Visual Assessment & Photo-Simulations

NORWICH 4
110 YANTIC LANE
NORWICH, CT 06360

Prepared in April 2020 by:
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Prepared for Verizon Wireless

ALL-POINTS
TECHNOLOGY CORPORATION

VISUAL ASSESSMENT & PHOTO-SIMULATIONS

Cellco Partnership, d/b/a Verizon Wireless is seeking approval for the development of a new wireless communications facility (the "Facility") at 110 Yantic Lane in Norwich, Connecticut (the "Host Property"). At the request of Verizon Wireless, All-Points Technology Corporation, P.C. ("APT") completed this assessment to evaluate the potential visual effects of the proposed Facility from within a 2-mile radius (the "Study Area"). The Study Area includes portions of the neighboring municipalities of Bozrah to the west and Franklin to the north.

Project Setting

The 115-acre Host Property is located on the northeast shoulder of Wawecus Hill, east of Yantic Lane, north of Cottonwood Road, and north of the cul-de-sacs of Philanne Drive and Beechwood Boulevard. The parcel is developed with a single-family residence, municipal water supply tank, and salvage yard. A gated gravel access driveway extends onto the Host Property from Yantic Lane and provides access to the residence. An Eversource electrical transmission corridor traverses the central portion of the Host Property in a southwest to northeast direction. An approximately 190' tall water supply tank, owned by the City of Norwich/Norwich Public Utilities, is located on the northern portion of the Host Property. An existing gated gravel access driveway extends northeastward onto the Host Property from Philanne Drive and provides access to the water tank compound. Remaining portions of the Host Property are largely wooded and undeveloped. Residentially-developed properties abut the Host Property to the south and west. A large undeveloped, wooded parcel, owned by the State of Connecticut, abuts the Host Property to the north. Connecticut State Route 2 borders a portion of the Host Property to the east.

The topography within the Study Area consists of gently rolling terrain. Ground elevations range from approximately 68 feet AMSL in the southeastern portion of the Study Area to approximately 502 feet AMSL (Wawecus Hill) in the southwestern portion of the Study Area. Tree cover within the Study Area (consisting of mixed deciduous hardwoods and conifers) occupies approximately 4,345 acres (±54.03%) of the 8,042-acre Study Area. Portions of three (3) sizeable waterbodies; the Yantic River in Bozrah and Norwich, Fitchville Pond in Bozrah, and the southern extreme of Bog Meadow Reservoir in Norwich are located within the Study Area. In total, these waterbodies comprise approximately 120 acres (±1.5%) of the Study Area.

Project Undertaking

The proposed Facility would be located at a ground elevation of approximately 390 feet above mean sea level ("AMSL") and include a 110-foot tall monopole and associated ground-mounted equipment within a 50-foot by 50-foot fenced compound. The tops of the proposed Verizon Wireless panel antennas would extend to a height of 113' above ground level ("AGL"). The existing gravel drive to the water tank will also be used to provide access to the Facility.

The proposed monopole would be located approximately 335' southwest of a fenced equipment compound associated with the water tank and approximately 60' northwest off the existing gravel access road ("Site"). Please refer to the current Site Drawings prepared by On Air Engineering, LLC, dated February 8, 2020, and provided under separate cover, for details regarding the proposed installation.

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 Area, including private properties and other areas inaccessible for direct observations. The in-field analyses consisted of raising a brightly-colored flag with a crane to the proposed monopole height 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[1] 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).

[1] 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.

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[2] LAS[3] 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[4] within the DSM that can be seen from an observer location. 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 views is not sufficient for the human eye to recognize the Facility or discriminate it from other surrounding or intervening objects.

[2] Light Detection and Ranging

[3] An LAS file is an industry-standard binary format for storing airborne LiDAR data.

[4] Each DSM cell size is 1 square meter.

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.

