

**Commercial Wind Farms
In Tompkins County
An Atlas to Support Decision-Making at the Local Level**



December, 2010

Prepared by the Tompkins County Planning Department

INTRODUCTION

The purpose of this atlas is to provide local decision-makers, elected officials and planning board members, with information related to the location of commercial wind farms in their municipalities.

Wind turbines can be deployed individually, in small clusters, and in large-scale arrangements known as wind farms. In general, the wind power generated in a wind farm is fed directly into the electric grid for sale and delivery of electricity to many customers. It is these wind farms that are the focus in this atlas.

Wind energy offers two primary environmental benefits: wind energy is a renewable energy source and it produces zero emissions.

Wind farms also have potential negative environmental impacts. Wind facilities can degrade and fragment wildlife habitat because towers, lighting systems, power lines, and access roads alter natural landscapes. This may lead to changes in animals' travel and migration pathways and to the physical displacement of individual animals. Also, birds, bats, and insects that collide with spinning blades or stationary towers may be killed.

Noise impacts may be experienced on properties located in close proximity to wind farms. In addition, commercial-scale wind turbines can be very visible, impacting the scenic resources of a community. A second visual impact is light flicker, which can be a nuisance for neighboring properties.

Larger-scale turbines can cause line-of-sight interference with radio waves and TV signals. Larger-scale installations can also have echo effects on aircraft radar systems. Interference is generally limited to situations where turbine blades create a physical shadow, such as when aircraft are flying at a very low altitude.

The atlas contains information about

- areas that are technically better suited for the location of commercial wind farms;
- areas where development of commercial wind farms may interfere with community services;
- environmentally sensitive areas and scenic features; and
- agricultural and forested areas.

Brief information is provided about how the mapped information relates to the development of commercial wind farms.

This atlas should not be interpreted as the County endorsing or opposing any specific location for a commercial wind farm. It is meant to provide relevant information for local decision-makers when considering local actions related to wind farms.

LIST OF MAPS

Potential Wind Areas
Electric Transmission Lines
Large Land Parcels

Agricultural Areas
Public Facilities
Developed Areas

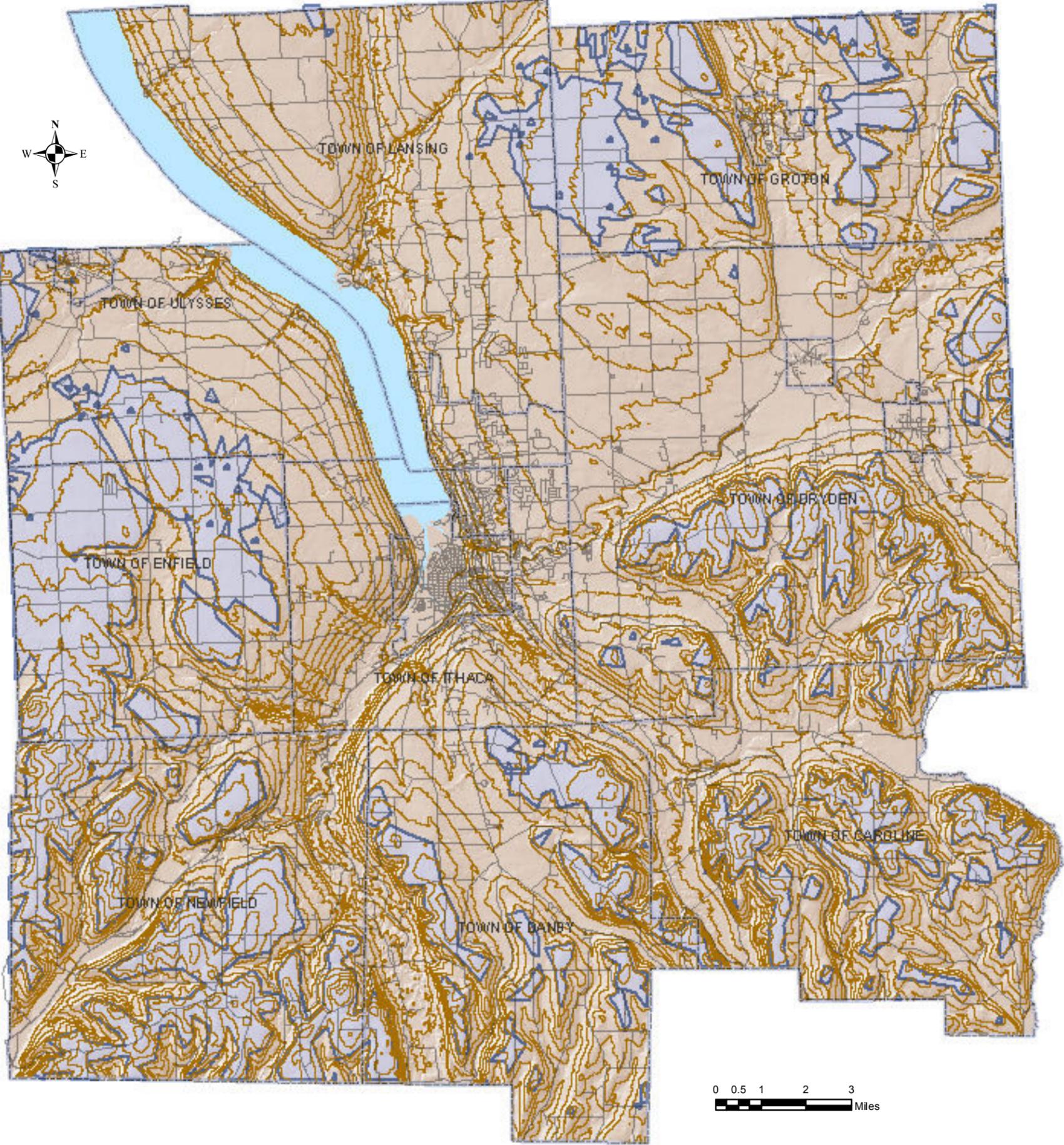
Environmentally Sensitive Areas
Scenic Features
Forested Areas

Potential Wind Areas

Generally speaking, the highest elevations in the County have the highest potential for wind farm development.

