Tools, Tips, and Workflows
What's new in Terrasolid over the past year?
Terrasolid, v015

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Unlike most software vendors Terrasolid makes progressive releases of their software modules over the course of a calendar year. The calendar year in turn corresponds directly with the maintenance cycle for the products. Hence, once a year all users must renew their maintenance and move on to the current year major release (for example, v015 for 2015) prior to the March 31st license expiration. The end of March expiration is simply a means of providing an overlap period between the expiration of maintenance on Dec 31, 2014 and the release of the v015 software and licenses. If you have not received your v015 licenses, and you've made the request for them from Terrasolid, please contact us at support@geocue.com with the information on when the request was made.

Of course, what all of this means is that there really is no major release of the Terrasolid software containing a number of new features but rather a steady stream of new features and refinements that have been added over the course of the past year, enabling users access to those features as soon as they became available. Hence, one cannot simply state what the new features are in a particular version but rather must look at what has been added over the course of the past year.

TerraScan

There were a number of minor modifications to the TerraScan software over the past year, but what follows is a highlight of the new functionality, or ones that may affect most users.

When a user creates a macro using the TerraScan interface, and that macro contains a path, say for an output location, then TerraScan will now save that path in the macro as a relative path to the output folder from the macro folder. This may adversely affect some users' workflows, so it is important to highlight and understand the ramifications. On the plus side, this makes things a lot simpler when moving datasets and macros around as a unit. Note that one may input a full UNC, or logical path, in a macro via an editor, such as notepad, and that will still be used as expected.

The Scale dz from TIN transformation macro process that was introduced last year in order to better visualize the rutting of roads versus the model surface has been streamlined into a Scale dZ from TIN Transformation. The result is an easier way to apply an exaggeration to the road surface, while keeping the overall height unaffected, to enable a direct comparison between a design or desired surface and the surveyed as-built surface.
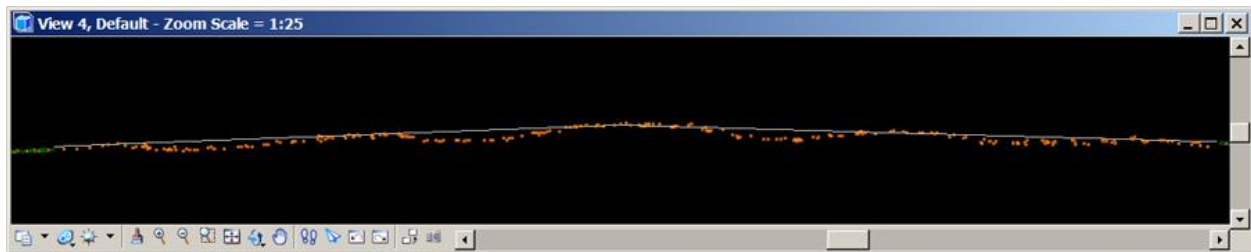
Figure 1 - Scale dZ from TIN result to compare as-built with design surfaces