Crane Test and Field Reconnaissance

To supplement and fine tune the results of the computer modeling efforts, APT completed in-field verification activities consisting of a crane test, vehicular and pedestrian reconnaissance, and photo-documentation. The crane test and field reconnaissance were completed on February 14, 2020. The crane test consisted of affixing a brightly-colored, approximately 4' by 4' flag to a crane boom and raising it to a height of approximately 113 feet AGL[5] at the proposed monopole location. Weather conditions were favorable for the in-field activity with variable winds and sunny skies.

APT conducted a Study Area reconnaissance by driving along local and State roads and other publicly accessible locations to document and inventory where the flag could be seen above and through the tree canopy and other visual obstructions. 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 and Simulations

During the Study Area reconnaissance, APT obtained photo-documentation of representative locations where the 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[6] and Canon EF 24 to 105 millimeter ("mm") zoom lens. APT typically uses a standard focal length of 50mm to present a consistent

[5] The top of the flag represented the top of the proposed antennas.

[6] 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.

field of view. On occasion, photos are taken at lower focal lengths to provide a greater depth of field and to provide context to the scene by including surrounding features within the photograph. During this evaluation, one (1) photograph was taken at a 24mm focal length and six (6) photographs were taken at a 35mm focal length as noted in the table (Table 1 – Photo Locations) on the following pages.

Photographic simulations were generated to portray scaled renderings of the proposed Facility from thirteen (13) locations presented herein where the Facility may be recognizable above or through the trees. Using field data, Site plan information and 3-dimensional (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 flag) and the corresponding simulation (the Facility) is 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 size, we believe it is important to present the largest view while providing key contextual landscape elements (existing developments, street signs, utility poles, etc.) so that the viewer can determine the proportionate scale of each object within the scene. 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 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 monopole height of 110' AGL with the tops of the proposed antennas at 113' AGL. 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 unobstructed view lines were chosen wherever possible.

Table 1 – Photo Locations summarizes the photographs and simulations presented in the attachment to this report, and includes a description of each location, view orientation, distance from where the photo was taken relative to the proposed Facility, and the general characteristics of the view. The photo locations are depicted on the photolog and viewshed maps provided as attachments to this report.

Table 1 – Photo Locations

Photo	Location	Orientation	Distance to Site	Visibility
1	Yantic Lane	Southeast	± 0.29 Mile	Not Visible
2	Cottonwood Road	Northeast	± 0.20 Mile	Seasonal
3	Philanne Drive at Entrance to Host Property*	Northeast	± 0.19 Mile	Not Visible
4	Philanne Drive	Northeast	± 0.40 Mile	Year Round
5	Beechwood Boulevard	North	± 0.36 Mile	Year Round
6	Beechwood Boulevard at Fruitwood Drive	North	± 0.25 Mile	Seasonal
7	Fruitwood Drive	North	± 0.28 Mile	Not Visible
8	Lornadale Drive	Northwest	± 0.39 Mile	Not Visible
9	Lornadale Drive	Northwest	± 0.43 Mile	Year Round
10	Dalewood Drive at Blueberry Hill Road	North	± 0.52 Mile	Not Visible
11	Norwich Little League Fields**	Northwest	± 0.80 Mile	Not Visible
12	Otrobando Avenue	Northwest	± 1.05 Miles	Year Round
13	Sholes Avenue at Sturtevant Street**	West	± 1.06 Miles	Not Visible
14	Case Street	West	± 1.18 Miles	Seasonal
15	West Town Street Parking Lot	Southwest	± 1.05 Miles	Year Round
16	Clinton Avenue at Wawecus Street	West	± 0.89 Mile	Seasonal
17	West Town Street**	Southwest	± 0.66 Mile	Not Visible
18	Norwich-Colchester Turnpike**	South	± 0.57 Mile	Not Visible

**Photograph was taken at 24 mm focal length.*
***Photograph was taken at 35 mm focal length.*
(Table continued on the following page)

Table 1 – Photo Locations (continued)

