

Proposed Wireless Telecommunications Facility

CTNL804B
387 Shore Road (Route 156)
Old Lyme, Connecticut

Prepared for 

Prepared by **VHB/Vanasse Hangen Brustlin, Inc.**
54 Tuttle Place
Middletown, CT 06457

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Visual Resource Evaluation

Omni Point Communications, Inc., dba T-Mobile, seeks approval from the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need for the construction of a wireless telecommunications facility ("Facility") to be located on property at 387 Shore Road, in the Town of Old Lyme, Connecticut (identified herein as the "host property"). This Visual Resource Evaluation was conducted to assess the visibility of the proposed Facility within a two-mile radius ("Study Area"). Attachment A contains a photograph of the proposed project area. Attachment A also contains a map that depicts the location of the proposed Facility and the limits of the Study Area.

Project Introduction

The proposed Facility includes the installation of an 80-foot tall monopole with associated ground equipment to be located at its base. Both the proposed monopole and ground equipment would be situated within a 20-foot by 40-foot fence-enclosed compound. The proposed Facility is located at approximately 30 feet Above Mean Sea Level ("AMSL"). Access to the Facility would utilize an existing dirt path (to be improved to accommodate service vehicles) currently located on the host property.

Site Description and Setting

Identified in the Town of Old Lyme land records as Map 10/Lot 8, the host property consists of approximately 2.15 acres of land and is currently occupied by a small, single story commercial building. The proposed Facility would be located in a lightly wooded, undeveloped area on the host property, immediately north of an existing Amtrak railroad corridor and associated overhead electrical infrastructure. Land use in the immediate vicinity of the host property consists of the existing Amtrak right-of-way; several commercial establishments located along Route 156 (Shore Road); and medium-density residential development to the south. Segments of Interstate 95 and Route 156 are contained within the Study Area. In total, the Study Area features approximately 85 linear miles of roadways and rail line.

The topography within the Study Area is characterized by gently rolling hills with ground elevations that range from approximately sea level to approximately 215 feet AMSL. The Study Area contains approximately 3,579 acres of surface water, dominated in large measure by portions of Long Island Sound which occupies the southern third of the Study Area. The tree cover within the Study Area consists mainly of mixed deciduous hardwood species. The tree canopy occupies approximately 2,964 acres of the 8,042-acre study area (44%). During the in-field activities associated with this analysis, an infrared laser range finder was used to determine the average tree canopy height throughout the Study Area. Numerous trees were selected for measurement and the average tree canopy was determined to be 60 feet.

METHODOLOGY

In order to better represent the visibility associated with the Facility, VHB uses a two-fold approach incorporating both a predictive computer model and in-field analysis. The predictive model is employed to assess potential visibility throughout the entire Study Area, including private property and/or otherwise inaccessible areas for field verification. A “balloon float” and Study Area drive-through reconnaissance are also conducted to obtain locational and height representations, back-check the initial computer model results and provide documentation from publicly accessible areas. Results of both activities are analyzed and incorporated into the final viewshed map. A description of the methodologies used in the analysis is provided below.

Visibility Analysis

Using ESRI’s ArcView® Spatial Analyst, a computer modeling tool, the areas from where the top of the Facility is expected to be visible are calculated. This is based on information entered into the computer model, including Facility height, its ground elevation, the surrounding topography and existing vegetation. Data incorporated into the predictive model includes a digital elevation model (DEM) and a digital forest layer for the Study Area. The DEM was derived from the Connecticut LiDAR-based digital elevation data. The LiDAR data was produced by the University of Connecticut Center for Land Use Education and Research (CLEAR) in 2007 and has a horizontal resolution of 10 feet. In order to create the forest layer, digital aerial photographs of the Study Area are incorporated into the computer model. The mature trees and woodland areas depicted on the aerial photos are manually traced in ArcView® GIS and then converted into a geographic data layer. The aerial photographs were produced in 2006 and have a pixel resolution of one foot.

