**STATE OF CONNECTICUT**
**CONNECTICUT SITING COUNCIL**

Application of Crown Communications, Inc. For a Certificate of Environmental Compatibility and Public Need for the Town Owned Property, 258 Ridge Road, Madison, Connecticut

DOCKET NO. 363

August 6, 2008

## INTERROGATORY RESPONSES TO CONNECTICUT SITING COUNCIL FROM OMNIPOINT COMMUNICATIONS, INC.

Omnipoint Communications, Inc., a subsidiary of T-Mobile USA, Inc. ("T-Mobile") submits the following responses to the interrogatories from the Connecticut Siting Council in connection with the above captioned Docket.

**Q1. Discuss T-Mobile's need for the proposed facility. Specifically, what level of coverage does T-Mobile currently have in this area, and in what ways would the proposed facility improve the existing level of service?**

A1. T-Mobile currently has existing coverage in the Town of Madison focused primarily around the Interstate 95 and Route 1 corridors with additional coverage located at the intersection of Routes 79 and 80. Coverage in the area of the intersection of Routes 79 and 80 is provided by a facility on the self supported tower located at the Madison Fire Department property, approximately 5 miles north of Interstate 95. In the median area along Route 79, T-Mobile has an existing gap in service that measures approximately 4 miles in length. This gap in service extends laterally to the surrounding side streets in the area as well. This gap in service along the Route 79 corridor is the primary focus of T-Mobile's coverage objective.

The proposed Crown Castle facility at the Madison Transfer Station will provide coverage to approximately 2 miles of this coverage gap, resulting in a connecting service footprint to T-Mobile's existing coverage along Interstate 95 at the southern end of Route 79.

T-Mobile's service in this coverage gap area ranges between -85 dBm and -110 dBm. This falls below T-Mobile's minimum design coverage threshold of -84 dBm. As a result, T-Mobile can not provide reliable

coverage to its customers in this area for voice, data and emergency 911 calls and data services.

**Q2. What is T-Mobile's operating frequency and the minimum signal level threshold for this area?**

A2. T-Mobile's operating frequencies for this area are:

TX: 1935.000 MHz to 1945.000 MHz (A Band)
RX: 1855.000 MHz to 1865.000 MHz

TX: 1980.200 MHz to 1984.800 MHz (C Band)
RX: 1900.200 MHz to 1904.800 MHz

TX1: 2140.000 MHz to 2145.000 MHz (AWS)
RX1: 1740.000 MHz to 1745.000 MHz

TX2: 2110.000 MHz to 2120.000 MHz (AWS)
RX2:1710.000 MHz to 1720.000 MHz

**Q3. Provide antenna specifications, including type, make, size, model, number of channels, and maximum power output. Indicate the proposed antenna height, number of antennas and antenna mounting configuration planned for the site.**

A3. T-Mobile proposes to install the following equipment at this facility:

Antenna Type: directional panel antenna
Number of antennas: 3 antennas per sector (9 total)
Make: RFS APX16PV-16PVL-E (quad pol)
Antenna Size: 55.9" x 13" x 13.5" (H x W x D)
Mounting Configuration: platform /3 antennas per sector
Proposed Antenna Height: 147 feet AGL
Maximum Channels per Sector: 8 Channels per Sector
Maximum Power Output per sector (EiRP): 1986.23 Watts EiRP

**Q4. Did T-Mobile perform the drive test provided in Application Attachment 1? If so, when was the drive test performed?**

**A4.** Yes. T-Mobile did perform the drive test at the proposed facility location. The drive test was performed on February 6, 2008.

**Q5. Provide a multi-signal level propagation plot at a scale of 1:40,000, depicting coverage from all existing and/or approved T-Mobile sites in the area. Provide a brief description of the existing sites including location, distance to the proposed facility, facility type, and antenna height. Depict and label major roads on the plot.**

A5. See plot attached hereto as Attachment A, depicting coverage from all existing and/or approved T-Mobile sites in the area.

| Site ID | Address | Town | Facility Type | Structure Height | T-Mobile Antenna Height | Distance to Proposed Crown Castle Madison Site |
|---|---|---|---|---|---|---|
| CT11394A | 864 Opening Hill Road | Madison | Self Supported Tower | 180 feet AGL | 135 feet AGL | 3.6 miles |
| CT11167A | 8 Old Route 79 | Madison | Monopole | 150 feet AGL | 120 feet AGL | 1.75 miles |
| CT11028A | 119 Tanner Road | Guilford | Monopole | 150 feet AGL | 163 feet AGL | 2.65 miles |
| CT11029I | 135 New Road | Madison | Guyed tower | 190 feet AGL | 162 feet AGL | 2.18 miles |

