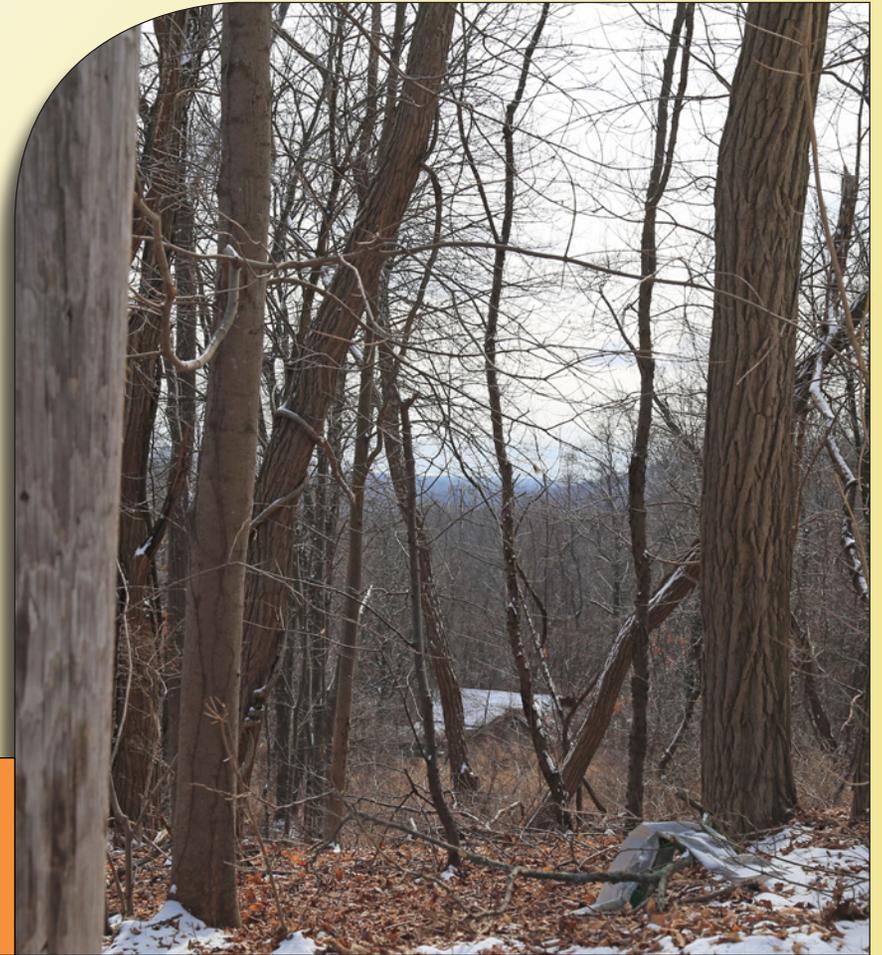


# Visual Assessment & Photo-Simulations

HAMDEN CT  
796 WOODIN STREET  
HAMDEN, CT 06514

*Prepared in April 2019 by:*  
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# VISUAL ASSESSMENT REPORT

Tarpon Towers is seeking approval for the development of a new wireless communications facility (“Facility”) at 796 Woodin Street in Hamden, Connecticut (“Host Property”) See *Figure 1 – Site Location Map*. At the request of Tarpon Towers, All-Points Technology Corporation, P.C. (“APT”) completed this assessment to evaluate the potential visual effects of the proposed Facility from within a two-mile radius (the “Study Area”).

## Project Undertaking

Tarpon Towers plans to install a 120-foot tall steel monopole within an approximate 40-foot by 70-foot gravel base, fence-enclosed equipment compound, located south-centrally in the Host Property (“Site”). The base of the Facility would be constructed at an approximate elevation of 185 feet above mean sea level (“AMSL”) and the highest antenna platform would be installed generally at the top of the monopole such that the panel antennas would extend to a height of approximately 124 feet above ground level (“AGL”). The Facility has been designed to accommodate up to four separate service providers. Access to the Site would be gained from Woodin Street initially via the existing driveway and subsequently over a new, 12-foot wide gravel base road. The proposed Facility components and their locations are illustrated in *Figure 2 – Proposed Equipment Location Plan* and *Figure 3 – Proposed Equipment Elevation Plan*.

## Project Setting

The Host Property is located south of Woodin Street and abutted by the Wilbur Cross Parkway to the west/northwest, West Rock Park (City of New Haven Nature Center) to the south, and a residence to the east. Generally, land use within the immediate vicinity of the Site is a mix of forested land, residential development and the Route 15 (Wilbur Cross Highway) transportation corridor. Single-family residentially-developed properties and an apartment/condominium complex are located east/northeast and southeast of the Host Property, respectively. West Rock Ridge State Park and the Wilbur Cross Parkway’s West Rock tunnel are located southwest of the Host Property.

The topography within the Study Area is characterized as generally level terrain surrounding the Host Property and extending eastward, with rolling to steep hills farther to the north, south and west. Ground elevations range from approximately 15 feet AMSL to 1000 feet AMSL. The tree cover within the Study Area (consisting primarily of mixed deciduous hardwoods with interspersed stands of conifers) occupies approximately 4,626 acres of the 8,042-acre Study Area (±58%).

## Methodology

APT used the combination of a predictive computer model, in-field analysis, and a review of various data sources to evaluate the visibility associated with the proposed Facility on both a quantitative and qualitative basis. The predictive model provides a measurable assessment of 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 field reconnaissance of the Study Area to record existing conditions, verify results of the model, inventory seasonal and year-round view 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 ESRI's ArcMap GIS<sup>1</sup> software and available GIS data. 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 (the primary features that can block direct lines of sight).

A digital surface model ("DSM"), capturing both the natural and built features on the Earth's surface, was generated for the extent of the Study Area utilizing State of Connecticut 2016 LiDAR<sup>2</sup> LAS<sup>3</sup> data points. LiDAR is a remote-sensing technology that develops elevation data 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." Derived from the 2016 LiDAR data, the LAS datasets contain the corresponding elevation point data and return classification values. The Study Area DSM incorporates the first return LAS dataset values that are associated with the highest feature in the landscape, typically a treetop, top of a building, and/or the highest point of other tall structures.

Once the DSM was generated, ESRI's Viewshed Tool was utilized to identify locations within the Study Area where the proposed Facility may be visible. ESRI's Viewshed Tool predicts visibility by identifying those cells<sup>4</sup> within the DSM that can be seen from an observer location (the proposed Facility). Cells where visibility was indicated were extracted and converted from a raster dataset to a polygon feature which was then overlaid onto an aerial photograph and topographic base map. Since the DSM includes the highest relative feature in the landscape, isolated "visible" cells are often indicated within heavily forested areas (e.g., from the top of the highest tree) or on building rooftops during the initial processing. It is recognized that these areas do not represent typical viewer locations and overstate visibility. As such, the resulting polygon feature is further refined by extracting those areas. The viewshed results are also cross-checked against the most current aerial photographs to assess whether significant changes (a new housing development, for example) have occurred since the time the LiDAR-based LAS datasets were captured.