Once the data are entered, a series of constraints are applied to the computer model to achieve an estimate of where the Facility will be visible. Initially, only topography was used as a visual constraint; the tree canopy is omitted to evaluate all areas of potential visibility without any vegetative screening. Although this is an overly conservative prediction, the initial omission of these layers assists in the evaluation of potential seasonal visibility of the proposed Facility. The average height of the tree canopy was determined in the field using a laser range finder. The average tree canopy height is incorporated into the final viewshed map; in this case, 60 feet was identified as the average tree canopy height. The forested areas within the Study Area were then overlaid on the DEM with a height of 60 feet added and the visibility calculated. As a final step, the forested areas are extracted from the areas of visibility, with the assumption that a person standing among the trees will not be able to view the Facility beyond a distance of approximately 500 feet. Depending on the density of the vegetation in these areas, it is assumed that some locations within this range will provide visibility of at least portions of the Facility based on where one is standing.

Also included on the map is a data layer, obtained from the State of Connecticut Department of Environmental Protection ("CTDEP"), which depicts various land and water resources such as parks and forests, recreational facilities, dedicated open space, CTDEP boat launches and other categories. Lastly, based on both a review of published information and discussions with municipal officials in Old Lyme, it was determined that there are no designated scenic roadways located within the Study Area.

A preliminary viewshed map (using topography only) is used during the in-field activity to assist in determining if significant land use changes have occurred since the aerial photographs used in this analysis were produced and to compare the results of the computer model with observations of the balloon float. Information obtained during the reconnaissance was then incorporated into the final visibility map.

Balloon Float and Study Area Reconnaissance

On May 11, 2009 Vanasse Hangen Brustlin Inc., (VHB) conducted a balloon float at the proposed Facility location to further evaluate the potential viewshed within the Study Area. The balloon float consisted of raising and maintaining an approximate four-foot diameter, helium-filled weather balloon at the proposed site location at a height of 80 feet. Once the balloon was secured, VHB staff conducted a drive-by reconnaissance along the roads located within the Study Area with an emphasis on nearby residential areas and other potential sensitive receptors in order to evaluate the results of the preliminary viewshed map and to document where the balloon was, and was not, visible above and/or through the tree canopy. VHB staff also hiked portions of the trail system within Rocky Neck State Park as part of the field reconnaissance. During the balloon float, the temperature was approximately 65 degrees Fahrenheit with calm wind conditions and sunny skies.

Photographic Documentation

During the balloon float, VHB personnel drove the public road system within the Study Area (and hiked portions of the Rocky Neck State Park Trail system) to inventory those areas where the balloon was visible. The balloon was photographed from a number of different vantage points to document the actual view towards the proposed Facility. Several photographs where the balloon was not visible are also included. The locations of the photos are described below:

1. View from Route 156 (Shore Road) approaching proposed Facility.
2. View from Route 156 (Shore Road) at Connecticut Road.
3. View from Walnut Road adjacent to house #2.
4. View from Hillcrest Road at Connecticut Road.
5. View from North Road at Shore Acres Road.
6. View from Tony's Nose Overlook within Rocky Neck State Park.
7. View from Swan Avenue.

8. View from Route 156 (Shore Road).
9. View from Mile Creek Road west of Chestnut Hill Road.
10. View from Shore Route 156 (Shore Road) at Oakridge Drive.

Photographs of the balloon from the view points listed above were taken with a Nikon D-80 digital camera body and Nikon 18 to 135 mm zoom lens. For the purposes of this report, the lens was set to 50 mm. "The lens that most closely approximates the view of the unaided human eye is known as the normal focal-length lens. For the 35 mm camera format, which gives a 24x36 mm image, the normal focal length is about 50 mm."¹

The locations of the photographic points are recorded in the field using a hand-held GPS receiver and are subsequently plotted on the maps contained in the attachments to this document.

Photographic Simulation

Photographic simulations were generated for the five representative locations where the balloon was visible during the in-field activities. The photographic simulations represent a scaled depiction of the proposed Facility (a monopole) from these locations. The height of the Facility is determined based on the location of the balloon in the photograph and a proportional monopole image is simulated into the photographs. The simulations are contained in Attachment A.

