

STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL

IN RE: :  
 :  
 APPLICATION OF NEW CINGULAR : DOCKET NO. 442  
 WIRELESS PCS, LLC (AT&T) FOR A :  
 CERTIFICATE OF ENVIRONMENTAL :  
 COMPATIBILITY AND PUBLIC NEED FOR :  
 THE CONSTRUCTION, MAINTENANCE AND :  
 OPERATION OF A TELECOMMUNICATIONS :  
 FACILITY AT THE CONNECTICUT STATE :  
 ARMORY SITE AT 284 NEW CANAAN :  
 AVENUE (STATE ROUTE 123) NORWALK, :  
 CONNECTICUT : NOVEMBER 26, 2013

RESPONSES OF CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS  
TO CONNECTICUT SITING COUNCIL PRE-HEARING QUESTIONS – SET ONE

On November 5, 2013, the Connecticut Siting Council (“Council”) issued Pre-Hearing Questions, Set One to Cellco Partnership d/b/a Verizon Wireless (“Cellco”), relating to the above-captioned docket. Below are Cellco’s responses. Cellco identifies this facility as its “Norwalk 3 cell site”.

Question No. 1

1. Discuss Cellco’s need for the proposed facility. Specifically, what level of voice and data service does Cellco currently have in this area, and in what ways would the proposed facility improve these services? Indicate the size of Cellco's proposed service area for each frequency in square miles.

Response

The Norwalk 3 cell site will provide both coverage and capacity relief to Cellco’s network in portions of northwest Norwalk and southeast New Canaan. Cellco currently experiences gaps in wireless service at each of its operating frequencies, along portions of Routes 15 and 123 and along local roads and in residential areas to the north, west and south of the

proposed Norwalk 3 cell site.

Initially, Cellco only intends to install and utilize its 700 MHz (LTE) and 2100 MHz (AWS) frequencies at the Norwalk 3 cell site. Cellco's existing signal strength in the area around the proposed Norwalk 3 cell site ranges from -86 dBm and -103 dBm at 700 MHz (LTE) frequencies and -86 dBm and -108 dBm at 2100 MHz (AWS) frequencies. The coverage footprint for the proposed Norwalk 3 cell site would be 12.49 square miles at 700 MHz (LTE) frequencies and 6.14 square miles at 2100 MHz (AWS) frequencies.

Question No. 2

What are Cellco's operating frequencies and minimum signal level thresholds?

Response

As mentioned above, Cellco intends to install and utilize its 700 MHz (LTE) and 2100 MHz (AWS) frequencies at the proposed Norwalk 3 cell site. Cellco's minimum design threshold signal strength is -85 dBm for in-vehicle service of and -75 dBm for in-building service.

Question No. 3

What are Cellco's proposed antenna height(s)? How many antennas does Cellco intend to locate at each height?

Response

Cellco intends to install three (3) AWS antennas at the 117-foot level and three (3) LTE antennas at the 107-foot level on the second unipole tower proposed to be located in the southerly portion of the facility compound.

Question No. 4

How will the unipole design affect performance and maintenance of Cellco's equipment at the cell site? What is the current trend in antenna design that Cellco is utilizing, and given the

current trend, would the unipole design be able to accommodate potential technological antenna advancements?

Response

As Cellco's witnesses have discussed in prior Council proceedings, anytime Cellco modifies its standard antenna configuration (12 to 15 antennas attached to a platform at the same horizontal level on a tower) it is making compromises that will, in some fashion, impact network performance. Going from a traditional horizontal array to "flush-mounted" or "unipole" type antennas, requires Cellco to utilize two (2) or three (3) antenna levels on a tower and results in a loss of approximately 3 dB of service, thereby shrinking the coverage footprint from that particular cell site. Occasionally, Cellco can compensate for that 3 dB loss by increasing the height of certain antennas. The use of the unipole design also impacts Cellco's ability to install and utilize remote radio heads ("RRH") and/or tower-mounted amplifiers ("TMA"), due to the limited space inside the stealth tower structure. A larger diameter unipole may allow for the installation of RRHs or TMAs and may offer some additional flexibility for new antenna configurations in the future.

Question No. 5

What is the minimum tower height Cellco would require if the site were designed as a traditional monopole with platform mounted antennas?

Response

If Cellco were able to utilize a traditional platform-mounted antenna array at the proposed cell site, it would install all of its antennas at the 117' level on the tower.

Question No. 6

Provide specifications of the radio equipment to be installed at the proposed site.

Response

Specifications for Cellco's antennas and base station equipment is included in Attachment 1.

Question No. 7

Provide a multi-signal level propagation plot at a scale of 1:40,000, depicting coverage from all existing and/or approved Cellco 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.

Response

Plots showing coverage from Cellco's existing sites in the area around the proposed Norwalk 3 cell site, at each of its FCC licensed frequencies (850 MHz, 700 MHz, 1900 MHz and 2100 MHz), are include in Attachment 2. Cellco's existing cell sites in the area include:

1. New Canaan South – Waveny Park Water Tank off South Avenue in New Canaan. This cell site is located approximately 2.0 miles to the southwest of the proposed Norwalk 3 cell site. Cellco antennas are located at a height of 122 feet above ground level ("AGL").
2. New Canaan – 39 Locust Street in New Canaan. This roof-top cell site is located approximately 2.0 miles to the northwest of the proposed Norwalk 3 cell site. Cellco antennas are located at a height of 45.9 feet AGL.
3. Wilton 2 – 50 Danbury Road in Wilton. This roof-top mounted flagpole cell site is located approximately 3.0 miles to the northeast of the proposed Norwalk 3 cell site. Cellco antennas are located at heights of 75 feet and 85 feet AGL.

4. North Norwalk – 173 West Rocks Road in Norwalk. This water tank cell site is located approximately 2.0 miles to the east of the proposed Norwalk 3 cell site. Cellco antennas are located at a height of 94 feet AGL.
5. Darien East – 4 Tower Drive in Darien. This water tank cell site is located approximately 2.5 miles southwest of the proposed Norwalk 3 cell site. Cellco antennas are located at a height of 108 feet AGL.

Question No. 8

Provide a multi-signal level propagation plot, at a scale of 1:40,000, depicting coverage from existing sites and the proposed site. Depict and label major roads on the plot.

Response

Plots showing anticipated coverage at Cellco's 700 MHz (LTE) and 2100 MHz (AWS) frequencies are included in Attachment 3. As mentioned in Response to Question No. 1 above, initially Cellco intended to install and utilize its 700 MHz and 2100 MHz frequencies at the proposed Norwalk 3 cell site.

Question No. 9

Provide the type and run time of the emergency power equipment to be installed at the proposed site.

Response

Cellco intends to install a battery back-up system and a diesel-fueled backup generator inside its equipment shelter in the facility compound. Under normal operating conditions, the battery back-up system can power a cell site for up to eight (8) hours. A diesel generator, with its typical 210 gallon fuel tank can run continuously for up to four (4) days before refueling is required.

Question No. 10

Did Cellco 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.

