LECLAIRRYAN

February 28, 2018

VIA ELECTRONIC MAIL &
OVERNIGHT COURIER

Ms. Lucy Stoll
City Planner
City of Hampton
Community Development Department
22 Lincoln Street, 5th Floor
Hampton, Virginia 23669

Requested Additional Materials for Use Permit No. 17-00013
PI Wythe – 1821 Cemetery Lane
Jewish Cemetery of the Virginia Peninsula, Inc. ("Jewish Cemetery")
PI Tower Development, LLC ("Applicant")

Dear Ms. Stoll:

In response to your February 16th correspondence to Drew Patterson, we have assembled the enclosed materials. Since an analysis of the potential for increasing the height of the proposed tower in order to expand coverage was a critical component of the follow-up information requested by you and by the Planning Commission, I thought it would make sense to address tower height first.

Regulatory Limitations on Tower Height

As indicated in Drew Patterson's follow-up email to you on February 23rd, the Virginia Department of Historic Resources ("VADHR", which is often referred to as "SHPO") is the state agency tasked with identifying and evaluating historic properties and with assessing the effects of towers on those resources. In this case, VADHR has determined that a tower height of 155 feet (150 foot tower with a 5 foot lightning rod) is the maximum height at which it will issue a "no adverse effect" determination.[1]

[1] As you may note, there was a slight discrepancy between the plans submitted to VADHR and the plans submitted with the zoning application. VADHR's determination will not affect the proposed tower height; however, it will result in a shorter lighting rod than what is currently depicted on the zoning drawings.

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As mentioned in my email to you last Friday, in addition to going through the local zoning and permitting process, all communications towers have to comply with federal regulations in order to be registered with the Federal Communications Commission ("FCC"). The most important part of that review process, other than compliance with Federal Aviation Administration requirements, is compliance with the National Environmental Policy Act ("NEPA") and the National Historic Preservation Act ("NHPA"). The NEPA/NHPA review process includes, among other things, making sure that there are no wetlands (or other sensitive environmental resources), migratory birds, endangered species, historic resources (including archeological sites), Native American Tribes or cultural resources that would be effected by a proposed tower. The federal regulatory review process runs on a parallel path with the local zoning process.

As depicted on the aerial enclosed as Exhibit A, there are multiple historic resources (each identified by a number) in the area of potential effect ("APE") of the tower, which are located on the other side of Kecoughtan Road. Historic resources included in VADHR's impact analysis do not have to be listed on the National Register of Historic Places, they need only be eligible for inclusion. At the time of the February Planning Commission Hearing, neither Drew Patterson, nor I realized that there were historic resources in such close proximity to the proposed tower site. For your files, I have enclosed as Exhibit B a copy of the email chain between Chris Novelli of VADHR and Mark Larocque of Practical Environmental Solutions LLC, the Applicant's NEPA/NHPA consultant. Based on Mr. Novelli's email response on February 20th, the Applicant will not be able to increase the height of the proposed tower.

Analysis of RF Coverage Objectives

As I indicated at the Planning Commission Hearing, in order to keep up with the dramatic increase in demand for wireless services, T-Mobile needs an antenna site in this area to connect with the following existing sites, depicted on the network map and on the propagation maps enclosed as Exhibit C: (1) a 130 foot tower 1.17 miles to the northeast at Bassette Elementary School (VA096A); (2) a lattice tower 1.18 miles to the northwest located at the Gately Communications Building at 501 Industry Drive (VA100B); and (3) a rooftop installation 1.15 miles to the southwest on the top of the Riverside Rehabilitation Institute Building (VA100B). In fact, at last month's hearing Commissioners Kellum and Southall, both appeared to recognize the need for an antenna site to expand and enhance wireless coverage in the area. I am also aware of at least one other carrier in the last few years, who was also searching for a site in the area and who approached Planning staff about applying for a conditional use permit for a tower on

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another parcel owned by the Jewish Cemetery adjacent to Kecoughtan Road in a location that would have been much more visible. That application was ultimately abandoned.

T-Mobile's radio frequency ("RF") design standard coverage thresholds are classified into four levels: (1) In-building commercial (darkest green); (2) In-building residential (medium dark green); (3) In-vehicle (light green); and (4) Outdoor (lightest green). Commercial/industrial buildings tend to be constructed with materials that are denser than the materials used in constructing residential dwellings. As a result, it is more difficult for RF signals to penetrate commercial buildings, which leads to additional attenuation loss of RF signal coverage. The weaker the signal when it hits the building exterior, the less likely it is to penetrate. For this reason, T-Mobile's RF engineers distinguish between "in-building commercial" and "in-building residential" coverage. It is T-Mobile's goal to provide the best coverage possible to all locations where their customers need and want service. However, as a practical matter in developing and enhancing their network of antenna sites, the least coverage they will accept from a new site is "in-building residential levels".