In the mobile world there are a lot of features for which in the past one had to manually classify. Several tools have been added to assist with this process, some of which may also be directly applicable to high density airborne datasets, such as those collected for corridor work. These tools mainly take advantage of the ability in TerraScan to Assign Groups to points based on their relationship to other points. By doing so, one may then use an old reliable tool, Assign Point Class, to assign a classification to a group of points. In addition, routines have been added to automate the identification of groups of points where there is evidence that the object is moving, such as cars or people, and Classify Moving Objects. This routine does require multiple scanners, as is typically found with most mobile mapping systems. In addition to moving objects, one may now Classify Groups as Trees. This has only been tested with mobile datasets but could conceivably work with high density airborne data as well. This routine does not look for specific shapes of trees, as is done in the Detect Trees routine, rather it looks for groups of points that make sense that they would likely be trees. The new Classify Walls routine is primarily for mobile and terrestrial scanner data due to density requirements and the lack of wall hits in airborne data. The wall routine will classify anything that is a large enough planar surface so it will also pick up large trucks, signage, etc., and more than just the planar surface will get classified as walls generally have features on them such as windows and trimmings. The Classify by Normal Vector routine can be used following the Classify Walls routine to reduce the thickness of the wall classification to just the planar surfaces.
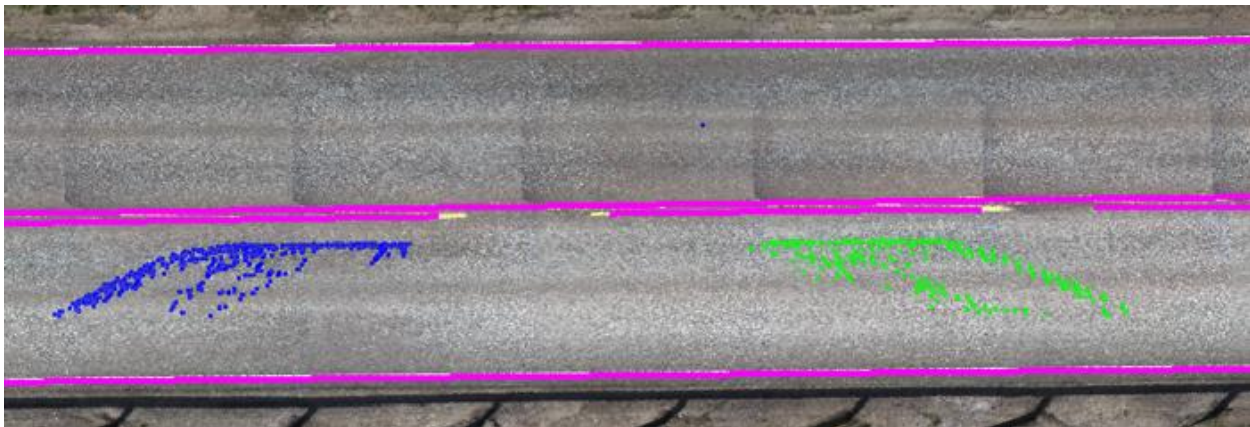

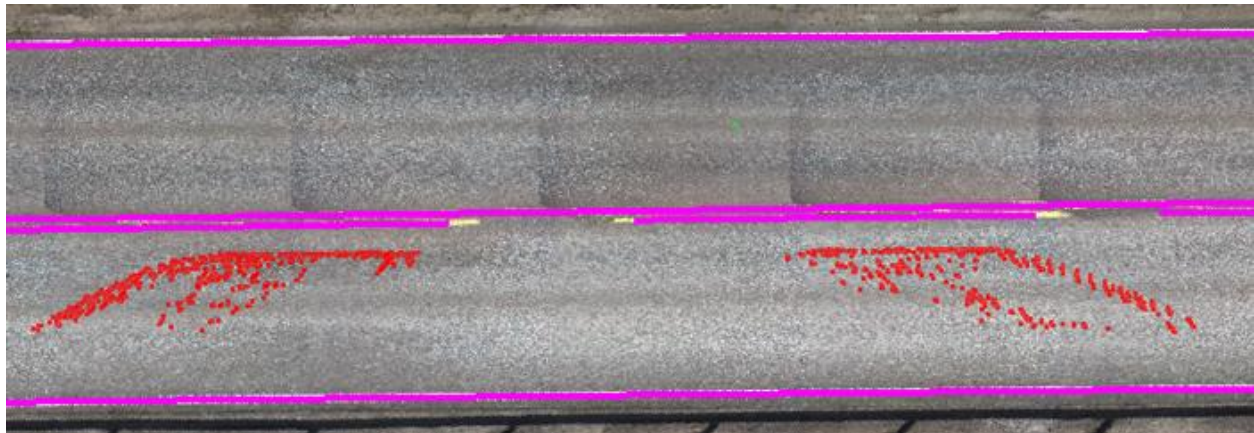*Figure 2 - Moving Objects Displayed By Scanner*