**Q6. Provide a multi-signal level propagation plots, at a scale of 1:40,000, depicting coverage from existing sites and the proposed site at tower heights of 147 feet and 137 feet. Depict and label major roads on the plots.**

A6. See plots attached hereto as Attachment B, depicting coverage from existing sites and the proposed site at tower heights of 147 feet and 137 feet.

**Q7. Provide specifications of the equipment building or cabinets to be installed at the proposed site. What type of emergency power system will be used at the site?**

A7. T-Mobile will be deploying 3 Nortel S12000 GSM cabinets, as well as 1 Ericsson RBS3106 UMTS cabinet. Specifications sheets for both cabinets are attached hereto as Attachment C.

T-Mobile will utilize battery back up for its emergency power source.

**Q8. Did T-Mobile have a search ring in this area prior to the filing of this application? If so, provide a map depicting the search ring and describe the properties and/or structures identified for possible use prior to selecting the proposed site.**

A8. Yes, T-Mobile did have a search ring in this area prior to filing this application. Search ring map is attached hereto as Attachment D. Below are the properties examined for use prior to selecting the proposed site.

| Site ID | Name | Address | Town | Notes |
|---|---|---|---|---|
| CTHA332A | CL&P Pole | 3 Little Hollow Road | Madison | RF Reject - Does not cover objective |
| CTHA332B | Country School | 341 Opening Hill Road | Madison | RF Reject - Does not cover objective |
| CTHA332D | Driving Range Property | 391-B Durham Road | Madison | Property unleasable per Landlord |
| CTHA332E | Crown Alt Site | 781 Durham Road | Madison | site moved to transfer station |
| | | | | |

**Q9. Provide a power density analysis according to the methodology prescribed in the FCC Office of Engineering and Technology Bulletin No. 65E, Edition 97-01 (August 1997) assuming all T-Mobile antennas are oriented towards the base of the tower and all channels are operating simultaneously.**

A9. See power density analysis attached hereto as Attachment E.

Respectfully Submitted,

By:_____

Attorney for Omnipoint
Communications, Inc.
Julie D. Kohler, Esq.
jkohler@cohenandwolf.com
Cohen and Wolf, P.C.
1115 Broad Street
Bridgeport, CT 06604
Tel. (203) 368-0211
Fax (203) 394-9901

