

Review of AT&T Mobility Tower Application for Ashfield

Fred Goldstein, Interisle Consulting Group, November 2020

Centerline Communications LLC, on behalf of AT&T Mobility, has filed an application to construct a tower in Ashfield, on property located at 2003 Conway Road. The proposed tower would be a monopole 120 feet high, located on a small portion of a wooded area almost 2000 feet from Rt. 116 and almost 1800 feet from the nearest public road (Murray Rd.). The 120 foot height would allow the tower to support up to four carriers at 10' spacing while remaining above the tree line. The primary purpose of the tower is to provide service to a section of the rt. 116 corridor where service is currently lacking. That section essentially follows a curve around the hill on which the proposed tower is sited, so that the tower will reach approximately 3 miles of Rt. 116, as well as several nearby roads, primarily in Ashfield though also reaching nearby portions of Conway.

Both Town and federal laws are potentially applicable. 47 U.S.C. 332(c)(7), part of the Telecommunications Act, protects the right of localities to enforce zoning codes for wireless towers but only to the extent that the zoning does “shall not prohibit or have the effect of prohibiting the provision of personal wireless services”. The application need not be granted as proposed if an adequate alternative is available, or if limiting its waivers do not substantially impair service.

AT&T Mobility is a commercial mobile radio service provider, as well as the operator of FirstNet, a service aimed at public safety first responders. AT&T typically provides initial mobile coverage as well as FirstNet coverage on the 700 MHz or 800 MHz bands, which are relatively immune to blockage from foliage. AT&T also operates on several other higher-frequency bands. Thus coverage is studied both on 700 MHz and at 1900 MHz, which is in the vicinity of both the PCS and AWS bands.

Terrain in the vicinity of the proposed facility

Ashfield is a “hill town”, on the high ground between the region’s major valleys (the Connecticut and Housatonic), and most of the hills in the region are ridges in the Appalachian chain. which characteristically run north-northeast to south-southwest. Ashfield is mainly on high ground, and a small ridge runs more in an east-west direction, north of the proposed site, while the ground also rises in a corresponding ridge a short distance to the south. Route 116 bends through this valley, essentially as a hollow. Mobile coverage to that section of Route 116 and nearby would thus only come from a site that essentially overlooks that hollow.

The proposed tower is on the south side of the small north-south ridge that rises north of the middle of the Rt. 116 bend, and thus should provide usable coverage along Rt. 116 from just into Conway westward to the hamlet of South Ashfield. The ridge that the site is on rises higher to the north of the site, to a point labeled Mt. Owen on an old map, which is more than 150 feet higher than the proposed site. The sides of the ridge are partially cleared as farmland by the site owners.

