VISIBILITY ANALYSIS

HAMDEN 8
208 KIRK ROAD
HAMDEN, CONNECTICUT

Prepared for:

Verizon Wireless
99 East River Drive
East Hartford CT 06108

Prepared by:

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Project Introduction

Cellco Partnership d/b/a Verizon Wireless is pursuing a Certificate of Environmental Compatibility and Public Need from the Connecticut Siting Council ("Council") for the development of a new wireless communications facility ("Facility") at 208 Kirk Road in Hamden, Connecticut (the "Property"). At the request of Verizon Wireless, All-Points Technology Corporation, P.C. ("APT") prepared this Visibility Analysis to evaluate the potential visual impacts associated with the proposed Facility from within a two-mile radius (the "Study Area"). Parts of the neighboring municipalities of Bethany and Woodbridge are located in the western portion of the Study Area; similarly, a small part of North Haven is located in the east portion of the Study Area.

Site Description and Setting

The Property consists of a large parcel of mixed woods and relatively open areas currently used for tree farming. The area proposed for the Facility (the "Site") is located in the northwest corner of the Property at an approximate ground elevation of 296 feet Above Mean Sea Level ("AMSL"). The proposed Facility would include a 160-foot tall monopole with appurtenances surrounded by a 55-foot by 50-foot, gravel base equipment compound. The Verizon Wireless antenna arrays would extend approximately three (3) feet above the top of monopole, resulting in a total Facility height of ±163 feet above ground level ("AGL").

Land use within the immediate vicinity of the Property is primarily residential to the east and south with undeveloped woods to the north. The Laurel View Country Club is located immediately to the west. The topography within the Study Area is characterized generally by rolling topography with steep hills to the west; ground elevations range from approximately 40 feet AMSL to 700 feet AMSL. The tree cover within the Study Area (consisting of mixed deciduous hardwoods with interspersed stands of conifers) occupies approximately 5,468 acres of the 8,042-acre study area (±68%).

Methodology

APT used the combination of a predictive computer model and in-field analysis to evaluate the visibility associated with the proposed Facility on both a quantitative and qualitative basis. The predictive model provides a measurable assessment of potential visibility throughout the entire Study Area including private properties and other areas inaccessible for direct observations. The in-field analyses included a balloon float and reconnaissance of the Study Area to record existing conditions, verify results of the model, inventory visible and nonvisible locations, and provide photographic documentation from publicly accessible areas. A description of the procedures used in the analysis is provided below.

Preliminary Computer Modeling

To conduct this assessment, a predictive computer model was developed specifically for this project using TerrSet, an image analysis program developed by Clark Labs at Clark University, to provide an estimation of potential visibility throughout the Study Area. The predictive model incorporates Project- and Study Area-specific data, including the site location, its ground elevation and the proposed Facility height, as well as the surrounding topography, existing vegetation, and structures (which are the primary features that can block direct lines of sight).

Information used in the model included lidar[1]-based digital elevation data and customized land use data layers developed specifically for this analysis. Lidar is a remote-sensing technology that develops elevation data in meters by measuring the time it takes for laser light to return from the surface to the instrument's sensors. The varying reflectivity of objects also means that the returns can be classified based on the characteristics of the reflected light, normally into categories such as "bare earth," "vegetation," "road," or "building." The system is also designed to capture many more data points than older radar-based systems. Thus, lidar-based digital elevation models ("DEM"s) have a much finer resolution and can also identify the different features of the landscape at the time that it was captured.

Viewshed analysis using lidar data provide a much more detailed view of the potential obstacles (especially trees and buildings), and therefore the viewshed modeling produces results with many smaller areas of visibility than those produced by using radar-based DEMs. Its precision makes lidar a superior source of data, but at present it is only available for limited areas of the state. The viewshed results are also checked against the most current aerial photographs in case significant changes (a new housing development, for example) have occurred since the time the lidar data was captured.

The lidar-based DEM created for this analysis represents topographic information for the state of Connecticut that was derived through the spatial interpolation of airborne LiDAR-based data collected in the years 2007 through 2012 and has a horizontal resolution of approximately two (2) feet. In addition, multiple land use data layers were created from the Natural Resources Conservation Service (through the USDA) aerial photography (1-meter resolution, flown in 2012) using the image processing tools. Terrset develops light reflective classes defined by statistical analysis of individual pixels, which are then grouped based on common reflective values such that distinctions can be made automatically between deciduous and coniferous tree species, as well as grassland, impervious surface areas, surface water and other distinct land use features.

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[1] Lidar (a word invented to mean "light radar") may also be referred to as LiDAR, an acronym for Light Detection and Ranging. It is a technology that utilized lasers to determine the distance to an object or surface. LiDAR is similar to radar, but incorporates laser pulses rather than sound waves. It measures the time delay between transmission and reflection of the laser pulse.

