

CT11796G Danbury Drive Test Results

Test Date: June 26, 2006

T-Mobile

Purpose

A drive test was performed at the proposed T-Mobile location at 52 Stadley Rough Road, in Danbury, CT. The purpose of the drive test was to gather accurate signal strength measurements along the objective routes at various heights. The results allow for T-Mobile Radio Frequency (RF) Engineering to determine the minimum height required to achieve the coverage objective and further fine tune the propagation prediction model for this area. The coverage objective for the CT11796 Ring is defined as the primarily residential area north of Routes 84 and 7, east of Lake Candlewood and west of Route 202 centered around Stadley Rough Road and Great Plain Road.

Procedure

To gather the required data, a simulated test site was constructed at the location of the proposed facility. To construct the test site, a crane was used to lift an omni-directional antenna to the desired height. The omni-directional antenna was chosen for its ability to direct a signal equally in all directions along the horizontal plane extending away from the antenna, eliminating any nulls between antennas as typically seen with directional panel antennas. A test transmitter is then attached to feed the desired signal to the omni-directional antenna. A watt meter was installed in-line between the test transmitter and the antenna. The purpose of the watt meter is to measure the forward power sent from the transmitter to the antenna and to check for the presence of reflected power which would indicate either a faulty antenna or coax feedline system. Once the power levels were recorded, the watt meter was removed and the transmitter was attached directly to the test antenna. All values were entered into the attached T-Mobile drive test form (Addendum A)

With the transmitter attached to the antenna and the test channel broadcasting, the crane lifted both to the first desired height of 147 feet above ground level (AGL) to the center of the test antenna.

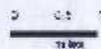
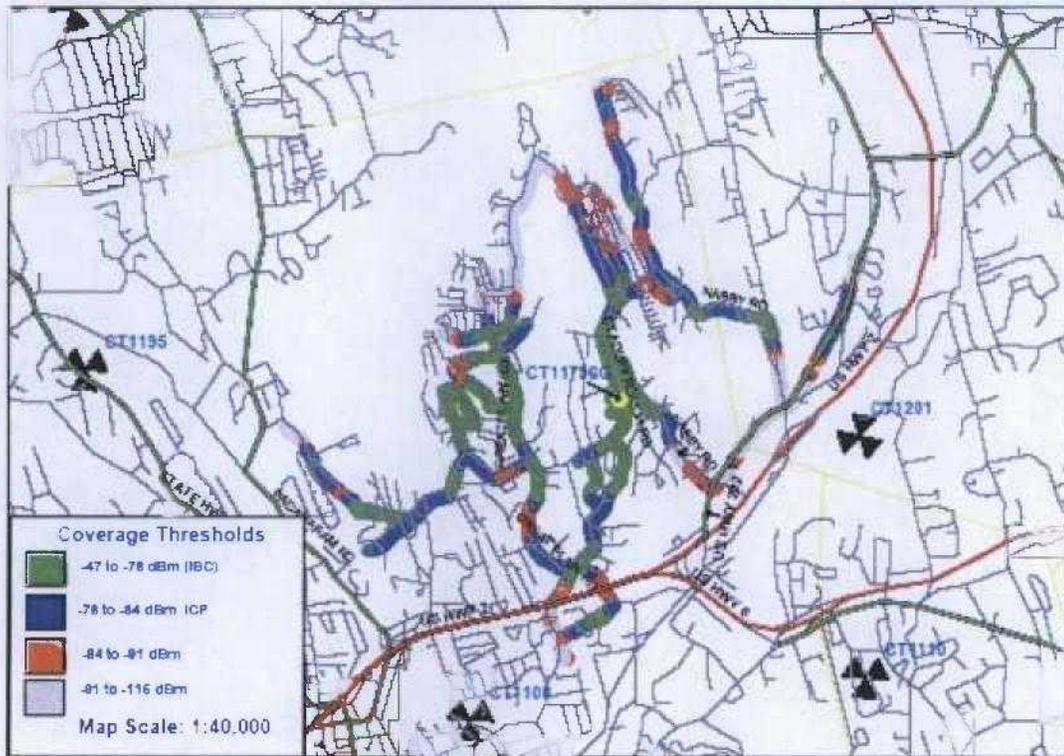
For the collection process, a Grayson scan receiver, Model# GMR 203, was used to sample the signal levels. The Grayson receiver was installed in a vehicle with the receive antenna and GPS antenna roof mounted. The purpose of roof mounting the receive antenna is to eliminate any additional attenuation in signal strength from the material composition of the vehicle (vehicle penetration loss) and the location of the receive antenna inside the vehicle. With the receiver scanning, a predetermined route was driven surrounding the proposed facility. The collected samples were stored in Grayson format log files to be exported and processed following the test. This process was repeated for antenna heights of 127, 117, 107 and 97 feet AGL.