This maps illustrates the areas in Tompkins County with the greatest potential for the development of wind farms. This is based on a model that predicts average wind speeds at 80 meters above ground elevation

While every town is home to at least some high-potential wind farm areas, the Towns of Caroline, Danby, Enfield, Newfield and Groton and the southern halves of Dryden and Ulysses are heavily represented on this map.



- 100 ft contours
- Potential Wind Areas

Data Sources:

Potential Wind Areas - TCPD from AWS Truewind
Topography - USGS Digital Elevation Models
Municipal Boundaries - Tompkins County Assessment 2009



Electric Transmission Lines

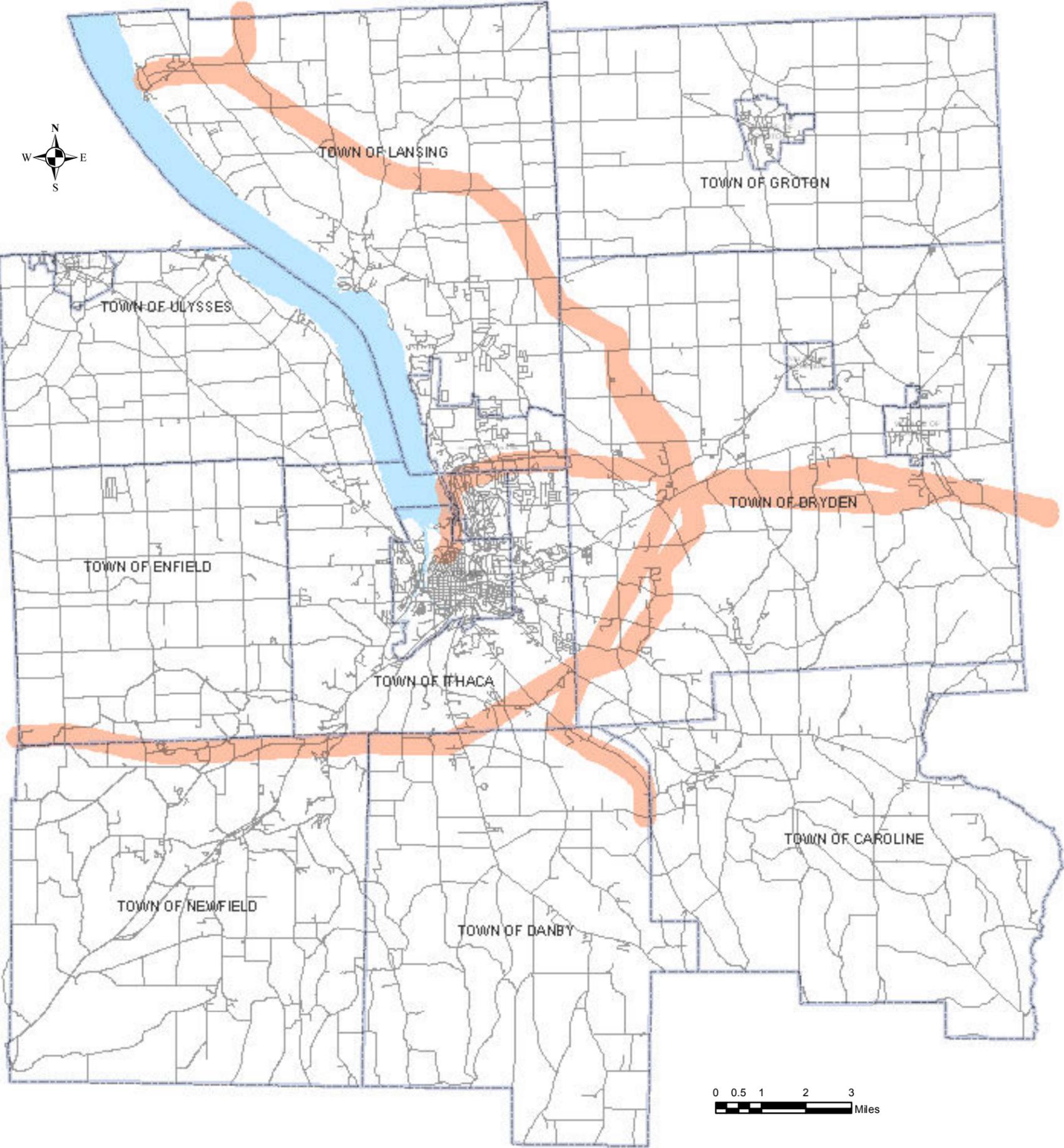
Energy produced at commercial-scale wind farms needs to be transmitted to the electric grid. While transmission lines can be built to serve any location, those sites closer to existing transmission lines are more likely to be developed first.