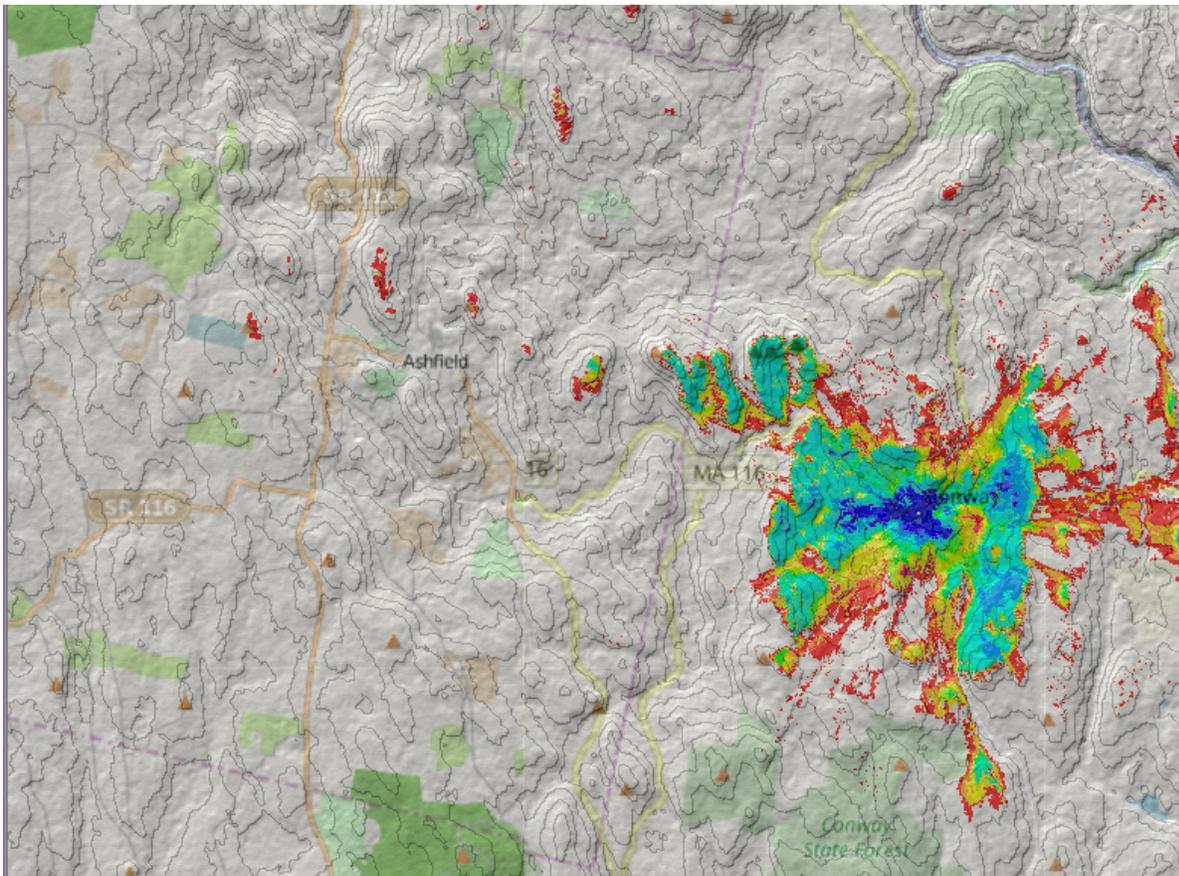
Existing sites and coverage gaps

There are no existing towers in the immediate vicinity of the proposed site. The application lists a number of towers in nearby towns, and provides estimated coverage maps from those sites. Interisle independently evaluated coverage from the nearby sites using a coverage prediction tool and did not find any that covered the bulk of the planned coverage area.

The pictures below are scaled with strongest coverage in blue and green, down to marginal coverage (-90 to -96 dBm RSSI), which may still be usable for voice, in red. Terrain lines are at 30 meter intervals of elevation. The 700 MHz band was used; higher frequency coverage will not be as good.