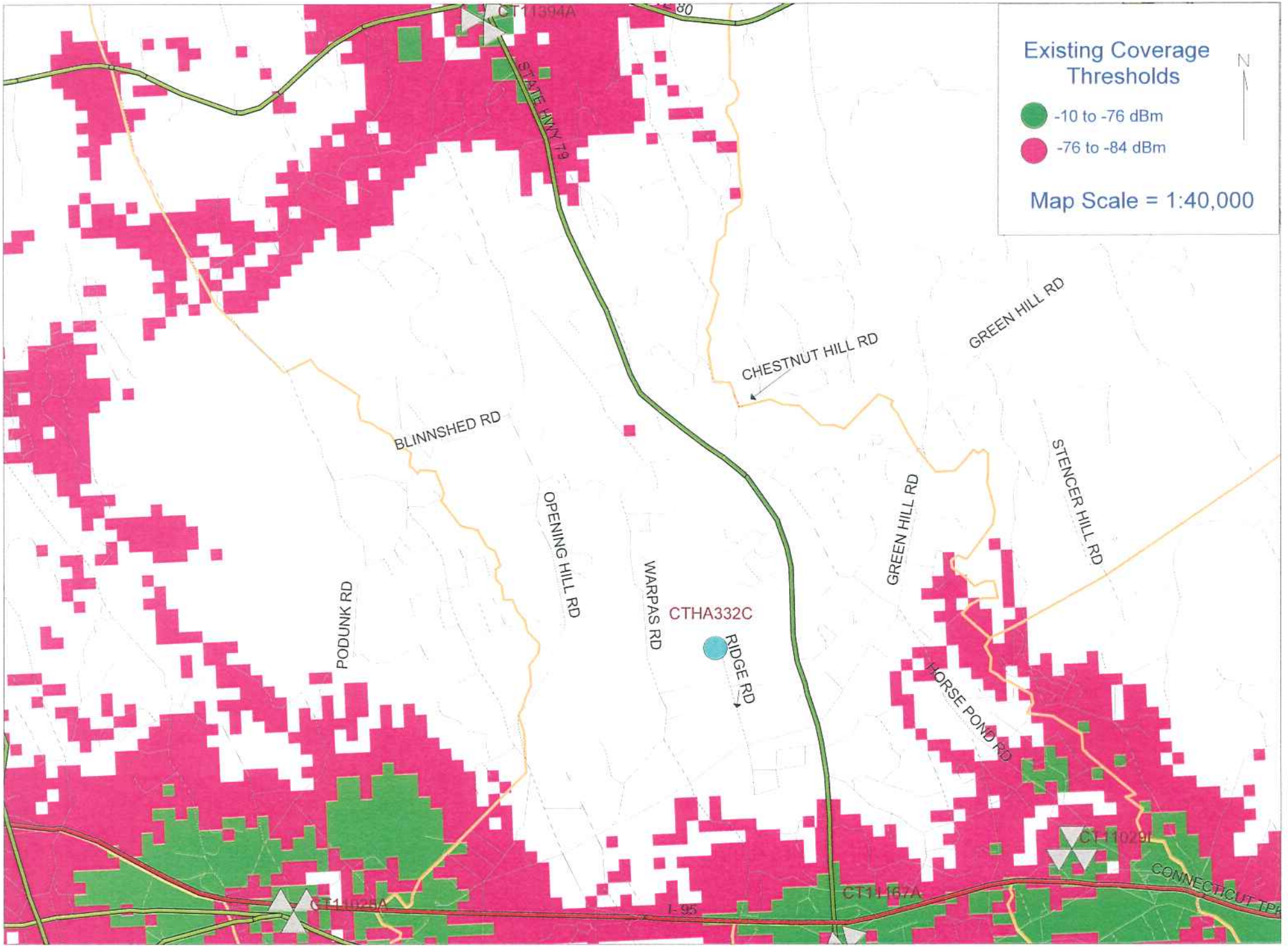
## CERTIFICATE OF SERVICE

I hereby certify that on this day a copy of the foregoing was delivered by regular mail, postage prepaid, to all parties and intervenors of record.

Christopher B. Fisher, Esq.
Cuddy & Feder LLP
445 Hamilton Avenue, 14th Floor
White Plains, NY 10601