This map shows the location of lands within ¼ of a mile of a major electric transmission line in Tompkins County.

 Transmission Lines quarter mile buffer

Data Sources:

Transmission Corridor obtained from AWS Truewind LLC from the Platts Powermap Transmission Line Layer, not warranted
Municipal Boundaries - Tompkins County Assessment



Large Land Parcels

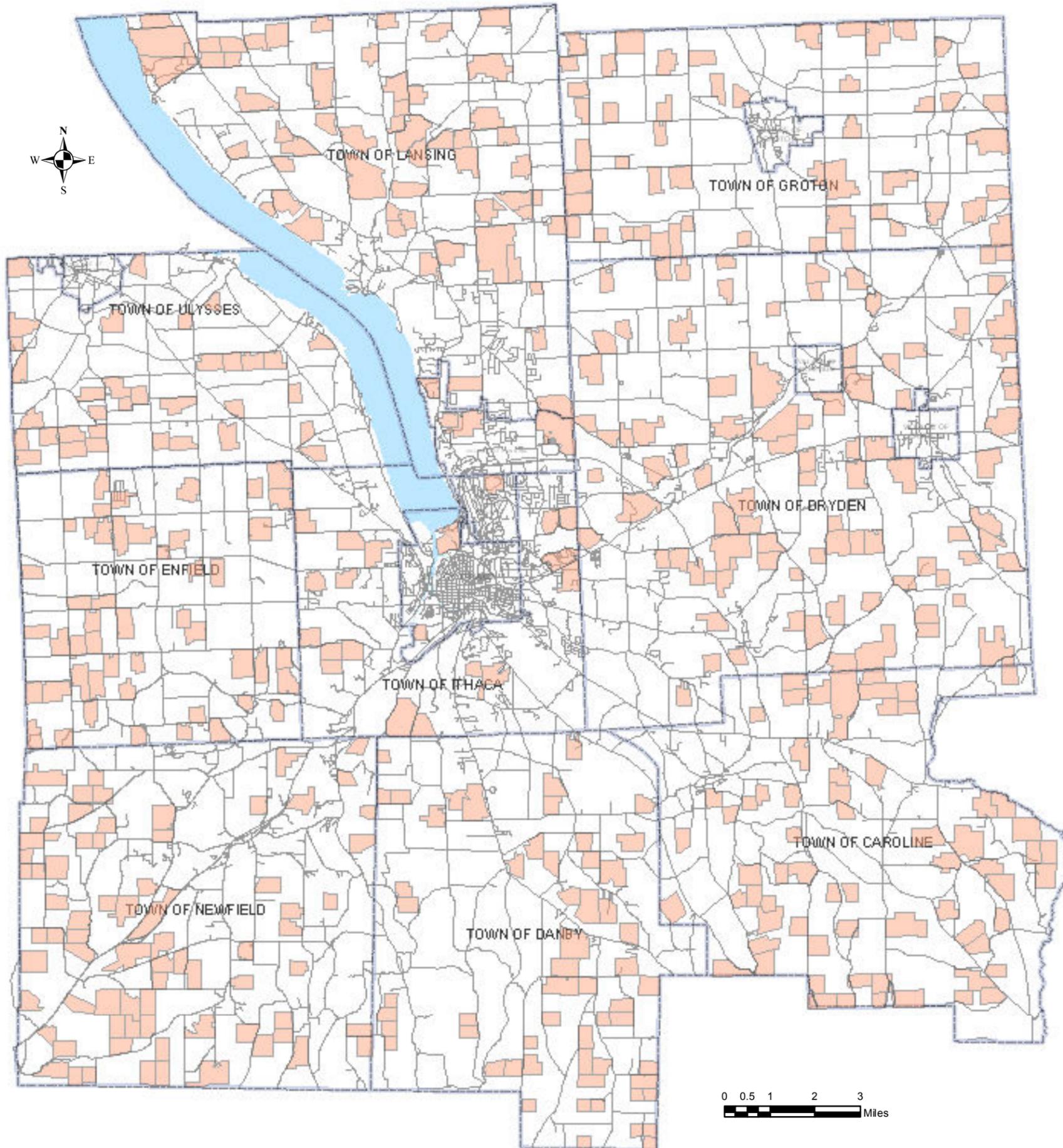
In order to be large enough for a commercial grade wind farm and to meet anticipated setbacks from property lines, wind farms would need to be located on large parcels of land.

This map shows the location of individual tax parcels that are large enough to completely include a circular area of at least 35 acres. Such parcels would be large enough to locate a commercial wind farm while meeting setbacks of at least 1.5 times the height of an average wind turbine.

 Properties That May be Sufficiently Large for a Wind Farm

Data Sources:

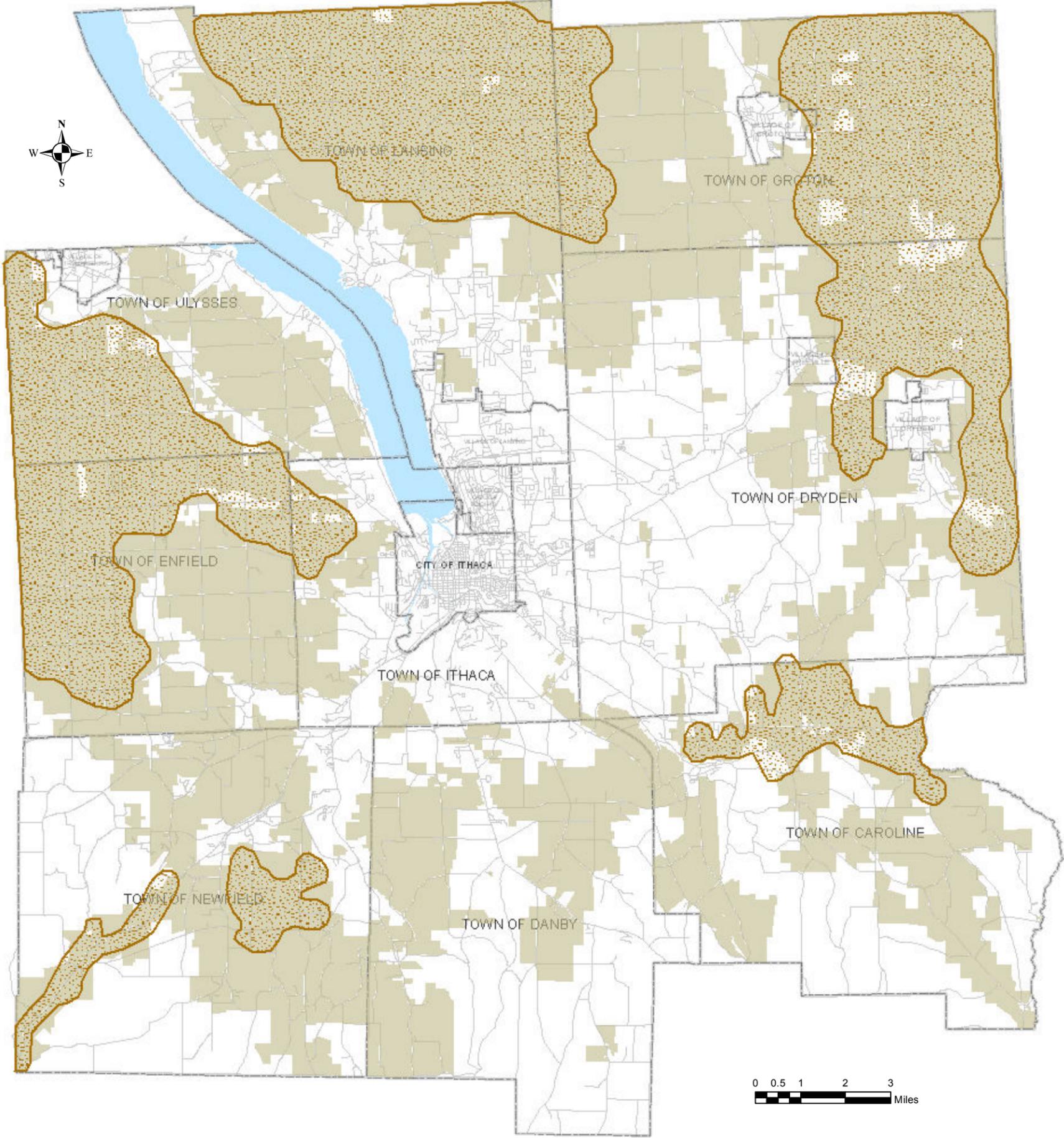
Property Data - Tompkins County Assessment 2009
Municipal Boundaries - Tompkins County Assessment 2009



Agricultural Areas

Commercial wind farms are compatible with agricultural operations. Agricultural areas are lightly developed, allowing an opportunity to separate wind farms from sensitive land uses. The development of commercial wind farms in agricultural areas can also enhance the income of farmers while still allowing a majority of their lands to be farmed, helping to preserve the agricultural sector of the county's economy.

This map shows the location of Agricultural Districts, established by the County legislature and renewed every eight years. The map also shows the location of Agricultural Resource Focus Areas, which are identified in the Tompkins County Comprehensive Plan.



-  Agricultural Resources Focus Area
-  Agricultural Districts 2008

Data Sources:

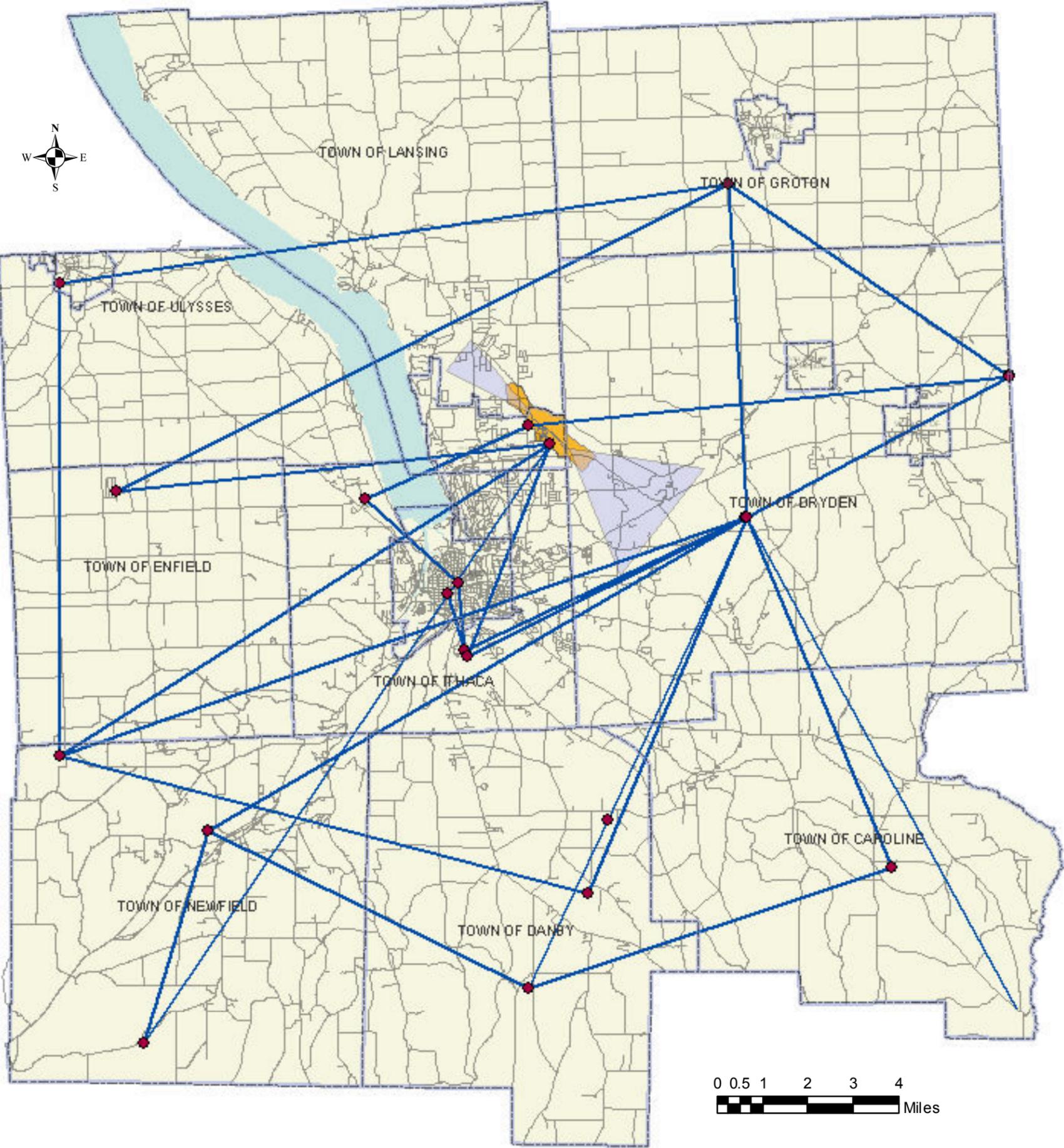
- Agricultural Resources Focus Areas:
 - Tompkins County Planning Department, 2009.
- Agricultural Districts 2008:
 - New York State Ag and Markets, 2008
- Municipal Boundaries: Tompkins County Assessment 2009



Public Facilities

There are certain public facilities that could be negatively affected by the location of wind farms.

This map shows the location of the county's Emergency Communications System, both towers and line-of-site connections between them. The map also shows those areas around the Ithaca-Tompkins County Airport where height restrictions have been established.



- County Emergency Communication System
- Lines of Site Connections
- Approximate Runway Approach Zone
- Airport Clear Zone

Data Sources:

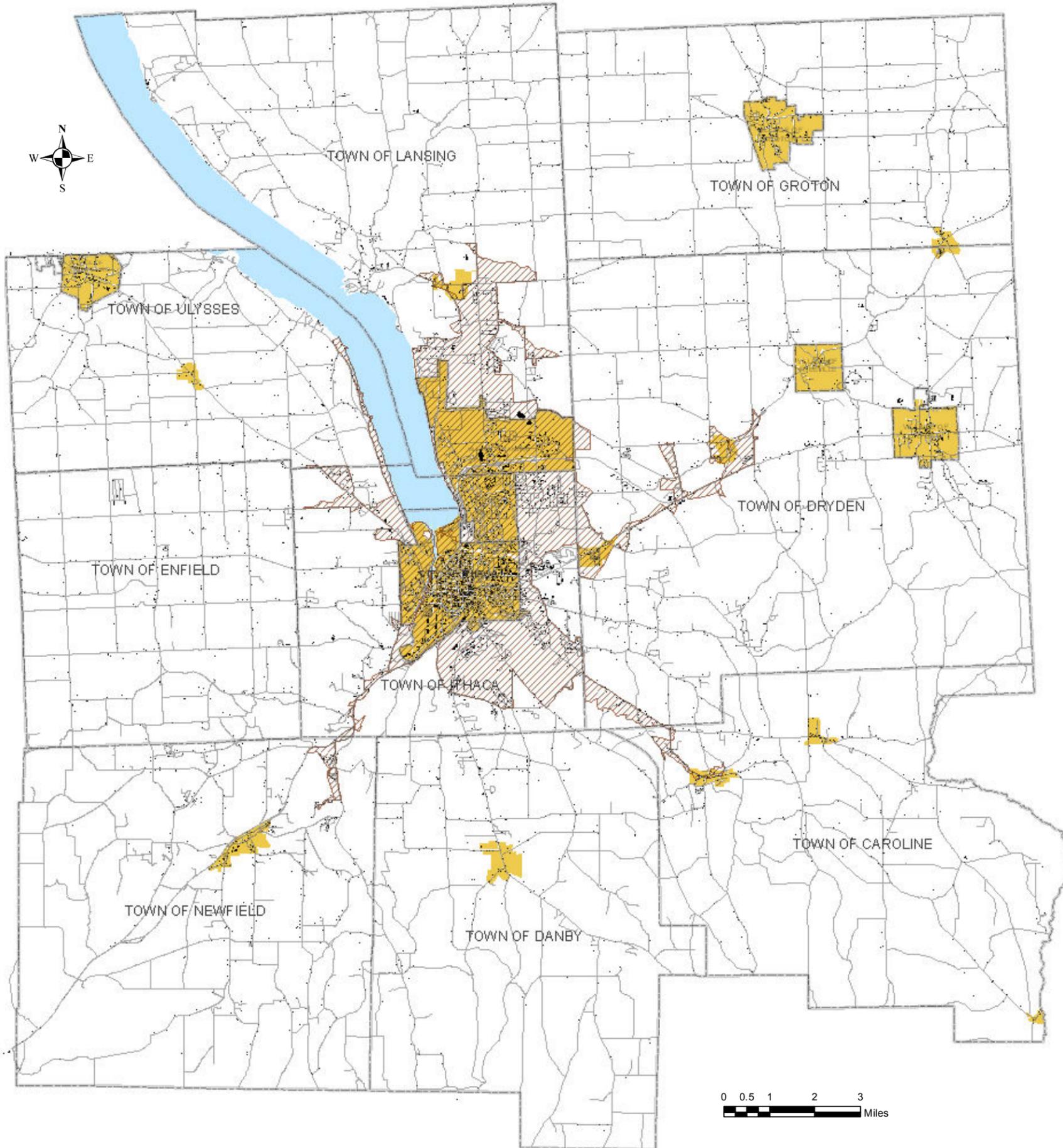
Communications Towers and microwave paths- Tompkins County
Emergency Response 2009
Airport Runway Approach and Clear Zone - Tompkins County Airport
Municipal Boundaries - Tompkins County Assessement 2009