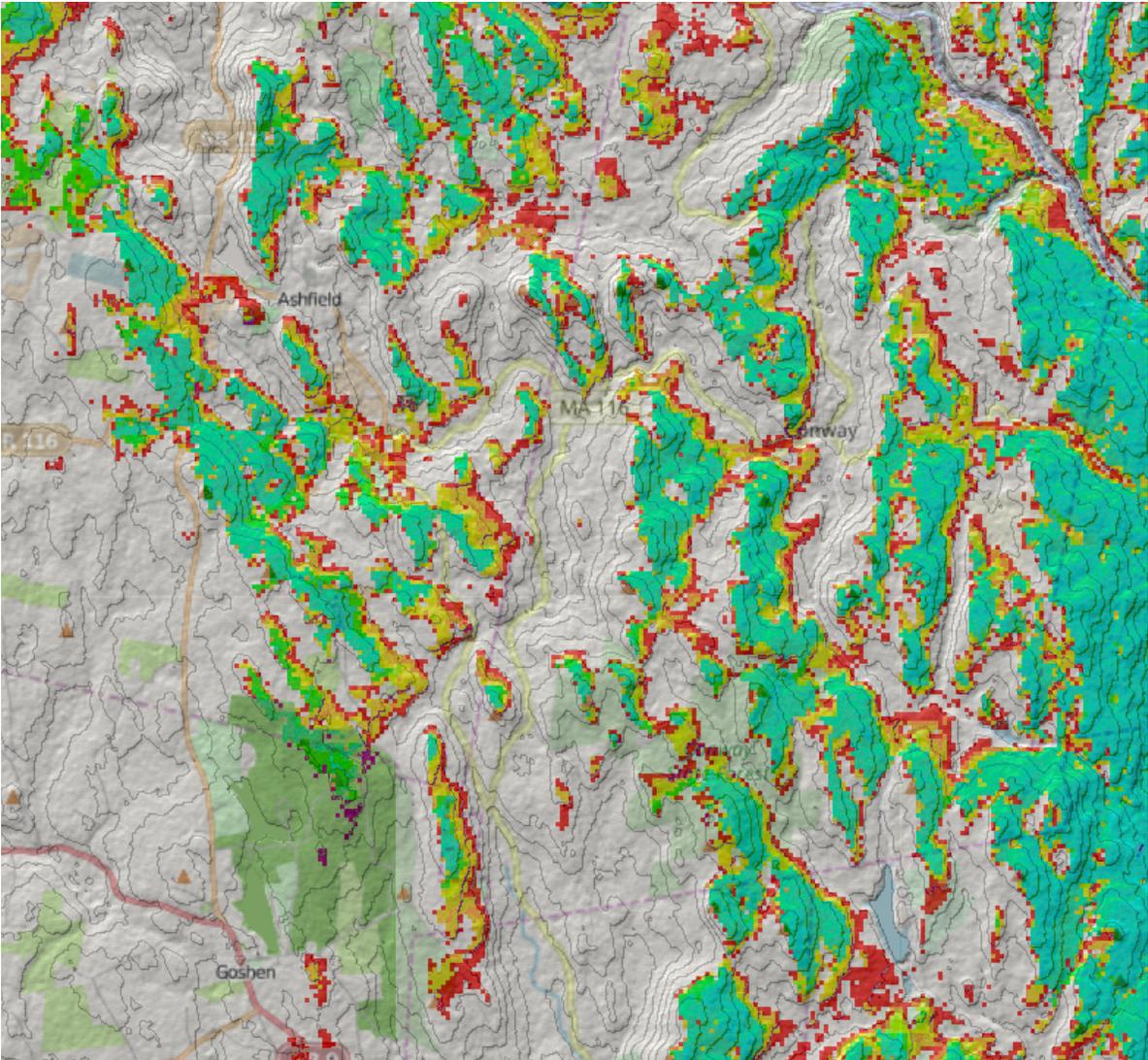
8-10 Ashfield Rd., Conway

This water tank is one of the closest existing base station sites, listed as 120 feet high. Coverage does not however reach Ashfield.



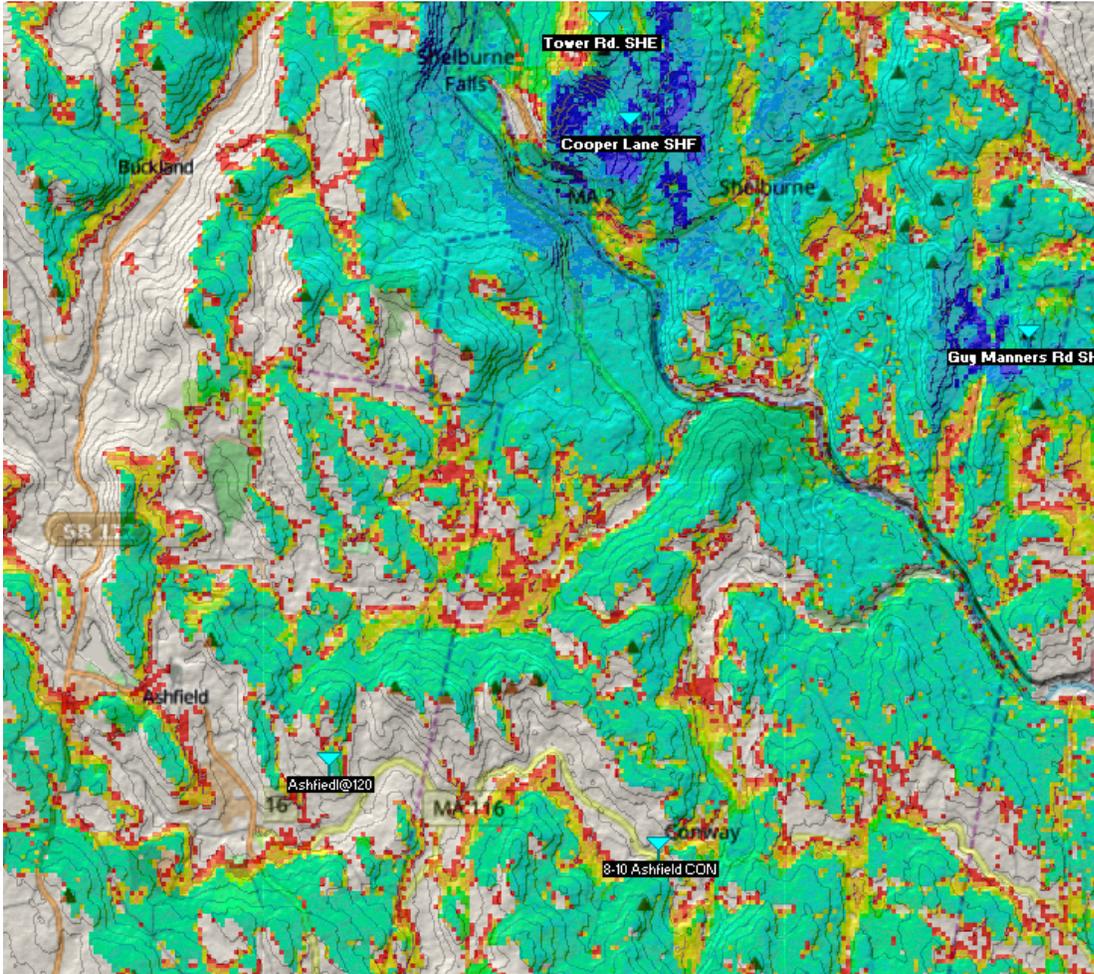
Deerfield sites

Two existing locations in Deerfield were noted, one on Christina Lane and one on Old Pine Nook Road. Their primary service area is the Rt. 91 corridor. While they do put some signal onto hilltops in Ashfield, they do not reach the targeted roadways.