Following the test, all log files were processed into text files using the Grayson log file converter and analyzed in MapInfo. These results are shown in the "Results" section.

Results

The following plots (1 to 5) show the result from the drive test at the T-Mobile proposed facility at 52 Stadley Rough Road, in Danbury, CT. For these, signal levels ranging from -10 dBm to -116 dBm are shown. T-Mobiles required lower limit threshold is -84 dBm, which is required for in vehicle coverage. The higher threshold level of -76 dBm is the minimum required to provide reliable in-building coverage. Levels below the -84 dBm threshold are shown to demonstrate routes driven and to show areas of unacceptable signal degradation

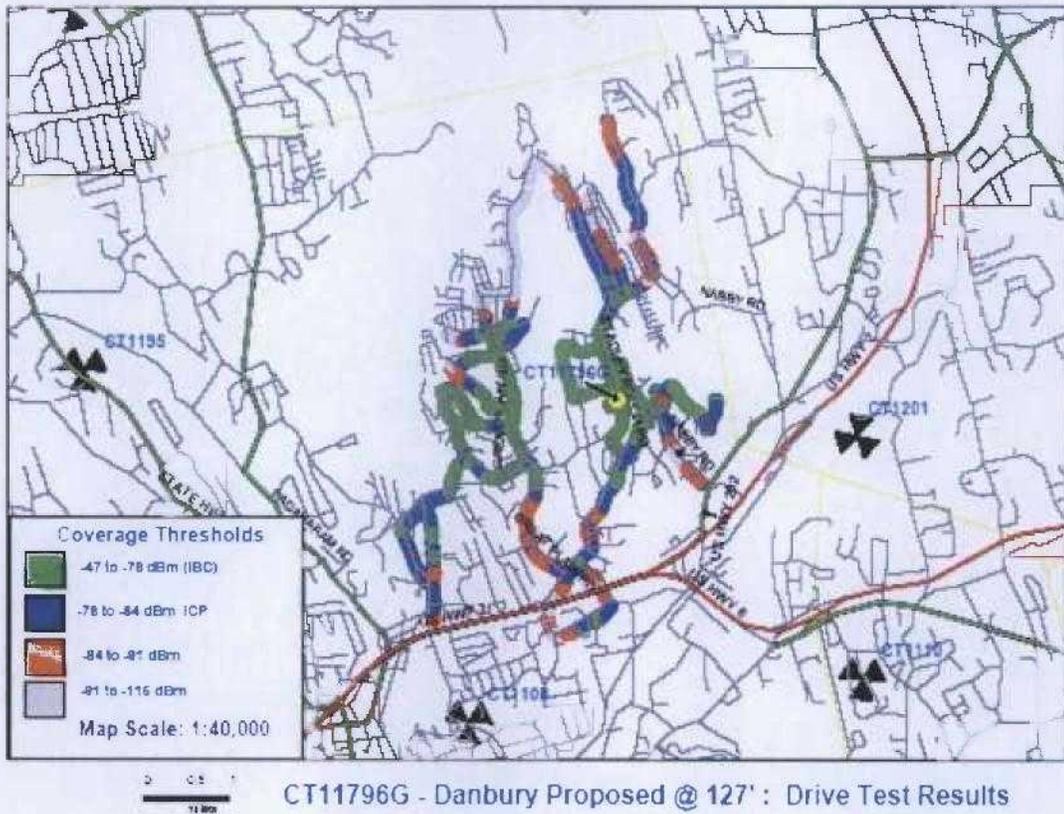
Plots 1



CT11796G - Danbury Proposed @ 147' : Drive Test Results

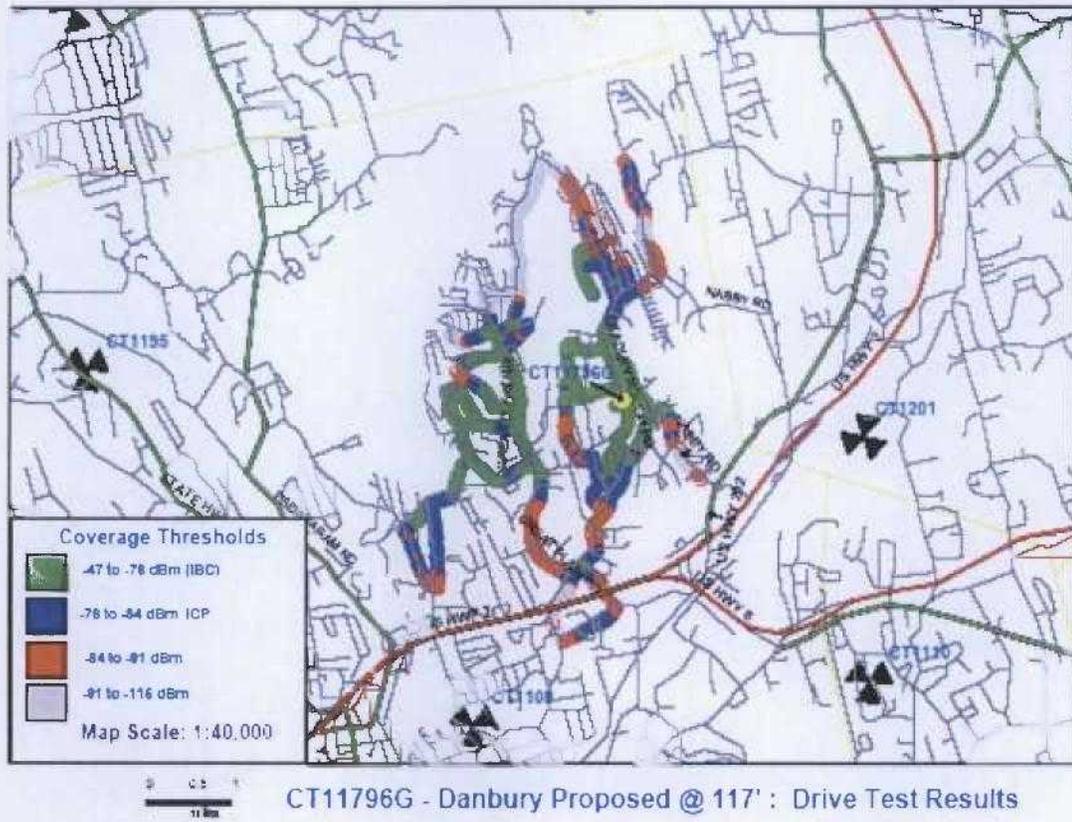
Plot 1 shows the results of the CT11796G drive test at 147 feet AGL

