

Westchester County LiDAR Data

WHAT IS LiDAR DATA

LiDAR basics: Huge numbers of densely-spaced discrete pulses of light (signals) are sent towards a surface from an aerial or, more recently, ground-based, platform. Sensors measure the return time (travel time over the speed of light = distance, or elevation) and other qualities, of all signals reflected back to the platform. The data is delivered in **LAS**-format files. *Millions of highly accurate data points can be produced in just a few city blocks.*

From NOAA: [http://www.csc.noaa.gov/digitalcoast/data/coastallidar/pdf/What is Lidar.pdf](http://www.csc.noaa.gov/digitalcoast/data/coastallidar/pdf/What%20is%20Lidar.pdf)

ABOUT THIS DATA

Westchester County acquired LiDAR data, developed in 2009 through a cooperative project of NYC DEP, NYS CSCIC, and the USGS. The County received the **raw LAS data** (ASPRS LAS v1.1) and a 3-m terrain dataset (UTM, Zone 18N, meters; Horizontal Datum NAD 83, Vertical Datum NAVD 88), and converted the 3-meter-resolution digital elevation model to NY State Plane East, U.S. survey feet. Through a contract, the County will also obtain new products from the LAS data, including updated 2-foot elevation contours, and the first countywide digital surface model (DSM).

These data were specified at accuracies required for updating FEMA flood maps. Collected between April 16 and June 25, 2009, with some re-flights on November 29 and December 2, at a nominal 1-meter point spacing, and a vertical accuracy of 18.5 centimeters root mean square error (RMSE) or better.

DOWNLOAD THE DATA

The **LAS FILES** are being distributed to the general public through Westchester County's **Mapping Westchester County** application: <http://giswww.westchestergov.com/gismap/>

Organized in a grid of square 750-meter-sided tiles ('10-digit-coords.LAS'), each file contains X, Y, and Z coordinates (points) for all returns. Each point also has:

a return number: a single signal can bounce back to the sensor from multiple surfaces depending on the penetrability of the materials it hits (water is essentially impenetrable). *First returns* comprise the uppermost surface.

a code: 1 (unclassified), 2 (bare ground), 7 (low point/noise), or 12 (overlap), and

an intensity: these values can indicate variation of the surface material.