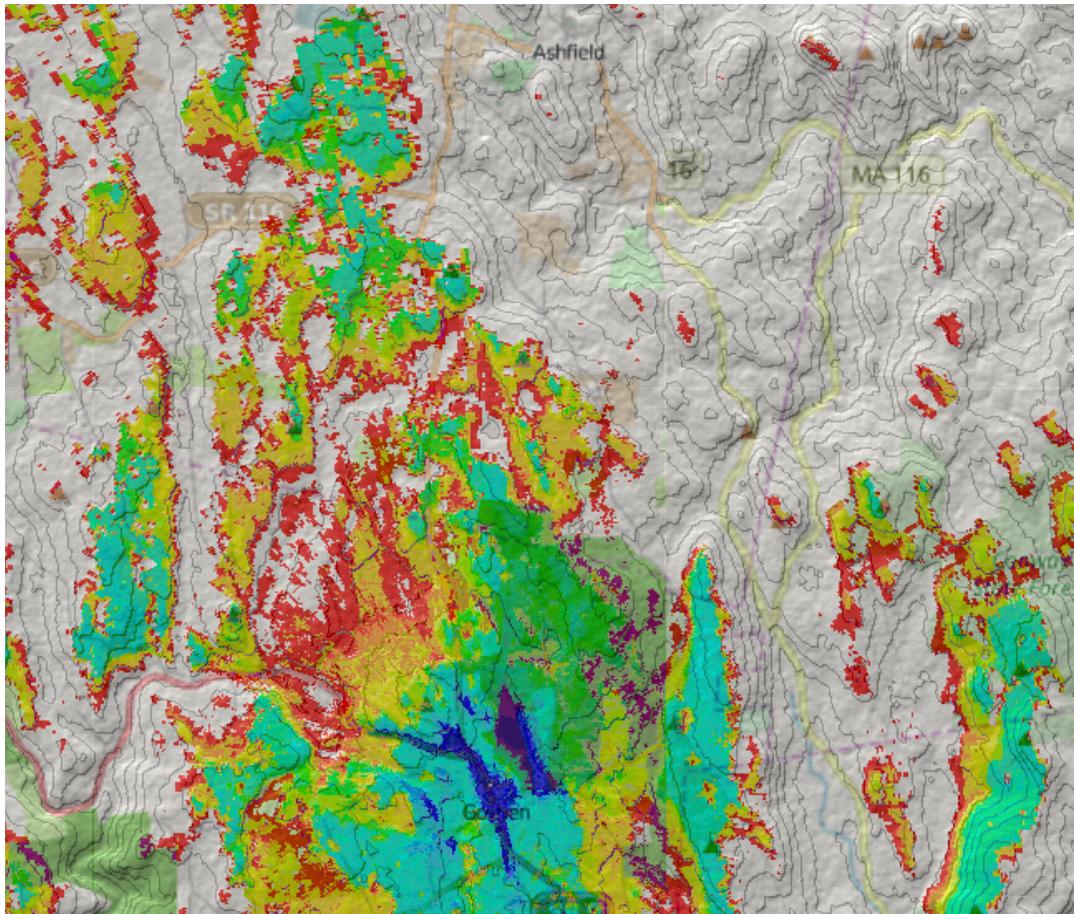
Shelburne sites

Three sites to the northeast, in Shelburne and Shelburne Falls, were noted in the application, on Cooper Lane, Guy Manners Rd., and Tower Rd. These sites do put some signal into parts of Ashfield, apparently including some roads in the vicinity of South Ashfield, but do not cover the Rt. 116 corridor in question. Their primary service area is the Rt. 2 corridor.



Goshen site

A 193-foot tower on Loomis Road in Goshen covers a stretch of Rt. 9, and reaches some of southwestern Ashfield, but the ridge to the south of Rt. 112 completely shadows that stretch.



Other sites noted in the application

A site was noted on Goshen Rd. (Rt.9), Williamsburg. This too does not significantly reach over the terrain into Ashfield. A site on Stage Rd. in Cummington reaches southwestern Ashfield but not the area targeted by the applied-for tower. A site in Windsor reaches even less of Ashfield. Similarly, a site on Energy Lane in Hawley, on the side of Mt. InSTITUTE (home of the Berkshire East Ski Area), does not provide meaningful mobile coverage into Ashfield.