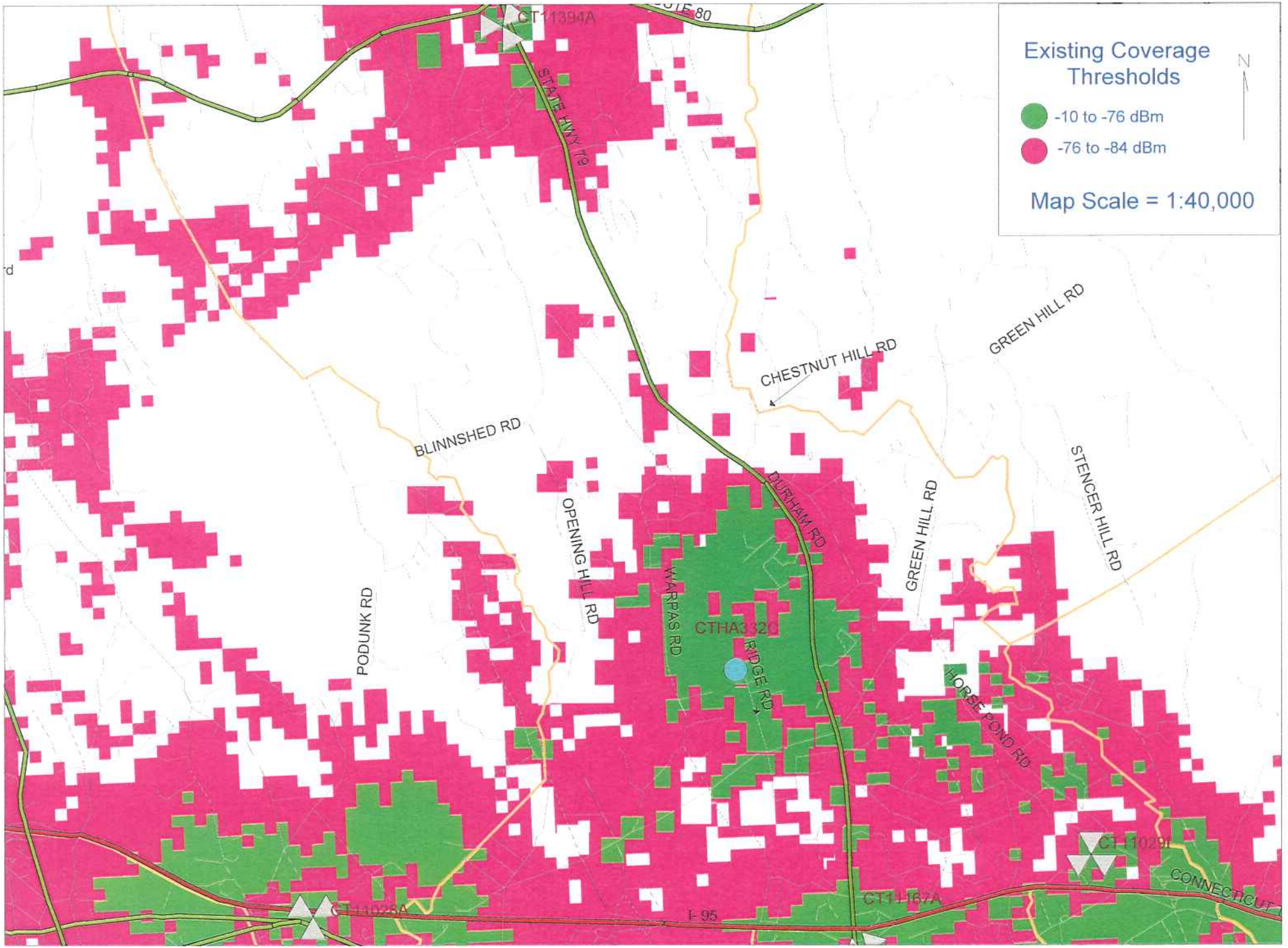
Julie D. Kohler

# ATTACHMENT A

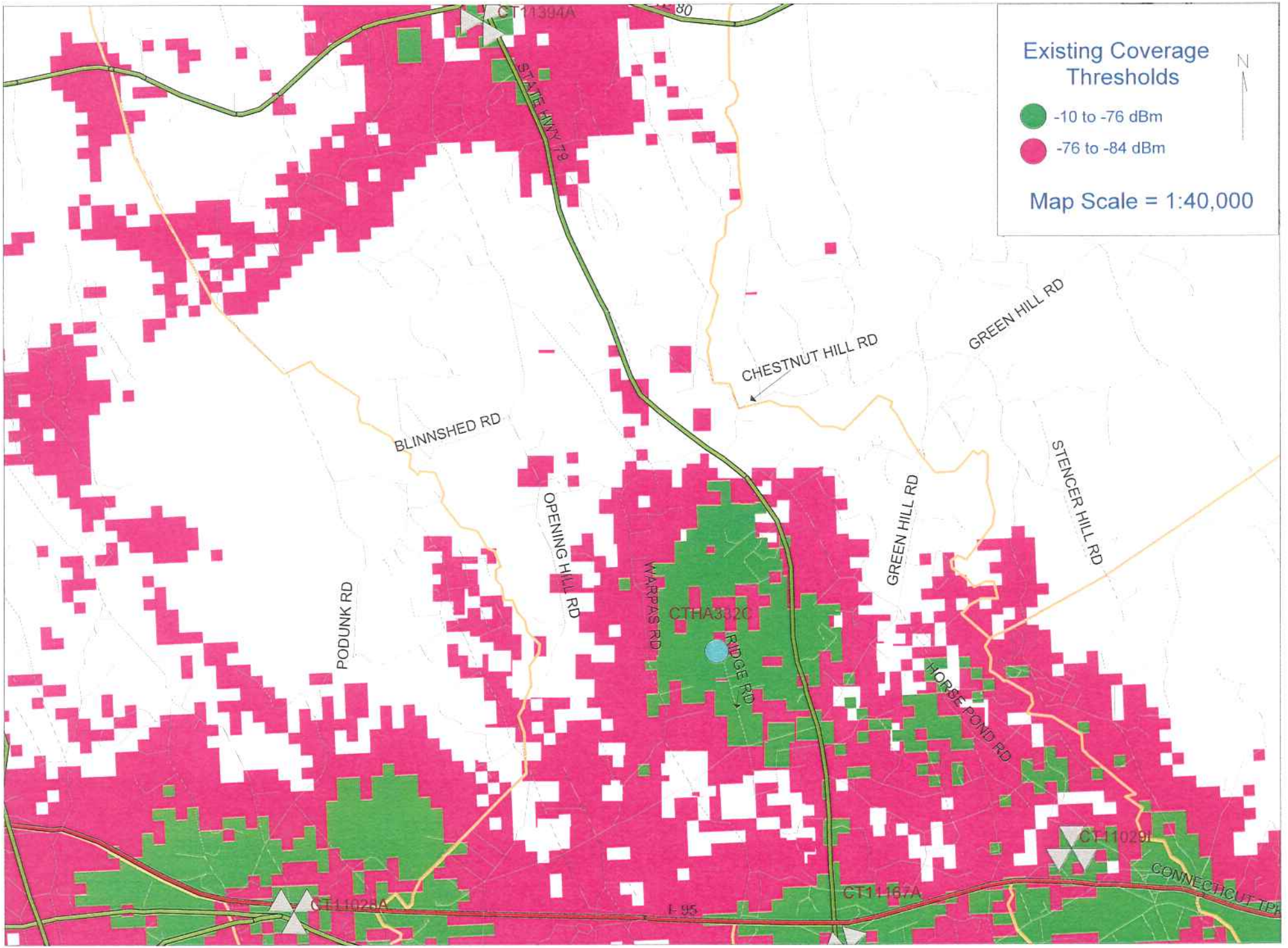



**Existing T-Mobile Coverage**

# ATTACHMENT B




**Existing T-Mobile Coverage With CTHA332C @ 147 feet AGL**




**Existing T-Mobile Coverage With CTHA332C @ 137 feet AGL**

# ATTACHMENT C

# Cabinet Comparison 2G & 3G

**UMTS RBS 3106** **GSM RBS 2106**

The picture above shows an Ericsson's UMTS radio cabinet 3106 with a GSM RBS 2106. Here is the comparison between the two, as far as dimensions and weights are concerned.

| Unit | Height [mm/inches] | Footprint | | Depth [mm/inches] |
|---|---|---|---|---|
| | | Width [mm/inches] | Depth [mm/inches] | |
| **RBS 2106** | 1614/63.5 | 1300/51.2 | 710/30 | 940/37.0 |
