

GEOGRAPHIC INFORMATION SYSTEMS

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Westchester County GIS Maps Southern Exposure

County residents can map solar power potential

County GIS has recently completed the development of an online mapping application which enables property owners and residents of the county to determine which properties have good "southern exposure" and may be suitable locations for developing solar power.

Entitled the "Solar Power Property Finder," the user-friendly application is launched by entering a street address and then locates the address in context of the appropriate tax parcel, building footprint, surrounding planimetric data, and shaded southern exposure polygon data (Figure 1).

Embedded in the county's primary online mapping portal *Mapping Westchester County*, the application comes with the normal suite of mapping tools including zoom/pan, identify, and the capability to print from a 8" X 11" map template.

Application Components

In order to identify areas of the county with

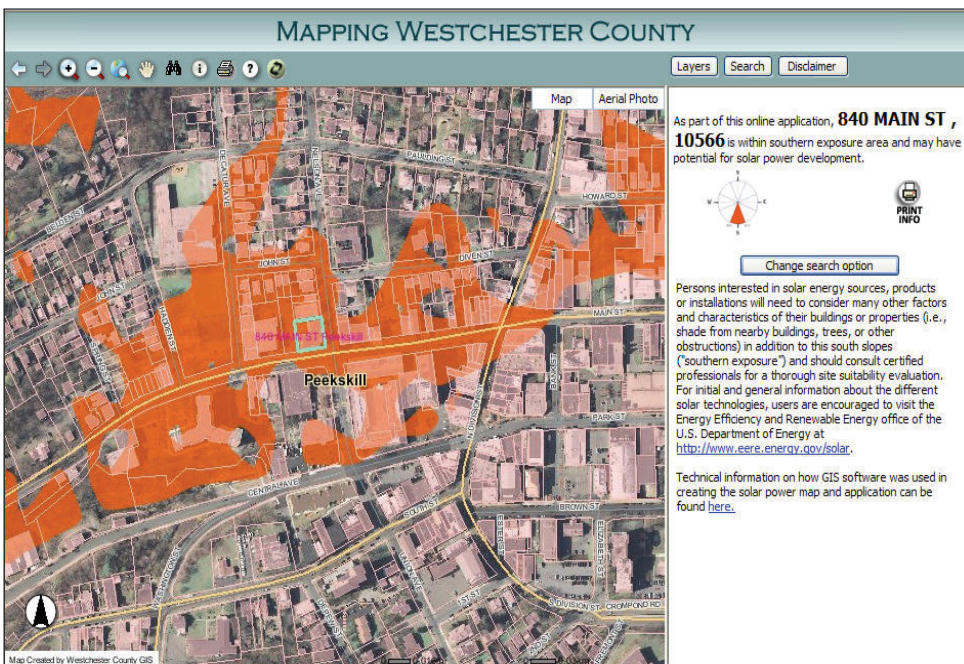
a southern exposure it was first necessary to develop a Digital Elevation Model (DEM) based on 25-foot contours from the countywide base map project. Using ESRI's ArcGIS Spatial Analyst Extension software, the DEM was processed to derive an "Aspect" map.

The Aspect map shows the solar orientations of slopes in the county, identifying the compass direction of the landscape, where South = 180°, North = 0°, East = 90°, and West = 270°. The Aspect map was then reclassified to highlight south facing slopes (those values between 157.5° and 202.5°).

Next, using ArcGIS Desktop, southern exposure areas were "smoothed" around edges for better cartographic representation. Finally, southern exposure areas which intersected building footprints were selected, along with areas over 0.11 acres in size. (Note: Additional software and

data processing information is available from within the online application.) Persons interested in solar energy sources, products or installations will need to consider other factors and characteristics of buildings or properties (i.e., shade from nearby buildings, trees, or other obstructions,) and should consult certified professionals for a thorough site suitability evaluation.

The *Solar Power Property Finder* application can be accessed from the interactive Mapping Westchester County application at <http://giswww.westchestergov.com>. A PDF map (9.7MB) of the Southern Exposure areas is also available for download under the Service Center tab on the GIS homepage. For more information on the *Solar Power Property Finder* application, contact Xiaobo Cui at xxc1@westchestergov.com.