Response

Yes. A copy of Cellco's search area map is included in Attachment 4. Prior to intervening in the AT&T application, Cellco was considering the use of a water tank at 3 Flower Lane in Norwalk, approximately one-half mile south of the proposed Norwalk 3 cell site. The Flower Lane water tank is located in a residential zone district in Norwalk. Norwalk Zoning Regulations prohibit the use of this tank for telecommunications purposes.

Question No. 11

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 Cellco antennas are directed at the base of the tower and all channels are operating simultaneously.

Response

Included in Attachment 5 is a General Power Density table calculating Radio Frequency (RF) emissions from Cellco's 700 MHz and 2100 MHz antennas. The Cellco facility will operate well within the FCC standard for RF emissions.

**CERTIFICATION OF SERVICE**

I hereby certify that on this 26<sup>th</sup> day of November, 2013, a copy of the foregoing was sent,  
via U.S. Mail and electronic mail, to the following:

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Kenneth C. Baldwin

# **ATTACHMENT 1**



# Product Specifications

COMMSCOPE®

LNX-6514DS-VTM

Andrew® Antenna, 698–896 MHz, 65° horizontal beamwidth, RET compatible

POWERED BY



## Electrical Specifications

Frequency Band, MHz	698–806	806–896
Gain, dBi	15.7	16.3
Beamwidth, Horizontal, degrees	65	65
Beamwidth, Horizontal Tolerance, degrees	±3	±3
Beamwidth, Vertical, degrees	12.5	11.2
Beam Tilt, degrees	0–10	0–10
USLS, typical, dB	17	18
Front-to-Back Ratio at 180°, dB	32	30
CPR at Boresight, dB	20	20
CPR at Sector, dB	10	10
Isolation, dB	30	30
VSWR   Return Loss, dB	1.4   15.6	1.4   15.6
PIM, 3rd Order, 2 x 20 W, dBc	-150	-150
Input Power per Port, maximum, watts	400	400
Polarization	±45°	±45°

## Mechanical Specifications

Color   Radome Material	Light gray   Fiberglass, UV resistant
Connector Interface   Location   Quantity	7-16 DIN Female   Bottom   2
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h   149.8 mph
Antenna Dimensions, L x W x D	1847.0 mm x 301.0 mm x 181.0 mm   72.7 in x 11.9 in x 7.1 in
Net Weight	17.6 kg   38.8 lb
Model with factory installed AISG 2.0 RET LNX-6514DS-A1M	



# Product Specifications

COMMScope®

HBX-6517DS-VTM

Andrew® Teletilt® Antenna, 1710–2180 MHz, 65° horizontal beamwidth, RET compatible

POWERED BY



## Electrical Specifications

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain, dBi	19.0	19.1	19.2
Beamwidth, Horizontal, degrees	65	65	65
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beam Tilt, degrees	0–6	0–6	0–6
USLS, typical, dB	18	18	18
Front-to-Back Ratio at 180°, dB	30	30	30
Isolation, dB	30	30	30
VSWR   Return Loss, dB	1.4   15.6	1.4   15.6	1.4   15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°

## Mechanical Specifications

Color | Radome Material Light gray | PVC, UV resistant

Connector Interface | Location | Quantity 7-16 DIN Female | Bottom | 2

Wind Loading, maximum 393.2 N @ 150 km/h  
88.4 lbf @ 150 km/h

Wind Speed, maximum 241.0 km/h | 149.8 mph

Antenna Dimensions, L x W x D 1902.0 mm x 166.0 mm x 83.0 mm | 74.9 in x 6.5 in x 3.3 in

Net Weight 6.2 kg | 13.7 lb

Model with factory installed AISG 2.0 RET HBX-6517DS-A1M



## Alcatel-Lucent RRH2x40-07-U

### REMOTE RADIO HEAD

The Alcatel-Lucent RRH2x40-07-U is a high-power, small form-factor Remote Radio Head (RRH) operating in the North American Digital Dividend / 700MHz frequency band (3GPP Band 13). The Alcatel-Lucent RRH2x40-07-U is designed with an eco-efficient approach, providing operators with the means to achieve high quality and capacity coverage with minimum site requirements.



A distributed eNodeB expands deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of an eNodeB to be installed separately, within the same site or several kilometres apart.

The Alcatel-Lucent RRH2x40-07-U is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information. The Alcatel-Lucent RRH2x40-07-U has two transmit RF paths, 40 W RF output power per transmit path, and is designed to manage up to two-way receive diversity. The device is ideally suited to support macro coverage, with multiple-input multiple-output (MIMO) 2x2 operation in up to 10 MHz of bandwidth.

The Alcatel-Lucent RRH2x40-07-U is designed to make available all the benefits of a distributed eNodeB, with excellent RF characteristics, with low

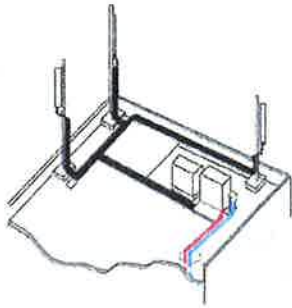
capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent RRH2x40-07-U installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

#### Fast, low-cost installation and deployment

The Alcatel-Lucent RRH2x40-07-U is a zero-footprint solution and operates noise-free, simplifying negotiations with site property owners and minimizing environmental impacts. Installation can easily be done by a single person because the Alcatel-Lucent RRH2x40-07-U is compact and weighs less than 23 kg (50 lb), eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day — a fraction of the time required for a traditional BTS.

## Excellent RF performance

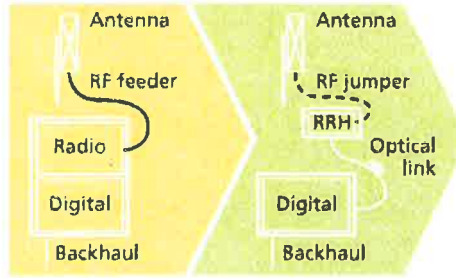
Because of its small size and weight, the Alcatel-Lucent RRH2x40-07-U can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-07-U where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation costs are reduced or eliminated, and there is no need for a Tower Mounted Amplifier (TMA) because losses introduced by the RF feeder are greatly reduced. The Alcatel-Lucent RRH2x40-07-U provides more RF power while at the same time consuming less electricity.