Plot 2



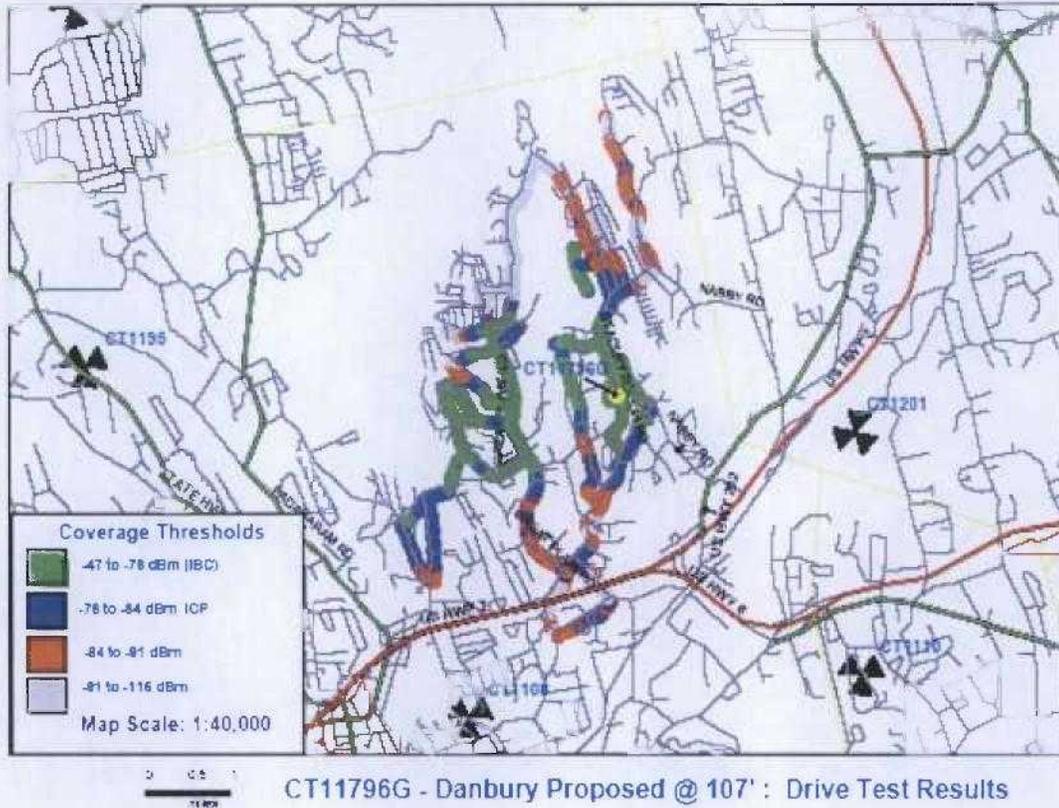
Plot 2 shows the results of the CT11796G drive test at 127 feet AGL