This image highlights 840 Main St., Peekskill, NY 10566 showing it may be a candidate site for solar power development. ESRI's ArcGIS 9.2 Desktop, Spatial Analyst Extensions, and ArcIMS software were used in the development of the application.

GeoSpatial Summit

May 20, 2009

8:00AM - 5:00PM

Pre-Summit Evening Reception
May 19th

6:30PM - 9:30PM

Proctors Theater
Schenectady, NY

The New York State GeoSpatial Summit is a great opportunity to network with other GIS professionals and hear about the industry's new perspectives. Speakers for this year's event include Anne Hale Miglarese, Booz Allen Hamilton; Jim Geringer, ESRI; Ronald Beck, USGS; Art Kalinski, Pictometry International; and Adam Szofran, Microsoft, among others. To register or for more information visit www.nygeo-summit.org.

Countywide Parcel Data

GIS staff recently completed, for the very first time, a countywide point dataset of street addresses, produced from parcel tax assessment records. Where available, the dataset also contains Section-Block-Lot (SBL) information, so that it can be associated with other tabular data as required. Assessment records typically include a site or property address, with house number and street name - though for undeveloped parcels this information may not exist. The data incorporates even more spatially accurate building 'centroid' data for four municipalities. The impetus behind the effort was to improve location results for County geocoding applications, including the Enterprise Geocoding Service currently in development under contract with Bergmann Associates. For more information, contact Deborah Parker at dape@westchestergov.com.

Enterprise Geocoding Service

In 2008, Westchester County GIS released a RFP to develop an enterprise geocoding service. After a series of interviews and a lengthy review process, Bergmann Associates (Rochester, New York) was awarded the project in December 2008. The Bergmann Associates Geospatial Division team will assist the county in creating a service which will result in a common, standardized source of address-based geographic locations (geocoding) for multiple systems throughout the County. The implementation of this service will ensure users get consistent results for address locations, eliminating the inefficiency and time lost investigating location discrepancies. For more information, contact Dongming Tang at dqt3@westchestergov.com.

Mapping Web Visitors

Using Google Analytics (<http://www.google.analytics>), GIS staff has assembled data which provides background on web traffic data (visitors) for the GIS website (<http://giswww.westchestergov.com>). Web traffic metrics indicate that in 2008, the top five countries visiting the GIS website (in descending order) include the **United States, India, Canada, United Kingdom**, and the **Philippines** and the top five states include **New York, New Jersey, Connecticut, California** and **Texas**. Leading cities include **New York, Brooklyn, the Bronx, Elmsford** and **White Plains**. Such statistics assist the county in creating focused outreach programs which expose the county's GIS website to users in both general and mission critical web mapping programs. Be a statistic! Visit the county's GIS website at <http://giswww.westchestergov.com>.

Optimal Routing Application (ORA)

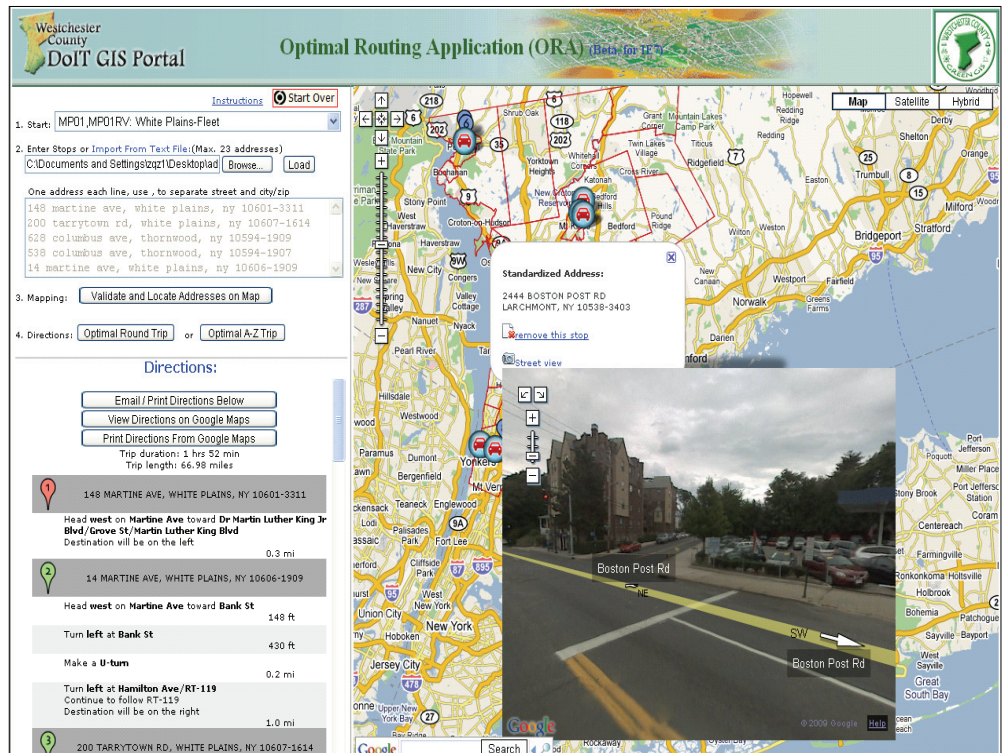
Application leverages Google Maps API and other online resources