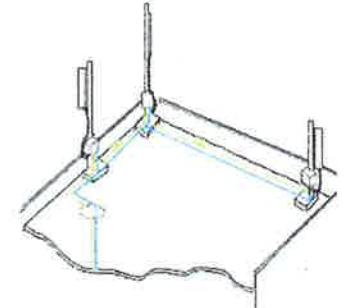
Macro

## Features

- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless), noise-free, and heaterless unit
- Best-in-class power efficiency, with significantly reduced energy consumption



RRH for space-constrained cell sites



Distributed

## Benefits

- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility to network planning

## Technical specifications

### Physical dimensions

- Height: 390 mm (15.4 in.)
- Width: 380 mm (15 in.)
- Depth: 210 mm (8.2 in.)
- Weight (without mounting kit): less than 23 kg (50 lb)

### Power

- Power supply: -48V

### Operating environment

- Outdoor temperature range:
  - With solar load: -40°C to +50°C (-40°F to +122°F)
  - Without solar load: -40°C to +55°C (-40°F to +131°F)
- Passive convection cooling (no fans)

- Enclosure protection
  - IP65 (International Protection rating)

### RF characteristics

- Frequency band: 700 MHz; 3GPP Band 13
- Bandwidth: up to 10 MHz
- RF output power at antenna port:
  - 40 W nominal RF power for each Tx port
- Rx diversity: 2-way or 4-way
- Noise figure: below 2.5 dB typical
- ALD features
  - TMA
  - Remote electrical tilt (RET) support (AISG v2.0)

### Optical characteristics

#### Type/number of fibers

- Up to 3.12 Gb/s line bit rate
- Single-mode variant
  - One SM fiber (9/125 μm) per RRH2x, carrying UL and DL using CWDM (at 1550/1310 nm)
- Multi-mode variant
  - Two MM fibers (50/125 μm) per RRH2x: one carrying UL, the other carrying DL (at 850 nm)

### Optical fiber length

- Up to 500 m (0.31 mi), using MM fiber
- Up to 20 km (12.43 mi), using SM fiber

### Alarms and ports

- Six external alarms
- Two optical ports to support daisy-chaining

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## Alcatel-Lucent RRH2x40-AWS

### REMOTE RADIO HEAD

The Alcatel-Lucent RRH2x40-AWS is a high-power, small form-factor Remote Radio Head (RRH) operating in the AWS frequency band (1700/2100MHz - 3GPP Band 4). The Alcatel-Lucent RRH2x40-AWS is designed with an eco-efficient approach, providing operators with the means to achieve high quality and capacity coverage with minimum site requirements.



A distributed eNodeB expands deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of an eNodeB to be installed separately, within the same site or several kilometres apart.

The Alcatel-Lucent RRH2x40-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information. The Alcatel-Lucent RRH2x40-AWS has two transmit RF paths, 40 W RF output power per transmit path, and is designed to manage up to four-way receive diversity. The device is ideally suited to support macro coverage, with multiple-input multiple-output (MIMO) 2x2 operation in up to 20 MHz of bandwidth.

The Alcatel-Lucent RRH2x40-AWS is designed to make available all the benefits of a distributed eNodeB, with excellent RF characteristics, with low

capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent RRH2x40-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

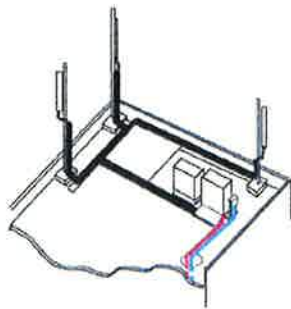
#### Fast, low-cost installation and deployment

The Alcatel-Lucent RRH2x40-AWS is a zero-footprint solution and operates noise-free, simplifying negotiations with site property owners and minimizing environmental impacts. Installation can easily be done by a single person because the Alcatel-Lucent RRH2x40-AWS is compact and weighs less than 20 kg (44 lb), eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day — a fraction of the time required for a traditional BTS.



## Excellent RF performance

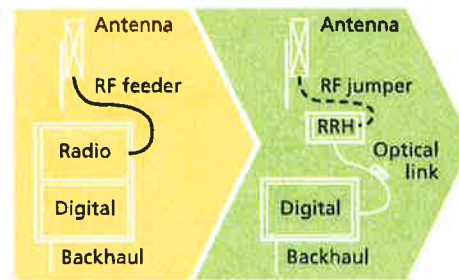
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation costs are reduced or eliminated, and there is no need for a Tower Mounted Amplifier (TMA) because losses introduced by the RF feeder are greatly reduced. The Alcatel-Lucent RRH2x40-AWS provides more RF power while at the same time consuming less electricity.



Macro

## Features

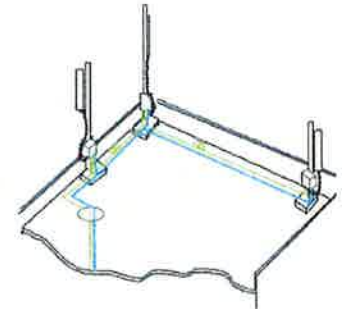
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption



RRH for space-constrained cell sites

## Benefits

- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility to network planning



Distributed

## Technical specifications

### Physical dimensions

- Height: 620 mm (24.4 in.)
- Width: 270 mm (10.63 in.)
- Depth: 170 mm (6.7 in.)
- Weight (without mounting kit): less than 20 kg (44 lb)

### Power

- Power supply: -48VDC

### Operating environment

- Outdoor temperature range:
  - With solar load: -40°C to +50°C (-40°F to +122°F)
  - Without solar load: -40°C to +55°C (-40°F to +131°F)

- Passive convection cooling (no fans)
- Enclosure protection
  - IP65 (International Protection rating)

### RF characteristics

- Frequency band: 1700/2100 MHz (AWS); 3GPP Band 4
- Bandwidth: up to 20 MHz
- RF output power at antenna port: 40 W nominal RF power for each Tx port
- Rx diversity: 2-way or 4-way with optional Rx Diversity module
- Noise figure: below 2.0 dB typical
- Antenna Line Device features
  - TMA and Remote electrical tilt (RET) support via AISG v2.0

### Optical characteristics

#### Type/number of fibers

- Single-mode variant
  - One Single Mode Single Fiber per RRH2x, carrying UL and DL using CWDM
  - Single mode dual fiber (SM/DF)
- Multi-mode variant
  - Two Multi-mode fibers per RRH2x: one carrying UL, the other carrying DL

### Optical fiber length

- Up to 500 m (0.31 mi), using MM fiber
- Up to 20 km (12.43 mi), using SM fiber

### Digital Ports and Alarms

- Two optical ports to support daisy-chaining
- Six external alarms

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# Alcatel-Lucent 9412 eNodeB Compact

## Product Datasheet

### eUTRAN Introduction

This data sheet provides a high level description of the key aspects of the Alcatel-Lucent Long Term Evolution (LTE) 9412 Compact eNode B.

LTE is a pure packet system, with no support for legacy circuit switched voice/data. This shift allows a significant simplification of the network, reducing the number of nodes and improving operational efficiencies. This network simplification also removes the bottlenecks from the system, ensuring the network permanently runs closer to peak efficiency.

The two logical entities in the LTE network are the eUTRAN (evolved UTRAN) on the access side, and the enhanced Packet Core (ePC). The eUTRAN follows a flat architecture; for example the eNodeB concentrates most of the access functions that were split into the RNC and Base Station in 3G CDMA.

### Architecture

The 9412 eNodeB Compact is a high capacity integrated baseband and RF cabinet solution, housing the Alcatel-Lucent 9926 Digital d2u LTE Module as well as up to 3 integrated Radio Modules (TRDUs).