Photo	Location	Orientation	Distance to Site	Visibility
19	Ohio Avenue	Southwest	± 1.04 Miles	Seasonal
20	Wisconsin Avenue	Southwest	± 1.08 Miles	Year Round
21	Plain Hill Road	Southwest	± 1.56 Miles	Not Visible
22	Plain Hill Road	Southwest	± 2.00 Miles	Year Round
23	Senator Thomas J. Dodd Memorial Stadium Parking Lot	Southwest	± 1.85 Miles	Not Visible
24	Hilltop Road at Wisconsin Avenue	Southwest	± 1.54 Miles	Not Visible
25	New Park Avenue	South	± 1.07 Miles	Not Visible
26	Windham Turnpike	Southeast	± 1.53 Miles	Not Visible
27	Rachel Drive, Bozrah	Southeast	± 1.47 Miles	Year Round
28	Stockhouse Road, Bozrah **	Southeast	± 1.65 Miles	Not Visible
29	Gifford Lane, Yantic**	Southeast	± 0.66 Mile	Not Visible
30	Gifford Lane, Yantic	Northeast	± 1.45 Miles	Not Visible
31	Wawecus Street at Browning Road	Northeast	± 1.25 Miles	Not Visible
32	Goldmine Road	North	± 1.96 Miles	Not Visible
33	North Wawecus Hill Road	North	± 1.49 Miles	Not Visible

**Photograph was taken at 24 mm focal length.*

***Photograph was taken at 35 mm focal length.*

Final Visibility Mapping

Information obtained during the field reconnaissance was incorporated into the mapping data layers, including observations of the field reconnaissance, the photograph 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 recalculated the visibility of the proposed Facility within the Study Area.

Conclusions

As presented on the attached viewshed maps, views of the Facility would be limited to select areas immediately south and at distance to the east and north/northwest. The nearest year-round views of the Facility would be from the residential neighborhood south of the Facility. Photo locations 4, 5, and 9 depict representative year-round views from the neighborhood, at distances ranging approximately 0.36 mile to 0.43 mile away from the Facility. The existing water tank and electrical system infrastructure are present in these views. Perhaps the most prominent year-round views occur to the east and north at distances of one (1) mile and beyond, as documented in Photos 12, 15, 20, 22, and 27. The Site's location on the broad, elevated northern plateau of Wawecus Hill provides open vistas from these areas. The combination of topography and large expanse of undeveloped wooded land on the Host Property and in the immediate vicinity help to minimize views of the Facility.

Seasonally, when the leaves are off the deciduous trees, additional areas of heavily obstructed visibility are predicted in the neighborhood south of the Facility (see Photos 2 and 6). Additional views would expand seasonally from areas farther east, as seen in Photos 14, 16, and 19.

Predicted year-round visibility of the proposed Facility is estimated to include approximately 44 acres. Predicted seasonal visibility is estimated to include an additional ±26 acres. Collectively, the total acreage of visibility represents less than one percent of the Study Area.

Proximity to Schools And Commercial Child Day Care Centers

No schools or commercial day care centers are located within 250 feet of the proposed Facility. The Deborah-Tennant Zinewicz School is located approximately 1.23 miles west of the Site at 30 Case Street in Norwich. Photo 14 documents an isolated seasonal view of the Facility from Case Street. No visibility is predicted to extend onto the grounds of the school across the street. The nearest commercial child care center is Champions Day Care Center, approximately 1.27 miles to the southeast of the Site at 80 West Town Street in Norwich. No visibility is predicted from or in the vicinity of the day care center.

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 five (5) feet above the ground and intervening topography, tree canopy and structures. 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 variable winds and sunny skies.