CONCLUSIONS

Based on this analysis, areas from where the proposed 80-foot tall monopole may be visible comprise approximately 679 acres within the 8,042-acre Study Area. As depicted on the attached viewshed map, the majority of the potential visibility occurs over open water on Long Island Sound located to the south, 0.5-mile and beyond. Year-round visibility on Long Island Sound accounts for approximately 662 acres of the 679-acre total, or roughly 97% of the overall visibility associated with the proposed site. The predictive model also depicts areas of potential visibility that are located within the immediate vicinity of the proposed site along select portions of Route 156 (Shore Road) and the existing Amtrak right-of-way, extending 0.25-mile to 0.50-mile along the railroad corridor. The viewshed map also depicts a limited area of potential visibility within the Point O' Woods residential development located to the south/southeast of the proposed site. Overall, VHB estimates that at least partial year-round views of the proposed Facility may be achieved from portions of approximately 12 residential properties located within the Study Area. This includes four residences located along Route 156 (Shore Road) within the immediate vicinity of the proposed Facility and roughly eight residences located within the Point O' Woods development.

¹ Warren, Bruce. *Photography*, West Publishing Company, Eagan, MN, c. 1993, (page 70).

The viewshed map also depicts several additional areas where seasonal (i.e. during “leaf off” conditions) views are anticipated. These areas comprise approximately 31 additional acres and are limited to the general vicinity of the proposed Facility. VHB estimates that seasonal views of the proposed Facility may be achieved from portions of approximately 14 additional residential properties located along Shore Road (Route 156) and within the Point O’ Woods development.

Attachment A

Project Area Photograph, Photolog Documentation Map, Balloon Float Photographs, and Photographic Simulations