Some of the key features of the 9412 eNodeB Compact and its equipment provisions:

- Sub compact sized cabinet – cabinets are stackable for growth.
- Small Foot print, allowing simple transport, movement and easy installation.
- Mounting Flexibility – Floor or wall mountable.
- Base Band Unit support – either the Digital d2u or the LTE Module with up to 3 modems each. Each baseband unit has 6 CPRI based optical ports for RF unit connection.
- RF support – each unit can support up to 3 TRDUs. A stacked configuration can support 6 sectors of LTE in a single ETSI compliant footprint.
- Rack mountable assets: All the major assets are 19 inches for rack mount versatility.
- User Space : when deployed with the LTE Module the 9412 eNodeB cabinet supports an additional 2U of user space.
- Stackable – Capacity expansion without footprint growth
- NEBS, FCC and UL compliance
- ROHS support for Cabinet and PDP
- All modules/interfaces are front access.
- Antenna jumper cable pass through or bulkhead mounting
- Antenna Sharing with co-located CDMA systems.

### LTE deployment scenarios

Alcatel-Lucent intend to cover both Greenfield, standalone networks in new spectrum bands as well as offering a smooth evolution path for currently deployed GSM, WCDMA/HSPA and CDMA/EV-DO networks.

To this end, our LTE solution is designed to integrate into existing product offerings to support a graceful evolution to an LTE eNode B: The solution is modular and is composed of the digital or baseband unit (9926 Digital 2U), which may be deployed in a distributed architecture with Remote Radio Heads (RRHs) or in classical Macro configurations with integrated Radio Modules (i.e. TRDUs) as in the 9412 eNodeB Compact.



Figure 1 - Alcatel-Lucent 9412 eNode B Compact

The 9412 eNodeB Compact offers wireless operators an easy way to support LTE either greenfield or co-located indoor site deployments where existing equipment may require sharing of antenna resources. The eNodeB Compact can be wall mounted if site constraints exist, and where growth into additional sectors is expected the eNodeB Compact can be stacked to support that future growth in the same ETSI compliant footprint as the primary frame.

### Spectrum considerations

The Alcatel-Lucent 9412 eNodeB Compact can be used to deploy LTE in recently auctioned spectrum bands (such as the 700mhz spectrum in North-America) or in an existing spectrum band (such as AWS or PCS) shared with a different RAT. Initial deployment is planned with 700MHz. Additional frequencies will be rolled out based on customer demand.

Flexible spectrum use maximizes flexibility in the network, with Bandwidth options of 1.4, 3, 5, 10, 15, or 20 MHz supported.

# Physical Characteristics

## Mechanical Data

Size (mm) h x w x d	Single Cabinet - 675 x 600 x 575 (w/mount plate) Stacked - 1550 x 600 x 575 (w/mount plate)
Size (in) h x w x d	Single Cabinet - 26.5 x 23.5 x 22.5 (w/mount plate) Stacked - 61 x 23.5 x 22.5 (w/mount plate)
Weight (kg)	135 Kg (Typical fully loaded system)
Weight (lbs)	300lb (Typical fully loaded system)

## Interface/Capacity

Transmission	Gigabit Ethernet: 2 ports
Sectors	Single Cabinet - 3 Sectors Stacked Cabinet - 6 Sectors
Base Band	<ul style="list-style-type: none"> <li>One Digital d2u or LTE Module LTE Modules.</li> </ul>
RF	<ul style="list-style-type: none"> <li>3 Dual TX TRDU modules</li> </ul>
Optical connectivity	Up to 6 CPRI based optical lines can be run to dual TX TRDU's or to a combination of TRDU's and RRU's.

## Environmental Data

Operational	Telcordia GR-63-CORE 4.1.2
Operating Temp	5° C to +40° C
Relative Humidity	+8% to +100%
Absolute Humidity	0.03 g/m³ to 36 g/m³
Vibration & Shock	Compliant with GR-63-CORE Zone 4 earthquake compliance
Ingress Protection	IP20
Cooling Method	Fan unit
Acoustic Noise	Telcordia GR-63-CORE 4.6

## Electrical Data

Power Supply	+ 24V DC -48V DC
Power Consumption	Typical value of ~1400 watts (configuration with one modem)

# Safety/Regulatory Data

EMC	Compliant with ETSI EN 300 386 & 47 / CFR Part 15
Safety	Europe : Compliant with EN 60950-1 Others : Compliant with UL 60950-1 & CAN/CSA C22.2 No.60950-01
CE /NEBS	CE Mark & CSA/UL-60950-1/CSA 22.2 No. 60950-1-03
R&TTE	European EMC directive 89/336/EEC and new European EMC Directive 2004/108/EC.

# Deployment & Connectivity

The Alcatel-Lucent 9412 eNodeB Compact has been planned to facilitate easy installation with auto commissioning, reducing deployment costs & minimizing migration costs. The Alcatel-Lucent 9412 eNode B Compact can be installed in less than 60 minutes on a readied site. The software solution will minimize OPEX as the architecture is fully compatible and capable of interworking with legacy networks. The solution offers seamless mobility and service continuity for customers and offers tracing, logging & measurements for operators.

### About Alcatel-Lucent

Alcatel-Lucent (Euronext Paris and NYSE: ALU) provides solutions that enable service providers, enterprises and governments worldwide, to deliver voice, data and video communication services to end-users. As a leader in fixed, mobile and converged broadband networking, IP technologies, applications, and services, Alcatel-Lucent offers the end-to-end solutions that enable compelling communications services for people at home, at work and on the move. For more information, visit Alcatel-Lucent on the Internet: <http://www.alcatel-lucent.com>. Copyright © 2008 by Alcatel-Lucent. All Rights Reserved. November, 2008