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. However, the Facility may not necessarily be visible from all locations within those areas identified by the predictive model, which has limitations. For instance, it is important to note that the computer model cannot account for mass density, tree diameters and branching variability of trees, or the degradation of views that occur with distance. As a result, some areas depicted on the viewshed maps as theoretically offering potential visibility of the Facility may be over-predicted because the quality of those

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<sup>1</sup> ArcMap is a Geographic Information System desktop application developed by the Environmental Systems Research Institute for creating maps, performing spatial analysis, and managing geographic data.

<sup>2</sup> Light Detection and Ranging

<sup>3</sup> An LAS file is an industry-standard binary format for storing airborne LiDAR data.

<sup>4</sup> Each DSM cell size is 1 square meter

views is not sufficient for the human eye to recognize the Facility or discriminate it from other surrounding or intervening objects.

### **Seasonal Visibility**

Visibility also varies seasonally with increased, albeit obstructed, views occurring during “leaf-off” conditions. Beyond the variabilities associated with density of woodland stands found within any given Study Area, each individual tree also has its own unique trunk, pole timber and branching patterns that provide varying degrees of screening in leafless conditions which, as introduced above, cannot be precisely modeled. Seasonal visibility is therefore estimated based on a combination of factors including the type, size, and density of trees within a given area; topographic constraints; and other visual obstructions that may be present. Taking into account these considerations, areas depicting seasonal visibility on the viewshed maps are intended to represent locations from where there is a potential for views through intervening trees, as opposed to indicating that leaf-off views will exist from within an entire seasonally-shaded area.

To refine the estimate of seasonal visibility through the trees, forested areas were manually adjusted to eliminate 500-foot wide areas of vegetation surrounding the Facility and perimeters of forested areas with otherwise unimpeded aspects toward the site. This distance, although considered conservative, is based on 20+ years of field experience and observations, and assumes that a person standing within a forested area will not be able to discern an object like the Facility beyond 500 feet. Depending on the density of the intervening tree canopy and understory of the surrounding woodlands, it is assumed that some locations (but not all) within 500 feet could provide visibility of at least a portion of the Facility during “leaf-off” conditions.

### **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. Two separate balloon floats and field reviews were completed on June 21, 2018 and March 1, 2019<sup>5</sup> respectively, to evaluate the visibility associated with the proposed Facility during both “leaf-on” and “leaf-off” conditions. The balloon floats consisted of raising a brightly colored, approximately four-foot diameter, helium-filled balloon tethered to a string height of  $\pm 120$  feet AGL<sup>6</sup> at the Site. Weather conditions were favorable for the in-field activities during both events, with calm winds (4 mph and below).

On each occasion, 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.

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<sup>5</sup> Notice of the recent balloon float was published on February 20, 2019 in the New Haven Register, New Haven, CT.

<sup>6</sup> The bottom of the balloon represented the top of monopole and the top of balloon represented the top of antennas.

## **Photographic Documentation**

During the Study Area reconnaissance, APT obtained photo-documentation of representative locations where the boom/flag was 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.<sup>7</sup> APT typically uses a standard focal length of 50mm to present a consistent field of view. On occasion, photos are taken at lower focal lengths to provide a greater depth of field and context to the scene by including surrounding features within the photograph.

### **Photograph Locations**

The table on page 6 summarizes the photographs and simulations presented in the attachment to this report, and includes a description of each location, view orientation, the distance from where the photo was taken relative to the proposed Facility site, and the general characteristics of the view. The photo locations are depicted on the photolog and viewshed maps provided as attachments to this report.

### **Photographic Simulations**

Photographic simulations were generated to portray scaled renderings of the proposed Facility from nine (9) locations presented herein where the Facility may be recognizable above or through the trees. There were an additional seven (7) specific locations from where the balloon was visible to APT staff during the reconnaissance. However, if constructed, the Facility would not be easily discernable as a tower due to the thickness of the trees in those locations and/or the distance from the Site. As a result, no simulations were prepared for these photographs. These photo locations have been assigned "Balloon Visible Through Trees" designations on the photolog and viewshed maps.

Using field data, site plan information and 3-dimension (3D) modeling software, spatially referenced models of the site 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, which were ultimately composited and merged with the existing conditions photographs (using Photoshop image editing software). The scale of the subjects in the photograph (the boom/flag) and its corresponding simulation (the Facility) are proportional to their surroundings.

For presentation purposes in this report, the photographs were produced in an approximate 7-inch by 10.5-inch format. When reproducing the images in this format, we believe it is important to present the largest view while providing key contextual landscape elements (existing development, street signs, utility poles, etc.) so that the viewer can determine the proportionate scale of each object within the scene.

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<sup>7</sup> The Canon EOS 6D is a full-framed camera which includes a lens receptor of the same size as the film used in 35mm cameras. As such, the images produced are comparable to those taken with a conventional 35mm camera.

Photo-documentation of the field reconnaissance and photo-simulations of the proposed Facility are presented in the attachment at the end of this report. The field reconnaissance photos that include the boom/flag in the view provide visual reference points for the approximate height and location of the proposed Facility relative to the scene.

All simulations were created to represent the proposed Facility height of  $\pm 120$  feet AGL, with the faux top extending up an additional  $\pm 5$  feet. The photo-simulations are intended to provide the reader with a general understanding of the different view characteristics associated with the Facility from various locations. Photographs were taken from publicly-accessible areas and were chosen to present unobstructed view lines (wherever possible).