Plot 3



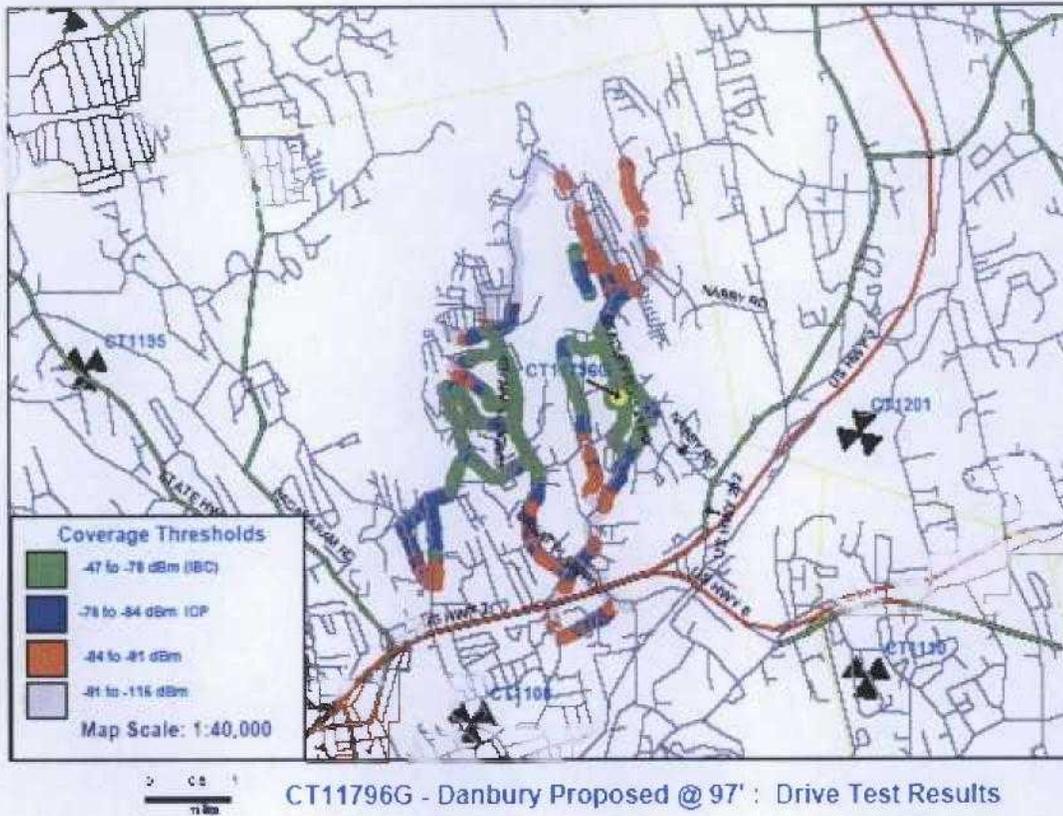
Plot 3 shows the results of the CT11796G drive test at 117 feet AGL