| **RBS 3106** | 1630/64.2 | 1300/51.2 | 710/30 | 926/36.5 |

| Unit | Height [mm/inches] | Footprint | | Depth [mm/inches] |
|---|---|---|---|---|
| | | Width [mm/inches] | Depth [mm/inches] | |
| **RBS 2206** | 1850/64.2 | 600/23.6 | 400/15.8 | 470/18.5 |
| **RBS 3206** | 1950/76.8 | 600/23.6 | 400/15.8 | 470/18.5 |

| Unit | Fully Configured*[1] Weight [kg/lbs] |
|---|---|
| **RBS 2106** | 590/1300 |
| **RBS 3106** | 850/1889 |

| Unit | Fully Configured*[1] Weight [kg/lbs] |
|---|---|
| **RBS 2206** | 230/507 |
| **RBS 3206** | 200/440 |

*[1] Please refer to Page 3 for weight of a 3x06 in Typical (3x1) configuration.

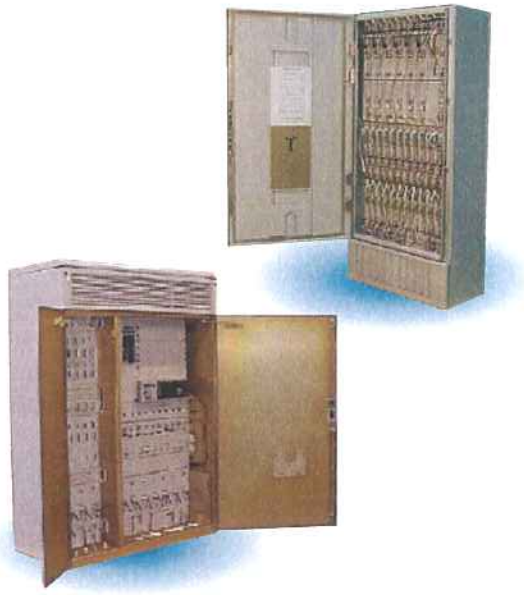
# Nortel Networks
# Univity GSM S12000 BTS