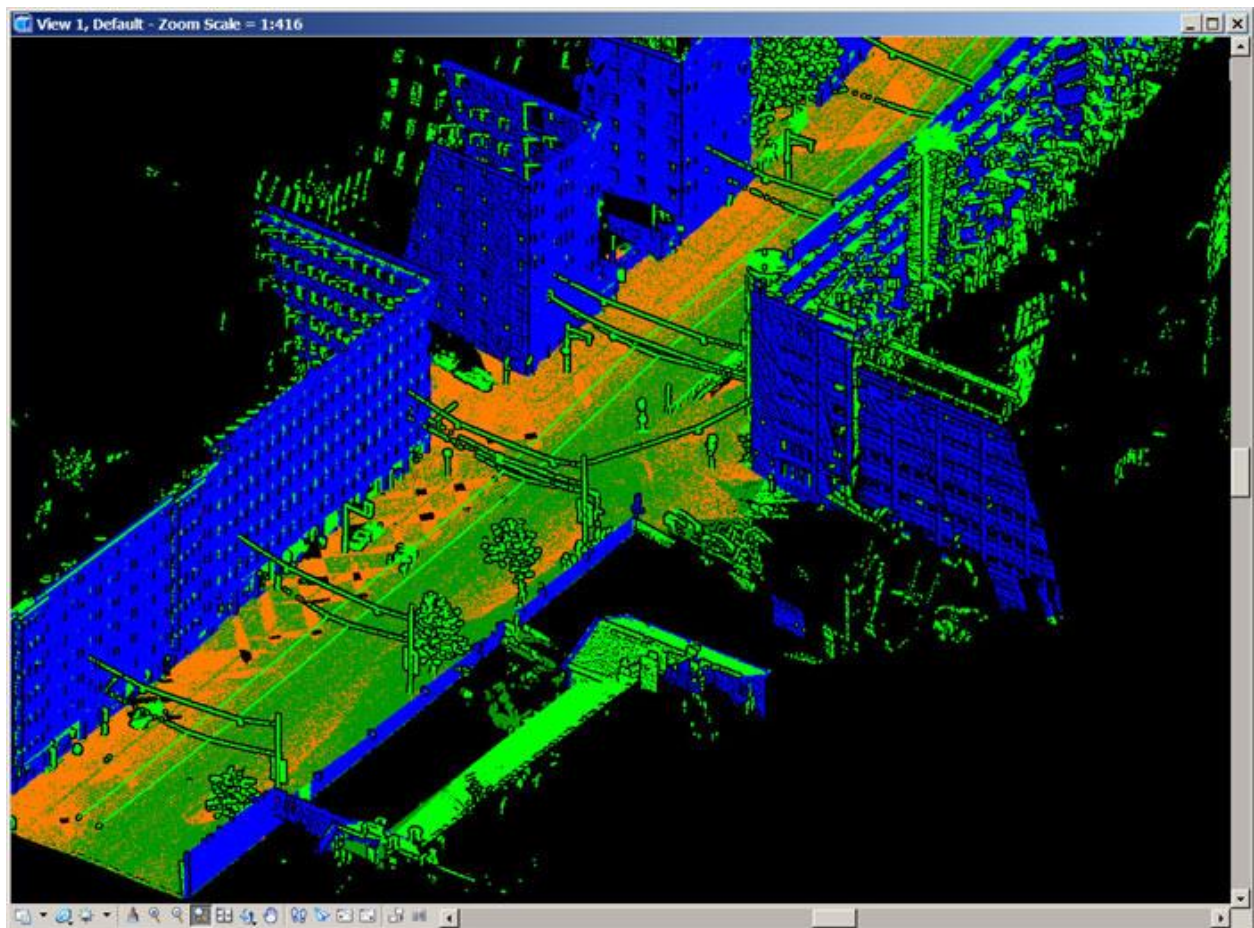*Figure 3 (bottom) - Moving Objects automatically classified*

Figure 4 - Classify Walls Routine

A lot of the new features added to TerraScan are part of a workflow to help achieve a nicely colorized point cloud. Why would one want to do so? On one hand, it makes for very nice visuals of the point data, but the reason that we see as being important is that it brings the mobile dataset one step closer to being a full 3D image with realistic coloring that is easily interpretable by even those unfamiliar with

point clouds. Imagine being able to "walk" down the street and seeing it as you would in the real world but being able to do so and take measurements, etc. all from your desktop. The new visualization tool, Travel View, assists with creating this view of the data.

