Broadcast Signal Lab

Further Commentary on T-Mobile Application for Variance for a Wireless Communications Facility at 22 Griffin Road, Westford, Massachusetts

24 September 2010

Broadcast Signal Lab was engaged by the Town of Westford to assist with the review of the T-Mobile application for variances for a Wireless Communications Facility (WCF) including a new tower, at 22 Griffin Road (Site). The applicant seeks a use variance as well as a variance from the 900-foot dwelling setback in the WCF bylaw (6.2.3) and from the 35 foot height limitation in the Table of Dimensional and Density Regulations (Appendix C). Applicant also seeks a variance to the limitation of not more than one principal structure on a lot (4.1.2).

In our Initial Commentary dated May 14, 2010, we summarized topics of inquiry. In our Further Commentary July 16, 2010, we remarked in depth on various issues. We also provided a separate document confirming the proposed facility's design is compliant with FCC regulations concerning the facility's radio frequency emissions to the environment. We provided a separate coverage analysis report showing our assessment of the projected coverage from the proposed facility and from alternatives on the Walsh park site owned by the Town, and from a location on the hill that is south of the proposed tower site. We provided an addendum to the coverage report (under Isotrope Wireless letterhead, which is in the process of restructuring the consulting services of David Maxson). This addendum was prepared in response to the suggestion of a location on the hill that would be in the Walsh parcel.

This commentary attempts to wrap up various factual matters to assist with bringing the application review toward a conclusion. In our initial commentary, we listed some topics in need of further elaboration. Below, these topics are listed again, and brief comments are added.

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- Demonstrate inability to use
    - 1 existing wireless facilities,
        - We are satisfied that this approach has no material impact on the proposed facility.
    - 2 other existing structures, or the 500-foot highway margin,
        - No existing structures (singly or severally) have been identified that would be able to substantially substitute for all or even substantial portions of T-Mobile's coverage objective.
        - The highway median is geographically and topographically unable to provide a suitable tower location for the objecvite.
        - The Puma building is very duplicative of existing coverage and primarily benefits coverage along Carlisle Road north of the Route 225 (Concord Rd) intersection.
            - Noting here, while discussing Puma, the Butterbrook site provides no material improvement in the applicant's desired coverage along Route 225, and is even more duplicative of existing coverage than Puma is, at their respective locations. Consequently, the combination of Puma and Butterbrook is of little benefit and is not recommendable engineering practice due to the significant overlaps in an area of moderate subscriber demand (based on the land uses).
    - 3 site with no eligible historic assets within 4x the tower height and no visibility to a scenic road,
        - We have not mapped these for the proposed site or alternatives.
        - Would a tower on either of the two Walsh parcel locations be more, less, or equally compliant compared to the proposed tower? (We recognize the applicant's concern that the Walsh parcel is not presently available in the manner that a private property could be. This is a legal matter we leave for the Board)
        - Would a tower just above the trees, placed on the hill location we illustrated in our coverage report (C2) be more, less, or equally compliant compared to the proposed tower? Applicant suggests that, compared to the proposed tower, the location of a shorter tower on the hill
            - "increases the *potential* visibility" (*emphasis added*);

- requires "similar relief" in zoning,
- "may not" be possible because the landowner(s) have not been contactes. (We indicated location C2 is in the vicinity of several parcels.)
- reduces co-location potential and increases the number of towers likely to be needed in the area

▪ We note the natural tension in the bylaw to maximize co-location in an effort to minimize the number of towers with the bylaw requirement that the view of the tower from other areas be minimized and the tower shall be "screened from abutters and neighbors as feasible."

- Have all screening options been identified?
  - Plant tall trees to screen view from neighbors?
  - Relocate tower to another location on site to achieve effective screening?
  - Use tower design elements to reduce visual impact? (Surface mounted antennas, antennas concealed within the pole surface, tree camouflage, require all surfaces and components on the tower to be the same color?)

o <u>4 other installations that otherwise comply with §6.2.</u>

▪ Methods considered have not been recommendable.

o <u>Consider the above (in order of priority 1-4, greatest to least) to achieve coverage to all or a substantial part of the claimed gap.</u>

In the Further Commentary, we also recommended the following:

- <u>Demonstrate effect of complying with 100-foot limit</u>
  - Applicant's coverage at 100 feet is somewhat less than at 140 feet
    - Compared to the 140 foot coverage, at 100 feet, the white space that opens up on Carlisle Rd north of Route 225 is short and we believe it to be inconsequential.
    - Compared to the 140 foot coverage, at 100 feet, the coverage to Acton Rd does not meet the applicant's desired threshold. Acton Rd can be treated as a separate coverage objective by placing a facility in Westford or Carlisle closer to the Acton Rd objective.

- Demonstrate that higher than 100 feet the proposed tower will promote co-location, reduce the number of towers in the area, or have an overall lesser visual impact.
    - This is an opportunity to compare the general visual impacts of perhaps two 100 foot towers, or three 90 foot towers (worst case) at carefully selected locations if and when four to six carriers express a desire to add facilities (with the first two or three being on the first tower) with respect to the visual impacts of the proposed tower at 140 feet.
    - 140 feet produces more co-location space, but that does not guarantee that over time four to six carriers will actually use it.
    - A middle ground would be to approve at 100 feet, and require the structure and foundation be built to be extendable in the future if the tower becomes full and a carrier demonstrates a need for greater height. It could be extended in 20 foot steps. Applicant could be given the right under the permit to always have the top spot, regardless of height. This would ensure that the tower remains only tall enough to serve the number of carriers that need it.
    - The applicant's coverage map at 100 feet falls short of providing the desired signal level to Acton Rd. This suggests that the 120 foot height or both the 120 and 130 foot heights could have similar shortcomings with respect to reaching Acton Rd at the desired signal level. Consequently, the fourth co-locator (100 ft) on a 140 foot tower may need an additional facility along Acton Rd anyway. By extension, it is possible that the third and even the second co-locator may have the same issues.
    - At 75 feet, the proposed facility reveals a larger white space on Carlisle Road north of the Route 225 split than the 100 foot height does. A 100 foot tower may be suitable for serving two or three carriers (100, 90 and 80 feet) to serve the Griffin Rd, Route 225, Carlisle Rd area. The Acton Rd area may need separate facilities for these carriers.
- Demonstrate effect of complying with 900 and 300-foot setbacks.
    - The applicant has provided some information on this question. It is difficult to find sites in residential communities that meet these criteria and are in the right general location.

Conclusion

We believe the most likely potential alternatives to the proposed facility include relocation on the site, siting the facility on the hill at the most opportune location, and using the Walsh parcel.

More due diligence would have to be conducted to rule out alternatives on the hill.

Coverage from the Hill would be substantial with respect to that of the proposed facility.

Co-location space would likely be reduced with a shorter tower on the hill; however it is not apparent how many co-locators would find the proposed facility useful.

The applicant states -84 dBm represents its coverage gap threshold; we suggest that, in context, there are locations that have less than the official desired level that are also receiving service, or would receive service. For example, the white spaces that open up along certain roads with a shorter tower or an alternate location may not be large enough to be detrimental to the provision of service.

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