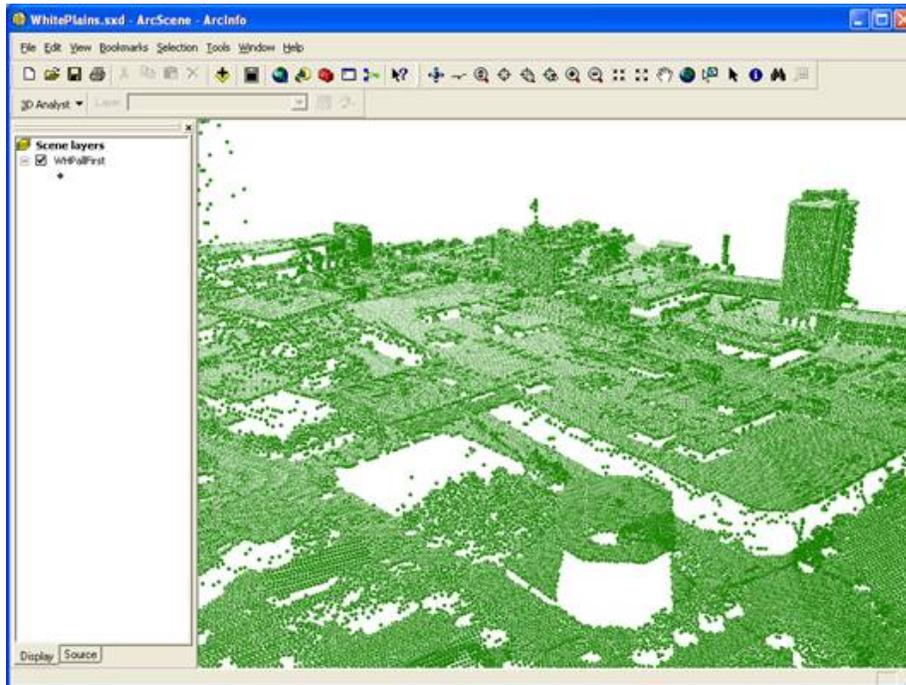
WORKING WITH LAS FILES

1) Using LAS files in CAD software

Especially useful for engineers and planners working in design software such as AutoCAD Civil 3d, LAS files may first need to be converted to TXT. *See sample instructions, pages 3 and 4 of this document.* One free command-line converter utility 'LASTools' can be downloaded here: <http://www.cs.unc.edu/~isenburg/lastools/>

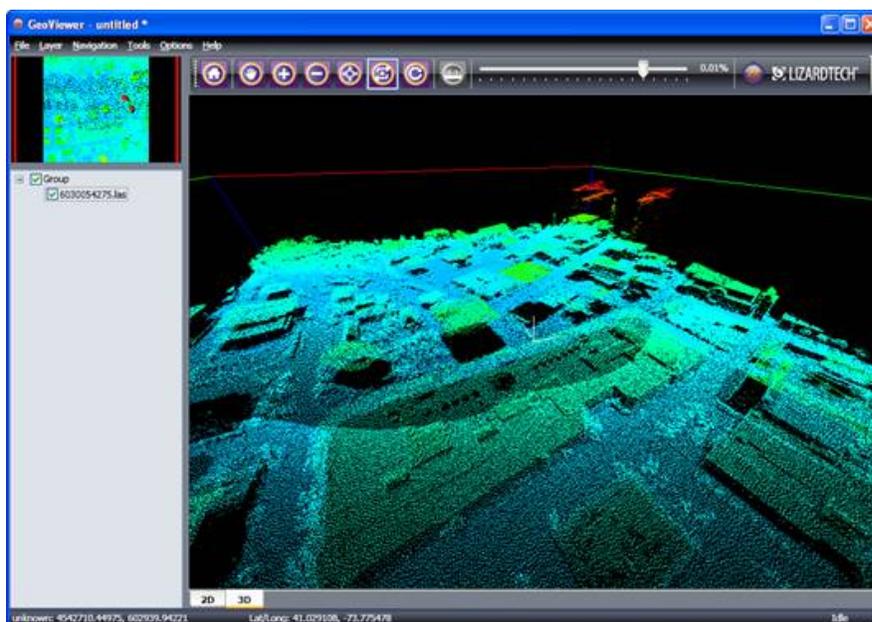
2) Using LAS files in ESRI software

For small-area projects: ArcScene will display output from 3d Analyst/LAS to multipoint tool. NOTE: *first* run Point File Information tool, which calculates average point spacing (required as input for creating the multipoint dataset). The single LAS tile covering the Westchester County Office Building has almost a million **1st Return** data points in it:



3) Free LAS Viewers

Some free Viewers are available that will directly display LAS data, including **GeoViewer** from LizardTech:



Using LiDAR data in AutoCad Civil 3D

Open AutoCad Civil 3D. Start with a new project with your appropriate template open.

Toolspace > Prospector > Right Click on Surfaces > Create Surface (change any settings you want in the dialog box) > OK.