Plot 4



Plot 4 shows the results of the CT11796G drive test at 107 feet AGL

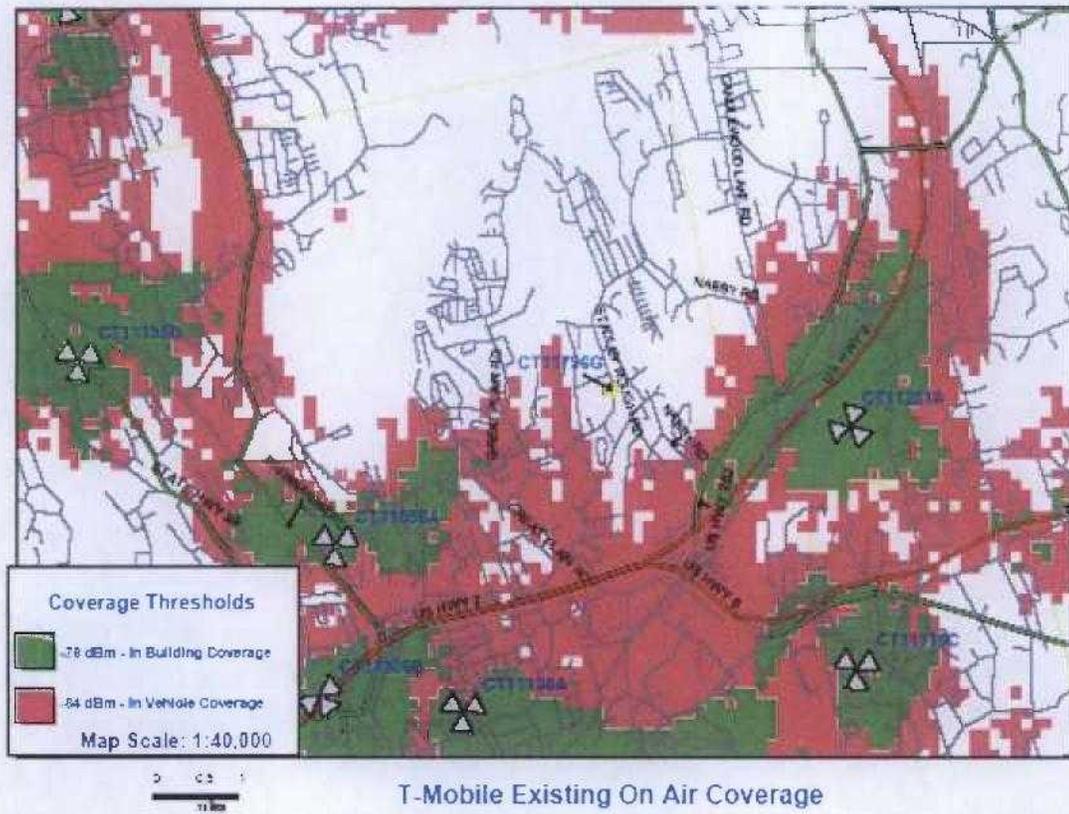
Plot 5



Plot 5 shows the results of the CT11796G drive test at 97 feet AGL

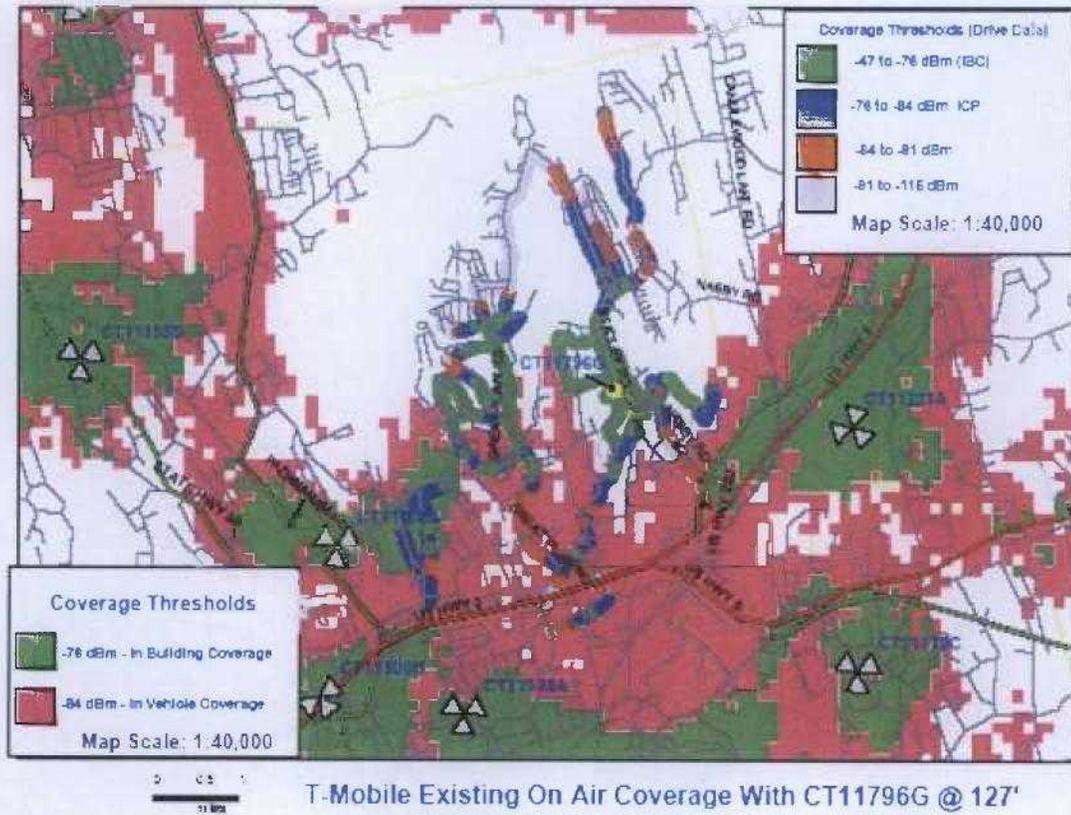
Plots 6 through 11 show existing coverage and existing coverage with drive test data overlaid at the five test heights.

