Wind Power GeoPlanner™

Microwave Study

Forest Ave – Oneida Wind

Prepared on Behalf of
New Leaf Energy

February 14, 2023

COMSEARCH®
A CommScope Company

Table of Contents

1. Introduction

Microwave bands that may be affected by the installation of wind turbine facilities operate over a wide frequency range (900 MHz – 23 GHz). Comsearch has developed and maintains comprehensive technical databases containing information on licensed microwave networks throughout the United States. These systems are the telecommunication backbone of the country, providing long-distance and local telephone service, backhaul for cellular and personal communication service, data interconnects for mainframe computers and the Internet, network controls for utilities and railroads, and various video services. This report focuses on the potential impact of wind turbines on licensed, proposed and applied non-federal government microwave systems.

2. Project Overview

Project Information

Name: Forest Ave – Oneida Wind

County: Madison

State: New York

Number of Turbines: 1

Blade Diameter: 140 meters

Hub Height: 169 meters

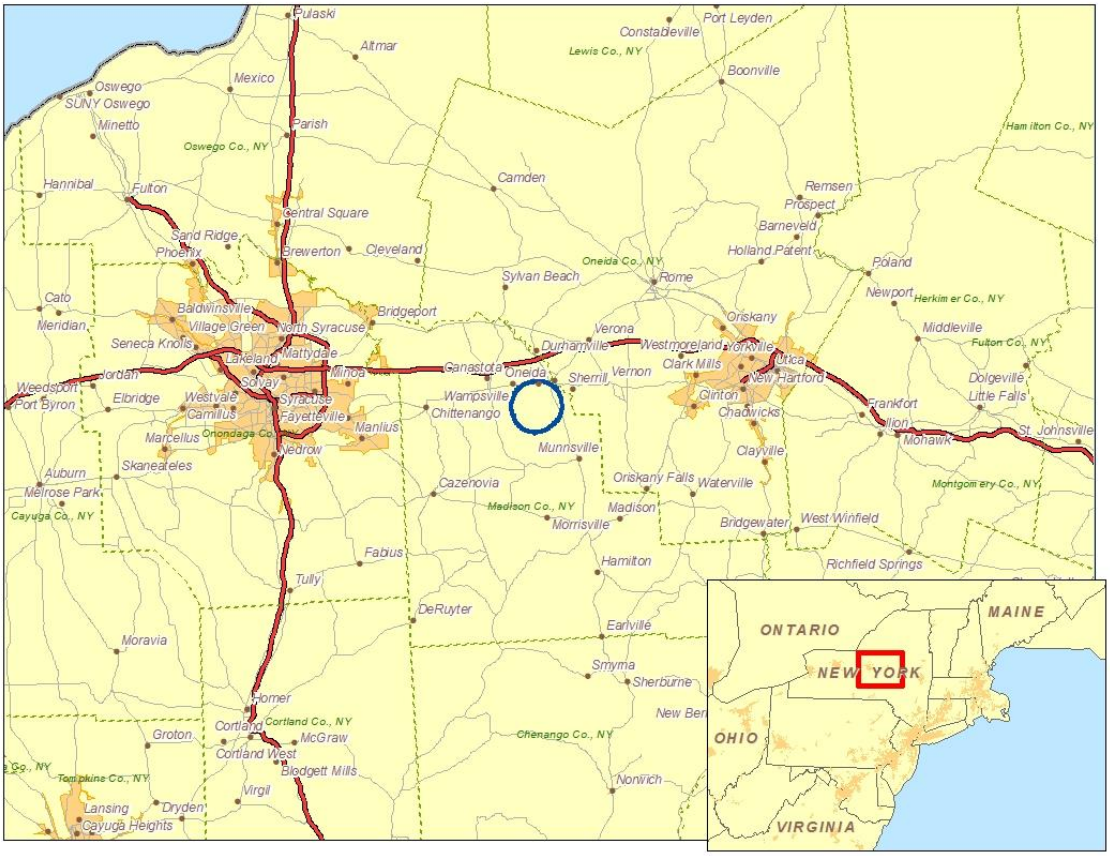


Figure 1: Area of Interest

3. Two-Dimensional Fresnel Zone Analysis

Methodology

Our obstruction analysis was performed using Comsearch's proprietary microwave database, which contains all non-government licensed, proposed and applied paths from 0.9 - 23 GHz[1]. First, we determined all microwave paths that intersect the area of interest[2] and listed them in Table 1. These paths and the area of interest which represents two miles of the turbine project area are shown in Figure 2.

