

**STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL**

RE: APPLICATION BY T-MOBILE  
NORTHEAST, LLC FOR A  
CERTIFICATE OF ENVIRONMENTAL  
COMPATIBILITY AND PUBLIC NEED  
FOR A TELECOMMUNICATIONS FACILITY  
AT 61-1 BUTTONBALL ROAD IN THE TOWN  
OF OLD LYME, CONNECTICUT

DOCKET NO. 393

Date: January 27, 2010

**PRE-FILED TESTIMONY OF SCOTT HEFFERNAN**

**Q1. Please state your name and profession.**

A1. Scott Heffernan, and I am the president and principal engineer for Transcom Engineering, Inc. ("Transcom"), which is located in Sterling, Massachusetts.

**Q2. What kind of services does Transcom provide?**

A2. Transcom provides wireless design services for both commercial and government projects including, but not limited to, evaluating possible sites for telecommunications facilities, system design, and determining radio frequency ("RF") coverage, capacity and interference for proposed telecommunications facilities.

**Q3. Please summarize your professional background in telecommunications.**

A3. I have a B.S. in Physics from Clark University and Graduate Certificates in Telecommunications Engineering and UNIX Programming from Northeastern University. I have over fourteen years of experience in wireless engineering, which includes the design, integration, optimization and management of network build-outs for commercial wireless carriers such as Nextel, AT&T, Wireless, Cingular and Voicestream (T-Mobile's

predecessor). I have also been involved in network design for government entities such as the Department of Homeland Security, Department of the Army, Department of the Navy, and the United States Marine Corps. I have spent the last six years primarily as an independent contractor for T-Mobile, focusing on the design and integration of the T-Mobile wireless network.

**Q4. What services did you provide T-Mobile regarding the proposed Facility?**

A4. I evaluated T-Mobile's existing network in this area of the State and assessed the need for the proposed telecommunications facility at 61-1 Buttonball Road, Old Lyme, Connecticut (the "Facility"). In doing so, I considered the general design of T-Mobile's network, the technical constraints in selecting certain proposed facilities, and the specific need for the Facility. I also evaluated the potential designs for the proposed Facility.

**Q5. Please describe T-Mobile's wireless network in Connecticut.**

A5. T-Mobile's predecessor entities began constructing a wireless network to provide PCS (Personal Communication Services) service in Connecticut in the mid-1990s. T-Mobile is licensed by the Federal Communications Commission to provide PCS service using frequencies in the 1900 MHz range and AWS service using frequencies in the 2100 MHz range. Current efforts are directed to providing signals to areas without coverage and meeting demand for additional capacity within the areas already served. Each new site must be chosen to meet the need for coverage and/or capacity without creating RF interference among sites.

**Q6. What requirements does the nature of wireless technology place on T-Mobile's selection of cellular tower locations?**

A6. Like all personal communications service providers, T-Mobile's wireless network is based on the principle of frequency reuse. T-Mobile must select cellular tower locations so that the towers provide sufficient signal strength overlap to allow a call to be "handed-off" between cellular tower locations without creating unnecessary duplicative coverage and frequency interference. Terrain variations may also limit the siting of cellular towers.

Technological advances in service, such as the availability of data and video services through customer handsets, are also significant factors in system development. Increased customer demand and expectations resulting from those advances drive the need for additional sites.

T-Mobile's required lower limit threshold is -84 dBm, which is expected to provide reliable in-vehicle coverage. A higher threshold level of -76 dBm is the minimum required to provide reliable in-building coverage. At levels below the -84 dBm threshold, T-Mobile's service to customers for voice and data services would experience signal degradation. In addition, levels below -84 dBm would adversely affect T-Mobile's ability to provide reliable E-911 services as mandated by the federal government.

**Q7. Please describe T-Mobile's need for the proposed Facility.**

A7. The Facility would be an integral component of T-Mobile's wireless network in Old Lyme. There is a significant coverage gap in the area of the proposed Facility. The Facility would provide much needed coverage in this area, including along Buttonball Road and Route 156, as well as the Amtrak rail line that passes through the area. The



Facility, in conjunction with other existing and future facilities in Old Lyme and surrounding towns, is necessary for T-Mobile to provide wireless services to people living and working in and traveling through this area of the State.

**Q8. How did you analyze the efficacy of the proposed Facility?**

A8. I used propagation prediction tools to determine the potential effectiveness of the proposed Facility in meeting the identified coverage need. That analysis took into account T-Mobile's coverage objective, T-Mobile's existing on-air sites in this area of the State and the existing terrain and vegetation. The analysis confirmed that the proposed Facility would provide service to the target area and would improve service generally within this area of Old Lyme. The Facility would provide effective service with an antenna array located at 97'9" feet above grade level ("AGL"). At lower heights, the coverage in this area of Old Lyme starts to deteriorate and fall below T-Mobile's minimum required threshold of -84 dBm.

**Q9. Has a test drive been conducted in this area regarding the proposed Facility?**

A9. Yes. T-Mobile continually drives its on-air sites for network analysis and propagation model tuning purposes. A wireless network is a very dynamic environment, subject to equipment, frequency and environmental changes. T-Mobile strives to have the most current drive data available for any given area in its network. This allows for greater accuracy in its current network design of new facilities to ensure they remain a quality addition to our network.

**Q10. Please summarize the basis for the height of the proposed Facility.**

A10. The analysis of this area of Old Lyme confirmed that the minimum height required to cover the intended coverage objective is at 97'9" AGL. At lower heights, the coverage in this area of Old Lyme starts to deteriorate and fall below T-Mobile's minimum required threshold of -84 dBm. The loss of coverage is depicted in the most recent propagation plots appended to the responses to the First Set of Interrogatories as Attachment C. Accordingly, antennae located at the proposed height would allow T-Mobile to provide adequate coverage within the target coverage area.

**Q11. Is adequate coverage in this area of Old Lyme necessary to provide consistent and reliable 911 service?**

A11. Yes. If the coverage within a specific area is inadequate, then not only does routine call reliability suffer, but so does 911 / emergency call reliability.



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Scott Heffernan

Sworn and subscribed to before me this  
\_\_\_ day of January, 2010.

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*Notary Public*  
*My Commission expires*