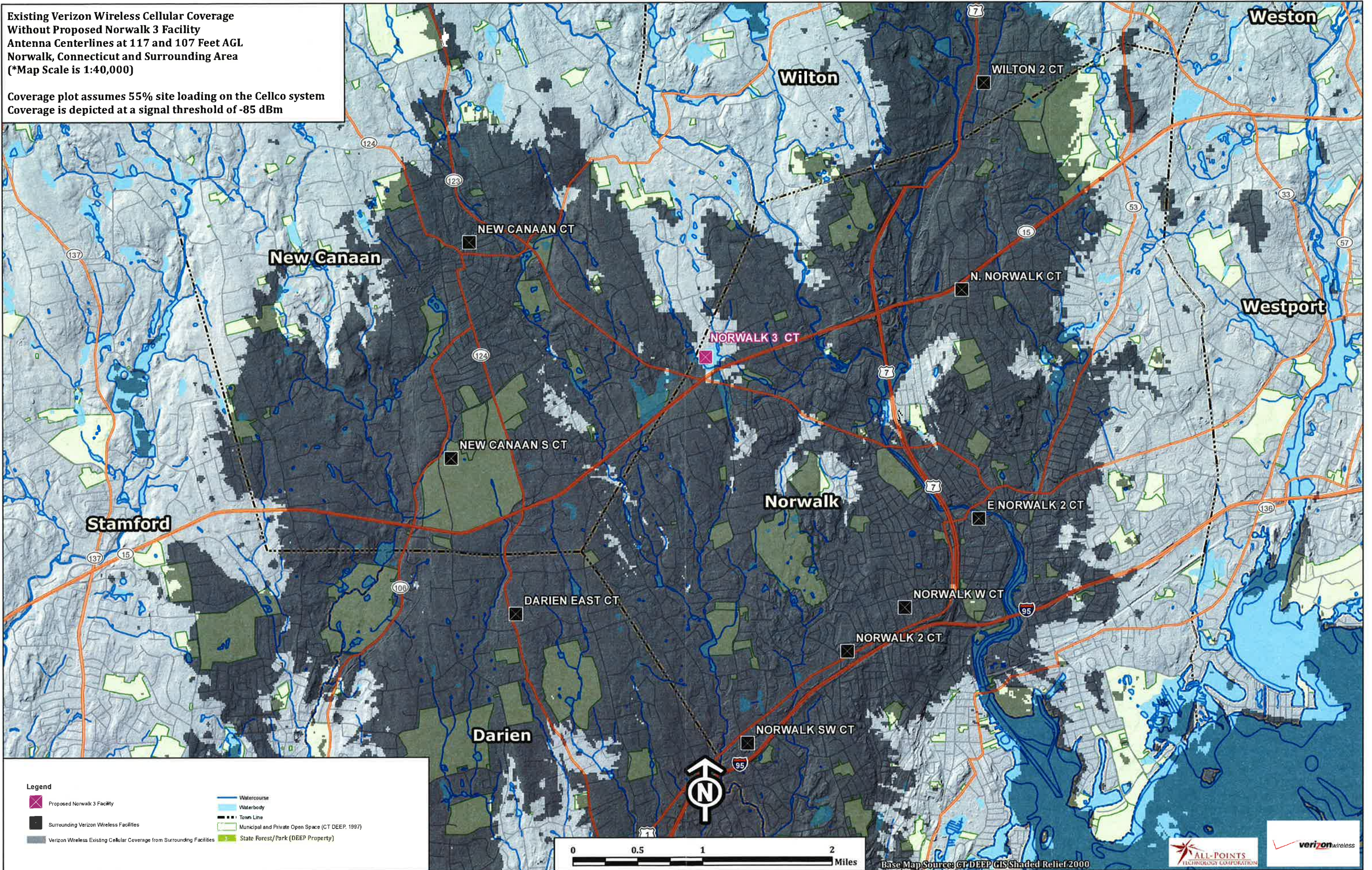


# **ATTACHMENT 2**



Existing Verizon Wireless Cellular Coverage  
Without Proposed Norwalk 3 Facility  
Antenna Centerlines at 117 and 107 Feet AGL  
Norwalk, Connecticut and Surrounding Area  
(\*Map Scale is 1:40,000)

Coverage plot assumes 55% site loading on the Cellco system  
Coverage is depicted at a signal threshold of -85 dBm



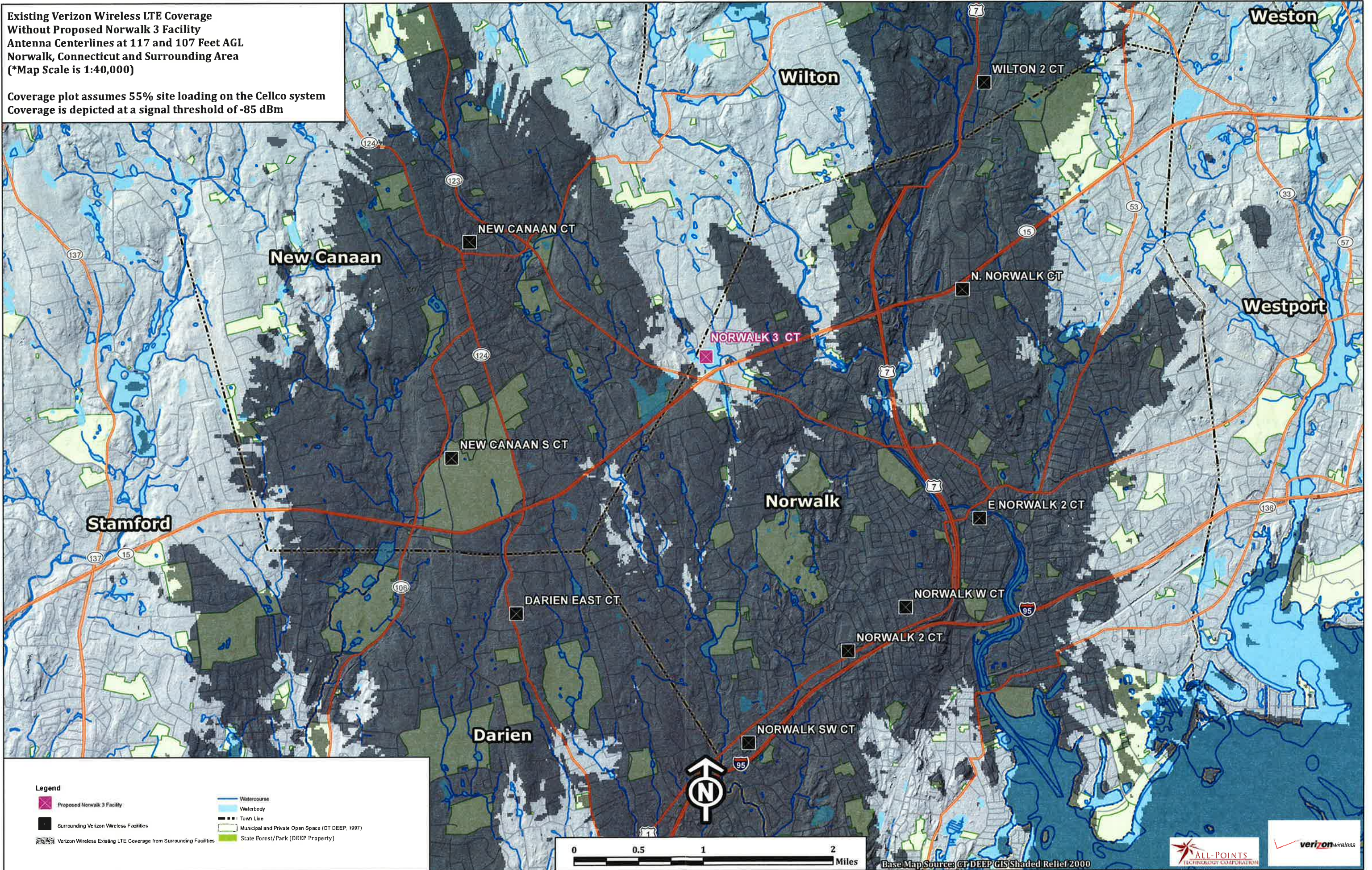
Base Map Source: CT DEEP GIS Shaded Relief 2000

Path: C:\All\_Points\_Tech\Projects\Client\Verizon\Norwalk\_3\GIS\Maps\Cell\WO\_Coverages\_Map.mxd



