Bow, NH Final RF report

July 19, 2024

Methodology

This document updates a previous report to summarize all considered options and analysis for potential current and future coverage in Bow, NH. The coverage maps have been transmitted in a separate file due to size, and this document will describe the analysis and results completed.

Step 1: Isotrope has identified and confirmed with the town/visual inspection several sites in and around Bow which currently (or are planned to) host wireless antennas:

- 10 Robinson Road, Tower adjacent to Bow DPW
- 2 towers adjacent to I-93 between Lucky's Trailer Sales and Pilot/Alltown Truck stop
- Blue Seal Feeds plant on Hall St, Bow
- 100 South Bow Road tower (currently used by Town of Hooksett for emergency communications and recently approved for reconstruction/extension to support Verizon Wireless)
- 91 Stark Highway, Dunbarton (SBA Tower)
- "Rising Tide" tower in construction off Branch Londonderry Turnpike

In addition, Isotrope was asked to review 3 additional sites outside Bow, to determine if they were able to provide some useful coverage in Bow. We looked at the following 3 additional sites:

- US Cellular tower in Dunbarton, south of the 91 Stark Highway location
- US Cellular tower in Hopkinton
- American Tower tower in SW Concord

None of these three locations will provide useful coverage in Bow to a substantial area that would affect the analysis below and a coverage plot from these 3 locations is also included in the files.

Heights for each were taken at currently available/permitted heights. (Permitted in the case of Rising Tide and South Bow Road). Coverage was analyzed at both 700 MHz (low band) and 1900 MHZ (mid-band).

For the 700 MHz plots, voice coverage levels can be assumed as follows: Green is best signal quality – very good at penetrating larger buildings. Yellow is good signal quality – Ok for smaller residences and in vehicles. Blue is a usable signal but is most reliable outdoors.

For the 1900 MHz plots, most carriers would use this spectrum to increase throughput so Green would be the highest speed data available, Yellow would provide a step below and Blue would be areas where data speeds would be lowest. Note: this is also dependent on instant usage and other

factors like throttling, etc. – the signal coverage only sets the potentially available maximum throughput.

Analysis[1]

Reviewing the 700 MHz plot, there are several areas within Bow where the available coverage is substantially insufficient for carriers and customers and an improvement would be beneficial i.e. "pressure points". These areas are:

- Around Bow High School
- Continuing South along White Rock Hill Road, up the hill to the Page Road area
- Page Road and surrounding roads to the West, continuing up to and past Route 13
- Dunbarton Center Road and Woodhill Road between Brown Hill/Woodhill-Hooksett roads and the Dunbarton line

Additionally, the town will be releasing a survey for residents to determine wireless user experience in Bow and traveling to neighboring towns. Since the analysis contained herein is the "best possible" coverage, if some carriers have not chosen to install (or not to deploy all available bands, specifically low-band) on all available sites in the Bow area, the service they provide their customers will not be comparable to the analysis provided.

In order to address the above gaps or pressure points, Isotrope selected several hypothetical site locations and we have modeled coverage from those locations, in order to assess the potential effectiveness of each hypothetical site. The hypothetical sites analyzed were:

1. Near the High School (all modelled at 120') in 3 different locations:
    a. Near the HS building itself
    b. Across White Rock Hill Road from the High School, between the tennis courts and the Bow Middle School baseball field
    c. Adjacent to the Football field beside the High School

[1] The heights listed in this report refer to the radiation centerline of antennas; the antenna and tower height could extend 10' above this height. For example, a 180' modeled propagation would be for a 190' tower height.

2. Off Branch Londonderry Turnpike W, near the intersection with Page Road (modelled at 180' and referred to as Big Bear area) as well as a high point just SW of this location, within the town of Dunbarton (also modelled at 180')
3. In the forest between Dunbarton Center Road and Woodhill Road (modelled at 120' and later at 180')

Conclusions

Through the iterations of potential future sites, several conclusions were reached:

1. The three options for coverage around the HS were somewhat similar, the location on the East side of White Rock Hill Road provides better coverage to the East but any one of the three locations would fill the gap around and at the HS.
2. The location in Dunbarton (on a hill near the intersection of Gile Hill Road and Great Road) provided better coverage in Dunbarton but did not effectively fill the gap in western Bow.
3. A 180' tower between Woodhill Road and Dunbarton Center road will fill the gap in South Bow effectively. Reducing the height to 120' would open some gaps.
4. The gap shown on the plots in NE Bow on and near I-93 south of the Blue Seal location may or may not exist. Isotrope recommends a drive test to confirm, and if necessary, a lower site could be proposed/added among the warehouse buildings in that area to address any small area of need on and near the highway. However, if the carriers are not driving a solution for dropped calls on I-93, it is likely that there is not an issue.
5. The SBA site in Dunbarton is quite low and potential coverage from that location is quite limited as a result. If the tower could be rebuilt/extended, improved coverage in Dunbarton would be available.

Generally, based on a potentially available tower infrastructure design including 3 additional sites in Bow (Branch Londonderry W and Page Road @ 180', One of 3 locations near the HS @120' and a tower between Woodhill and Dunbarton Center Roads @180') the wireless carriers serving Bow should have the opportunity to provide a strong, robust network for voice in Bow, NH.

Isotrope stands ready to assist the Town of Bow with any additional needs, potentially:

1. Drive data collection to confirm specific areas
2. Preparation or support of RFP for tower companies to propose locations
3. Support with town bylaws to encourage tower development in chosen areas

List of plots provided with this report, separately:

1. Aggregate coverage @700 MHz for all existing and 3 "best" proposed sites, overlaid on the town parcel maps and Google Earth, suitable for large-format printing

2. Individual plots of Existing sites, and Existing plus:
    a. Bow HS site at 120’
    b. Ball Field and Tennis at 120’
    c. Football Field potential lights at 120’
    d. Branch Londonderry W and Page Road at 180’
    e. Dunbarton Gile Hill Road and Great Road at 180’
    f. Dunbarton Center road/Woodhill Road at 120’ and at 180’