With these data inputs, the model is then queried to determine where the top of the Facility can be seen from any point(s) within the Study Area, given the intervening existing topography and vegetation. The results of the preliminary analysis are intended to provide a representation of those areas where portions of the Facility *may* potentially be visible to the human eye without the aid of magnification, based on a viewer eye-height of five (5) feet above the ground and the combination of intervening topography, trees and other vegetation, and structures. The Facility however may not necessarily be visible from all locations within those areas identified by the predictive model. It is important to note that the computer model cannot account for mass density, the height, diameter and branching variability of the trees, or the degradation of views that occur with distance. In addition, each point – or pixel - represents about one square meter in area, and thus is not predicting visibility from all viewpoints through all possible obstacles. Although large portions of the predicted viewshed may theoretically offer visibility of the Facility, because of these unavoidable limitations the quality of those views may not be sufficient for the human eye to recognize the tower or discriminate it from other surrounding objects. Visibility also varies seasonally with increased, albeit obstructed, views occurring during "leaf-off" conditions. Beyond the density of woodlands found within the given Study Area, each individual tree has its own unique trunk, pole timber and branching pattern characteristics that provide varying degrees of screening in leafless conditions which cannot be precisely modeled.

Once the data layers were entered, image processing tools were applied and overlaid onto USGS topographic base maps and aerial photographs to achieve an estimate of locations where the Facility might be visible. Additional data was reviewed and incorporated into the visibility analysis, including protected private and public open space, parks, recreational facilities, hiking trails, schools, and historic districts. Two major trail systems are located within the Study Area. The Farmington Canal Trail is located approximately 0.82 mile to the east and the West Rock Park Trail system is located approximately 0.75 mile to the west. Based on a review of publicly-available information, no designated state scenic roads exist within the Study Area.

Balloon Float and Field Reconnaissance

To supplement and fine tune the results of the computer modeling efforts, APT completed in-field verification activities consisting of a balloon float, vehicular and pedestrian reconnaissance, and photo-documentation.

A balloon float and field reconnaissance were conducted on January 16, 2017 to evaluate the visibility associated with the proposed Facility and to obtain photographs for use in this report. The balloon float consisted of raising an approximately four-foot diameter, red helium-filled balloon tethered to a string height of 163 feet above ground level ("AGL") at the proposed Facility location. Weather conditions were favorable for the in-field activities, with calm winds (average of 3 miles per hour) and mostly sunny skies. Once the balloon was secured, APT conducted a Study Area reconnaissance by driving along the local and State roads and other publicly accessible locations to document and inventory where the balloon could be seen above/through the tree canopy. Visual observations from the reconnaissance were also used to evaluate the results of the preliminary visibility mapping and identify any discrepancies in the initial modeling.

Photographic Documentation

APT drove the public roads within the Study Area during the balloon float and photo-documented representative areas where the balloon was and was not visible. At each photo location, the geographic coordinates of the camera's position were logged using global positioning system ("GPS") technology. Photographs were taken with a Canon EOS 6D digital camera body and Canon EF 24 to 105 millimeter ("mm") zoom lens. APT uses a standard focal length of 50mm; presenting a consistent field of view throughout the document.

Final Visibility Mapping

Information obtained during the field reconnaissance was incorporated into the mapping data layers, including observations of the balloon float, the photo locations, areas that experienced recent land use changes and those places where the initial model was found to over or under-predict visibility. Once the additional data was integrated into the model, APT re-calculated the visibility of the proposed Facility from within the Study Area to assist in producing the final viewshed map.

Photographic Simulations

Photographic simulations were generated to portray scaled renderings of the proposed Facility from representative locations where the proposed Facility would be visible. Using field data, site plan information and 3-dimension (3D) modeling software, spatially referenced models of the site area and Facility were generated and merged. The geographic coordinates obtained in the field for the photograph locations were incorporated into the model to produce virtual camera positions within the spatial 3D model. Photo simulations were then created using a combination of renderings generated in the 3D model and photo-rendering software programs. The scale of the subject in the photograph (the balloon) and its corresponding simulation (the tower) are proportional to its surroundings.

For presentation purposes in this report, the photographs were taken with a 50 mm focal length and produced in an approximate 7-inch by 10.5-inch format. When viewing in this format size, we believe it is important to provide the largest representational image while maintaining an accurate relation of sizes between objects within the frame of the photograph.

Photo-documentation of the balloon float and photo-simulations of the proposed Facility are presented in the attachment at the end of this report. The balloon float photos provide visual reference points for the approximate height and location of the proposed Facility relative to the scene; note the bottom of the balloon represents the total height of the proposed Facility at 163 feet AGL. The photo-simulations are intended to provide the reader with a general understanding of the different views that might be achieved of the Facility. It is important to consider that the publicly-accessible locations selected are typically representative of a "worst case" scenario. They were chosen to present unobstructed view lines (wherever possible), are static in nature and do not necessarily fairly characterize the prevailing views from all locations within a given area. From several locations, moving a few feet in any direction will result in a far different perspective of the

Facility than what is presented in the photographs. In several cases, a view of the Facility may be limited to the immediate area of the specific photo location presented herein.