As we try to automate the extraction of features that are discernable by intensity it becomes necessary to remove some of the noise in this attribute. Two new tools, one in TerraScan and one in TerraMatch (see below), were added specifically to assist with this issue. The TerraScan tool Smoothen Points can now also smooth the intensity values of points based on the intensity values of their neighboring points.

In conjunction with the intensity smoothing and correction tools, there is a new Export Raster Images type called Road Intensity. This improvement is motivated by the idea that an intensity raster can be a product unto itself, especially when driving at night when camera images are not an option. On roads or city streets the surface is pretty much grey scale, occasionally there may be some yellow or red, but usually it is just grey asphalt and white paint, making the intensity image almost the same as an ortho from camera images. Intensity rasters are much easier to generate and the Road Intensity option provides for an improvement of the linear features along the road corridor.
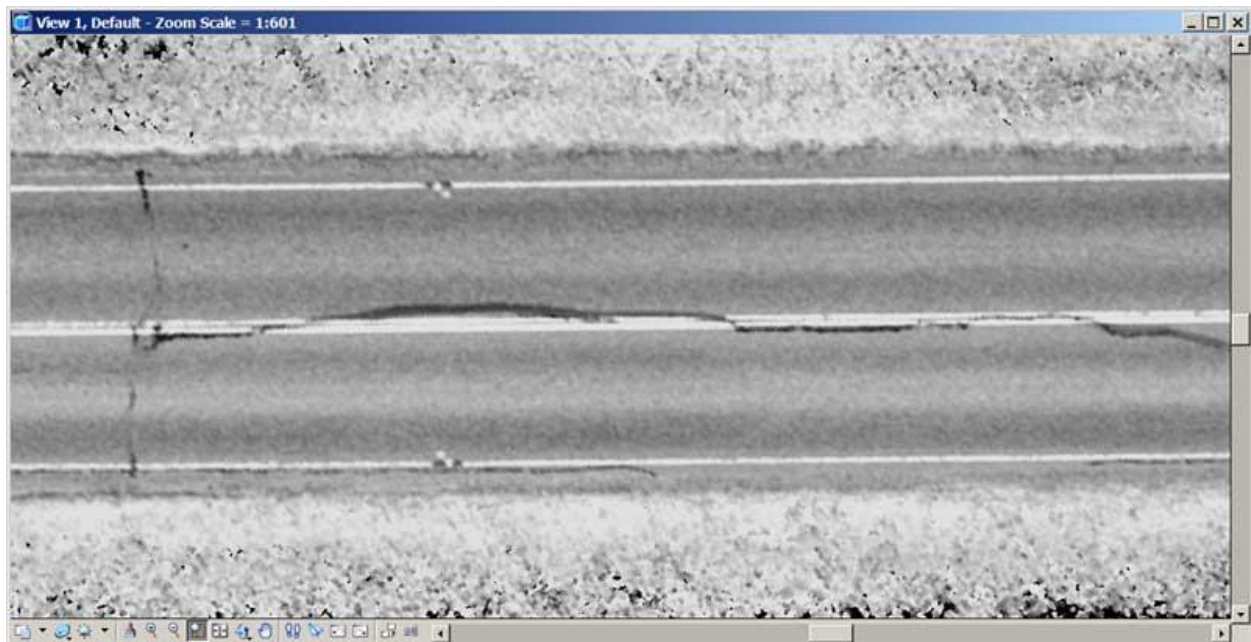

Figure 5 - Road Intensity image

TerraModeler

The improvements in the TerraModeler module were to add additional key-in commands to enable more automated processes. In addition, several tools were adapted to function with the MicroStation v8i display providing greater visibility during those workflows.