## Photograph Locations

View	Location	Orientation	Distance to Site	Visibility
1	Carbonella Drive	Northeast	±0.23 Mile	Not Visible
2	Wintergreen Avenue	Southeast	±0.16 Mile	Seasonal
3	Wintergreen Avenue	Southeast	±0.18 Mile	Year-Round
4	Wintergreen Avenue	Southeast	±0.20 Mile	Seasonal
5	Woodin Street	Southeast	±0.23 Mile	Seasonal
6	Woodin Street	South	±0.19 Mile	Seasonal
7	Woodin Street (At Host Property)	South	±0.14 Mile	Year-Round
8	Perry Road	South	±0.37 Mile	Not Visible
9	Perry Road*	South	±0.36 Mile	Balloon visible through trees
10	Perry Road	Southwest	±0.47 Mile	Not Visible
11	Main Street (At Entrance to West Rock Ridge)	Southeast	±0.71 Mile	Not Visible
12	Wintergreen Avenue (Overlooking Wilbur Cross Parkway)*	Southwest	±0.90 Mile	Balloon visible through trees
13	Pine Rock Recreation Field	Southwest	±1.02 Miles	Not Visible
14	Helen Street	West	±1.06 Miles	Not Visible
15	Fairview Avenue	Northwest	±1.25 Miles	Not Visible
16	Fitch Street (SCSU Parking Garage Rooftop)	Northwest	± 1.38 Miles	Not Visible
17	West Rock – Judge’s Cave	Northeast	±0.80 Mile	Not Visible
18	West Rock*	Northeast	± 0.44 Mile	Balloon visible through trees
19	West Rock – Overlooking Wilbur Cross Parkway	Northeast	± 0.38 Mile	Not Visible
20	West Rock*	Northeast	± 0.48 Mile	Balloon visible through trees
21	Brookside Avenue	Northwest	±0.55 Mile	Not Visible
22	Wilmot Road	Northwest	±0.26 Mile	Year-Round
23	Woodin Street at Fawn Ridge Road*	Southwest	±0.23 Mile	Balloon visible through trees
24	West Rock Nature Center	North	± 256 Feet	Seasonal
25	West Rock Nature Center	North	±0.14 Mile	Seasonal
26	West Rock Nature Center	North	± 0.14 Mile	Not Visible
27	West Rock Nature Center*	Northeast	± 0.18 Mile	Balloon visible through trees
28	West Rock Nature Center*	Northeast	± 0.11 Mile	Balloon visible through trees

*\*Photo Simulations were not prepared for these locations.*

## **Final Visibility Mapping**

Information obtained during each field reconnaissance was incorporated into the mapping data layers, including observations of the field reconnaissance, 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.

## **Conclusions**

Areas from where the Facility would be visible comprise  $\pm 21$  acres of year-round visibility and  $\pm 47$  acres of seasonal visibility. Cumulatively, this equals approximately 0.8% of the Study Area. As seen on the visibility maps, the year-round views beyond the Host Property would be limited to select locations within approximately 0.25 mile of the Site. Seasonally, when the leaves are off the deciduous trees, it is estimated that partially obstructed views could extend immediately beyond these areas. However, the combination of the relatively low tower height and presence of mature trees in the immediate area of the Host Property serves to minimize the extent of visibility.

Based on observations made during the field reconnaissance, it is evident that seasonal (“leaf-off”) views from the northern portions of the adjacent West Rock Nature Center Park will allow increased lines of sight to the Facility. No views are anticipated from the trails at West Rock Ridge State Park.

## **Proximity to Schools And Commercial Child Day Care Centers**

No schools or commercial child day care centers are located within 250 feet of the Host Property. The nearest commercial child day care center is Ja’Bean’s Sprouts Family Daycare, located approximately 0.81 mile to the northeast at 26 Greenhill Road in Hamden. The two nearest schools are the Clarence Rogers School, located approximately 0.43 mile to the south at 195 Wilmot Road in New Haven, and the Wintergreen Interdistrict Magnet School, located approximately 0.43 mile to the north at 670 Wintergreen Avenue in Hamden. No substantive views of the Facility are anticipated from these areas.

## **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 account for all visible locations, as it is based on the combination of computer modeling, incorporating 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 photo-simulations provide a representation of the Facility under similar settings as those encountered during the field review 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 field review included partly cloudy skies.

## ATTACHMENTS



**Legend**

-  Site
-  Subject Property
-  Approximate Parcel Boundary (CTDEEP GIS)
-  Municipal Boundary

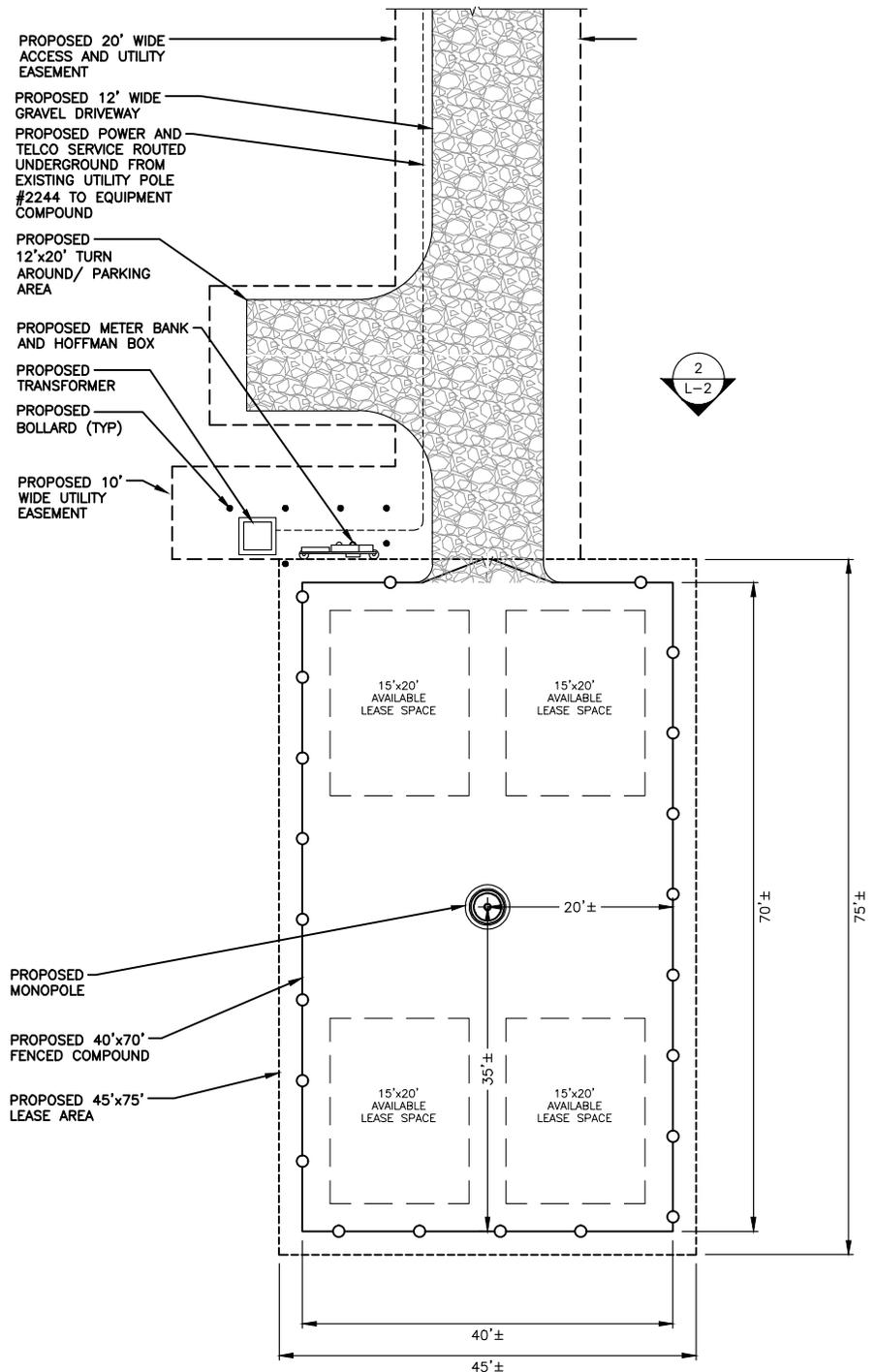
**Map Notes:**  
Base Map Source: CT ECO 2016 Imagery  
Map Scale: 1 inch = 300 feet  
Map Date: July 2018