Photograph Locations

The table below summarizes the photographs and simulations presented in the attachment to this report including a description of each location, view orientation, the distance from where the photo was taken relative to the proposed Facility and the general characteristics of that view. The photo locations are depicted on the visibility analysis maps provided as attachments to this report.

View	Location	Orientation	Distance to Site	View Characteristic
1	Hume Drive	Northwest	±0.65 Mile	Not Visible
2	Country Club Drive*	Northwest	±0.50 Mile	Seasonal
3	Country Club Drive	Northwest	±0.41 Mile	Seasonal
4	Sky View Circle	Northwest	±0.48 Mile	Not Visible
5	Country Club Drive at Bear Path Road	Northwest	±0.21 Mile	Seasonal
6	Bear Path Road*	Northwest	±0.31 Mile	Seasonal
7	Magee Drive at Funaro Road	Northwest	±0.32 Mile	Not Visible
8	Magee Drive	West	±0.24 Mile	Not Visible
9	Maplecrest Lane	Northwest	±0.67 Mile	Not Visible
10	Earl Avenue	North	±0.97 Mile	Seasonal
11	Paradise Avenue*	North	±0.70 Mile	Seasonal
12	Hunters Way	Northeast	±0.77 Mile	Not Visible
13	Autumn Ridge Road	Northeast	±1.06 Miles	Not Visible
14	Chauncey Road at Dunbar Hill Road	Northeast	±0.93 Mile	Not Visible
15	Mountain Road	Northeast	±1.09 Mile	Not Visible
16	Hill Street	Northeast	±0.50 Mile	Not Visible
17	Dunbar Hill Road	Northeast	±0.46 Mile	Not Visible
18	Hill Street*	Northeast	±0.42 Mile	Seasonal
19	Hill Street	Southeast	±0.57 Mile	Seasonal
20	Laurel View Country Club	Southeast	±0.20 Mile	Seasonal
21	Laurel View Country Club	Southeast	±0.19 Mile	Year Round
22	Laurel View Country Club	Southeast	±0.10 Mile	Seasonal
23	Paradise Avenue	Southeast	±0.22 Mile	Seasonal
24	West Shepard Avenue	Southwest	±0.44 Mile	Not Visible
25	West Rock Hiking Trail	Southeast	±0.68 Mile	Year Round
26	Paradise Avenue	South	±0.69 Mile	Not Visible
27	Old Coach Highway	Southwest	±1.04 Miles	Not Visible
28	Bender Road	Southwest	±1.06 Miles	Not Visible
29	Bender Road	Southwest	±1.36 Miles	Not Visible

*Although the balloon could be seen through trees in photo locations 2, 6, 11 and 18 no simulations were prepared due to the dense intervening trees.

Visibility Analysis Results

Results of this analysis are graphically displayed on the viewshed maps provided in the attachment at the end of this report. Areas from where the proposed Facility would be visible above the tree canopy year-round comprise a total of approximately 42 acres. When the leaves are off the trees, seasonal views through intervening tree trunks and branches have the potential to occur over some locations within an area of 385± additional acres.

In general, year-round views of portions of the Facility appear limited to locations within 0.25 mile or less of the Property. At nearby locations large portions of the monopole may be visible. Beyond the immediate area, views become more sporadic and intervening vegetation serve to obstruct large portions of the Facility. Potential seasonal views from those locations beyond 0.5 mile from the Property would be heavily obscured by intervening trees and in several instances largely unrecognizable due to the separating distances. A large portion of the potential seasonal visibility is located on the east and south facing slopes of West Rock, at distances of 0.75-mile or more away from the Site. Photo 25 is one of closest points of the trail (relative to the Site) and represents the select views down into the valley, where the Facility would have a backdrop of hills and tree canopy. Although the West Rock Park Trail system traverses areas of predicted seasonal visibility, most of locations on the ridge consist of steep slopes that are inaccessible to the general public.

Proximity to Schools And Commercial Child Day Care Centers

No schools or commercial child day care centers are located within 250 feet of the Property. The nearest school and commercial child day care center are commonly located at Bear Path School at 10 Kirk Road, approximately 0.6 mile to the southeast. No substantive views of the Facility are anticipated from this area.

Limitations

The viewshed maps presented in the attachment to this report depict areas where the proposed Facility may potentially be visible to the human eye without the aid of magnification based on a viewer eye-height of 5 feet above the ground and intervening topography. This analysis may not necessarily account for all visible locations, as it is based on the combination of computer modeling, incorporating 2012 aerial photographs, and in-field observations from publicly-accessible locations. No access to private properties was provided to APT personnel. This analysis does not claim to depict the only areas, or all locations, where visibility may occur; it is intended to provide a representation of those areas where the Facility is likely to be seen.

The simulations provide a representation of the Facility under similar settings as those encountered during the balloon floats and reconnaissance. Views of the Facility can change throughout the seasons and the time of day, and are dependent on weather and other atmospheric conditions (e.g., haze, fog, clouds); the location, angle and intensity of the sun; and the specific viewer location. Weather conditions on the day of the balloon float included partly cloudy skies.