Existing Verizon Wireless LTE Coverage  
 Without Proposed Norwalk 3 Facility  
 Antenna Centerlines at 117 and 107 Feet AGL  
 Norwalk, Connecticut and Surrounding Area  
 (\*Map Scale is 1:40,000)

Coverage plot assumes 55% site loading on the Cellco system  
 Coverage is depicted at a signal threshold of -85 dBm



- Legend**
- Proposed Norwalk 3 Facility
  - Surrounding Verizon Wireless Facilities
  - Verizon Wireless Existing LTE Coverage from Surrounding Facilities
  - Watercourse
  - Waterbody
  - Town Line
  - Municipal and Private Open Space (CT DEEP, 1997)
  - State Forest/Park (DEEP Property)



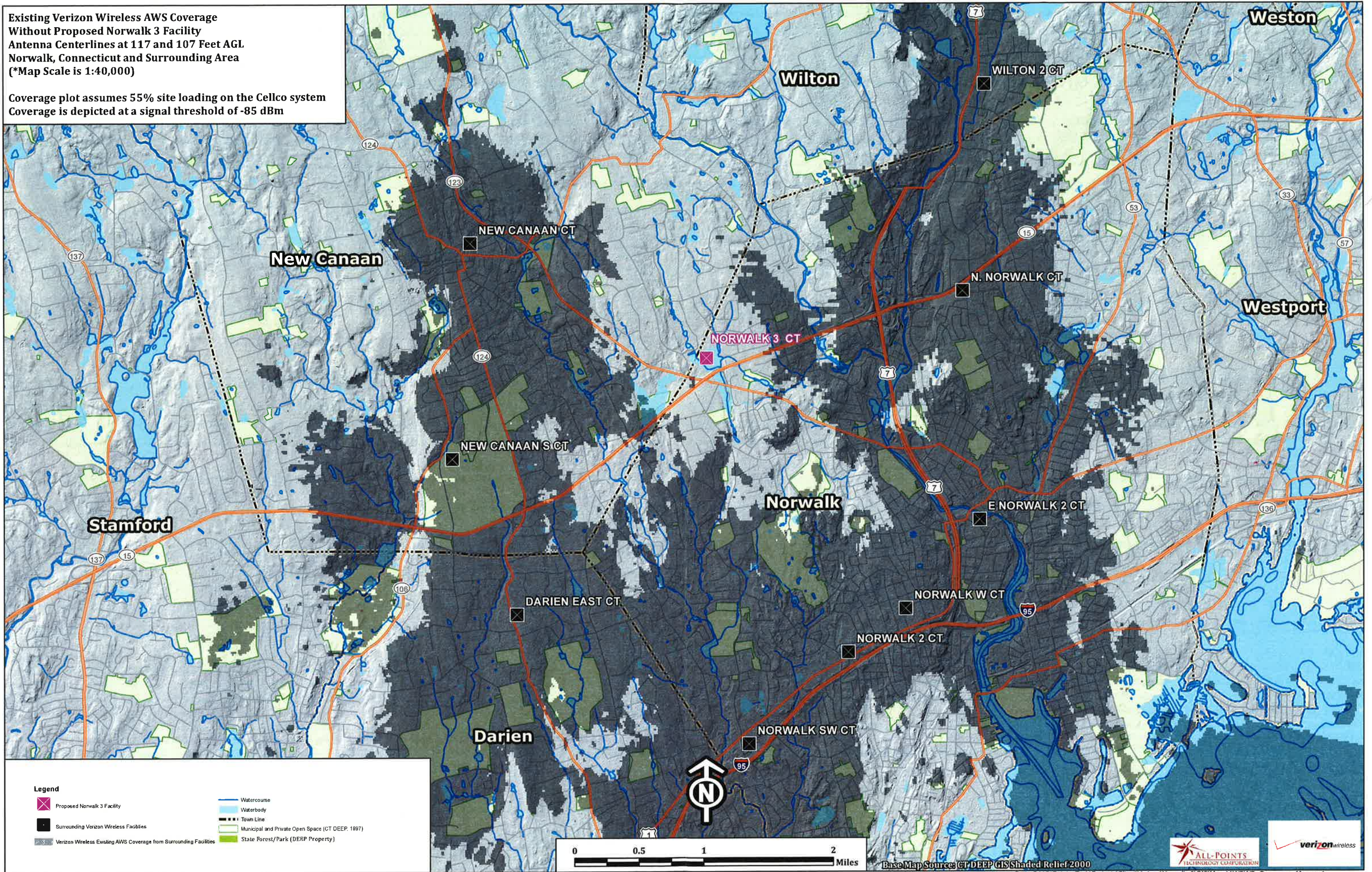
Base Map Source: CT DEEP GIS Shaded Relief 2000





Existing Verizon Wireless AWS Coverage  
Without Proposed Norwalk 3 Facility  
Antenna Centerlines at 117 and 107 Feet AGL  
Norwalk, Connecticut and Surrounding Area  
(\*Map Scale is 1:40,000)

Coverage plot assumes 55% site loading on the Cellco system  
Coverage is depicted at a signal threshold of -85 dBm



**Legend**

- Proposed Norwalk 3 Facility
- Surrounding Verizon Wireless Facilities
- Verizon Wireless Existing AWS Coverage from Surrounding Facilities
- Watercourse
- Waterbody
- Town Line
- Municipal and Private Open Space (CT DEEP, 1897)
- State Forest/Park (DERP Property)