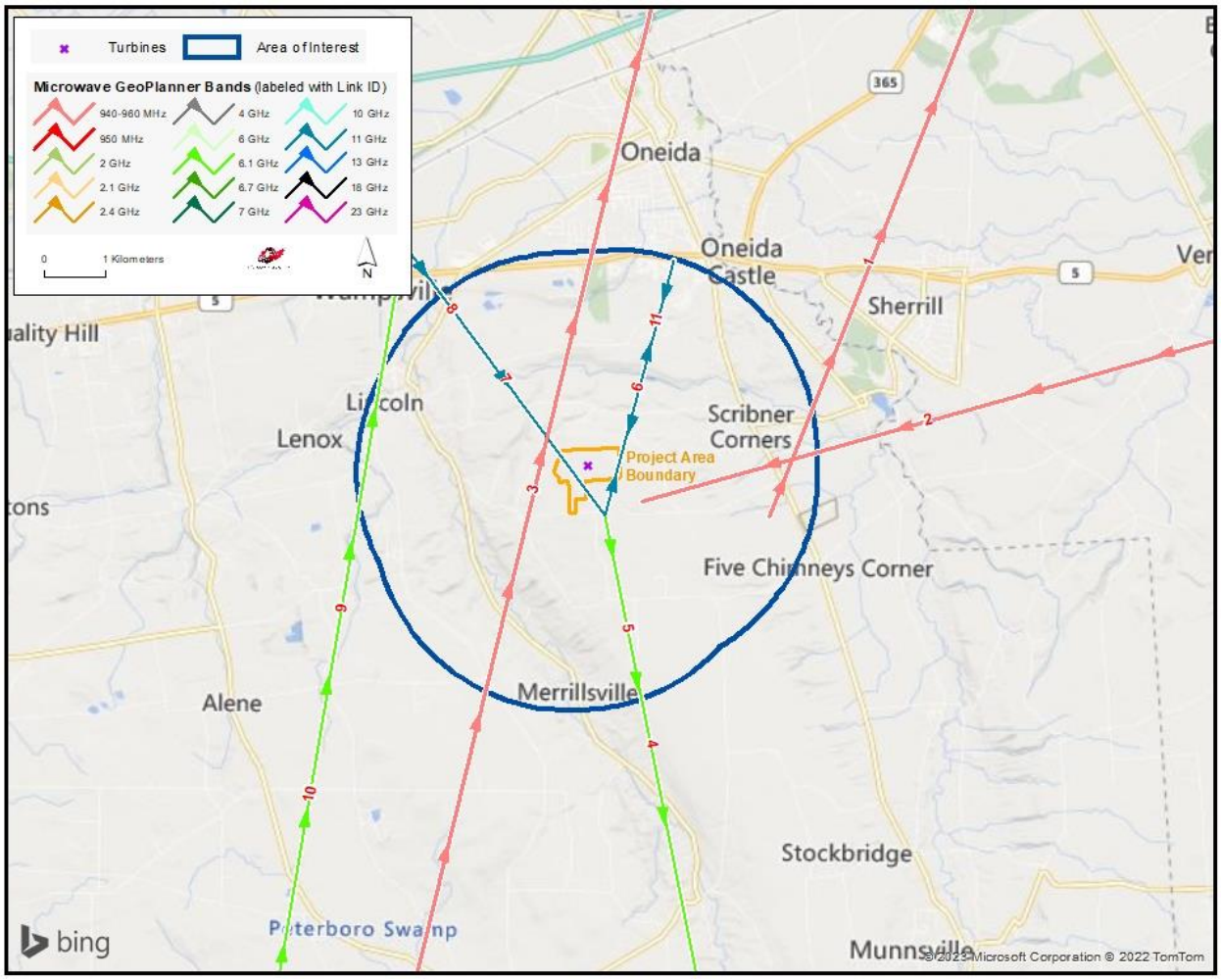


Figure 2: Microwave Paths that Intersect the Area of Interest

[1] Please note that this analysis does not include unlicensed microwave paths or federal government paths that are not registered with the FCC.

[2] We use FCC-licensed coordinates to determine which paths intersect the area of interest. It is possible that as-built coordinates may differ slightly from those on the FCC license.