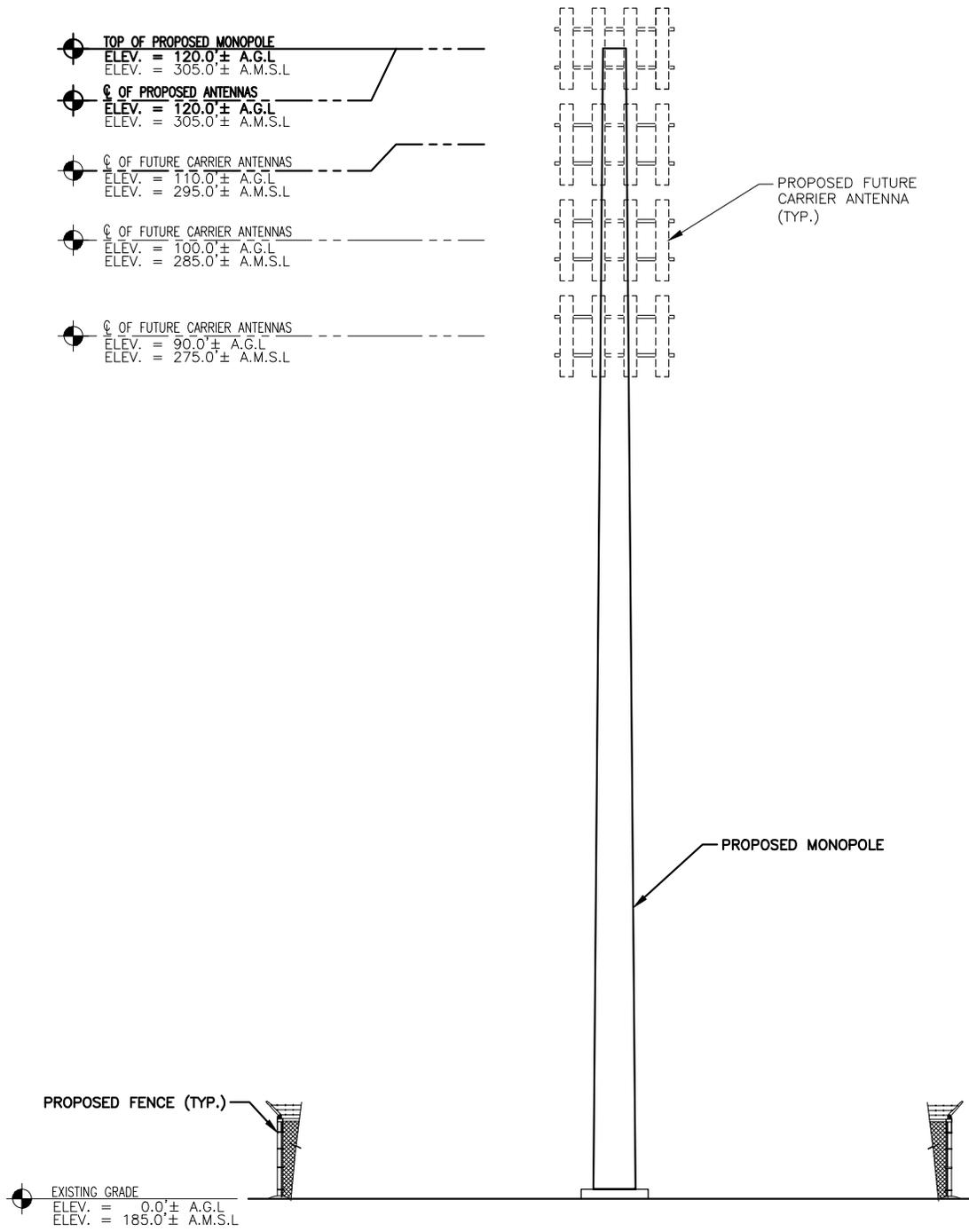
**Figure 1 - Site Location Map**

Proposed Wireless  
Telecommunications Facility  
Hamden CT  
796 Woodin Street  
Hamden, Connecticut