+EG (or your new surface name) + Definition

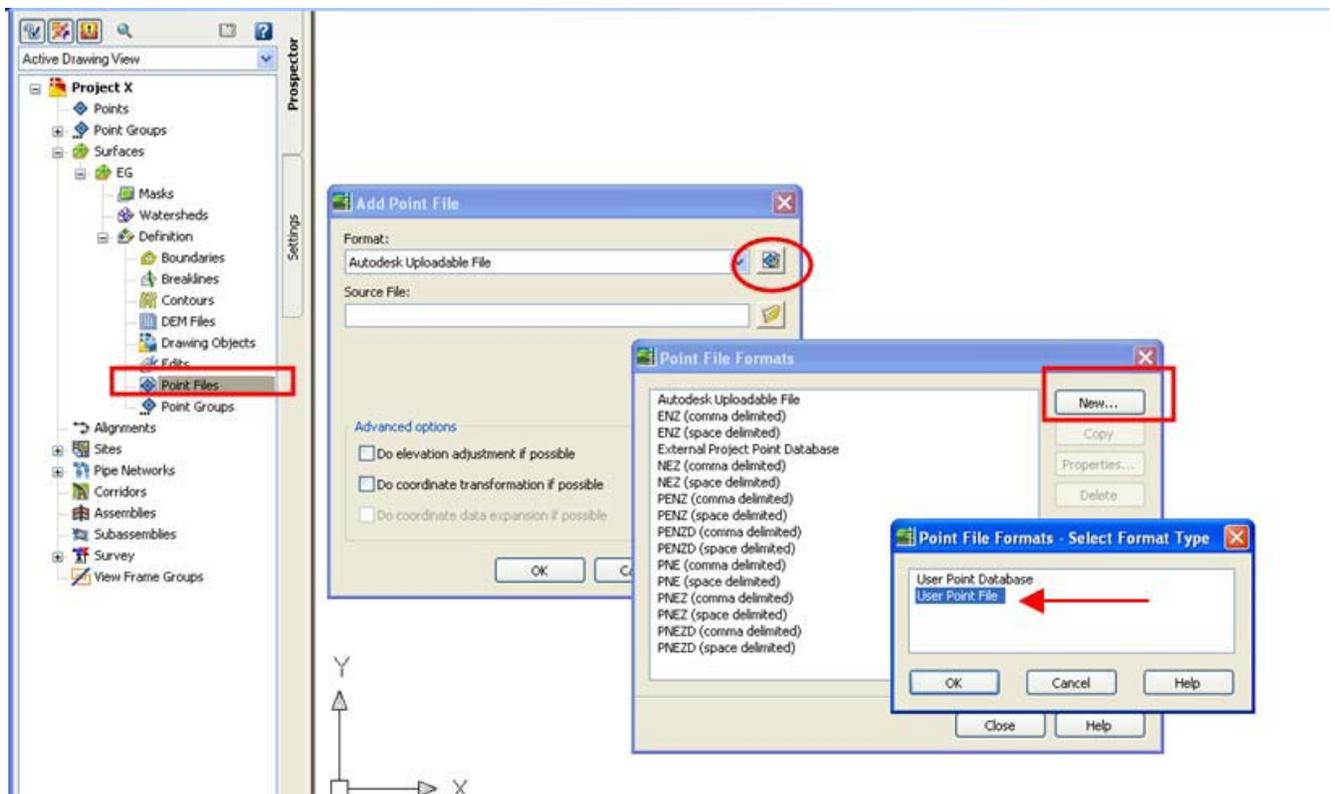
Right Click on “Point FILES” > Add

Check to see if “Your_Lidar” is a Point File Format. If Point File Format is not listed you will need to create this format. This is a “one time deal,” *if you save the changes in your template.* Create a Point File Format, so that inserting Lidar data on a regular basis will be easy.

Click on the “Add Point File Format” Icon

Click “New” in the dialog box

Select “User Point File”. Click “OK”

