (3.0) |
| Shipping Weight of mount and antenna, kg (lb) (Mount carton packaged with antenna for shipping) | 2.9 (6.3) |

**Customer Support Center:**
From North America: 1-800-255-1479
International: +1-708-873-2307
**www.andrew.com**



Bulletin # 94247 - Rev. 3/15/2002

# Exhibit H

# Examples of Typical E911 Installations

EJXAMPLES OF TYPICAL E – 911 ANTENNA INSTALLATIONS

GPS Antenna

Omni GSM Antenna
Adjoining Site Linking Antenna [Send/Receive]
Two Installed Per Facility

# Exhibit I

# Technical Memo on RF Emissions From E911 Equipment

VoiceStream

Global Wireless by T-Mobile

50 Vision Blvd., East Providence, Rhode Island 02914
Tel: 401 588 - 5600 Fax: 401-588 - 5658

August 29, 2002

Connecticut Siting Council
Ten Franklin Square,
New Britain, Connecticut 06051

Re: Petition No. 533 / E 911 Equipment Installation

To whom it may concern:

As part of a FCC mandate, PCS/Cellular operators must be able to accurately locate people who make 911 calls using mobile phones. The method that GSM technology operators are using to locate emergency callers requires very precise timing measurements. In order to facilitate accurate timing measurements special equipment (LMUs) need to be installed at our sites. This equipment will measures the signal from the surrounding sites along with a timing reference from GPS satellites. Then once a minute it will report the results using either a dedicated hard line or by transmitting an SMS message. For sites that will use a dedicated data line they will NOT transmit any signal, however this letter will address any concerns about EME for sites that will be transmitting SMS messages.

The equipment that will be deployed includes a GPS antenna, up to 2 GSM omni-directional antennas and a controlling box called the LMU. In SMS mode the LMU will transmit an SMS message at 0.01 watts once a minute via the GSM omni-directional antennas. The GPS antenna is only used to receive satellite signal and does not transmit.

The LMU is expected to transmit 40dB less power than the site at 1/240 the duty cycle. This is 0.000042% less energy than the site contributes to the EM fields and 0.03% less energy than a wireless handset. The impact of this output on any calculation of cumulative power density for a tower facility on which these units will be installed would effectively be within that which would be termed background emission level.

I trust the above will serve to summarize the emissions consequences associated with the E 911 antennae installation request now before the Council.

Yours truly,

Adolfo Sanchez
New England RF Engineering Manager