ATTACHMENTS

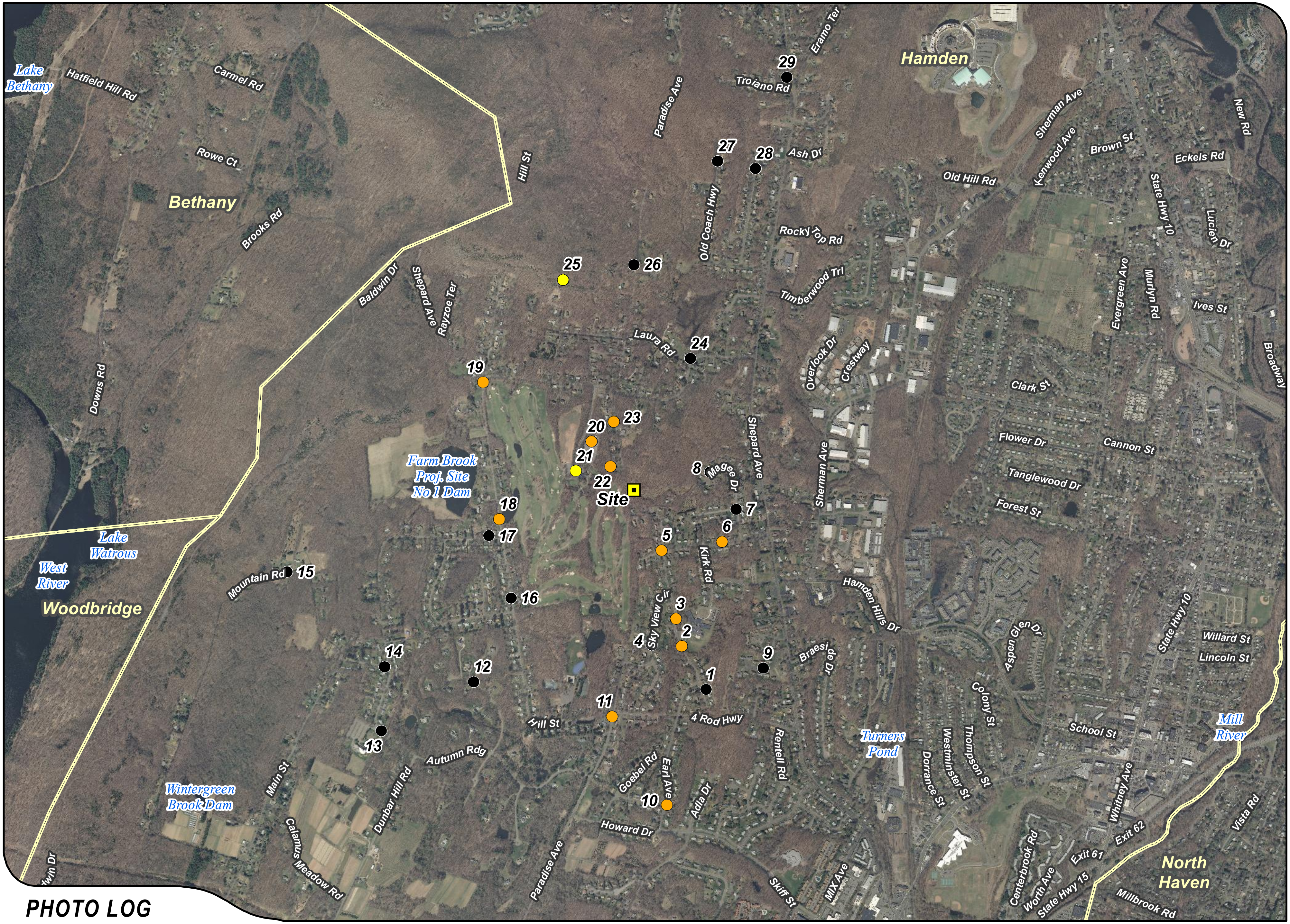

PHOTO LOG

Legend

Site | Year-Round Visibility | Seasonal Visibility | Not Visible

N S E W

1 inch = 2,000 feet

1,000 500 0 1,000 Feet

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
1	HUME DRIVE	NORTHWEST	+/- 0.65 MILE	NOT VISIBLE

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
2	**COUNTRY CLUB DRIVE**	**NORTHWEST**	**+/- 0.50 MILE**	**SEASONAL**

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
3	COUNTRY CLUB DRIVE	NORTHWEST	+/- 0.41 MILE	SEASONAL

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
3	**COUNTRY CLUB DRIVE**	**NORTHWEST**	**+/- 0.41 MILE**	**SEASONAL**

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
4	**SKY VIEW CIRCLE**	**NORTHWEST**	**+/- 0.48 MILE**	**NOT VISIBLE**

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
5	COUNTRY CLUB DRIVE AT BEAR PATH ROAD	NORTHWEST	+/- 0.21 MILE	SEASONAL

PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
5	COUNTRY CLUB DRIVE AT BEAR PATH ROAD	NORTHWEST	+/- 0.21 MILE	SEASONAL

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
6	BEAR PATH ROAD	NORTHWEST	+/- 0.31 MILE	SEASONAL

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
7	MAGEE DRIVE AT FUNARO ROAD	NORTHWEST	+/- 0.32 MILE	NOT VISIBLE

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
8	MAGEE DRIVE	WEST	+/- 0.24 MILE	NOT VISIBLE

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
9	MAPLECREST LANE	NORTHWEST	+/- 0.67 MILE	NOT VISIBLE

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
10	EARL AVENUE	NORTH	+/- 0.97 MILE	SEASONAL

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
10	EARL AVENUE	NORTH	+/- 0.97 MILE	SEASONAL

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
11	**PARADISE AVENUE**	**NORTH**	**+/- 0.70 MILE**	**SEASONAL**

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
12	**HUNTERS WAY**	**NORTHEAST**	**+/- 0.77 MILE**	**NOT VISIBLE**

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
13	AUTUMN RIDGE ROAD	NORTHEAST	+/- 1.06 MILES	NOT VISIBLE

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
14	CHAUNCEY ROAD AT DUNBAR HILL ROAD	NORTHEAST	+/- 0.93 MILE	NOT VISIBLE

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
15	MOUNTAIN ROAD	NORTHEAST	+/- 1.09 MILES	NOT VISIBLE

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
16	HILL STREET	NORTHEAST	+/- 0.50 MILE	NOT VISIBLE

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
17	DUNBAR HILL ROAD	NORTHEAST	+/- 0.46 MILE	NOT VISIBLE

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
18	HILL STREET	NORTHEAST	+/- 0.42 MILE	SEASONAL

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
19	**HILL STREET**	**SOUTHEAST**	**+/- 0.57 MILE**	**SEASONAL**

PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
19	HILL STREET	SOUTHEAST	+/- 0.57 MILE	SEASONAL

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
20	**LAUREL VIEW COUNTRY CLUB**	**SOUTHEAST**	**+/- 0.20 MILE**	**SEASONAL**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
20	LAUREL VIEW COUNTRY CLUB	SOUTHEAST	+/- 0.20 MILE	SEASONAL

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verizon

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
21	**LAUREL VIEW COUNTRY CLUB**	**SOUTHEAST**	**+/- 0.19 MILE**	**YEAR ROUND**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
21	**LAUREL VIEW COUNTRY CLUB**	**SOUTHEAST**	**+/- 0.19 MILE**	**YEAR ROUND**

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
22	LAUREL VIEW COUNTRY CLUB	SOUTHEAST	+/- 0.10 MILE	SEASONAL

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
22	LAUREL VIEW COUNTRY CLUB	SOUTHEAST	+/- 0.10 MILE	SEASONAL

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
23	**PARADISE AVENUE**	**SOUTHEAST**	**+/- 0.22 MILE**	**SEASONAL**

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verizon

PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
23	PARADISE AVENUE	SOUTHEAST	+/- 0.22 MILE	SEASONAL

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
24	**WEST SHEPARD AVENUE**	**SOUTHWEST**	**+/- 0.44 MILE**	**NOT VISIBLE**

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
25	**WEST ROCK HIKING TRAIL**	**SOUTHEAST**	**+/- 0.68 MILE**	**YEAR ROUND**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
25	WEST ROCK HIKING TRAIL	SOUTHEAST	+/- 0.68 MILE	YEAR ROUND

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
26	PARADISE AVENUE	SOUTH	+/- 0.69 MILE	NOT VISIBLE

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
27	OLD COACH HIGHWAY	SOUTHWEST	+/- 1.04 MILES	NOT VISIBLE

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
28	**BENDER ROAD**	**SOUTHWEST**	**+/- 1.06 MILES**	**NOT VISIBLE**

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
29	**BENDER ROAD**	**SOUTHWEST**	**+/- 1.36 MILES**	**NOT VISIBLE**