County GIS staff has designed and developed an application which is being offered to county staff to provide "optimal" routing functions for county vehicles. Unlike the popular online "map directions" programs which generate a sequence of directions (or stops) based solely on the order of the addresses provided by the user, this new GIS utility employs geospatial concepts and creates a travel manifest in "optimal order" which minimizes the number of miles needed to reach all of the specified addresses or stops. The user interface provides tools to enter multiple addresses or load addresses from a specified text file. The Optimum Routing Application (ORA) takes advantage of the free and powerful Google Maps API (<http://code.google.com/apis/maps>) which enables software developers to embed Google maps to their own application and add map content to create robust map application. Building the application within this framework also leverages other recognized Google Maps elements such as performance, powerful functionalities, and easy-to-use map tools. ORA users can easily switch between Map, Satellite and Hybrid options within the map viewer and includes county specific data layers such as county motor pool locations and municipal boundaries.

The ORA interface has been designed for ease of use. Users start the application by either selecting one of the county motor pools

or a specified address as the starting location and then enter stops (addresses) which define the trip. Addresses are validated and geocoded with County's geocoding web service and then plotted on the map viewer. Users now have the option to choose Optimal Round Trip or an Optimal A-Z Trip as part of their immediate routing needs. Users have several options for the output of directions. They can either print or alter the route from Google Maps, or print/email the route directly from the application. Google Maps Street View (<http://maps.google.com/help/maps/street-view>) has also been integrated into the application providing street level perspectives of the geocoded locations. The application's core function in generating the "optimum route" is provided by OptiMap, the script available for download from <http://www.gebweb.net>. Use of the script is available under the Common Public License as part of the Open Source Initiative (<http://www.opensource.org/licenses/cpl1.0.php>).

Since its release in January, the ORA application has been accessed by over 285 county users. Reducing the miles driven in county vehicles will save county tax dollars, reduce fleet management maintenance costs, and reduce the county's carbon footprint as part of the County Executive's Global Warming Task Force initiative. For more information on ORA, contact Zhenglu Zhang at zqz1@westchestergov.com.



The ORA application integrates the Google Maps API and Open Source components with other county resources to create "optimum routes" for trips. The application includes estimated mileage and turn directions (left panel) with maps, and customized information boxes including Street View (right panel).

GIS Applications Across County Agencies

Desktop, internet map services, and data viewers provide range of user options

GIS staff continues to collaborate with a growing number of GIS users in county government, supporting mapping and data development programs in areas such as Probation, DOT, Traffic Engineering, and Parks among others. While many applications have leveraged ArcIMS technology over the past 3-4 years, the county is now migrating to ArcGIS Server technology. The adoption of this new technology has many benefits, such as fast development, rich functionality, ease of maintenance and better performance. Illustrative GIS efforts include:

Probation: GIS created and supports Police District (PD) Locator and Sex Offender Address Verification (SOAV) applications for the department's Family Justice Bureau. The PD Locator identifies police districts and contact information by address. SOAV verifies the distance of an offender residence from schools, day care centers and public parks. GIS staff also provided training on the password-secured 'TrimWeb' automated vehicle tracking (AVL) application from Trimble Mobile Solutions. Nineteen supervising officers and assistant commissioners were trained on map viewing and replay tools, and customizable reports.