ATTACHMENTS

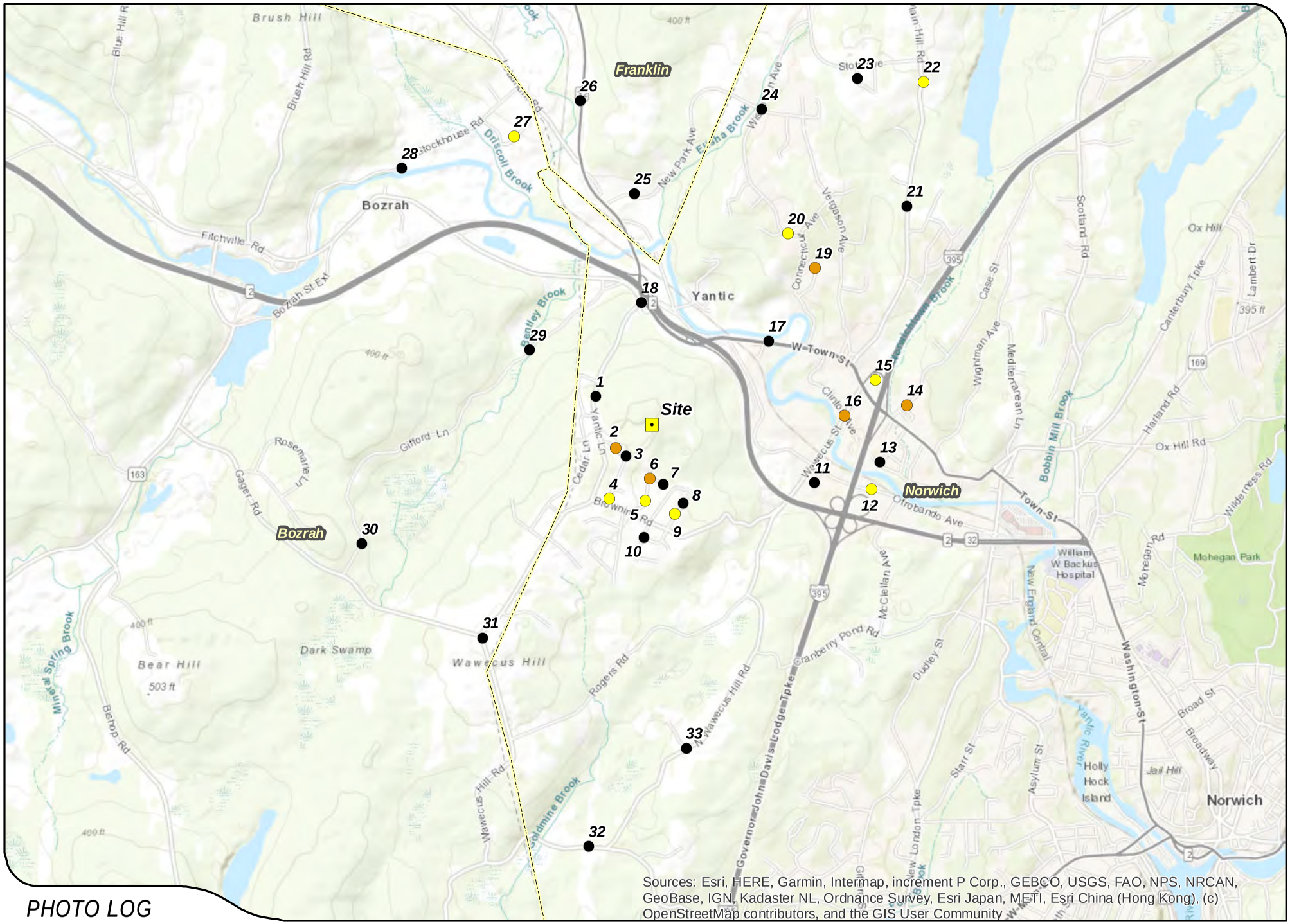

PHOTO LOG

Legend

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

1 inch = 3,000 feet

3,000 1,500 0 3,000 Feet

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
1	**YANTIC LANE**	**SOUTHEAST**	**+/- 0.29 MILE**	**NOT VISIBLE**