ID	Status	Callsign 1	Callsign 2	Band	Path Length (km)	Licensee
1	Licensed	WPZP732	WPZP734	940-960 MHz	9.53	New York State Thruway Authority
2	Licensed	WPZU506	WPZU510	940-960 MHz	40.55	JPJ Electronic Communications Inc.
3	Licensed	WQBX986	WQCB227	940-960 MHz	95.51	New York, State of
4	Licensed	WQNH536	WQNH563	6.1 GHz	15.39	Madison, County Of
5	Licensed	WQNH536	WQNH563	6.1 GHz	15.39	Madison, County Of
6	Licensed	WQNH536	WQVL932	11 GHz	4.31	Madison, County Of
7	Licensed	WQNH547	WQNH536	11 GHz	5.51	Madison, County Of
8	Licensed	WQNH547	WQNH536	11 GHz	5.51	Madison, County Of
9	Licensed	WQNH560	WQNH547	6.1 GHz	14.52	Madison, County Of
10	Licensed	WQNH560	WQNH547	6.1 GHz	14.52	Madison, County Of
11	Licensed	WQVL932	WQNH536	11 GHz	4.31	Madison, County Of

Table 1: Summary of Microwave Paths that Intersect the Area of Interest

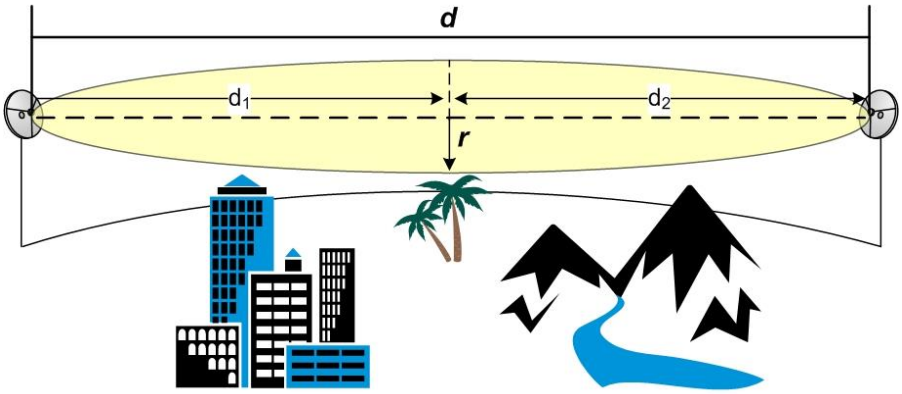
(See enclosed mw_geopl.xlsx for more information and GP_dict_matrix_description.xls for detailed field descriptions)

Verification of Coordinate Accuracy

It is possible that as-built coordinates may differ from those on the FCC license. For this project, four paths cross within close proximity of the proposed turbine and the tower locations for these paths will have a critical impact on the result. Therefore, we verified these locations using aerial photography. Some of the towers were found to be slightly off and were moved to their locations based on the aerial photos[3].

Next, we calculated a Fresnel Zone for each path based on the following formula:

$$r \cong 17.3\sqrt{\frac{n}{F_{GHz}}\left(\frac{d_1 d_2}{d_1 + d_2}\right)}$$



Where,

r	=	Fresnel Zone radius at a specific point in the microwave path, meters
n	=	Fresnel Zone number, 1
F_{GHz}	=	Frequency of microwave system, GHz
d_1	=	Distance from antenna 1 to a specific point in the microwave path, kilometers
d_2	=	Distance from antenna 2 to a specific point in the microwave path, kilometers

In general, this is the area where the planned wind turbines should be avoided, if possible. Likewise, Comsearch recommends that an area directly in front of each microwave antenna should be avoided. This corresponds to the Consultation Zone which measures 1 kilometer along the main beam of the antenna and 24 ft (7.3 meters) wide. A depiction of the Fresnel Zones and Consultation Zones for each microwave path listed can be found in Figure 3, and is also included in the enclosed shapefiles[4,5].

[3] See enclosed mw_geopl.shp (adjusted locations based on aerial photography/basis for report images and results) and mw_geopl_fcc.shp (locations solely based on FCC licensed information) for details.

[4] The ESRI® shapefiles enclosed are in NAD 83 UTM Zone 18 projected coordinate system.

[5] Comsearch makes no warranty as to the accuracy of the data included in this report beyond the date of the report. The data provided in this report is governed by Comsearch's data license notification and agreement located at http://www.comsearch.com/files/data_license.pdf.