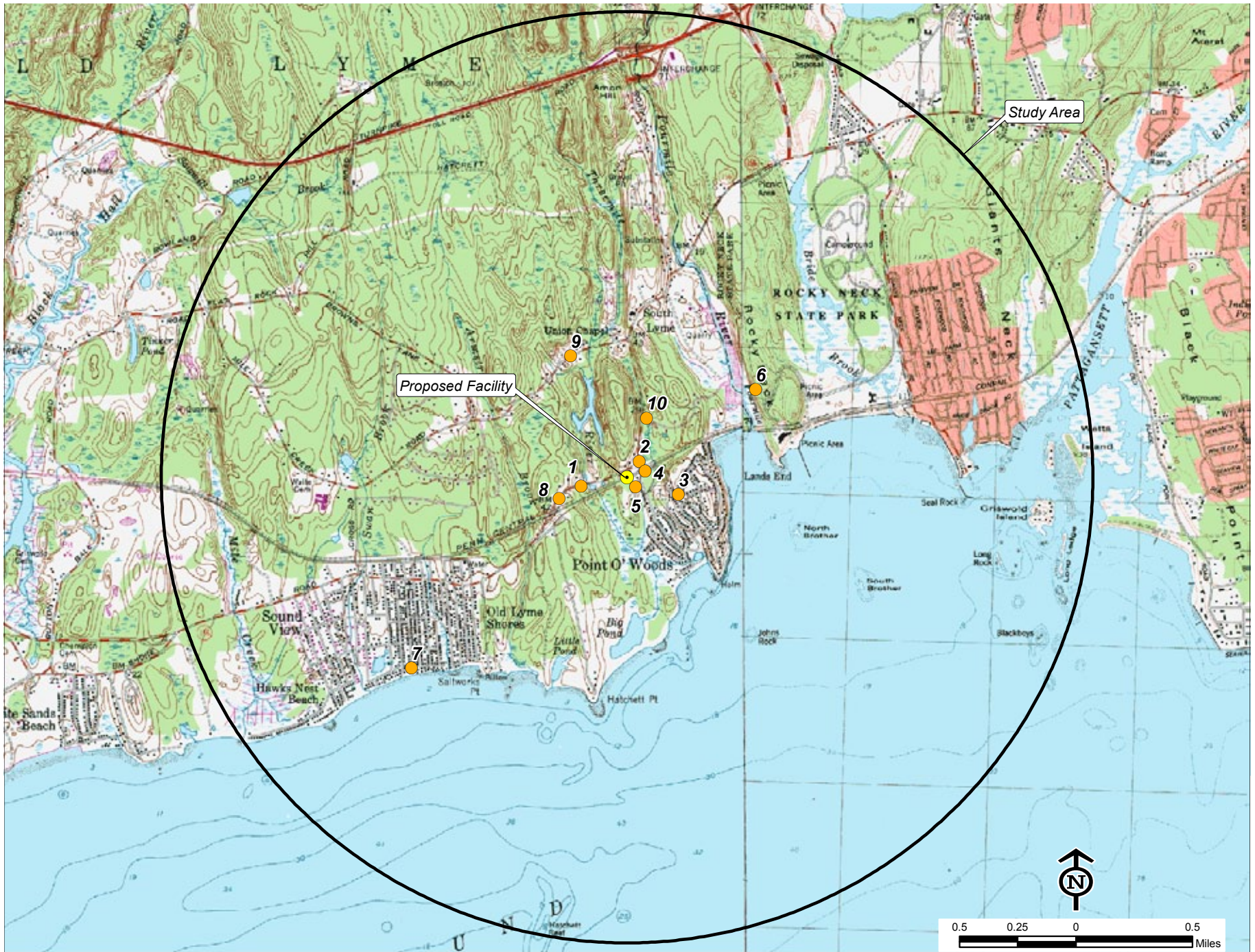
PHOTOGRAPHIC DOCUMENTATION



PROPOSED PROJECT AREA

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PHOTOLOG MAP



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VIEW 1



PHOTO TAKEN FROM ROUTE 156 (SHORE ROAD) APPROACHING PROPOSED FACILITY, LOOKING NORTHEAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.19 MILE +/-

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VIEW 1



PHOTO TAKEN FROM ROUTE 156 (SHORE ROAD) APPROACHING PROPOSED FACILITY, LOOKING NORTHEAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.19 MILE +/-

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VIEW 2



PHOTO TAKEN FROM ROUTE 156 (SHORE ROAD) AT CONNECTICUT ROAD, LOOKING SOUTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.09 MILE +/-

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VIEW 2



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PHOTO TAKEN FROM ROUTE 156 (SHORE ROAD) AT CONNECTICUT ROAD, LOOKING SOUTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.09 MILE +/-

VIEW 3



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PHOTO TAKEN FROM WALNUT ROAD ADJACENT TO HOUSE #2, LOOKING NORTHWEST - BALLOON IS VISIBLE THROUGH TREES
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.23 MILE +/-

VIEW 3



PHOTO TAKEN FROM WALNUT ROAD ADJACENT TO HOUSE #2, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.23 MILE +/-

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VIEW 4



PHOTO TAKEN FROM HILLCREST ROAD AT CONNECTICUT ROAD, LOOKING SOUTHWEST- BALLOON IS VISIBLE THROUGH TREES
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.08 MILE +/-

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VIEW 4



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PHOTO TAKEN FROM HILLCREST ROAD AT CONNECTICUT ROAD, LOOKING SOUTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.08 MILE +/-

VIEW 5



PHOTO TAKEN FROM NORTH ROAD AT SHORE ACRES ROAD, LOOKING NORTHWEST- BALLOON IS VISIBLE THROUGH TREES
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.06 MILE +/-

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VIEW 5



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**PHOTO TAKEN FROM NORTH ROAD AT SHORE ACRES ROAD, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.06 MILE +/-**

VIEW 6



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PHOTO TAKEN FROM TONY'S NOSE OVERLOOK WITHIN ROCKY NECK STATE PARK, LOOKING SOUTHWEST - BALLOON IS NOT VISIBLE

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.67 MILE +/-

VIEW 7



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PHOTO TAKEN FROM SWAN AVENUE, LOOKING NORTHEAST - BALLOON IS NOT VISIBLE
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 1.24 MILES +/-

VIEW 8



PHOTO TAKEN FROM ROUTE 156 (SHORE ROAD), LOOKING NORTHEAST - BALLOON IS NOT VISIBLE
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.30 MILE +/-

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VIEW 9



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**PHOTO TAKEN FROM MILE CREEK ROAD WEST OF CHESTNUT HILL ROAD, LOOKING SOUTHEAST - BALLOON IS NOT VISIBLE
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.57 MILE +/-**

VIEW 10



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PHOTO TAKEN FROM ROUTE 156 (SHORE ROAD) AT OAKRIDGE DRIVE, LOOKING SOUTHWEST - BALLOON IS NOT VISIBLE
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.26 MILE +/-

Attachment B

Viewshed Map