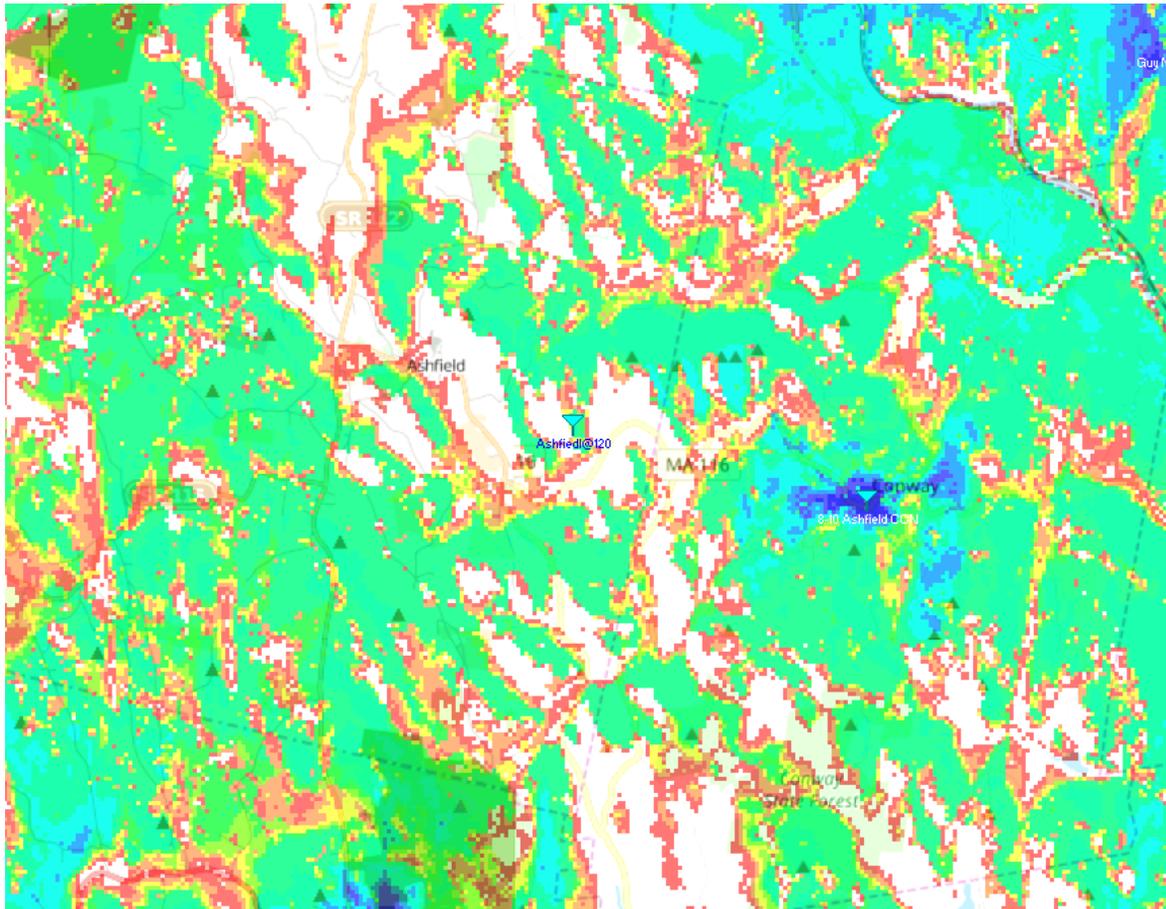
An alternative site (labeled MA5006_ICE by AT&T) in southwestern Ashfield was also noted, but due to the terrain, it would have little coverage into the area targeted by the proposed tower.

Backhaul

The Old Nook Rd., Cooper Lane, and Tower Rd. sites do appear to have line-of-sight paths to the top of the proposed tower, which may be enabling for microwave backhaul. There is also MassBroadband 123 fiber (operated by KCST) on Rt. 116, and may be other options available to AT&T and future collocators.