**Indoor & Outdoor versions**

As the GSM industry moves into the world of data, pressure has increased on capacity and so network enhancement and development costs are rising. The Univity GSM S12000 BTS – Indoor and Outdoor versions – is a product that meets the needs of a mature GSM market by increasing site capacity and at the same time lowering the risks and the costs of introduction.

The Univity GSM S12000 BTS – Indoor and Outdoor versions – is built on an existing field proven platform, the Univity GSM S8000 BTS, which is known for its quality and robustness. The reuse of a considerable amount of technology lowers the risk and cost for the operators when introducing this new product into their network.

The Univity GSM S12000 BTS – Indoor version is designed for protected sites while the Outdoor version is a fully integrated BTS site with AC power supply and extended temperature range.



*In this document the term "the S12000 BTS" stands for "the Univity GSM S12000 BTS - Indoor and Outdoor version" except where mentioned.*

## The high capacity cell site

Nortel Networks addresses the growing needs of GSM capacity by introducing the S12000 BTS, which is an innovative development of the S8000 BTS. This innovative approach to network expansion and development is aimed at providing high capacity sites installed with low risk, reduced network impact and a lower cost of ownership.

The S12000 BTS is a key component to the delivery of more capacity within a GSM/GPRS network while driving down network costs. The S12000 BTS offers nearly double the capacity of the S8000 BTS, thereby offering a more compact site and improved operational efficiency.

Finally the S12000 BTS supports more users and offers higher speed data access and quality then increasing opportunities of revenues.

## Lowering the cost of ownership and network introduction

It is not just the introduction of the evolution of a field proven and reliable technology that reduces the cost of ownership but also the reduced spares holding and training requirements. By the design of the S12000 BTS, Nortel Networks has aimed to reduce the cost of introducing the S12000 BTS into a GSM network. The S12000 BTS brings considerable savings in CAPEX and OPEX to the operator since main modules and skills are usable within both the S8000 BTS and S12000 BTS. The operator does not have to change the network Engineering and Operational procedures on the existing S8000 BTS. Moreover, via the high capacity and the high RF performance of the S12000 BTS, fewer sites are required. Low introduction costs are invaluable when facing the financial pressures of network enhancements such as GPRS or new services such as UMTS. The use of the S12000 BTS puts the operator in a position to make efficient use of all resources and reduce network complexity relieving pressure on investment.

NORTEL NETWORKS

## Modular and flexible

The S12000 BTS supports twelve TRX per cabinet and offers cost effective configurations from 1 to 16 TRX per cell in a tri-sector configuration. A dual band configuration of 6 + 6 TRX can be supported in a single cabinet for all coupling configurations.

The modular design of the S12000 BTS and the possibility to choose between multiple RF-combining options allows the operator to deploy the S12000 BTS solution in a number of different scenarios such as high-capacity solution in cities or alternatively enabling to provide wide coverage with a minimum number of sites in rural area.

## High Performance

The Nortel Networks family of BTS holds a high market position for reliability, operability and service quality. The S12000 BTS provides high data services and voice quality, high coverage and building penetration and smooth call handovers. It possesses many advanced RF features to improve spectral usage and optimisation and so increase available capacity. The AMR and EDGE solutions will further enhance spectrum efficiency. These high performance qualities are extremely important with the introduction of GPRS services.

In addition, as for the S8000 BTS, the S12000 BTS supports UMTS co-sitting thanks to specific combiners, allowing a smooth UMTS introduction.

The high radio performance and advanced digital processing of the S12000 BTS provide one of the highest receive sensitivity in the market today, offering –115 dBm guaranteed and without the need for masthead amplifiers (-117dBm typical). The high radio performance enhances the resistance to interference, improving voice quality, data throughput, cell coverage and service availability.

Nortel Networks experience in frequency hopping, fractional re-use, cell tiering and multi-layer management algorithms provide high spectrum efficiency which releases more capacity for a fixed allocation of spectrum.