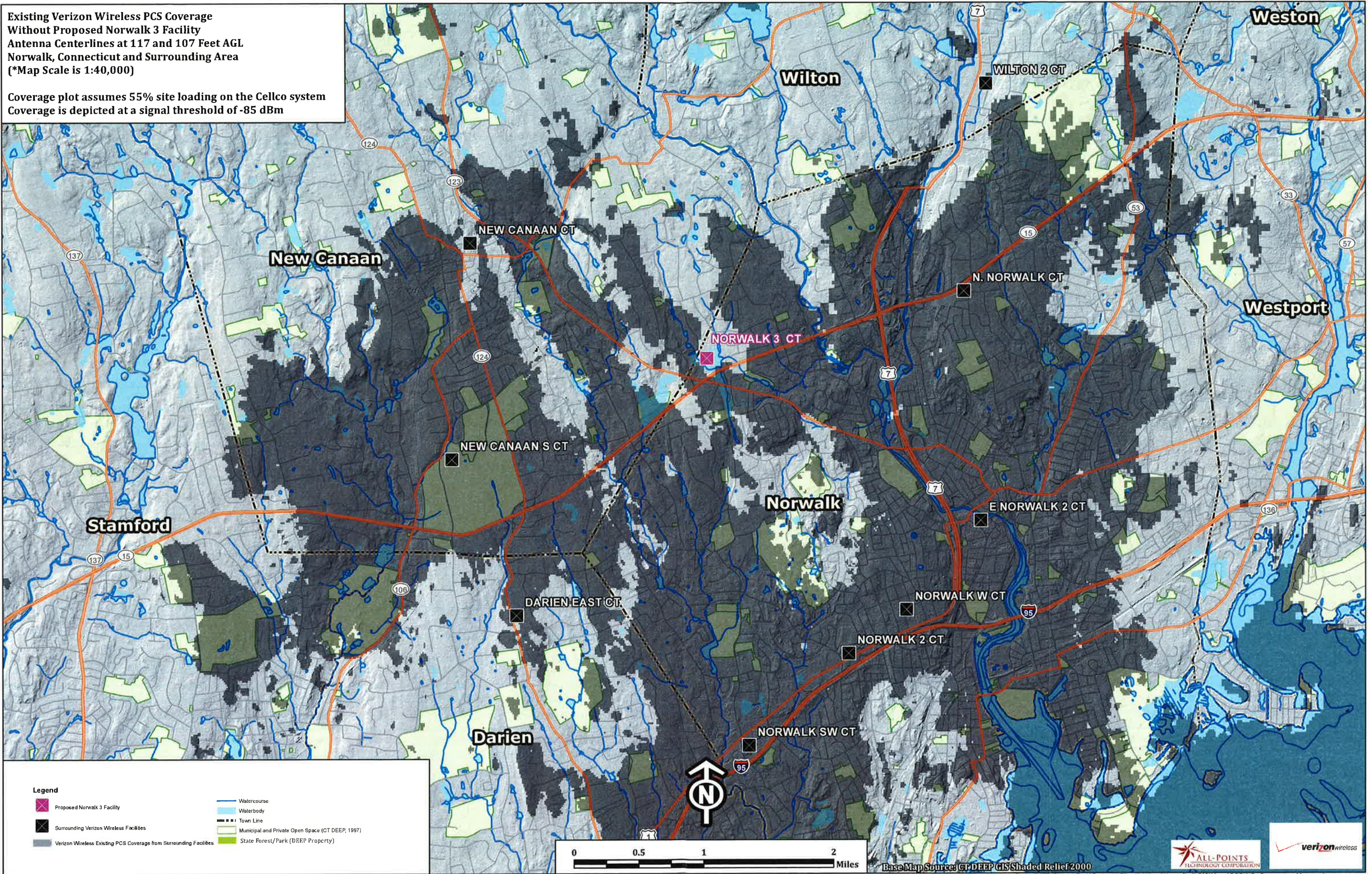
Base Map Source: CT DEEP GIS Shaded Relief 2000





Existing Verizon Wireless PCS Coverage  
 Without Proposed Norwalk 3 Facility  
 Antenna Centerlines at 117 and 107 Feet AGL  
 Norwalk, Connecticut and Surrounding Area  
 (\*Map Scale is 1:40,000)

Coverage plot assumes 55% site loading on the Cellco system  
 Coverage is depicted at a signal threshold of -85 dBm



- Legend**
- Proposed Norwalk 3 Facility
  - Surrounding Verizon Wireless Facilities
  - Verizon Wireless Existing PCS Coverage from Surrounding Facilities
  - Watercourse
  - Waterbody
  - Town Line
  - Municipal and Private Open Space (CT DEEP, 1997)
  - State Forest/Park (DEEP Property)



Base Map Source: CT DEEP GIS Shaded Relief 2000



Path: C:\All\_Points\_Tech\Projects\Client\Verizon\Norwalk\_3\GISMaps\PCSWO\_Coverages\_Map.mxd

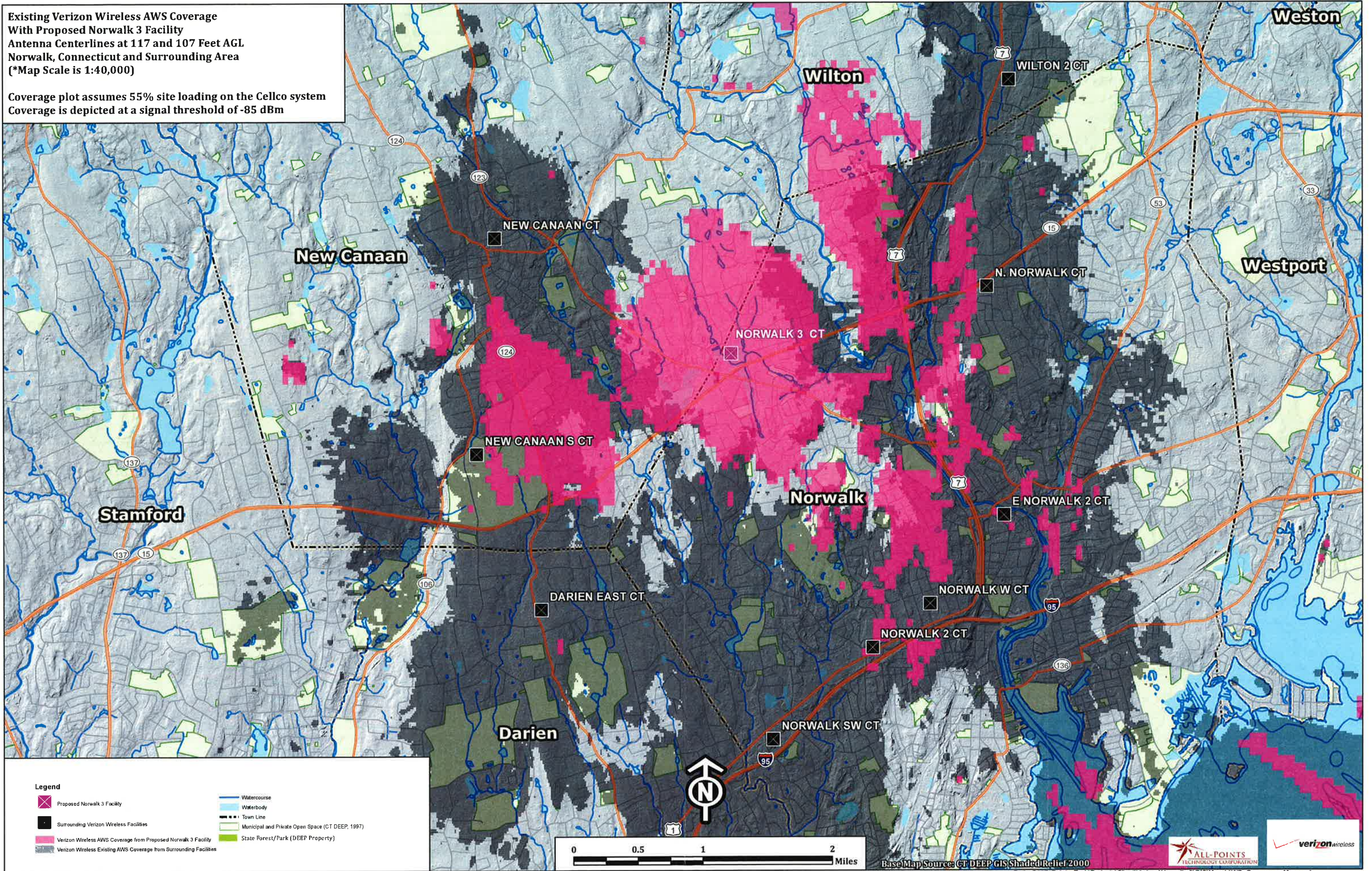


# **ATTACHMENT 3**



Existing Verizon Wireless AWS Coverage  
 With Proposed Norwalk 3 Facility  
 Antenna Centerlines at 117 and 107 Feet AGL  
 Norwalk, Connecticut and Surrounding Area  
 (\*Map Scale is 1:40,000)