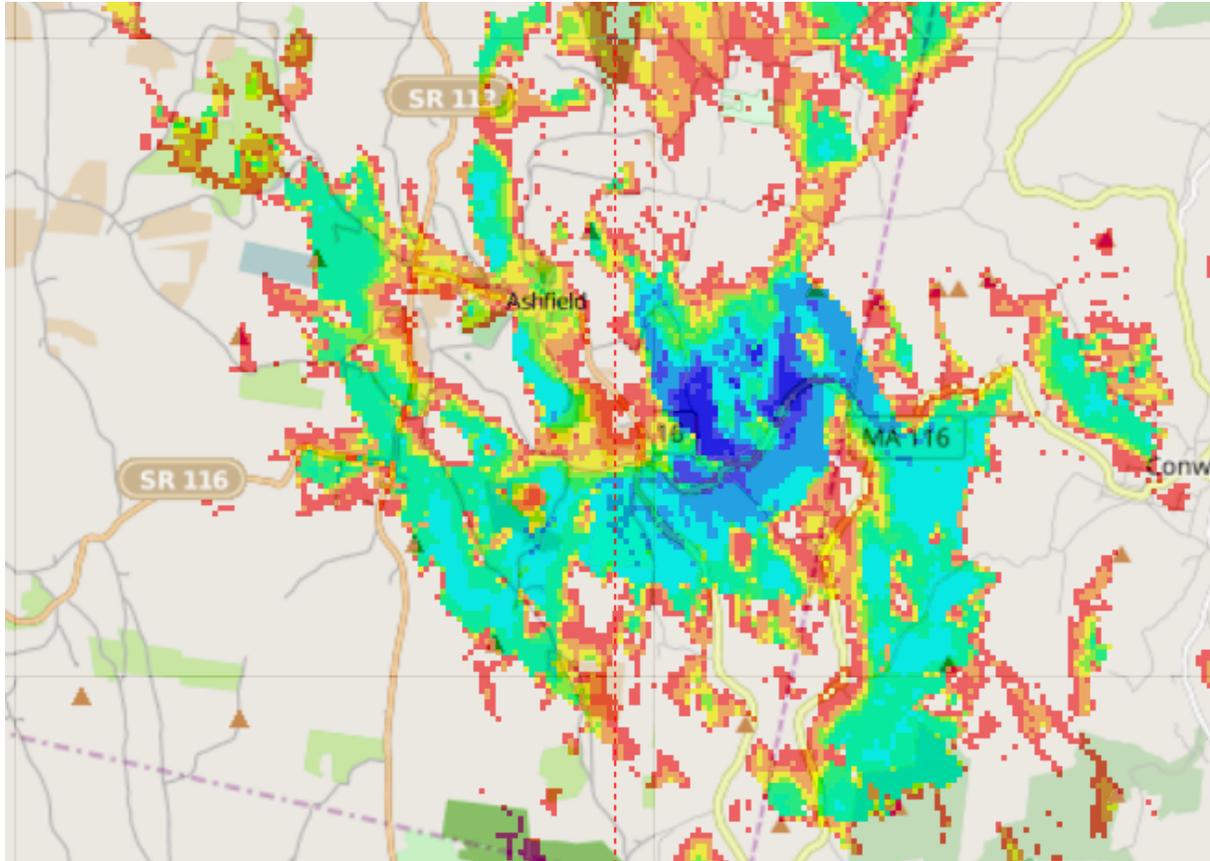
Composite coverage of existing sites

A combined coverage map from all of the existing sites described by AT&T in the application (and there are no known other ones that reach the targeted area) provides this map, which essentially validates the findings on page 24 of the application.



Coverage from the proposed site

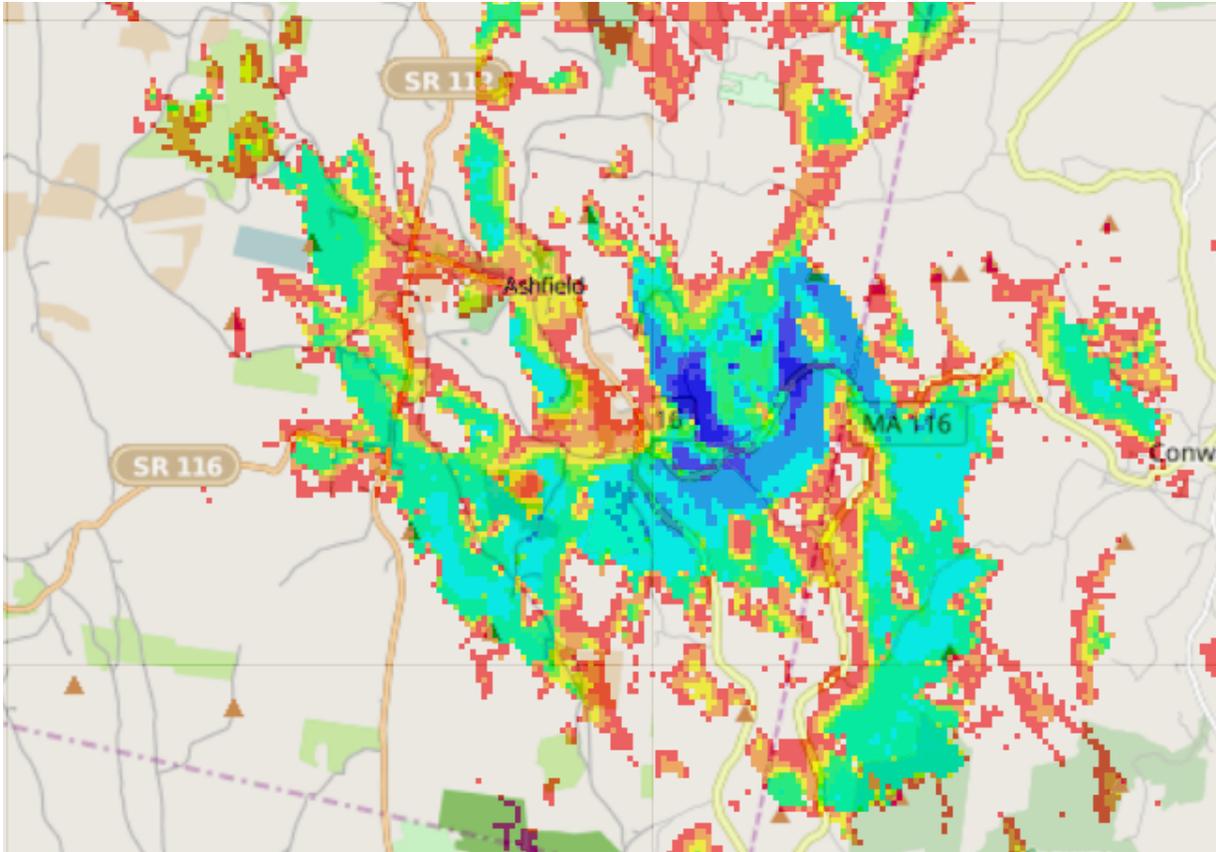
At an elevation of 120 feet, the proposed site coverage is primarily around the Rt. 112 area from South Ashfield to Conway, and also sees some areas beyond, mainly hillsides facing it, but it should also improve coverage in Ashfield Center.