## Growing the business and ensuring success

The Univity GSM S12000 BTS is future ready. The high capacity and flexibility of the S12000 BTS, the introduction of AMR and EDGE, put the operator in a best position to meet the challenges and opportunities of GSM/GPRS. These advantages enable the operator to capture new revenues, improve profitability and gain a better return on investment as the network develops and moves forward.

| Technical Specifications: | | Indoor | Outdoor |
|---|---|---|---|
| Frequency range | | 900 MHz GSM / 900 MHZ Extended GSM<br>1800 MHz GSM and Dual Band GSM 900 / 1800<br>850 MHZ GSM<br>1900 MHz GSM and Dual Band GSM 850 / 1900 | |
| Receive sensitivity | w/o diversity | -110 dBm garanteed (w/o TMA) | |
| | with diversity | -115 dBm garanteed (w/o TMA) | |
| Dimensions | Height | 1950 mm | 1910 mm |
| | Width | 910 mm | 1350 mm |
| | Depth | 450 mm | 650 mm |
| Weight | Empty cabinet | 170 kg | 200 kg |
| | Fully equipped | 415 kg | 570 kg |
| Capacity | Standard | 12 TRX per radio cabinet<br>Up to 3 radio cabinets | |
| | Future option | Up to 4 radio cabinets | |
| Configuration | Monoband Trisectorial | Up to S16-16-16 (4 radio cabinets) | |
| | Dual Band Trisectorial | S222_222 (1 radio cabinet)<br>Mono-BCCH dual band cells | |
| | Cell Splitting | Cell splitting across radio cabinets | |
| Amplifier output power | Standard | 30W (+/- 0.5 dB) GMSK<br>30W (+/- 0.5 dB) 8-PSK EDGE | |
| | Optional | 60W (+/- 0.5 dB) GMSK*<br>45W (+/- 0.5 dB) 8-PSK | |
| Transmission coupling | | All coupling configurations<br>From Duplexers to 4 Ways Hybrid Coupling (H4D) | |
| Power control | Static | 6 steps of 2 dB | |
| | Dynamic | 15 steps of 2 dB | |
| Space for customer Equipment | | NA | 6U |
| Frequency Hopping | | RF Synthetised | |
| Supported vocoders | | Full Rate (FR)<br>Enhanced Full Rate (EFR)<br>Adaptive Multi-Rate - Full Rate (AMR FR)<br>Adaptive Multi-Rate - Half Rate (AMR HR) | |
| Encryption algorithms | | A5/1 & A5/2 | |
| Power supply | Nominal | DC -48 V | Single, single-split or tri-phase 230V (50/60Hz) AC<br>Integrated battery backup<br>Optional ancillary battery cabinet |
| Operational temperature range | | -5°C to +45°C | -40°C to +50°C |
| Max acoustic noise | | 65 dB(A) | |
| Backhaul | Standard | 6 E1 / T1 links | |
| | Future option | 8 E1 / T1 links | |

** Frequency dependant*


In North america, the Caribbean, and Latin America :
Tel : 1-800-4-Nortel
or 1-506-674-5470

In Europe, Middle East, and Africa :
Tel : 00-800-8008-9009*
or +44 (0)20 8920 4618

In Asia :
Tel : 65-287-2877

for more information contact your Nortel Networks account representative, or visit :
www.nortelnetworks.com/contact

* call are not from all European Countries.