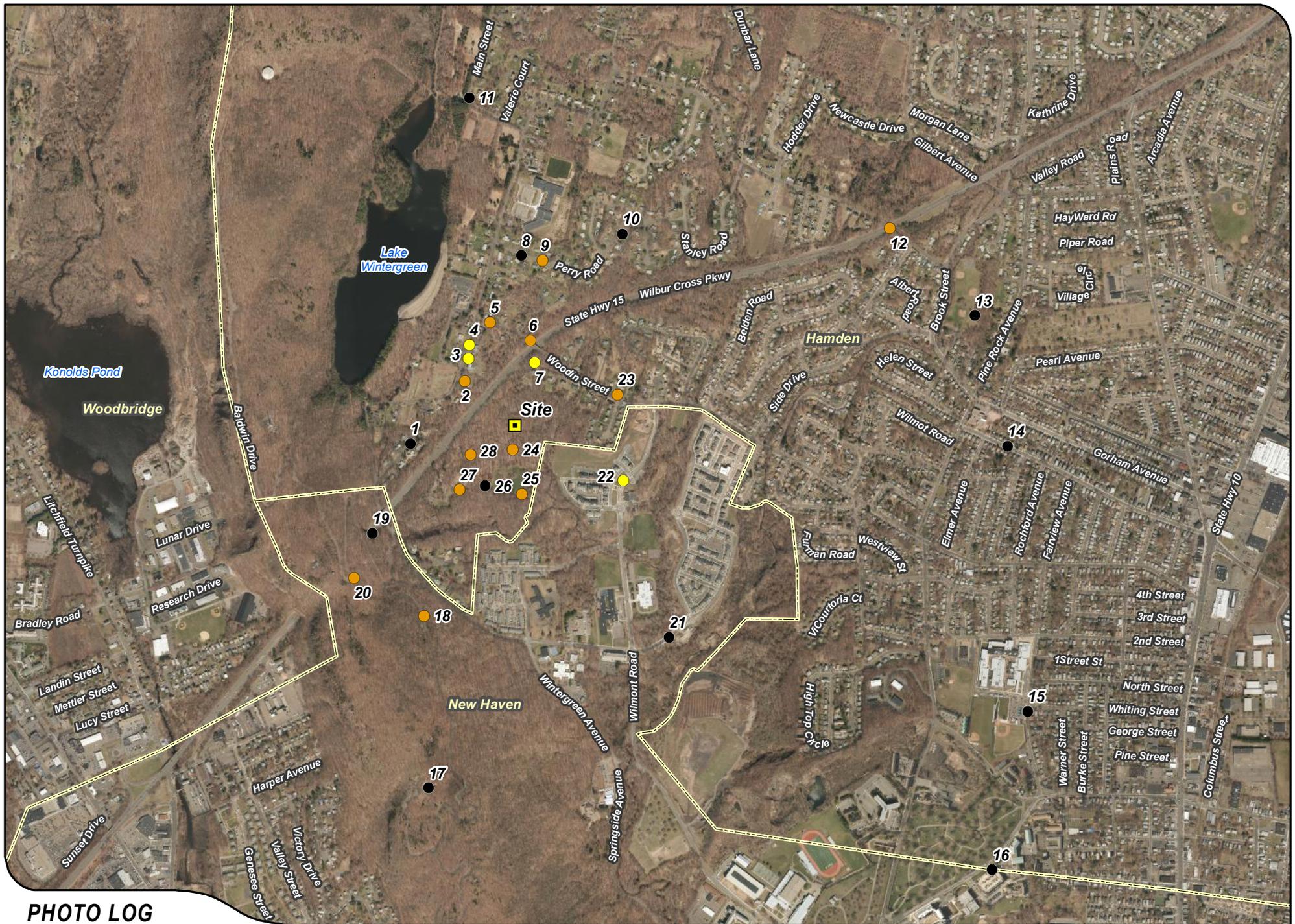




**FIGURE 2 - PROPOSED EQUIPMENT LOCATION PLAN**



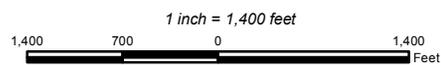
**FIGURE 3 - PROPOSED EQUIPMENT ELEVATION PLAN**



# PHOTO LOG

Legend

- Site
- Year-Round
- Seasonal
- Not Visible
- Municipal Boundary





PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO

1

LOCATION

**CARBONELLA DRIVE**

ORIENTATION

**NORTHEAST**

DISTANCE TO SITE

**+/- 0.23 MILE**

VISIBILITY

**NOT VISIBLE**



PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO

2

LOCATION

**WINTERGREEN AVENUE**

ORIENTATION

**SOUTHEAST**

DISTANCE TO SITE

**+/- 0.16 MILE**

VISIBILITY

**SEASONAL**



**PROPOSED**

PHOTO

2

LOCATION

**WINTERGREEN AVENUE**

ORIENTATION

**SOUTHEAST**

DISTANCE TO SITE

**+/- 0.16 MILE**

VISIBILITY

**SEASONAL**



PHOTOGRAPHED 04/31/2019

**EXISTING**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
3	<b>WINTERGREEN AVENUE</b>	<b>SOUTHEAST</b>	<b>+/- 0.18 MILE</b>	<b>YEAR ROUND</b>



**PROPOSED**

PHOTO

3

LOCATION

**WINTERGREEN AVENUE**

ORIENTATION

**SOUTHEAST**

DISTANCE TO SITE

**+/- 0.18 MILE**

VISIBILITY

**YEAR ROUND**



PHOTOGRAPHED ON 3/1/2019

**EXISTING**

PHOTO

4

LOCATION

**WINTERGREEN AVENUE**

ORIENTATION

**SOUTHEAST**

DISTANCE TO SITE

**+/- 0.20 MILE**

VISIBILITY

**SEASONAL**



**PROPOSED**

PHOTO

4

LOCATION

**WINTERGREEN AVENUE**

ORIENTATION

**SOUTHEAST**

DISTANCE TO SITE

**+/- 0.20 MILE**

VISIBILITY

**SEASONAL**



PHOTOGRAPHED ON 3/1/2019

**EXISTING**

PHOTO

5

LOCATION

**WOODIN STREET**

ORIENTATION

**SOUTHEAST**

DISTANCE TO SITE

**+/- 0.23 MILE**

VISIBILITY

**SEASONAL**



**PROPOSED**

PHOTO

5

LOCATION

**WOODIN STREET**

ORIENTATION

**SOUTHEAST**

DISTANCE TO SITE

**+/- 0.23 MILE**

VISIBILITY

**SEASONAL**



PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO

6

LOCATION

**WOODIN STREET**

ORIENTATION

**SOUTH**

DISTANCE TO SITE

**+/- 0.19 MILE**

VISIBILITY

**SEASONAL**



**PROPOSED**

PHOTO

6

LOCATION

**WOODIN STREET**

ORIENTATION

**SOUTH**

DISTANCE TO SITE

**+/- 0.19 MILE**

VISIBILITY

**SEASONAL**



PHOTOGRAPHED ON 3/1/2019

**EXISTING**

PHOTO

7

LOCATION

**WOODIN STREET AT HOST PROPERTY**

ORIENTATION

**SOUTH**

DISTANCE TO SITE

**+/- 0.14 MILE**

VISIBILITY

**YEAR ROUND**



**PROPOSED**

PHOTO

7

LOCATION

**WOODIN STREET AT HOST PROPERTY**

ORIENTATION

**SOUTH**

DISTANCE TO SITE

**+/- 0.14 MILE**

VISIBILITY

**YEAR ROUND**



PHOTOGRAPHED ON 3/1/2019

**EXISTING**

PHOTO

8

LOCATION

**PERRY ROAD**

ORIENTATION

**SOUTH**

DISTANCE TO SITE

**+/- 0.37 MILE**

VISIBILITY

**NOT VISIBLE**



PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO

9

LOCATION

**PERRY ROAD**

ORIENTATION

**SOUTHWEST**

DISTANCE TO SITE

**+/- 0.36 MILE**

VISIBILITY

**SEASONAL**



PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO

**10**

LOCATION

**PERRY ROAD**

ORIENTATION

**SOUTHWEST**

DISTANCE TO SITE

**+/- 0.47 MILE**

VISIBILITY

**NOT VISIBLE**



PHOTOGRAPHED ON 3/1/2019

**EXISTING**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
11	MAIN STREET AT ENTRANCE TO WEST ROCK RIDGE	SOUTHEAST	+/- 0.71 MILE	NOT VISIBLE



PHOTOGRAPHED 04/31/2019

**EXISTING**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
12	WINTERGREEN AVENUE OVERLOOKING WILBUR CROSS PARKWAY	SOUTHWEST	+/- 0.90 MILE	SEASONAL