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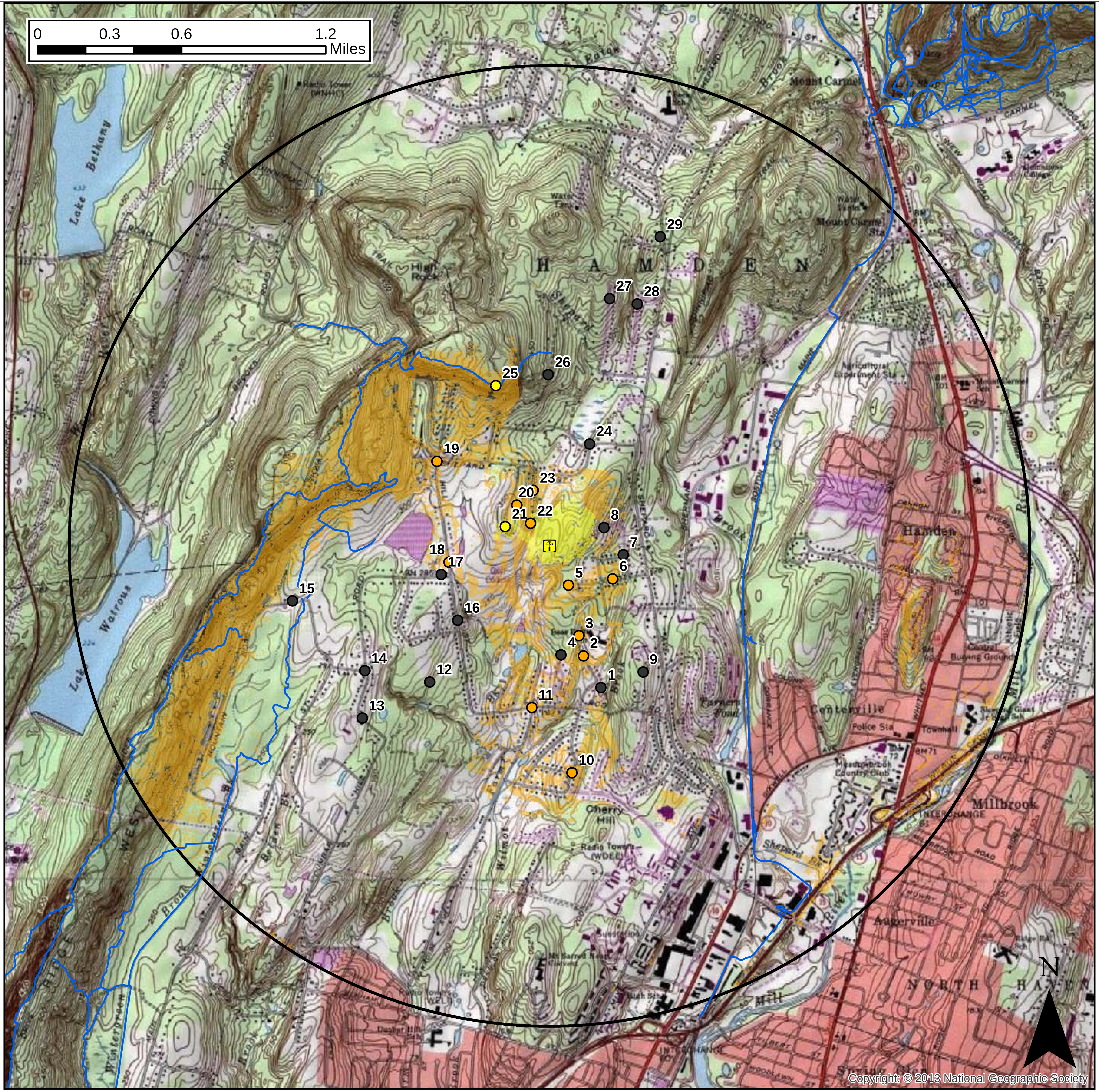
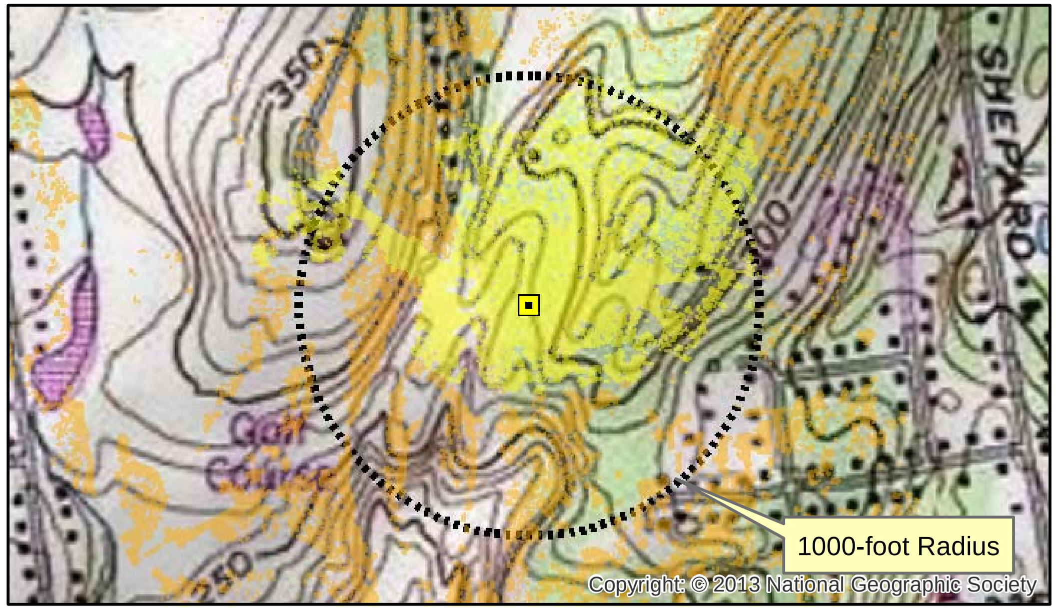




Preliminary Viewshed Map – Topo Base

Proposed Wireless Telecommunications Facility
Hamden 8
208 Kirk Road, Hamden, CT

Proposed facility height is 163 feet AGL.
Forest canopy height is derived from lidar data.
Study area encompasses a two-mile radius and includes 8,042 acres of land.