**www.nortelnetworks.com**




NN101082-0702


NORTEL NETWORKS

# ATTACHMENT D

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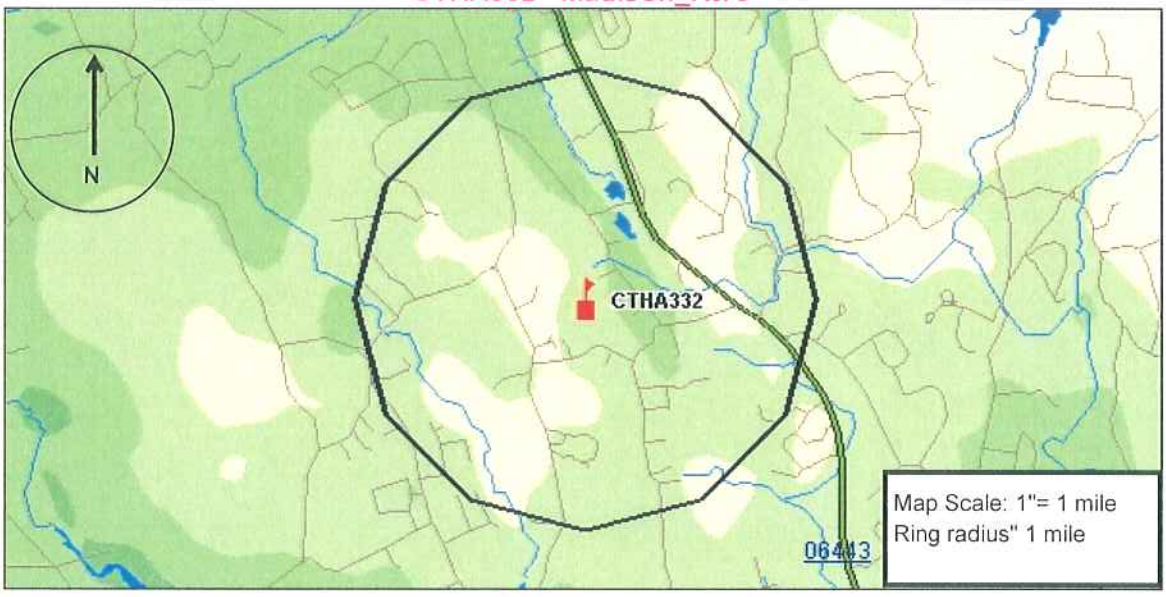
8/6/2008

# CTHA332 Madison_Rt79




Click on the map to: Zoom In Zoom Out Center Map width: 5 miles Change

| | | | | | |
|---|---|---|---|---|---|
| **Soft Cost Approved Date:** | 5/17/2005 | **BTA:** 318 | **Region:** CT01 | **AOR:** Patrick | |
| **RANK:** | 171 | | **Modified Date:** 8/15/2007 8:46:50 AM | **Modified By:** WO397787 | |
| **Capital Type:** | InFill | **Budget Year:** 2008 | **Created Date:** 4/21/2005 2:07:13 PM | **Created By:** joverbey | |
| **County:** | New Haven | **City:** Madison | **State:** CT | | |
| **Lat Decimal:** | 41.32481841 | | **Desired Cov Radius:** 1 | | |
| **Lon Decimal:** | -72.62812187 | | **RF Required OnAir Date:** 1/1/2006 | | |
| **Ring Rad Center:** | 150 | | **AMSL:** 164 | | |

| **Priority Comments:** | **Potential Candidate:** |
|---|---|
| **Justification**<br>RM14 score of 53 due to points in these categories: Drop=10,BAN=13,Pop=15 | **Coverage Objective**<br>Provide coverage in Madison along Rt 79 and surrounding area |

# ATTACHMENT E

# New England Market

## Worst Case Power Density

| | |
|---|---|
| **Site:** | **CTHA332C** |
| **Site Address:** | **258 Ridge Road** |
| **Town:** | **Madison** |
| **Tower Height:** | **150 ft.** |
| **Tower Style:** | **Monopole /Sign** |
| Base Station TX output | 25 W |
| Number of channels | 8 |
| Antenna Model | APX16PV-16PVL |
| Cable Size | 1 5/8 |
| Cable Length | 175 ft. |
| Antenna Height | 147.0 ft. |
| Ground Reflection | 1.6 |
| Frequency | 1945.0 MHz |
| Jumper & Connector loss | 4.50 dB |
| Antenna Gain | 16.5 dBi |
| Cable Loss per foot | 0.0116 dB |
| Total Cable Loss | 2.0300 dB |
| Total Attenuation | 6.5300 dB |
| Total EIRP per Channel | 53.95 dBm |
| (In Watts) | 248.28 W |
| Total EIRP per Sector | 62.98 dBm |
| (In Watts) | 1986.23 W |
| nsg | 9.9700 |
| **Power Density (S) =** | **0.021919 mW/cm^2** |
| **T-Mobile Worst Case % MPE =** | **2.1919%** |

*Equation Used :*

$$S = \frac{(1000)(grf)^2 (Power) * 10^{(nsg/10)}}{4\pi (R)^2}$$

*Office of Engineering and Technology (OET) Bulletin 65, Edition 97-01, August 1997*