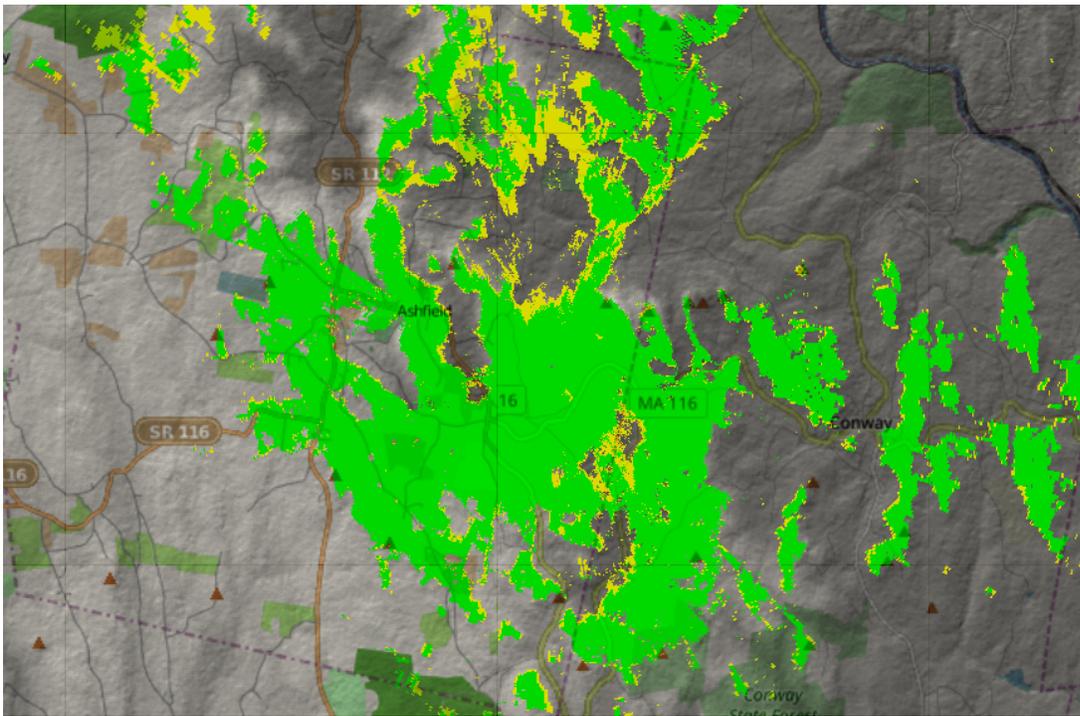
Coverage from 120' level

This is fundamentally similar to the coverage shown in the application. The -108 dBm signal level named in the application is RSRP, an LTE-specific measurement roughly 26 dB lower than the metric, RSSI, shown here, so the red area on the rainbow-shaded picture is below the predicted minimum reported by AT&T.

At the 90' level, which would typically be used by the fourth tenant on the tower, or what a shorter tower would provide, the coverage map is little changed, though somewhat lower along Main St. The additional 30 feet are much less important to coverage than the dominant terrain variation. The second map below, using a different coloring method, shows the 90' coverage in green and additional coverage from 120' in yellow, virtually none of which is along a roadway or in a populated area. Better-quality coverage within the green area, however, is not noted.