Developed Areas

In general, commercial wind farms should not be located in heavily developed areas due to potential conflicts.

This maps shows the location of the urbanized area of the county, the location of developed centers, and individual buildings can also be seen.



- Buildings
- Urbanized Area (MS4)
- Developed Centers

Data Sources:

Urbanized Areas (MS4) - US Census Data 2000
Developed Centers - Tompkins County Planning Dept 2009.
Buildings - Tompkins County GIS 2009.
Municipal Boundaries - Tompkins County Assessment 2009.



Environmentally Sensitive Areas

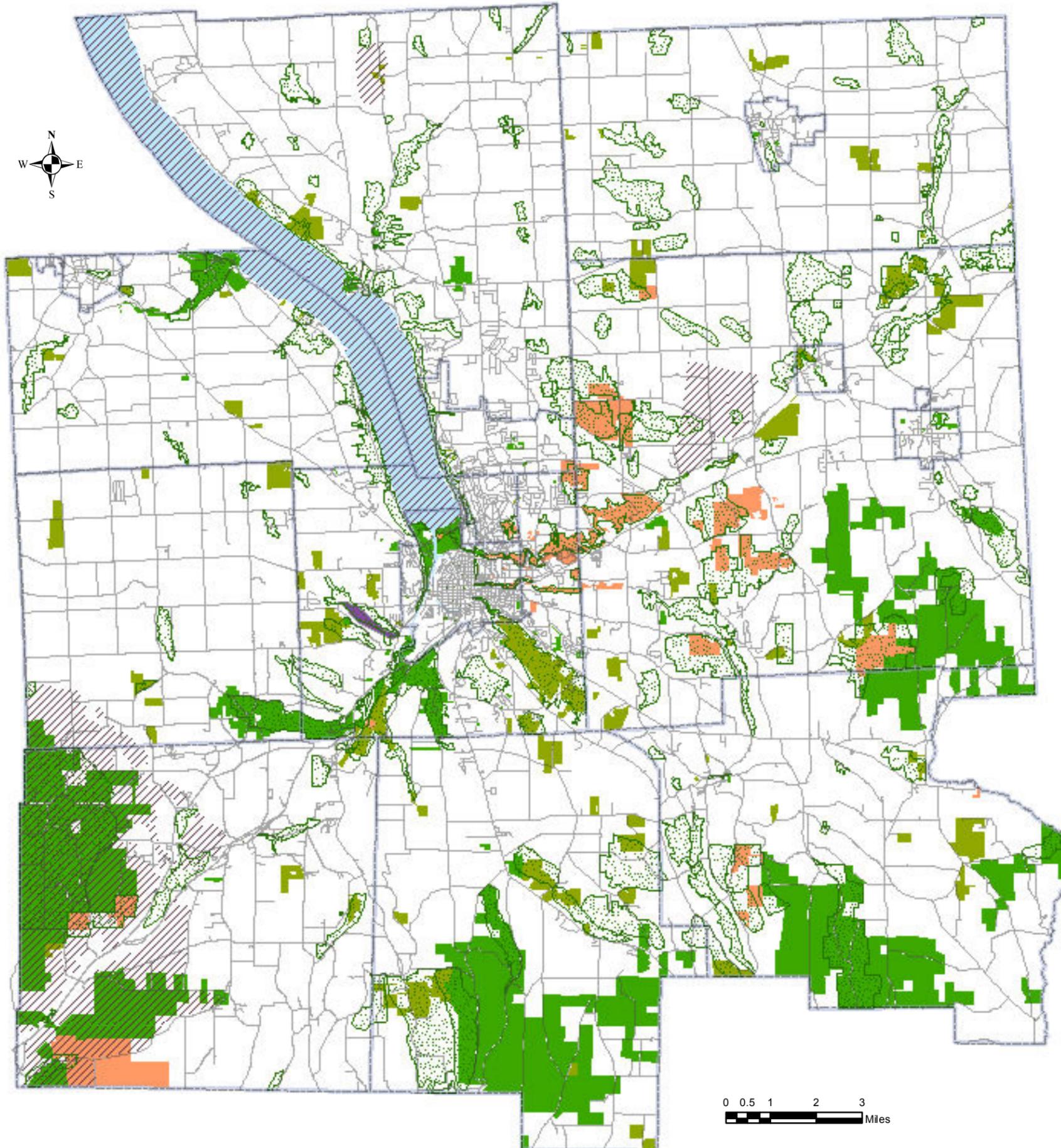
The development of commercial wind farms should take into consideration the potential environmental impact on nearby natural resources.