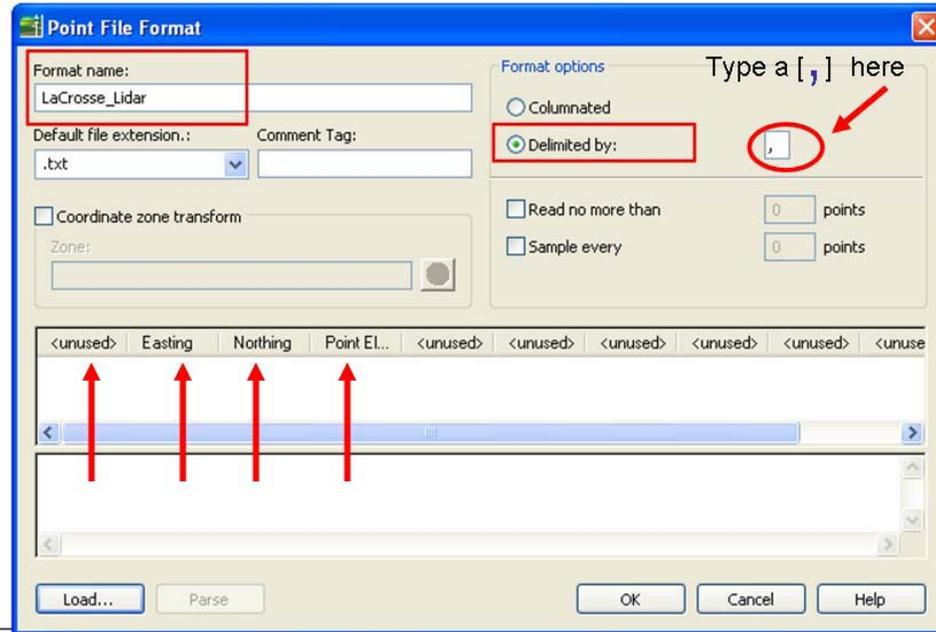


Give the Format a name (don't use spaces or symbols as part of the name)

Under “Format Options” Select “Delineated By” and type in a , (comma) in the box

On the boxes at the bottom click on the words <unused> and select the appropriate choice from the list so it matches the picture below. (*notice the first column is unused*)

Click “OK”



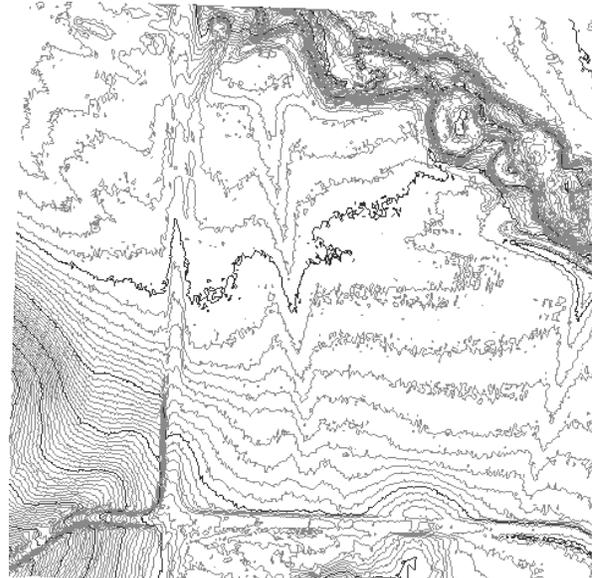
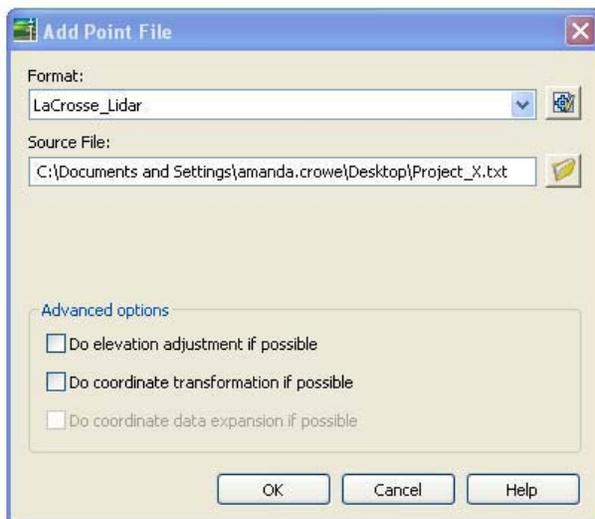
Choose your new Point File format from the list.

Browse to find your “Source file” (the text file with just the project area points).

Click “OK”.

You may have to type in “ZE” to zoom to your data.

The surface should be automatically created:



MORE tutorials:

http://www.co.outagamie.wi.us/landcons/LiDAR/Bringing%20Lidar%20into%20Civil%203D_AmandaCrowe_NRCS.pdf

http://docs.autodesk.com/MAP/2011/ENU/AutoCAD%20Map%203D%202011%20Help/Map3D_2011_HTML_Help/filesBestPracticesForGeoData/WS73099cc142f48755-575eab4c124f5234aa8-29d0.htm