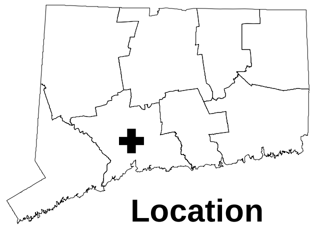
Map compiled 1/31/2017

Map information field verified by APT on 01/16/2017.

Only those resources located within the extent of the map are depicted. For a complete list of data sources consulted for this analysis, please refer to the Documentation Page.

Legend

- Proposed Tower
- **Photo Locations**
  - Not Visible
  - Seasonal Views
  - Year-round Views
- Trails
- Predicted Seasonal Visibility (385 Acres)
- Predicted Year-Round Visibility (42 Acres)
- Towns
- 2-Mile Study Area



Location

verizon wireless
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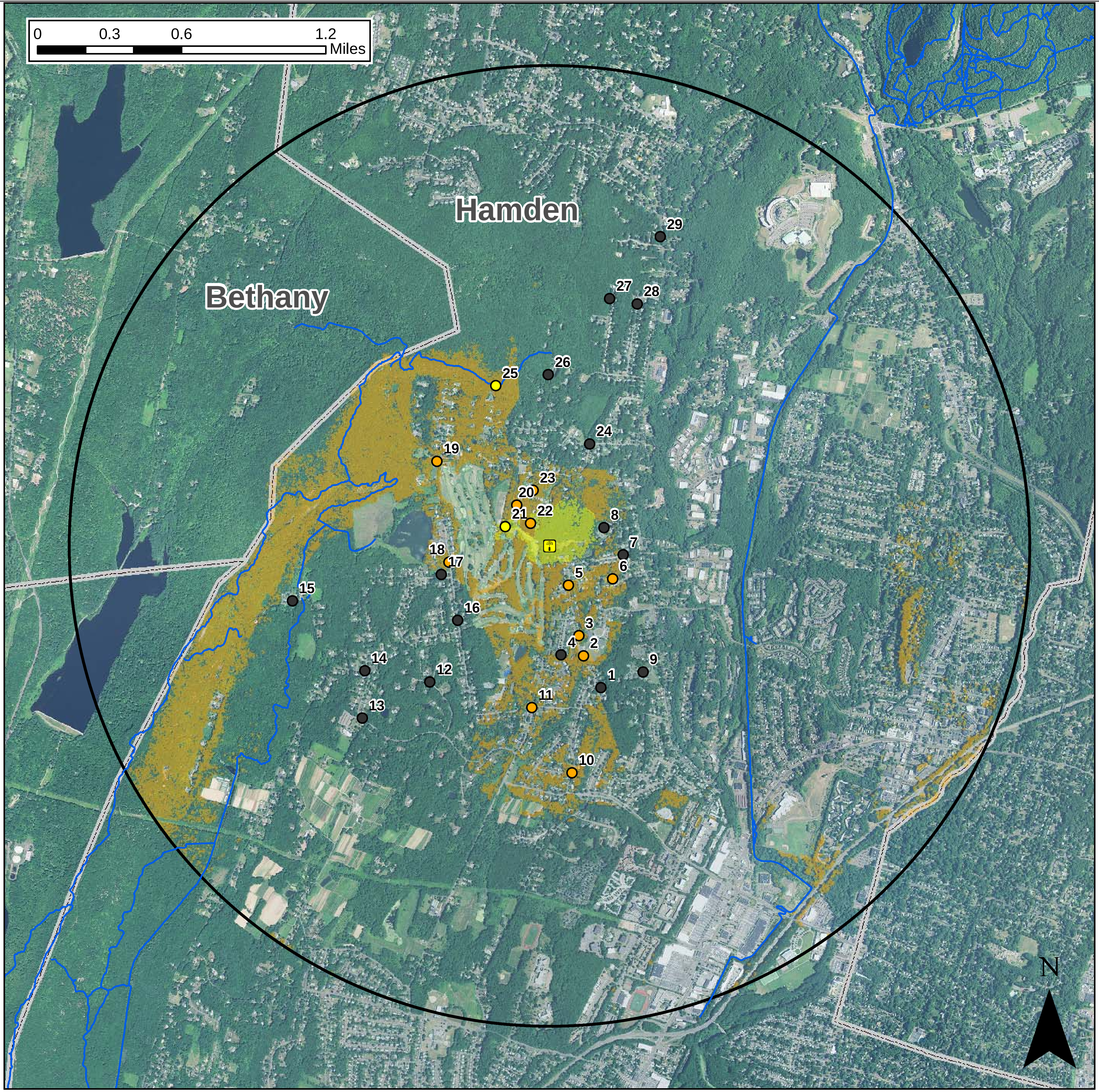

