

## 6. Coverage Analysis and Propagation Plots

The signal propagation plots provided in this report show coverage for the 700 and 1900 MHz frequency range and were produced using deciBel Planner™, a Windows-based RF propagation computer modeling program and network planning tool. The software considers the topographical features of an area, land cover, antenna models, antenna heights, RF transmitting power and receiver thresholds to predict coverage and other related RF parameters used in site design and network expansion.

Because of the superior propagation characteristics of 700 MHz relative to 1900 MHz, the 700 MHz coverage areas will encompass a larger geographic region compared to 1900 MHz. Presenting both frequency bands shows a typical best-case (700 MHz) and worse-case (1900 MHz) scenario. Commercial wireless service providers deploy their services over multiple frequency bands to support capacity demands and provide a variety of different services and must balance the coverage and capacity needs against the available FCC licensed spectrum resources they hold in a given region.

The coverage plots included as attachments are based on RSRP signal strengths of -85/-95/-105 dBm and above. All other areas (depicted in white) fall within coverage areas likely characterized by poor voice quality, low data throughput, and the substantial likelihood of unreliable service even when located in an outdoor environment. While each service provider designs their network based upon their own internal proprietary link budget, the -95 dBm threshold referenced on the coverage plots can be considered a reasonable RSRP threshold targeted by many operators for their LTE requirements in suburban areas such as Strafford.

Attachments A – F are discussed below:

**Attachment A** titled “*Strafford East - Existing 700 MHz LTE Coverage*” shows the 700 MHz coverage provided around Strafford from the surrounding existing sites listed in Table 1. and demonstrates that there are currently significant gaps in 700 MHz LTE coverage effecting service throughout much of Strafford. The coverage shown is where the signal strengths are: > -85 dBm (generally robust service and performance), > -95 dBm (generally adequate level of service) and >-105 dBm for marginal coverage. The proposed wireless facility at 15 Strafford Road would provide an infrastructure opportunity for the wireless operators serving the area to improve their service.

**Attachment B** titled “*Strafford East - Existing 700 MHz LTE Coverage with Proposed Site*” shows how this proposed site would fill in the existing coverage gaps and improve the 700 MHz LTE network within the targeted areas. As evident when compared against Attachment A, the proposed facility provides adequate coverage improvement to:

- o ~ 5.3 miles of State Hwy 202A;
- o ~ 3.8 miles of 2nd Crown Point Rd;
- o ~ 2.5 miles of New Bow Lake Rd;
- o ~ 2.1 miles of State Hwy 126,
- o ~ 1.7 miles of Johnsonboro Rd,

**Attachment C** titled “*Strafford East - Existing 1900 MHz LTE Coverage*” shows the coverage provided to areas of Strafford from the surrounding sites listed in Table 1. and similar to Attachment A, demonstrates that there are also currently significant gaps in 1900 MHz LTE coverage in Strafford, except to a greater extent than at 700 MHz.