Plot 5



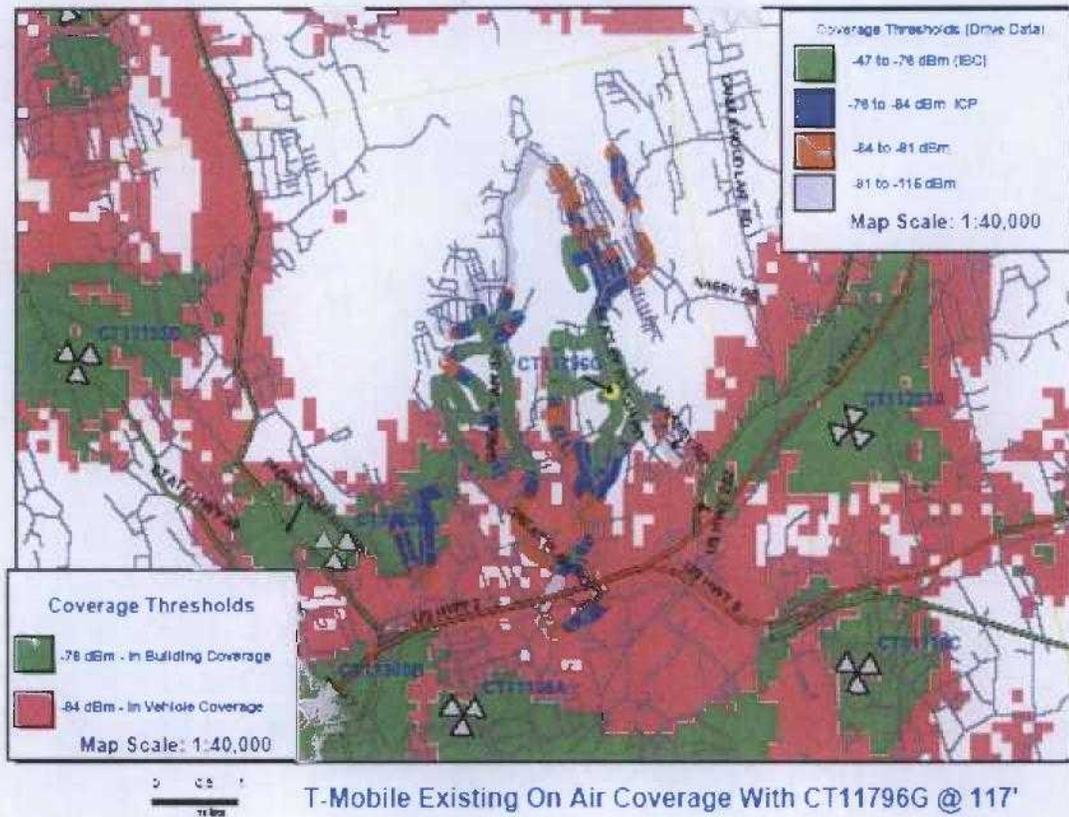
Plot 6 shows existing T-mobile on air coverage