PHOTOGRAPHED ON 3/1/2019

**EXISTING**

PHOTO

13

LOCATION

**PINE ROCK RECREATION FIELD**

ORIENTATION

**SOUTHWEST**

DISTANCE TO SITE

**+/- 1.02 MILES**

VISIBILITY

**NOT VISIBLE**



PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO

14

LOCATION

**HELEN STREET**

ORIENTATION

**WEST**

DISTANCE TO SITE

**+/- 1.06 MILES**

VISIBILITY

**NOT VISIBLE**



PHOTOGRAPHED 08/31/2019

**EXISTING**

PHOTO

15

LOCATION

**FAIRVIEW AVENUE**

ORIENTATION

**NORTHWEST**

DISTANCE TO SITE

**+/- 1.25 MILES**

VISIBILITY

**NOT VISIBLE**



PHOTOGRAPHED ON 3/1/2019

**EXISTING**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
16	<b>FITCH STREET</b> <b>SOUTHERN CONNECTICUT STATE UNIVERSITY PARKING GARAGE (ROOFTOP)</b>	<b>NORTHWEST</b>	<b>+/- 1.38 MILES</b>	<b>NOT VISIBLE</b>



PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO

17

LOCATION

**WEST ROCK - JUDGE'S CAVE**

ORIENTATION

**NORTHEAST**

DISTANCE TO SITE

**+/- 0.80 MILE**

VISIBILITY

**NOT VISIBLE**



PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO

**18**

LOCATION

**WEST ROCK**

ORIENTATION

**NORTHEAST**

DISTANCE TO SITE

**+/- 0.44 MILE**

VISIBILITY

**SEASONAL**



PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO

19

LOCATION

**WEST ROCK - OVERLOOKING WILBUR CROSS PARKWAY**

ORIENTATION

**NORTHEAST**

DISTANCE TO SITE

**+/- 0.38 MILE**

VISIBILITY

**NOT VISIBLE**



PHOTOGRAPHED ON 3/1/2019

**EXISTING**

PHOTO

20

LOCATION

WEST ROCK

ORIENTATION

NORTHEAST

DISTANCE TO SITE

+/- 0.48 MILE

VISIBILITY

SEASONAL



PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO

21

LOCATION

**BROOKSIDE AVENUE**

ORIENTATION

**NORTHWEST**

DISTANCE TO SITE

**+/- 0.55 MILE**

VISIBILITY

**NOT VISIBLE**



PHOTOGRAPHED ON 3/1/2019

**EXISTING**

PHOTO

22

LOCATION

**WILMOT ROAD**

ORIENTATION

**NORTHWEST**

DISTANCE TO SITE

**+/- 0.26 MILE**

VISIBILITY

**YEAR ROUND**



**PROPOSED**

PHOTO

22

LOCATION

**WILMOT ROAD**

ORIENTATION

**NORTHWEST**

DISTANCE TO SITE

**+/- 0.26 MILE**

VISIBILITY

**YEAR ROUND**



PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
23	WOODIN STREET AT FAWN RIDGE ROAD	SOUTHWEST	+/- 0.23 MILE	SEASONAL



PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO

24

LOCATION

**WEST ROCK NATURE CENTER**

ORIENTATION

**NORTH**

DISTANCE TO SITE

**+/- 256 FEET**

VISIBILITY

**SEASONAL**



**PROPOSED**

PHOTO

24

LOCATION

**WEST ROCK NATURE CENTER**

ORIENTATION

**NORTH**

DISTANCE TO SITE

**+/- 256 FEET**

VISIBILITY

**SEASONAL**



PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO

25

LOCATION

WEST ROCK NATURE CENTER

ORIENTATION

NORTH

DISTANCE TO SITE

+/- 0.14 MILE

VISIBILITY

SEASONAL



**PROPOSED**

PHOTO

25

LOCATION

**WEST ROCK NATURE CENTER**

ORIENTATION

**NORTH**

DISTANCE TO SITE

**+/- 0.14 MILE**

VISIBILITY

**SEASONAL**



PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO

26

LOCATION

**WEST ROCK NATURE CENTER**

ORIENTATION

**NORTHEAST**

DISTANCE TO SITE

**+/- 0.14 MILE**

VISIBILITY

**NOT VISIBLE**



PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO

27

LOCATION

**WEST ROCK NATURE CENTER**

ORIENTATION

**NORTHEAST**

DISTANCE TO SITE

**+/- 0.18 MILE**

VISIBILITY

**SEASONAL**



PHOTOGRAPHED ON 3/17/2019

**EXISTING**

PHOTO

28

LOCATION

WEST ROCK NATURE CENTER

ORIENTATION

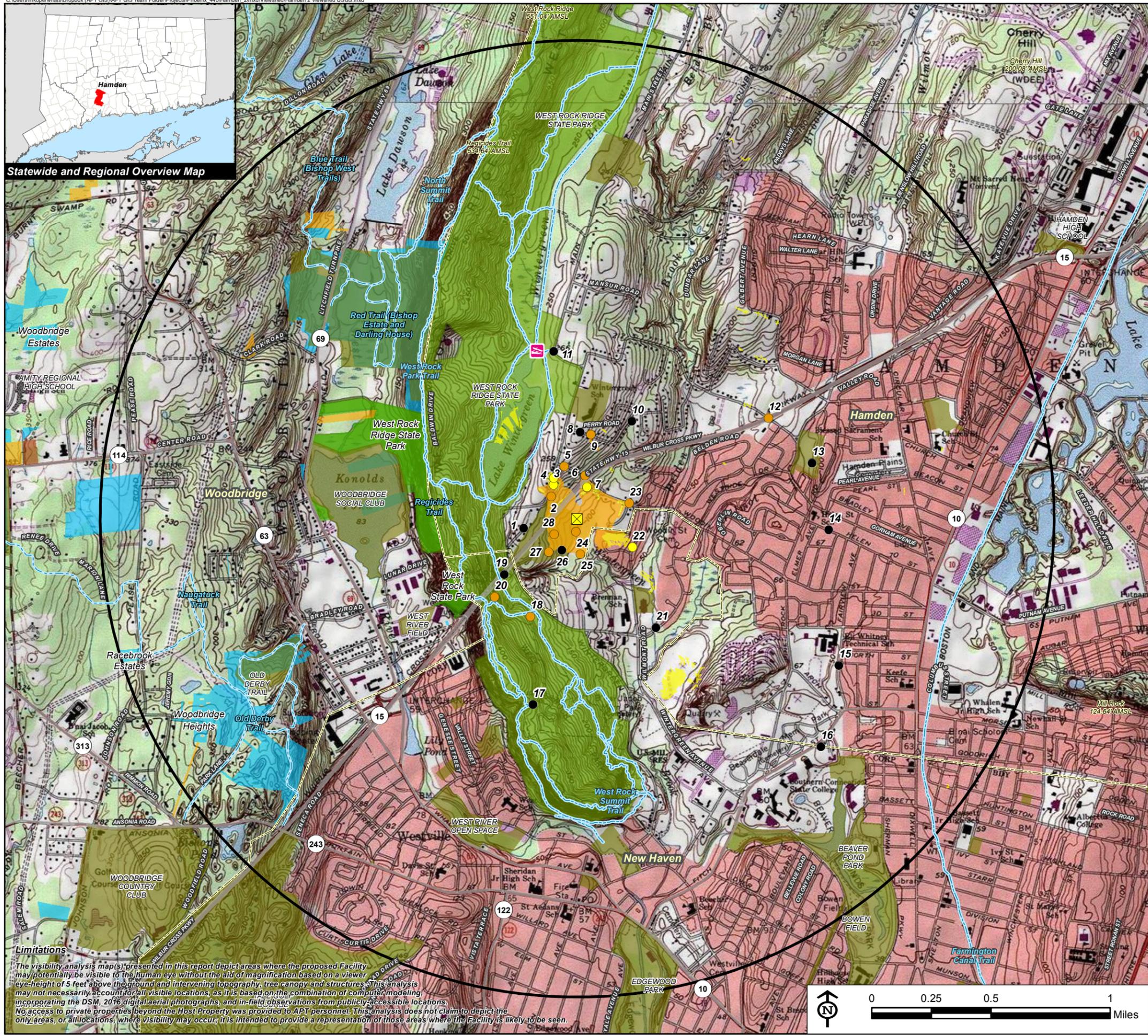
NORTHEAST

DISTANCE TO SITE

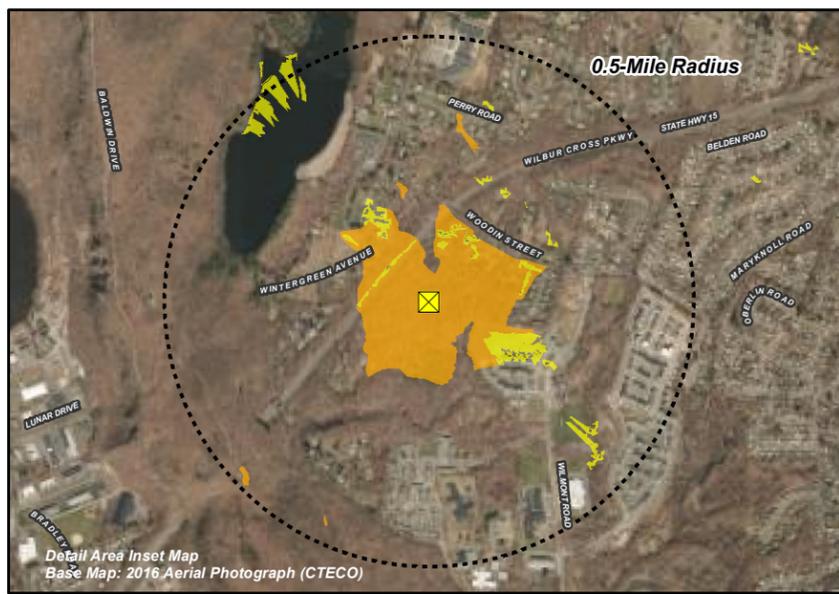
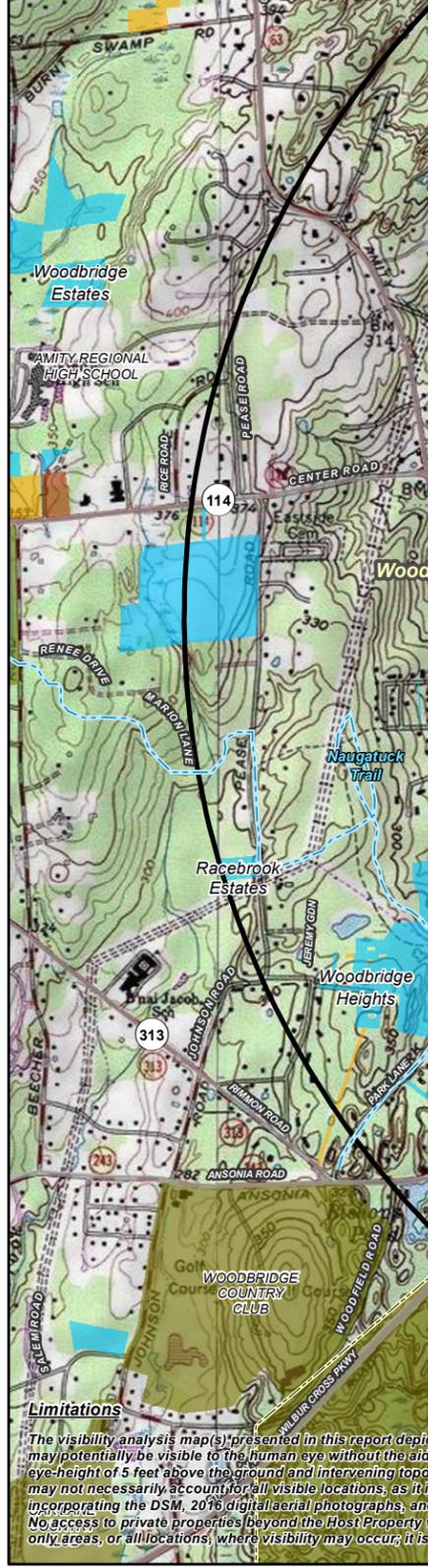
+/- 0.11 MILE

VISIBILITY

SEASONAL



**Statewide and Regional Overview Map**



**Viewshed Analysis Map**  
 Proposed Wireless Telecommunications Facility  
 Hamden CT  
 796 Woodin Street  
 Hamden, Connecticut

Proposed facility height is 120 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 information field verified by APT on June 21, 2018 and March 1, 2019.  
 Base Map Source: USGS 7.5 Minute Topographic Quadrangle Map, New Haven, CT (1984), Mount Carmel, CT (1984), and Ansonia (1984)  
 Map Date: April 2019

- Legend**
- Proposed Site
  - Study Area (2-Mile Radius)
  - Not Visible
  - Seasonal Visibility
  - Year-Round Visibility
  - Predicted Year-Round Visibility (21 Acres)
  - Areas of Potential Seasonal Visibility (47 Acres)
  - Municipal Boundary
  - Trail
  - DEEP Boat Launches
  - Municipal and Private Open Space Property
  - State Forest/Park
  - Protected Open Space Property**
  - Federal
  - Land Trust
  - Municipal
  - Private
  - State

**Data Sources:**  
**Physical Geography / Background Data**  
 A digital surface model (DSM) was created from the State of Connecticut 2016 LiDAR LAS data points, using first return values associated with the highest feature in the landscape (such as a treetop or top of building). The DSM captures the natural and built features on the Earth's surface.