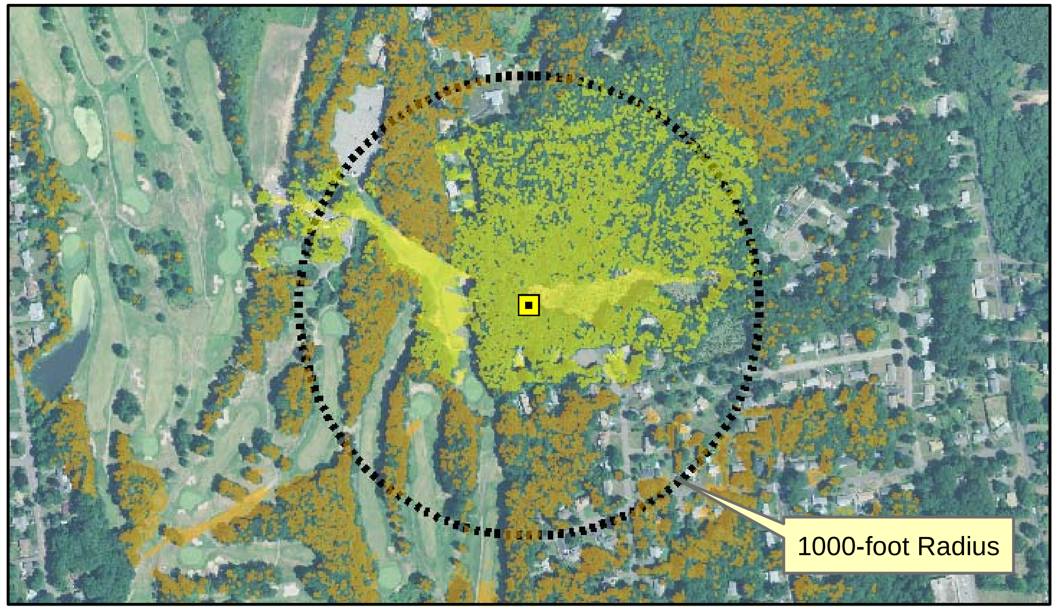

Preliminary Viewshed Map – Aerial Base

Proposed Wireless Telecommunications Facility
Hamden 8
208 Kirk Road, Hamden, CT

Proposed facility height is 163 feet AGL.
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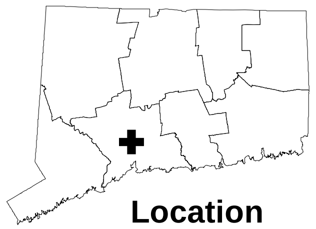

Location

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DOCUMENTATION

SOURCES CONSULTED FOR VIEWSHED MAPS
208 Kirk Road
Hamden, Connecticut

Physical Geography / Background Data
Digital elevation model (DEM) derived from 0.64-meter USGS lidar data obtained from NOAA (2015)

Forest areas are generated with TerrSet (Clark University) image processing from the lidar data and 2016 NRCS/NAIP digital orthophotos with 1-foot pixel resolution

Municipal Open Space, State Recreation Areas, Trails, County Recreation Areas, and Town Boundary data obtained from CT DEEP and the towns

United States Geological Survey
 *USGS topographic quadrangle maps – Mount Carmel (1984)
Department of Transportation data
 ^State Scenic Highways (updated monthly)
Heritage Consultants
 ^Municipal Scenic Roads

Cultural Resources
Heritage Consultants
 ^National Register
 ^ Local Survey Data

Dedicated Open Space & Recreation Areas
Connecticut Department of Energy and Environmental Protection (DEEP)
 *DEEP Property (May 2007)
 *Federal Open Space (1997)
 *Municipal and Private Open Space (1997)
 *DEEP Boat Launches (1994)
Connecticut Forest & Parks Association
 ^Connecticut Walk Books East & West –
 The Guide to the Blue-Blazed Hiking Trails of Western Connecticut Western Connecticut, 19th Edition, 2006.

Other
 ^ConnDOT Scenic Strips (based on Department of Transportation data)

 *Available to the public in GIS-compatible format (some require fees)
 ^ Data not available to general public in GIS format. Reviewed independently and, where applicable, GIS data later prepared specifically for this Study Area.

NOTE Not all the sources listed above appear on the Viewshed Maps. Only those features within the scale of the graphic are shown.

LIMITATIONS
Viewshed analysis conducted using Clark University's TerrSet. The visibility analysis map(s) presented in this report depict areas where the proposed Facility may potentially be visible to the human eye without the aid of magnification based on a viewer eye-height of 5 feet above the ground and intervening topography, tree canopy and structures. This analysis may not necessarily account for all visible locations, as it is based on the combination of computer modeling, incorporating the lidar DEM, 2012 digital aerial photographs, and in-field observations from publicly-accessible locations. No access to private properties beyond the host Property was provided to APT personnel. This analysis does not claim to depict the only areas, or all locations, where visibility may occur; it is intended to provide a representation of those areas where the Facility is likely to be seen.