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
2	**COTTONWOOD ROAD**	**NORTHEAST**	**+/- 0.20 MILE**	**SEASONAL**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
2	**COTTONWOOD ROAD**	**NORTHEAST**	**+/- 0.20 MILE**	**SEASONAL**

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24mm Focal Length

PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
3	**PHILANNE DRIVE AT ENTRANCE TO HOST PROPERTY**	**NORTHEAST**	**+/- 0.19 MILE**	**NOT VISIBLE**

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
4	**PHILANNE DRIVE**	**NORTHEAST**	**+/- 0.40 MILE**	**YEAR ROUND**

ALL-POINTS TECHNOLOGY CORPORATION

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
4	**PHILANNE DRIVE**	**NORTHEAST**	**+/- 0.40 MILE**	**YEAR ROUND**

PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
5	**BEECHWOOD BOULEVARD**	**NORTH**	**+/- 0.36 MILE**	**YEAR ROUND**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
5	**BEECHWOOD BOULEVARD**	**NORTH**	**+/- 0.36 MILE**	**YEAR ROUND**

PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
6	**BEECHWOOD BOULEVARD AT FRUITWOOD DRIVE**	**NORTH**	**+/- 0.25 MILE**	**SEASONAL**

PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
6	**BEECHWOOD BOULEVARD AT FRUITWOOD DRIVE**	**NORTH**	**+/- 0.25 MILE**	**SEASONAL**

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
7	**FRUITWOOD DRIVE**	**NORTH**	**+/- 0.28 MILE**	**NOT VISIBLE**

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
8	**LORNADALE DRIVE**	**NORTHWEST**	**+/- 0.39 MILE**	**NOT VISIBLE**

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
9	**LORNADALE DRIVE**	**NORTHWEST**	**+/- 0.43 MILE**	**YEAR ROUND**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
9	**LORNADALE DRIVE**	**NORTHWEST**	**+/- 0.43 MILE**	**YEAR ROUND**

PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
10	**DALEWOOD DRIVE AT BLUEBERRY HILL ROAD**	**NORTH**	**+/- 0.52 MILE**	**NOT VISIBLE**

35mm Focal Length

PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
11	**NORWICH LITTLE LEAGUE FIELDS**	**NORTHWEST**	**+/- 0.80 MILE**	**NOT VISIBLE**

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
12	**OTROBANDO AVENUE**	**NORTHWEST**	**+/- 1.05 MILES**	**YEAR ROUND**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
12	**OTROBANDO AVENUE**	**NORTHWEST**	**+/- 1.05 MILES**	**YEAR ROUND**

35mm Focal Length

PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
13	**SHOLES AVENUE AT STURTEVANT STREET**	**WEST**	**+/- 1.06 MILES**	**NOT VISIBLE**

PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
14	**CASE STREET**	**WEST**	**+/- 1.18 MILES**	**SEASONAL**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
14	**CASE STREET**	**WEST**	**+/- 1.18 MILES**	**SEASONAL**

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
15	**WEST TOWN STREET PARKING LOT**	**SOUTHWEST**	**+/- 1.05 MILES**	**YEAR ROUND**

ALL-POINTS TECHNOLOGY CORPORATION

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
15	**WEST TOWN STREET PARKING LOT**	**SOUTHWEST**	**+/- 1.05 MILES**	**YEAR ROUND**

PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
16	**CLINTON AVENUE AT WAWECUS STREET**	**WEST**	**+/- 0.89 MILE**	**SEASONAL**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
16	**CLINTON AVENUE AT WAWECUS STREET**	**WEST**	**+/- 0.89 MILE**	**SEASONAL**

ALL-POINTS TECHNOLOGY CORPORATION

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EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
17	**WEST TOWN STREET**	**SOUTHWEST**	**+/- 0.66 MILE**	**NOT VISIBLE**

35mm Focal Length

PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
18	**NORWICH-COLCHESTER TURNPIKE**	**SOUTH**	**+/- 0.57 MILE**	**NOT VISIBLE**