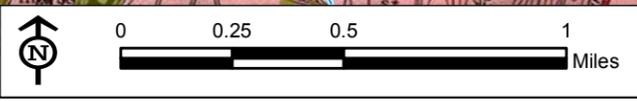
Municipal Open Space, State Recreation Areas, Trails, County Recreation Areas, and Town Boundary data obtained from CT DEEP. Scenic Roads: CTDOT State Scenic Highways (2015); Municipal Scenic Roads (compiled by APT)

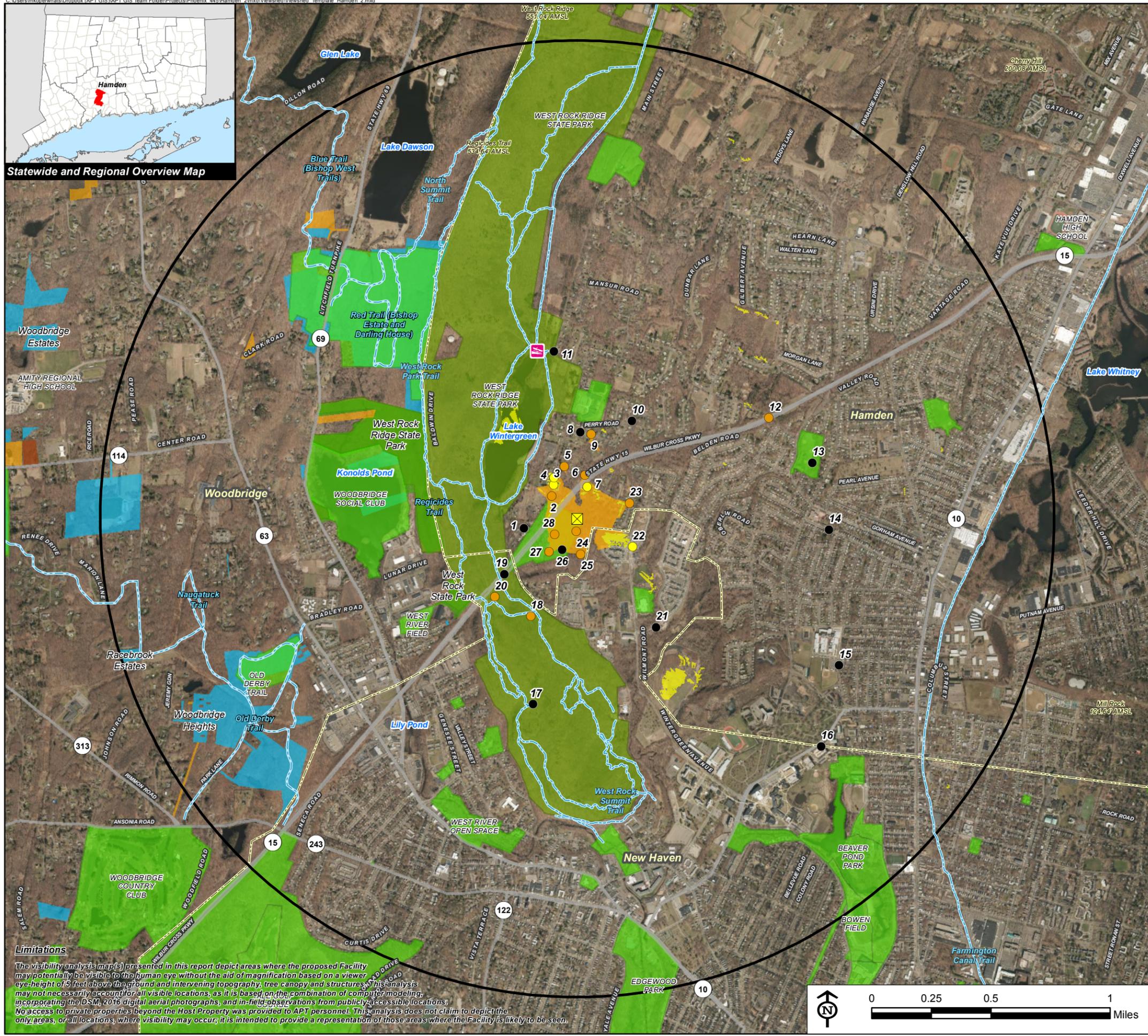
**Dedicated Open Space & Recreation Areas**  
 Connecticut Department of Energy and Environmental Protection (DEEP): DEEP Property (May 2007); Federal Open Space (1997); Municipal and Private Open Space (1997); DEEP Boat Launches (1994)  
 Connecticut Forest & Parks Association, Connecticut Walk Books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

**Other**  
 CTDOT Scenic Strips (based on Department of Transportation data)

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

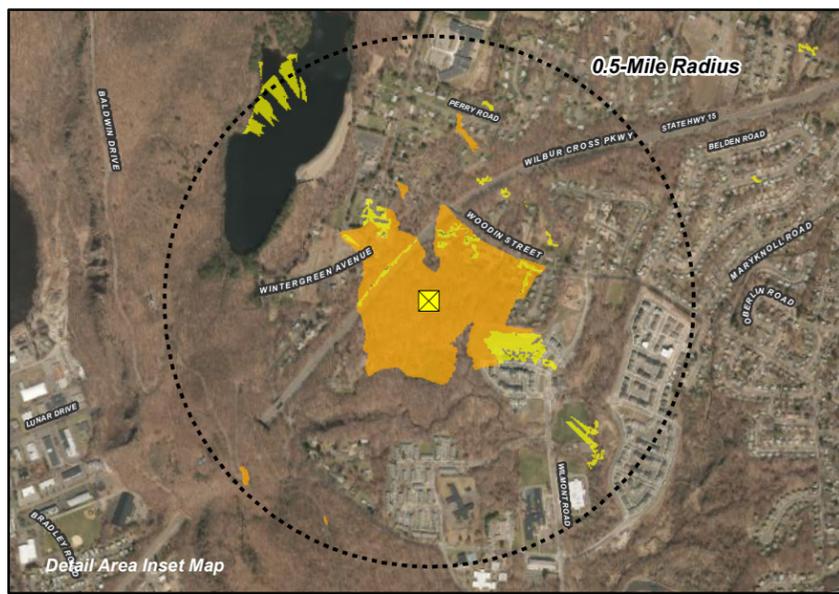
**Limitations**  
 The visibility analysis map(s) presented in this report depict areas where the proposed Facility may potentially be visible to the human eye without the aid of magnification based on a viewer eye-height of 5 feet above the ground and intervening topography, tree canopy and structures. This analysis may not necessarily account for all visible locations, as it is based on the combination of computer modeling, incorporating the DSM, 2016 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.





Statewide and Regional Overview Map

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 Base Map Source: 2016 Aerial Photograph (CTECO)  
 Map Date: March 2019

**Legend**

- Proposed Site
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