Coverage plot assumes 55% site loading on the Cellco system  
 Coverage is depicted at a signal threshold of -85 dBm



**Legend**

- Proposed Norwalk 3 Facility
- Surrounding Verizon Wireless Facilities
- Verizon Wireless AWS Coverage from Proposed Norwalk 3 Facility
- Verizon Wireless Existing AWS Coverage from Surrounding Facilities
- Watercourse
- Waterbody
- Town Line
- Municipal and Private Open Space (CT DEEP, 1997)
- State Forest/Park (DEEP Property)



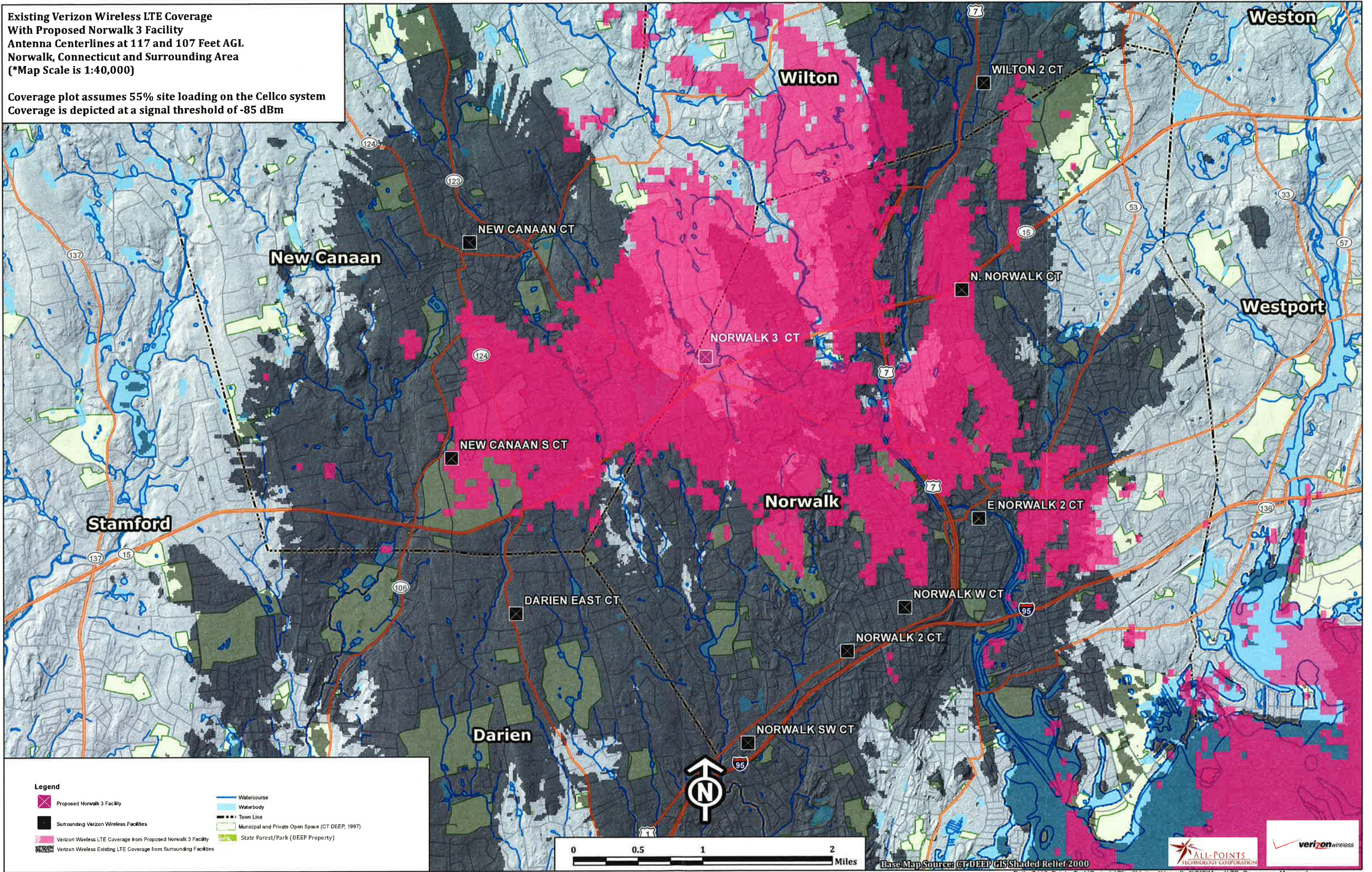
Base Map Source: CT DEEP GIS Shaded Relief 2000





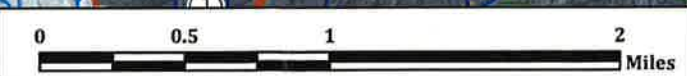
Existing Verizon Wireless LTE Coverage  
 With Proposed Norwalk 3 Facility  
 Antenna Centerlines at 117 and 107 Feet AGL  
 Norwalk, Connecticut and Surrounding Area  
 (\*Map Scale is 1:40,000)

Coverage plot assumes 55% site loading on the Cellco system  
 Coverage is depicted at a signal threshold of -85 dBm



**Legend**

-  Proposed Norwalk 3 Facility
-  Surrounding Verizon Wireless Facilities
-  Verizon Wireless LTE Coverage from Proposed Norwalk 3 Facility
-  Verizon Wireless Existing LTE Coverage from Surrounding Facilities
-  Watercourse
-  Waterbody
-  Town Line
-  Municipal and Private Open Space (CT DEEP, 1997)
-  State Forest/Park (DEEP Property)



Base Map Source: CT DEEP GIS Shaded Relief 2000





# **ATTACHMENT 4**



# **ATTACHMENT 5**



General Power Density

Site Name: NORWALK 3, CT  
 Cumulative Power Density

Operator	Operating Frequency (MHz)	Number of Trans.	ERP Per Trans. (watts)	Total ERP (watts)	Distance to Target (feet)	Calculated Power Density (mW/cm <sup>2</sup> )	Maximum Permissible Exposure* (mW/cm <sup>2</sup> )	Fraction of MPE (%)
VZW AWS	2145	1	1750	1750	117	0.0460	1.0	4.60%
VZW 700	698	1	612	612	107	0.0192	0.4653333333	4.13%
<b>Total Percentage of Maximum Permissible Exposure</b>								<b>8.73%</b>

\*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz  
 mW/cm<sup>2</sup> = milliwatts per square centimeter  
 ERP = Effective Radiated Power

Absolute worst case maximum values used.