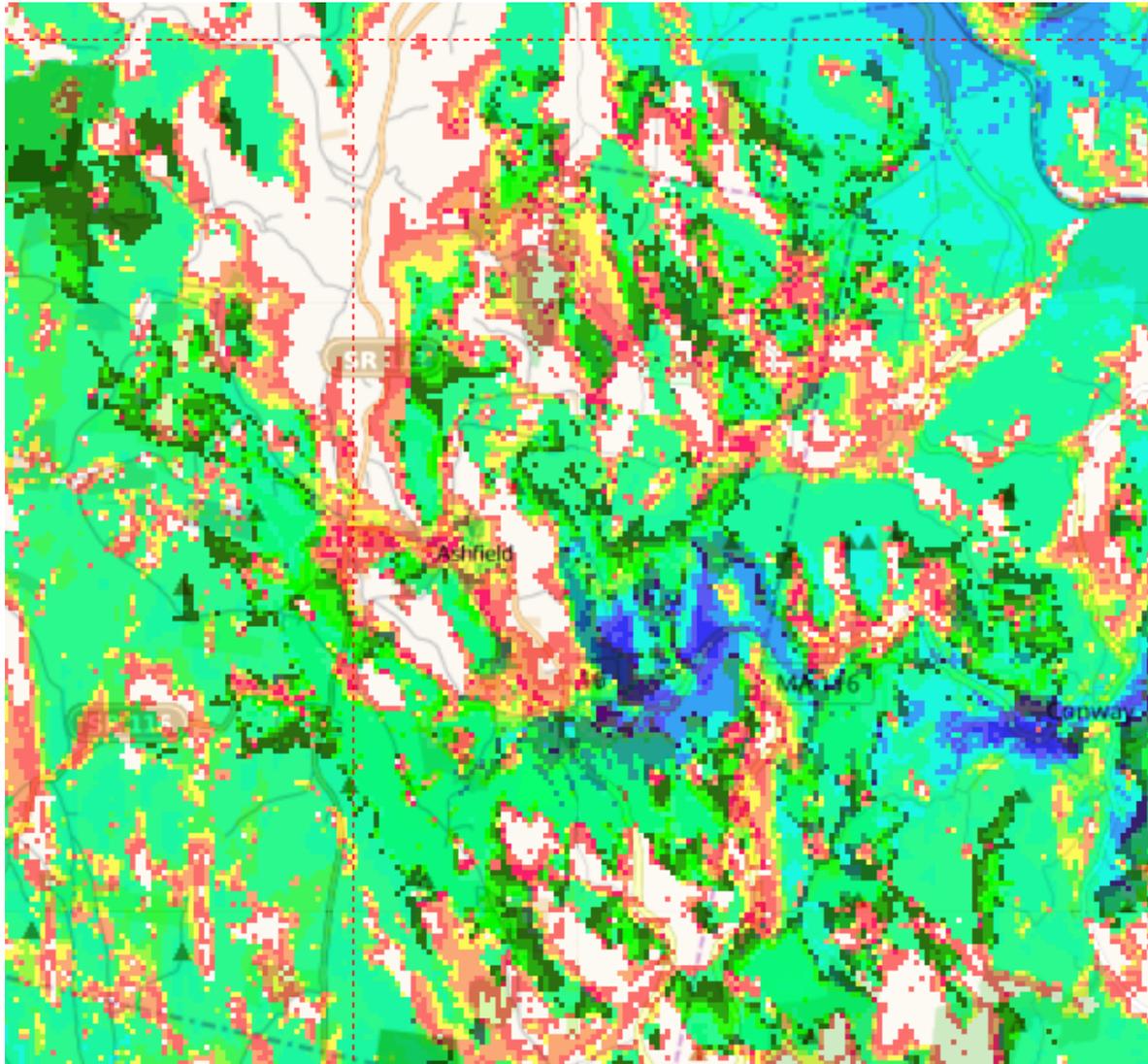
Coverage from 90' level.



Difference in coverage between 90 and 120' levels

Combined coverage

Overlaying the proposed site's coverage atop status quo coverage results in a fairly good overall coverage of the Town of Ashfield. The town center (Main St. area) is reasonably well covered, though a short gap in coverage still exists on Rt. 116 about a mile to its east. Gaps still exist in low-lying areas, especially along Creamery Rd. and Buckland Rd., but most well-populated areas should have service.



Conclusion

The AT&T application's technical analysis appear to be fundamentally correct. There are no existing towers that appear to be capable of reaching the coverage gap area targeted by the application, and the proposed tower will fill in a sizeable area now a coverage gap. Coverage from 90' would be adequate for most purposes but 120' would allow multiple users of the tower and would provide somewhat better coverage in the Main St. area.