Plot 8



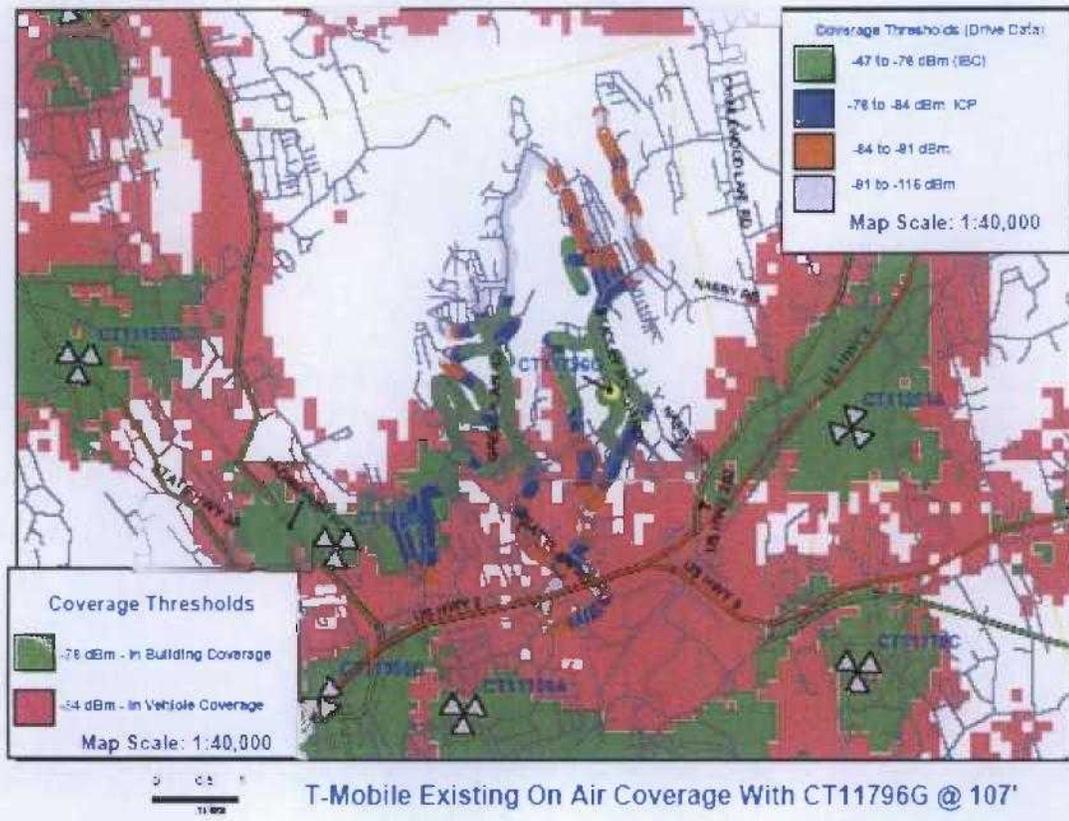
Plot 87 shows existing T-mobile on air coverage with the test site at 127 feet AGL

Plot 9



Plot 9 shows existing T-mobile on air coverage with the test site at 117 feet AGL.

Plot 10



Plot 10 shows existing T-mobile on air coverage with the test site at 107 feet AGL

Conclusion

Based upon the coverage plots produced from the drive test conducted at the proposed T-Mobile Danbury facility, the minimum height required to provide coverage the intended objective is 127 feet AGL. At a centerline height of 127 feet AGL, coverage extends roughly 2 miles north of the proposed facility along Stadley Rough Road before quickly dropping below the T-Mobile required threshold of -84 dBm. The quick drop off in signal after this point is due to a decrease in elevation and terrain shadowing when driving on Stadley Rough Road heading toward the north side of the plateau feature bounded by Stadley Rough Road and Great Plain Road, near Lake Candlewood. At heights below 127 feet AGL, the coverage produced from the test facility starts to break apart and fall below the T-Mobile minimum required threshold of -84 dBm in the transition area of slow descending terrain before the road starts to wrap around the north side of the plateau, where the roadway is pressed tight against the slope of the terrain.

The test height of 127 feet AGL produced roughly $\frac{1}{2}$ to $\frac{3}{4}$ mile of additional -84 dBm or greater coverage in the above mentioned northern section of Stadley Rough Road. Due to the nature of the terrain and roadway layout in this area, coverage from the higher test height of 147 feet AGL did not yield a substantial increase in coverage.