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TerraPhoto

The changes within the TerraPhoto software were mainly focused on expanding the color point process, color points and seamlines, to work with the point cloud and not just imagery. This enables a workflow whereby one may elect the best images that see each point in the cloud and eventually lead to the full 3D image with realistic coloring visualization.
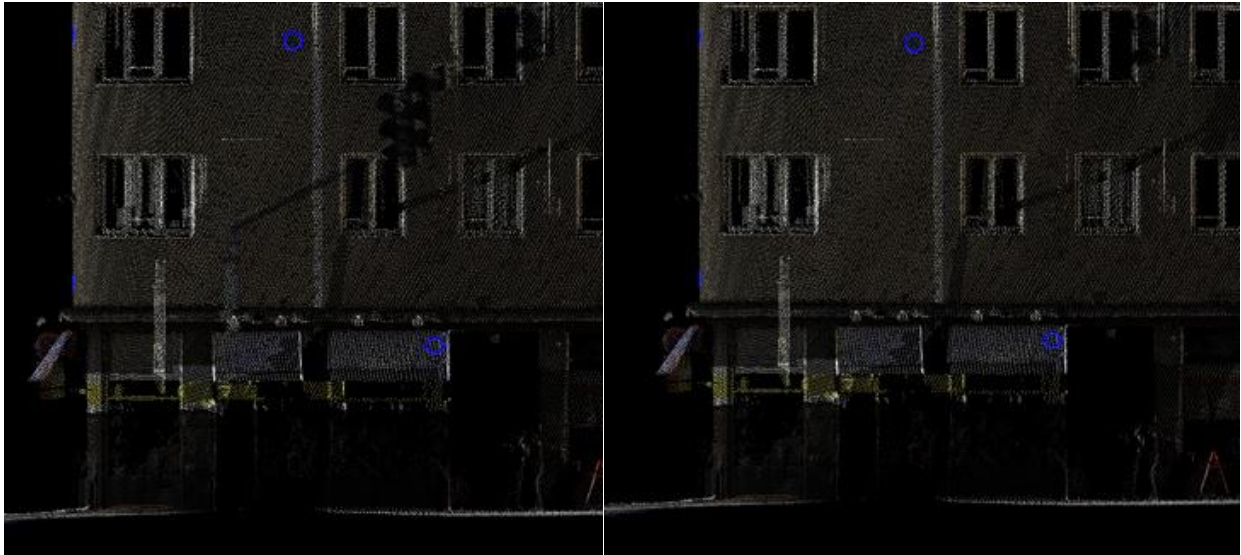

Figure 6 (left) - Color Points on the building

Figure 7 (right) - Seamline inserted to remove the traffic signal and pole from the building colorization