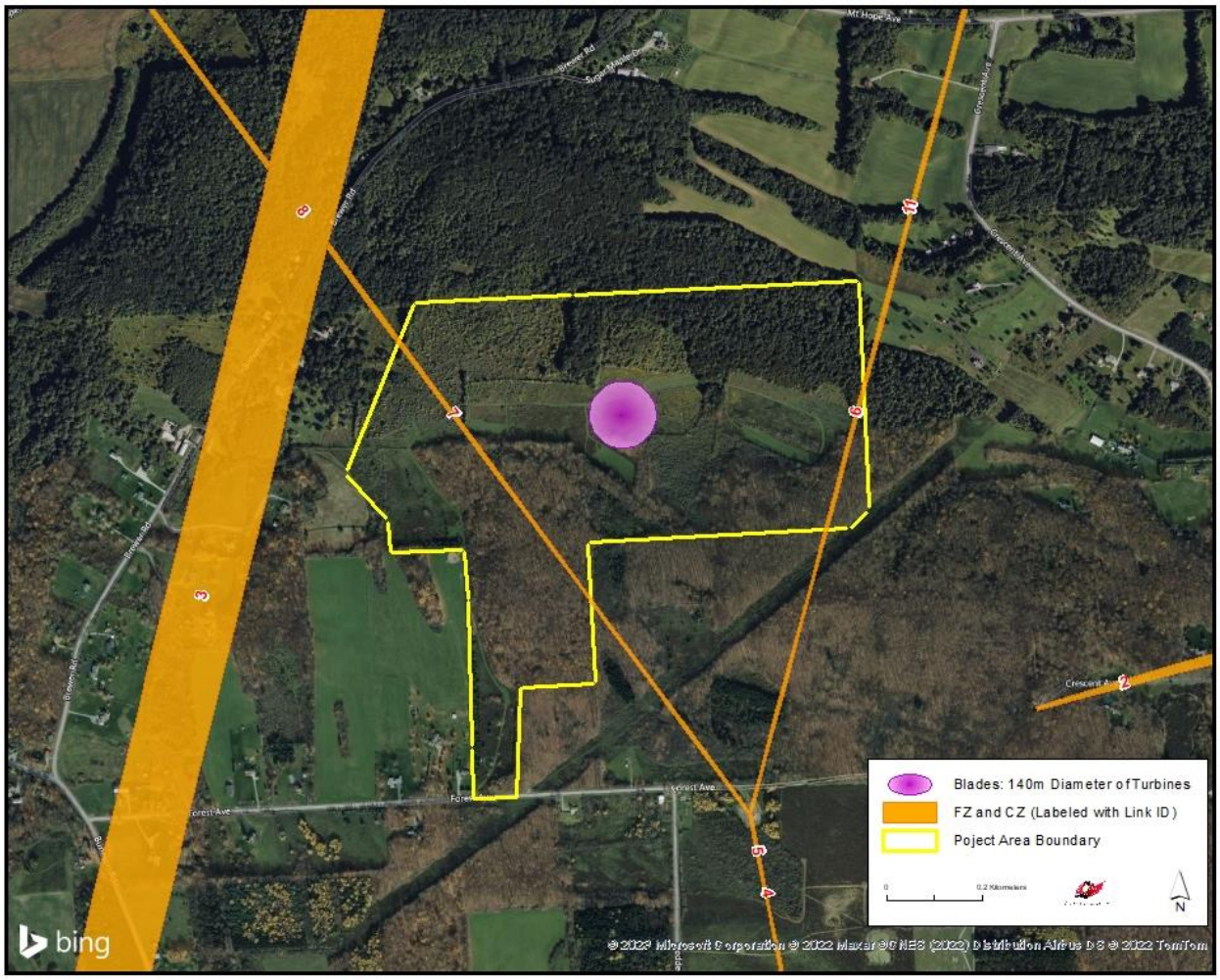


Figure 3: Microwave Paths with Fresnel Zones

4. Conclusion

Total Microwave Paths	Paths with Affected Fresnel Zones	Total Turbines	Turbines intersecting the Fresnel Zones
11	0	1	0

Table 2: Fresnel Zone Analysis Result

Our study identified eleven microwave paths within two miles of the the Forest Ave – Oneida Wind project area boundary. The Fresnel and Consultation Zones for these microwave paths were calculated and mapped in order to assess the potential impact from the turbine. One turbine was considered in the analysis, with a blade diameter of 140 meters and a hub height of 169 meters. The turbine was not found to have potential obstruction with the microwave systems in the area.

5. Contact

For questions or information regarding the Microwave Study, please contact:

Contact person: David Meyer
Title: Senior Manager
Company: Comsearch
Address: 21515 Ridgetop Circle, Suite 300, Sterling, VA 20166
Telephone: 703-726-5656
Fax: 703-726-5595
Email: David.Meyer@CommScope.com
Web site: www.comsearch.com

Appendix: Turbine Locations

Turbine ID	Lat	Lon
1	43.047990	-75.665345