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
19	**OHIO AVENUE**	**SOUTHWEST**	**+/- 1.04 MILES**	**SEASONAL**

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verizon

PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
19	**OHIO AVENUE**	**SOUTHWEST**	**+/- 1.04 MILES**	**SEASONAL**

PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
20	**WISCONSIN AVENUE**	**SOUTHWEST**	**+/- 1.08 MILES**	**YEAR ROUND**

ALL-POINTS TECHNOLOGY CORPORATION

verizon

PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
20	**WISCONSIN AVENUE**	**SOUTHWEST**	**+/- 1.08 MILES**	**YEAR ROUND**

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verizon

PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
21	**PLAIN HILL ROAD**	**SOUTHWEST**	**+/- 1.56 MILES**	**NOT VISIBLE**

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
22	**PLAIN HILL ROAD**	**SOUTHWEST**	**+/- 2.00 MILES**	**YEAR ROUND**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
22	**PLAIN HILL ROAD**	**SOUTHWEST**	**+/- 2.00 MILES**	**YEAR ROUND**

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
23	**SENATOR THOMAS J. DODD MEMORIAL STADIUM PARKING LOT**	**SOUTHWEST**	**+/- 1.85 MILES**	**NOT VISIBLE**

PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
24	**HILLTOP ROAD AT WISCONSIN AVENUE**	**SOUTHWEST**	**+/- 1.54 MILES**	**NOT VISIBLE**

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
25	**NEW PARK AVENUE**	**SOUTH**	**+/- 1.07 MILES**	**NOT VISIBLE**

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
26	**WINDHAM TURNPIKE**	**SOUTHEAST**	**+/- 1.53 MILES**	**NOT VISIBLE**

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
27	**RACHEL DRIVE, BOZRAH**	**SOUTHEAST**	**+/- 1.47 MILES**	**YEAR ROUND**

ALL-POINTS TECHNOLOGY CORPORATION

verizon

PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
27	**RACHEL DRIVE, BOZRAH**	**SOUTHEAST**	**+/- 1.47 MILES**	**YEAR ROUND**

35mm Focal Length

PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
28	**STOCKHOUSE ROAD, BOZRAH**	**SOUTHEAST**	**+/- 1.65 MILES**	**NOT VISIBLE**

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35mm Focal Length

PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
29	**GIFFORD LANE, YANTIC**	**SOUTHEAST**	**+/- 0.66 MILE**	**NOT VISIBLE**

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
30	**GIFFORD LANE, YANTIC**	**NORTHEAST**	**+/- 1.45 MILES**	**NOT VISIBLE**

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PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
31	**WAWECUS STREET AT BROWNING ROAD**	**NORTHEAST**	**+/- 1.25 MILES**	**NOT VISIBLE**

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verizon

PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
32	**GOLDMINE ROAD**	**NORTH**	**+/- 1.96 MILES**	**NOT VISIBLE**