This map shows the location of municipal and state open space, nature preserves and conservation easements, natural areas, and important bird areas.

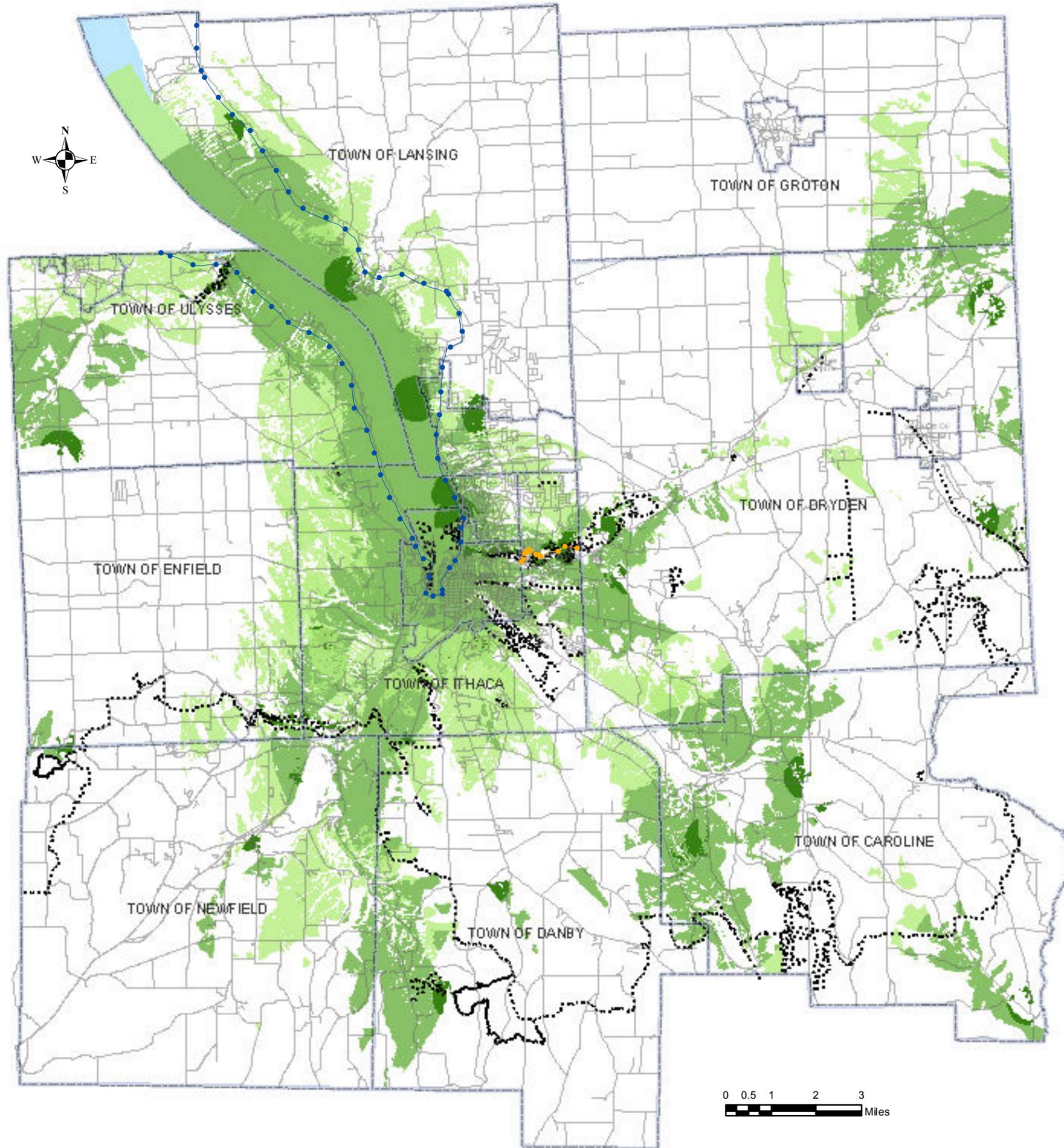
-  Unique Natural Areas
-  Important Bird Areas
-  Cornell Natural Areas
-  Public Open Space
-  Critical Environmental Area
-  Nature Preserves and Conservation Easements

Data Sources:

Municipal Boundaries - Tompkins County Assessment 2009
Unique Natural Areas - Tompkins County Environmental Management Council 1999
Important Bird Areas - Audobon Society, 2005
Cornell Natural Areas - Cornell University website.
Municipal Open Space - Tompkins County Planning 2009
State Open Space - Tompkins County Planning 2009
Critical Environmental Area - Town of Ithaca
Nature Preserves - Finger Lakes Land Trust and Tompkins County Planning 2009
Conservation Easements - Tompkins County Clerk 2009



Scenic Features



Commercial wind farms can dominate the landscape in the immediate vicinity and, because of their height, can be seen at some distance.