DOT: GIS is being used to develop a map to depict 2008 bus route service changes for its Bee-Line bus system. The Bee-Line is the second largest fixed-route bus system in the state, operating 64 routes each weekday and serving approximately 100,000 riders each weekday.

GIS helps DOT staff identify route connections and potential expansions. At county airport DOT staff uses GIS to display flight paths and noise monitors. Maps are used in public meetings to compare the number of flights in/out of the county airport vs flights from other regional airports. Maps also include location of noise monitors used for assessment and planning.

Traffic Engineering: This division, responsible for county roads and bridges, recently completed a pilot project to inventory approximately 1,000 new signs as they were installed on 13 miles of the Bronx River Parkway. The inventory process incorporated a custom ArcPad application on a Trimble Recon handheld, a digital camera, and a Trimble ProXR backpack GPS.

Parks, Recreation, and Conservation: the Conservation division now has ESRI software at the four Nature Centers with a broadband fiber optic connection to an enterprise GIS database. Curators and naturalists at these locations use GIS and GPS to map and track changes in wetland habitat such as vernal pools, salt marshes or invasive species such as phragmites, to delineate ecological communities, and for other special projects.

For more information on these applications contact Deborah Parker dape@westchestergov.com, Jennifer Irven at jmi2@westchestergov.com (DOT) or Zhenglu Zhang at zqz1@westchestergov.com.

New Website Launched

Westchester County GIS launched a new website in February which includes improved user utilities, resource and technical documentation, and new datasets. The new *Service Center* provides information on connecting to new map service technologies and links to download data viewers such as Google Earth & ArcGIS Explorer, NASA World Wind, GAIA 3, and Microsoft Virtual Earth. In addition to providing access to dozens of countywide GIS data layers in ESRI shapefile format, the *Data Warehouse* now also provides users with the ability to download Google Earth KMZ files for selected coverages. Planimetric datasets from the county basemap program are also available. Users can also take a short survey to assist county staff identify specific data and application needs of Westchester County geospatial community as well as to measure overall website user satisfaction. The new and redesigned website can be accessed at <http://giswww.westchestergov.com>.

Spring 2009 Aerials

A scheduled NYC Dept. of Environmental Protection (NYCDEP) photogrammetric project next month will provide the basis of new countywide one-foot resolution digital orthophotography. Though the project "geographic" footprint originally only included NYCDEP water supply and aqueduct lands throughout the county, county GIS staff were able to coordinate the project with funding from the U.S. Geological Survey to include both orthophotography and LiDAR data capture for all remaining areas of the county (486 square miles total). County staff are also reviewing options to update selected countywide planimetric datasets (last updated from Spring 2004 photography) from the 2009 NYCDEP project. For more information, contact Sam Wear at stw1@westchestergov.com.