ALL-POINTS TECHNOLOGY CORPORATION

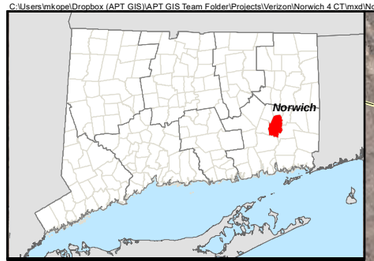
verizon

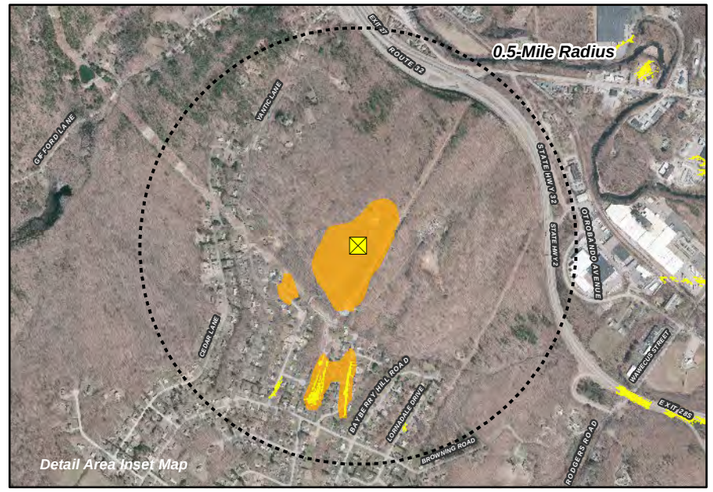
PHOTOGRAPHED ON 2/14/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
33	**NORTH WAWECUS HILL ROAD**	**NORTH**	**+/- 1.49 MILES**	**NOT VISIBLE**

C:\Users\mkopel\Dropbox (APT GIS)\APT GIS Team Folder\Projects\Verizon\Norwich 4 CT\mxd\Norwich 4 Viewshed Aerial.mxd





Viewshed Analysis Map

Proposed Wireless Telecommunications Facility
Norwich 4 CT
110 Yantic Lane
Norwich, Connecticut

Proposed facility height is 113 feet AGL.
Forest canopy height is derived from LiDAR data.
Study area encompasses a two-mile radius and includes 8,042 acres.
Map information field verified by APT on February 14, 2020
Base Map Source: 2019 Aerial Photograph (CTECO)
Map Date: April 2020

Legend

- Proposed Site
- Study Area (2-Mile Radius)
- Predicted Year-Round Visibility (44 Acres)
- Areas of Potential Seasonal Visibility (26 Acres)
- Municipal Boundary

Photo Locations (February 14, 2020)

- Year-Round
- Seasonal
- Not Visible

- Trail
- Scenic Highway
- 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. 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

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

This map depicts 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 account for all visible locations, as it is based on the combination of computer modeling, incorporating the DSM, 2019 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.

0.5 0.25 0 0.5 Miles

verizon

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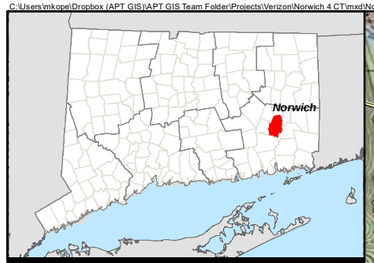
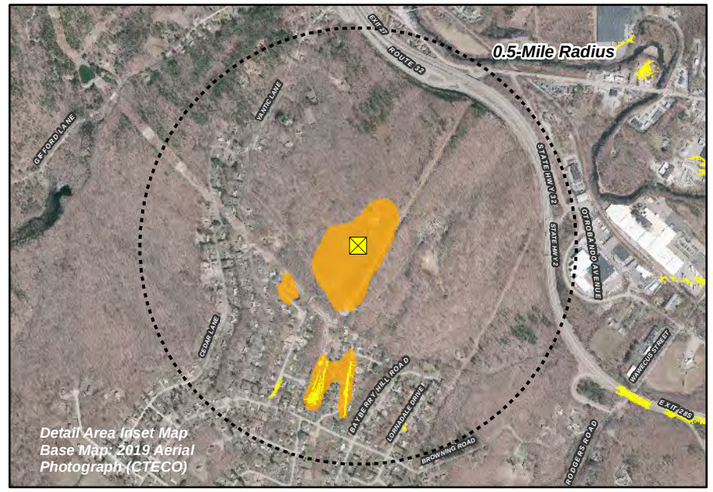
C:\Users\mkope\Dropbox (APT GIS)\APT GIS Team Folder\Projects\Verizon\Norwich 4 CT\mxd\Norwich 4 Viewshed USGS.mxd



Statewide and Regional Overview Map



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Map information field verified by APT on February 14, 2020
Base Map Source: USGS 7.5 Minute Topographic Quadrangle Maps,
Fitchville, CT (1983) and Norwich, CT (1983)
Map Date: April 2020

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0.5 0.25 0 0.5 Miles

verizon

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