This map shows the location of lands in the foreground (within ½ mile) of a distinctive or noteworthy view and lands within any distinctive or noteworthy viewshed. State-designated Scenic Byways are also shown, as well as existing and proposed trails.

Legend

- Cayuga Lake Scenic Byway
- Forest Home Scenic Byway
- Trails
- Half-mile Viewsheds
- Three-mile Viewsheds
- Five-Mile Viewsheds

Data Sources:

Trails - Tompkins County Planning Dept, Finger Lakes Land Trust and Finger Lakes Trail Conference 2009
 Cayuga Lake Scenic Byway - Tompkins County Planning 2009
 Forest Home Scenic Byway - Tompkins County Transportation Council 2009
 Viewsheds - Tompkins County Planning Dept 2007
 Municipal Boundaries - Tompkins County Assessment 2009

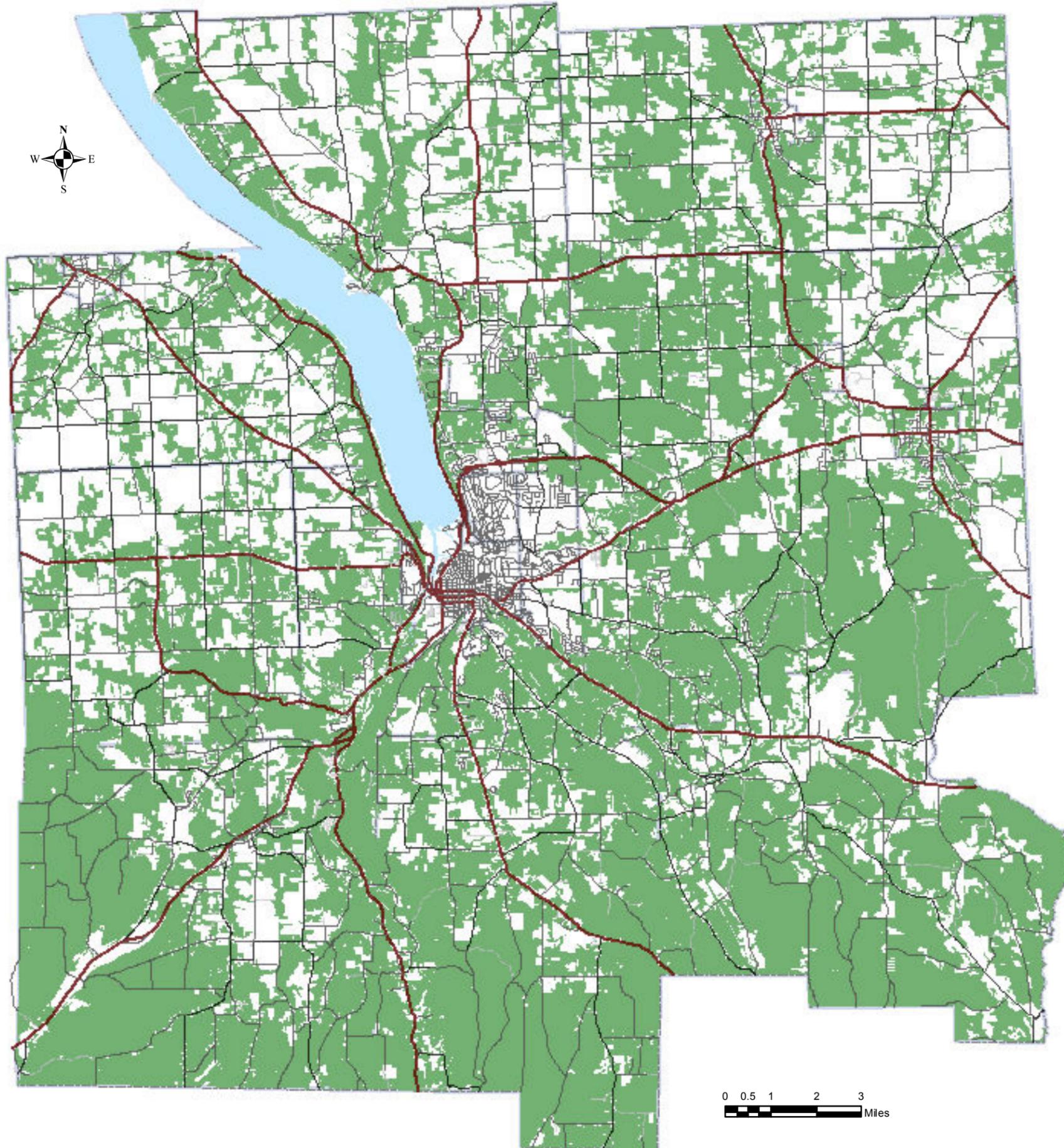


Forested Areas

Forested areas offer special concerns for the location of commercial wind farms. They offer the potential for partial screening of wind turbines, limiting their visual impact.

However, the development of wind farms in these areas can also result in the removal of a large number of trees, further changing the landscape. In particular, disturbance of large areas of forested lands can fragment the habitat, resulting in significantly smaller contiguous areas of forested landscapes. The turbine sites, service roads, and power transmission lines all add to the fragmentation of forested areas.

This map shows the location of forested areas of at least 135 contiguous acres in Tompkins County.



Forest

Data Sources:

Forest - Tompkins County Planning, Land Cover Inventory, 2007