TerraMatch

The correction algorithms in TerraMatch continued to be refined over the past year to help achieve more accurate datasets. These changes included modifying the Find Tie Line Fluctuations and Apply Corrections to remove errors potentially introduced at stops. The first new tool added to TerraMatch was one that enables the ability to Find and Apply a "Rubbersheet" Correction. The finding of the correction was actually added near the end of the v013 software versions, but the application of those corrections using the Apply Correction tool is now possible. This rubbersheet tool enables control points to be used in conjunction with airborne datasets, mobile datasets will more likely use the correction curve from a Find Tie Line Fluctuations, to average the XYZ corrections such that the dataset will best fit the control points.
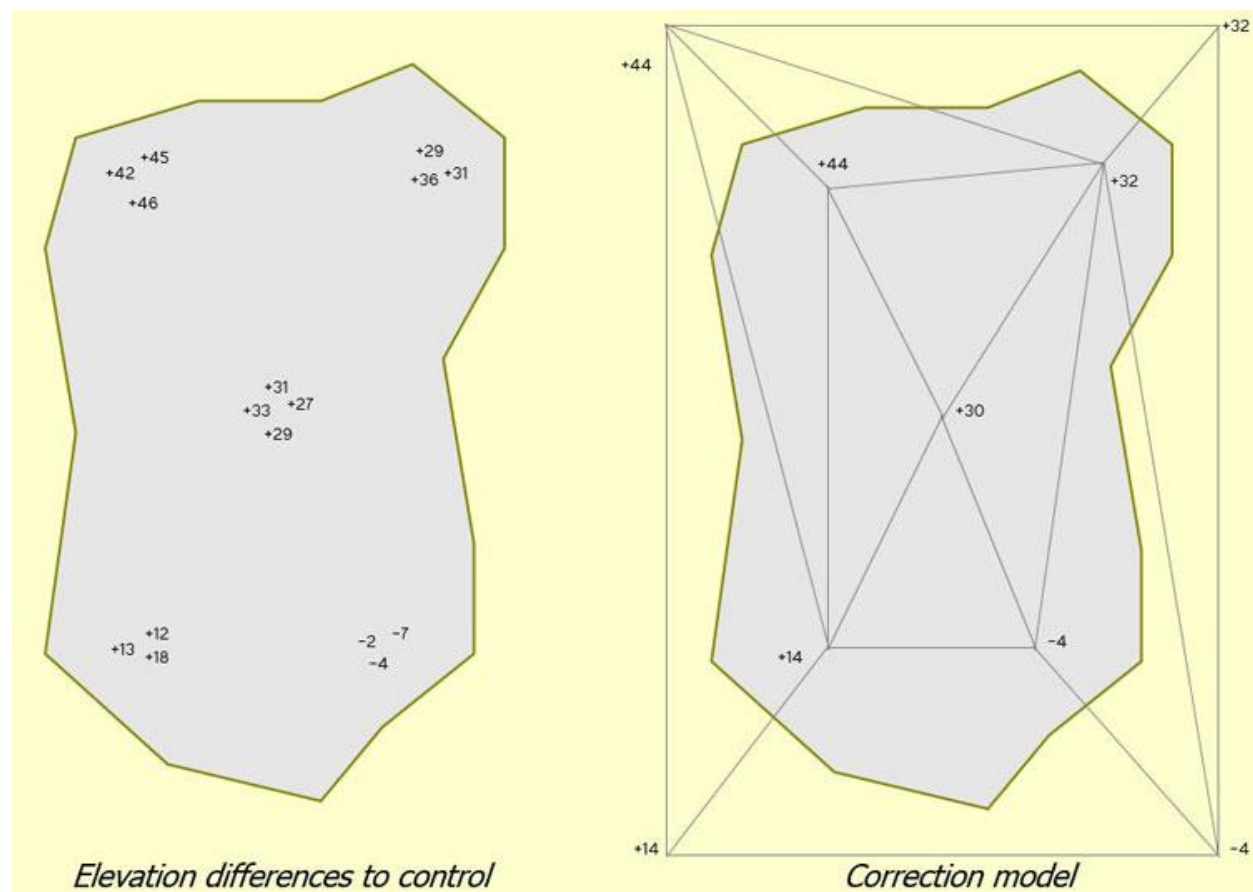
Figure 8 - New Find/Apply Rubbersheet correction

An additional new tool in the TerraMatch toolbox is one to Find Intensity Corrections for mobile datasets as the ranges for the points are affecting their intensity values. This tool used in conjunction with the TerraScan tool for smoothing the intensity values helps automate feature extraction capabilities and minimize false positives.

And more…

There is a 64-bit version of TerraScan that will work with the recently released MicroStation Connect Public Beta 2. More information on the 64-bit modules will be released soon.

For further information on any of the new features or changes introduced to each software module please see the downloadable PowerPoint presentation PDFs found on the "What's New in Terrasolid – Feb 2015" post on our new searchable online product knowledgebase, support.geocue.com. Highlights of the new features were covered in a webinar on Wed, February 18, 2015 which can be viewed by following that link. Apologies in advance for the degraded sound quality. Let us know if there is any assistance we can provide in helping you integrate the new functionality into your workflows.