In any radio network design, wireless coverage levels decay in proportion to the distance from the transmit point. Many other factors also affect the coverage levels, including antenna height, transmit power, antenna gain, licensed radio frequencies, and environmental features, such as terrain, trees, buildings, and population density. All of these factors have practical limits. For instance, antenna gain is limited by antenna size, transmit power is limited by radio equipment manufacturer specifications and FCC regulations, and antenna heights are limited by tower ordinances and structure height availability. Due to these factors, typical tower spacing runs from less than a mile in high density urban areas to roughly 8 miles in low density rural areas, depending on desired performance goals.

With all these factors in mind, generally speaking, increased tower heights will allow for bigger coverage footprints. Tower heights, which are not sufficient for the spacing and height of connecting sites, leave coverage gaps, depending on their locations, which would eventually lead to the need for additional antenna sites in the future to cover the same area. Conversely, if antennas are placed too high or too close together, they could potentially interfere with antennas operating at connecting sites.

As the enclosed propagation maps indicate, with antennas operating at 150 feet on the proposed tower, T-Mobile's signal will meet their coverage objectives for this site. While some

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additional height might provide a modest incremental benefit to T-Mobile and other users of the tower, it will not be allowed by VADHR.

Alternative Locations Explored by the Applicant

Once the approximate location of an antenna site necessary to satisfy a wireless carrier's coverage objectives is identified by the RF engineers, the area is searched for existing tall structures to meet RF coverage objectives. If there are none, the next step is to identify land within that relatively small area that meets local zoning requirements (use/placement/height, etc.) and to determine whether the owners of that land are willing to lease space for a tower and equipment compound. The email and corresponding aerials that show the properties investigated by the Applicant (yellow push pins) in relation to existing antenna sites (red push pins, including the proposed tower) enclosed as Exhibit D, identify the properties whose location was deemed suitable for an antenna site to meet coverage objectives by the RF engineers, with sufficient land to meet zoning requirements. From there, Roger Hughett, the Applicant's site acquisition consultant set out to identify property owners, who were willing to lease space to the Applicant. As the email and zoning map enclosed as Exhibit E indicate, the number of large non-residential properties in the area is limited, which is why it has been so difficult for anyone to identify a suitable location for an antenna site.

At last month's hearing, Commissioner Coleman asked, if we could go any further north. The answer to that question is that a site about 4/10ths of mile from the proposed site, large enough for a tower on property owned by the Boys & Girls Club was investigated, but was ultimately ruled out because the owner was in the process of selling the land and therefore was not interested in entering into a long-term lease with the Applicant. Going any further north than that would leave a gap in the area to the south closer to the water resulting in the need for an additional site to the south. It would also result in duplicative coverage with existing antenna sites at Bassette Elementary School to the northeast and on the Gately Communications tower to the northwest. Properties surrounding the proposed site, which are owned by the Catholic Church to the north, Colonial Landing Apartments, LLC to the east and other properties owned by the Jewish Cemetery nearby were examined, but were ruled out by the respective property owners.

Future Plans for New Sites

While the location and placement of antenna sites is proprietary, T-Mobile has indicated to the Applicant that it plans to continue investing in its network in the City of Hampton and

throughout Hampton Roads for the foreseeable future. These plans involve equipment modifications and upgrades at existing antenna sites and new antenna sites in critical locations where there are still gaps in coverage. Recently, Neville Ray, T-Mobile's CTO, stated that "Every dollar we invest in our network is a 5G dollar." He went on to say that "[A]ll the LTE Advanced work we do is 5G work, and we're leading the industry with the most advanced LTE network in the country. Every step we take — every innovation – builds toward a future-proof 5G network, one where our customers continue to come out on top."

Conclusion

Siting wireless antennas is a delicate balancing act that involves identifying a location that represents the intersection of several competing interests – the height and spacing requirements dictated by RF signal propagation; use, placement and height limitations imposed by local and federal laws, rules and regulations; the desires of the surrounding property owners; and the need to find a willing landlord. The application you have before you represents the best solution to a coverage need that will go unmet without a new antenna site in the general vicinity of the proposed site.

Please do not hesitate to call or email me should you have any questions or comments regarding the foregoing. As indicated at last month's hearing, we would be happy to participate in a work session to discuss the wireless industry and future development trends. With kind regards, I am

Very truly yours,

Lisa M. Murphy

Enclosures

cc: Bonnie Brown, Esq. (via electronic mail)(w/ encls.)
Mr. Drew Patterson (via electronic mail)(w/o encls.)
Ms. Alejandra Stinson (via electronic mail)(w/o encls.)
Ms. Tina Chambliss (via electronic mail)(w/o encls.)

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