



Transition  
Administrator

The Official Reconfiguration Manager

## **800 MHz Reconfiguration Program: Coverage Testing**

This Fact Sheet describes TA guidelines for three methods for coverage testing, and provides descriptions of when the use of each method may be appropriate. They are designed to allow licensees flexibility but provide boundaries that must be considered when a licensee is determining if testing is necessary and, if so, what level is appropriate. The appropriate method is the one that requires the minimum cost to determine comparability. These guidelines will be considered when the TA reviews Frequency Reconfiguration Agreements (FRAs). Licensees are advised that pursuant to the FCC's 800 MHz R&O, all costs related to reconfiguration, including those of system testing, must be agreed with Sprint. Licensees should also note that:

- Coverage testing for reconfiguration has a different objective than the testing necessary for acceptance of a new system. For reconfiguration, the coverage test objective is only to verify coverage is comparable **immediately before and after** reconfiguration to new frequencies.
- There may be specific conditions or system designs that cause some licensees to believe these methodologies will not determine comparable coverage in their system. For those cases, the licensee must describe why they need to use a different methodology to show comparable coverage and specifics of the methodology they propose.

**The focus of any testing must be on showing if comparable coverage is achieved.** These methodologies are general guidelines and licensees should develop a specific Method of Procedure (MOP) for their test environment to include specific pass/fail criteria.

### **Method 1 – Repeater Site Measurements**

This method is appropriate for sites where reconfiguration does not require substantial changes to the antenna or coax feed line. This method can be used if other transmission elements such as transmitter combiners, or filtering devices change, if those changes do not result in a change to the transmit power into the feed line. For those systems where the transmit power to the feed line does not change, it is sufficient to make a series of measurements at the repeater site.

This method assumes all existing equipment is specified to operate with comparable losses for the new channels compared to the existing channels. If the antenna bandwidth specifications include the new channels, then the radiated pattern and signal strength should not change assuming that equivalent transmit power is delivered to the antenna.

Prior to reconfiguring the site, measured losses for each component are recorded including the transmit power entering the transmission line. The measurements should include the return loss of the transmission line and antenna. After reconfiguration, the same measurements are made and compared to the prior measurements. If the two sets of measurements are comparable, then coverage will be comparable.

### **Method 2 – Line-of-Sight Measurements**

This method is appropriate for many systems or sites with a change in the antenna configuration. This method begins with the measurements in Method 1. Start with making and recording all the before reconfiguration measurements specified in Method 1. A series of static line-of-sight measurements are made before and after reconfiguration to verify comparability of the new antenna pattern. Typically this method employs eight locations evenly spaced around the site (assuming an omni directional antenna).

September 30, 2013 – V 1.1

Each location should have a line-of-sight path to the radio site. Measure the signal strength from the site, using a narrow beam-width directional antenna and a calibrated measuring device before reconfiguring the site. Next, make and record the measurements in Method 1 after the frequency change and repeat the signal strength measurements at each measuring location. If the measurements are comparable, the antenna patterns and gain match and the coverage will be comparable. If a directional and/or a down-tilt antenna is used at the radio site, then the locations should be modified as appropriate for the antenna pattern.

### **Method 3 - Drive Test**

This is the most complex and expensive method for determining comparable coverage, and is typically only appropriate for complex systems using simulcast technology or where extensive changes are made to the antenna and other transmission subsystem elements.

The drive test must be set up to be repeatable and based on a statistically valid method of measurement that minimizes the number of grids to be measured. As for the previous methods, testing should be performed immediately prior to and after rebanding to ensure location variability is minimized. The test need not include building penetration tests if the measurement grids are designed to show the signal strength around the buildings. If the signal levels are comparable in a statistically valid, random number of grid areas throughout the coverage area, then signal levels should be comparable in areas not measured.

To be valid, this test should employ automated signal strength measuring equipment and employ the following characteristics:

1. The measuring equipment should average measurements over 40 wavelengths with 50 samples per average.
2. The measuring equipment should include appropriate filters and high quality receivers.
3. The service area to be measured should be divided into uniform grids. The number of grids should be the minimum required to verify coverage and be statistically valid.
4. The baseline measurements should be collected immediately prior to reconfiguration and the post reconfiguration measurements collected immediately after reconfiguration. This will insure comparable testing.
5. This only compares existing service coverage to post reconfiguration coverage, if a service hole exists prior to reconfiguration it will exist after. All coverage comparisons should have a statistically valid basis.
6. Before and after rebanding, field audio or BER checks, to verify simulcast overlap distortion is unchanged, are acceptable. These checks should be conducted while collecting the signal strength data.

The TA recognizes 800 MHz licensees face a wide range of system configurations and circumstances. If a licensee believes more extensive testing is required than indicated above, they should submit an explanation of their particular circumstances and detailed MOP with their Cost Estimate. Licensees are especially advised to question proposals to conduct drive testing for simpler system configurations. For additional information on verifying comparable coverage for reconfiguration, please consult your system vendor.

This document is the TA's guidance; Sprint may need additional information for specific negotiations. If you would like more information regarding coverage testing, please refer to:

<http://www.pericle.com/papers/DriveTestGuidelines100105.pdf>, Guidelines for Conducting Drive Test Surveys for 800 MHz Rebanding (with a further bibliography), and also TIA TSB-88 (latest revision) Section 7.

For further guidance on reconfiguration, please visit our website ([www.800TA.org](http://www.800TA.org)).

#### **About the 800 MHz Transition Administrator**

800 MHz Transition Administrator, LLC ("TA LLC") is the Transition Administrator ("TA") for the reconfiguration of the 800 MHz band mandated by the Federal Communications Commission ("FCC"). TA, LLC has contracted with Deloitte Consulting LLP, Squire Sanders (US) LLP, and Baseline Wireless Services, LLC to perform the duties of the TA. Among its duties, the TA establishes reconfiguration guidelines, specifies replacement channels, reviews reconfiguration cost estimates, monitors payment of reconfiguration costs, manages the relocation schedule, facilitates issue resolution and administers the alternative dispute resolution process. TA LLC uses information it receives solely for the purposes of administering the 800 MHz reconfiguration process and may disclose such information to the FCC or other authorized parties pursuant to the requirements of the 800 MHz Order or other applicable laws.