Upcoming GIS Events

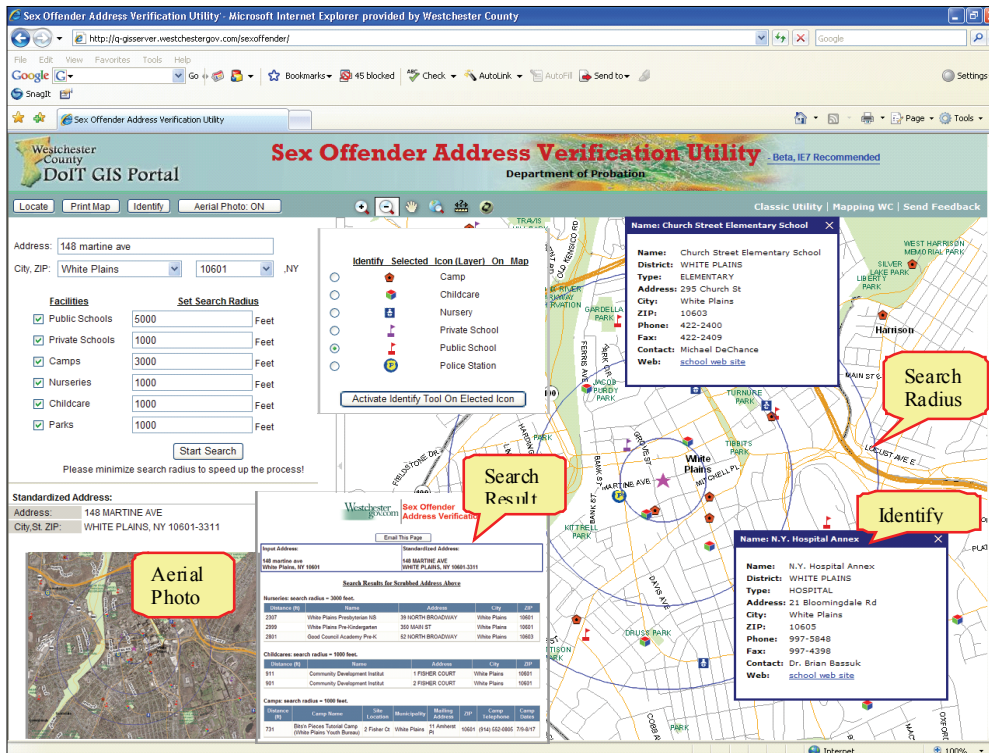
NYS GIS Conference

The 25th Annual New York State Conference will be held at the Crowne Plaza, Lake Placid, NY, October 25-27, 2009. A wide range of workshops, vendor presentations, and demonstrations including poster sessions are scheduled. For more information and registration visit www.esf.edu/nysgisconf.

NEARC

NEAR's spring meeting will be held May 12, 2009 at the Smith College Campus Center in Northampton, Massachusetts.

The 24th Annual Northeast Arc Users Group conference will be held in Hyannis, Massachusetts, October 4-7, 2009. For more information on these events visit www.northeastarc.org.



The Sex Offender Address Verification and Police District Locator applications are similar in design and functionality. Both are built on ArcGIS Server, Pitney Bowes Address Broker for geocoding, and written in C Sharp programming language combined with AJAX and JavaScript.

Articles and graphics in this newsletter prepared by: Xiaobo Cui, Jennifer Irven, Ana Hiraldo-Gomez, Cynthia Louie, Deborah Parker, Dongming Tang, Ilir Tota, Sam Wear, and Zhenglu Zhang.



<http://www.westchestergov.com>

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GIS Exhibits at the Greenburgh Nature Center

From February 8 through June 2, 2009 the Greenburgh Nature Center is hosting a Natural History Exhibit “Meeting Environmental Challenges in Westchester County,” sponsored in part by Westchester

County Parks, Recreation and Conservation. County GIS staff contributed a set of three (3) maps: “Green Facilities & Services,” “Environmental Features,” and “Wastewater Management Facilities & Hazardous Waste

Sites” for the exhibit. Both the *Environmental Features* and the *Green Facilities & Services* map focus on our natural resources such as water, open space, and river basins. In addition, *Green Facilities & Services* map shows the location of “green” sites which include nature preserves, farmer markets, cell phones dropoff locations, and energy star retailers among others. The *Wastewater Management Facilities & Hazardous Waste Sites* show locations of sewage treatment facilities and designated Environmental Protection Agency (EPA) hazardous waste sites.

“Saving the planet may best be achieved by starting at home. Our exhibit shows how we can all be better stewards of our planet and its resources,” said John Mancuso, director of the naturalist Education and Graphics at the Greenburgh Nature Center. “Stormwater run-off, idling cars and buses, harmful fertilizers and pesticides, consumer generated solid waste; these are formidable issues that are now being addressed by local governmental and community groups, schools, and individuals.” For more information visit <http://www.greenburghnature-center.org>.



The *Environmental Features* map is at the center of the *Environmental Challenge* exhibit now on display at the Greenburgh Nature Center. Major environmental themes of the exhibit include recycling, solid waste, water quality, stormwater management, and air quality.