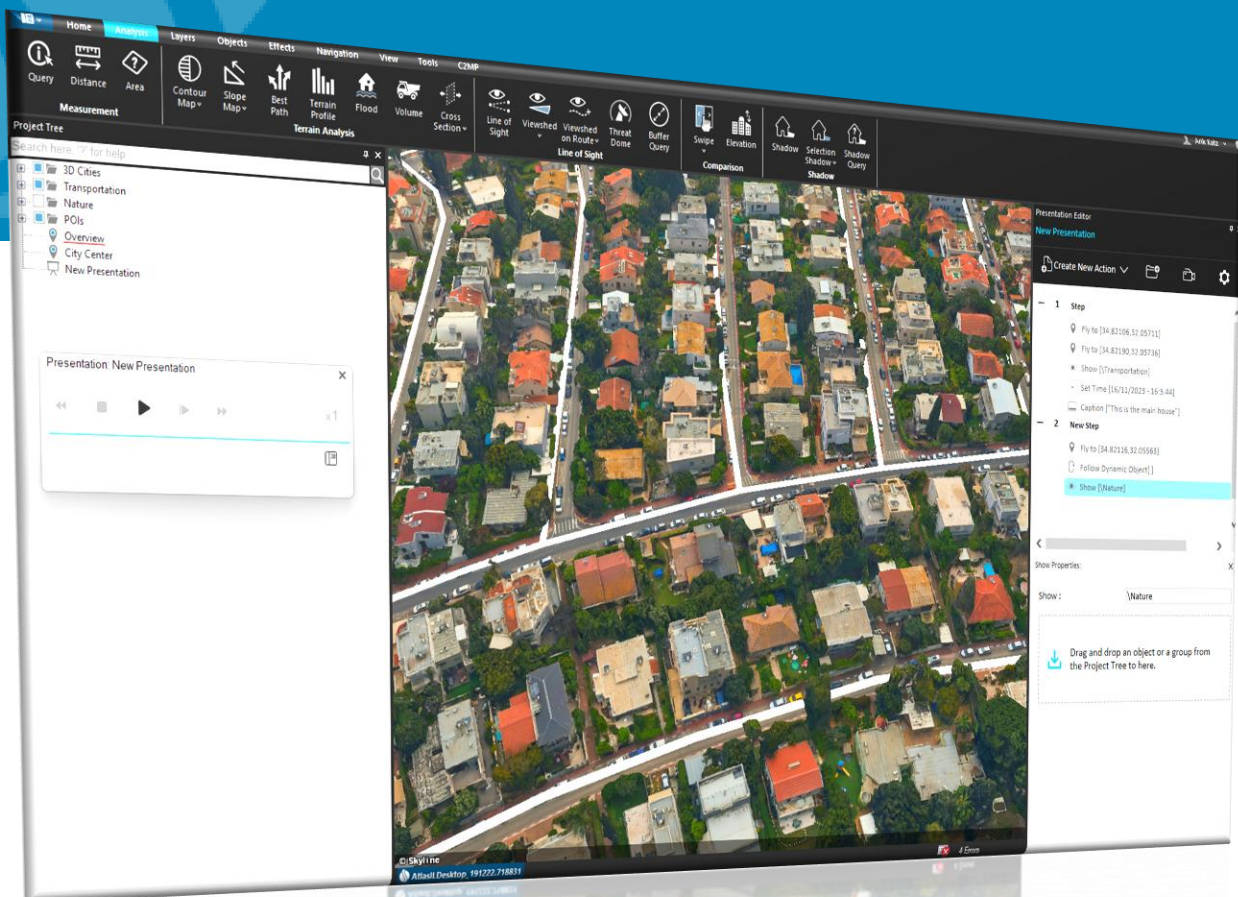


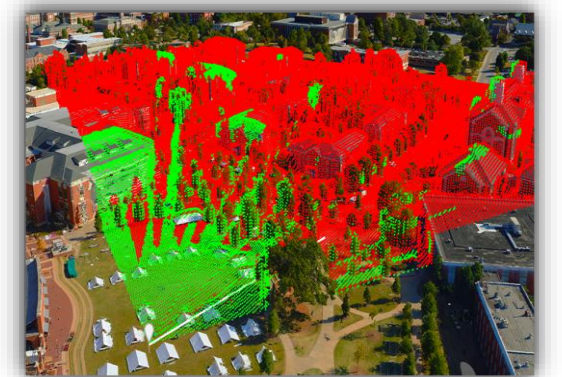
# TerraExplorer for Desktop

## Release Notes

### v8.1



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# OVERVIEW

TerraExplorer for Desktop is a high-performance 3D GIS application for viewing, analyzing, editing, and presenting geospatial data in a rich, realistic 3D environment. It enables users to combine terrain, imagery, 3D models, feature layers, and dynamic objects into compelling visualizations, supported by powerful analysis tools, flexible drawing and styling options, and advanced terrain and mesh editing capabilities. A comprehensive API further allows organizations to extend TerraExplorer or integrate its 3D capabilities into custom solutions.

Version 8.1 delivers major advancements across visualization, analysis, and mixed-reality workflows. Key additions include support for 3D Gaussian Splatting, a new Virtual 3D Layer system for combining multiple overlapping datasets, enhanced Mixed Reality (HoloLens) interaction tools, and a broad redesign of analysis and drawing tools featuring improved accuracy, performance, and usability. Together, these updates make TerraExplorer 8.1 a more powerful, modern, and efficient platform for advanced 3D geospatial work.



## TerraExplorer Support for 3D Gaussian Splatting (3DGS) Data

3D Gaussian Splatting (**3DGS**) is a modern 3D scene representation technique that reconstructs environments directly from imagery using millions of oriented 3D Gaussians rather than explicit meshes or surfaces. Compared to traditional mesh layers, 3D Gaussian Splatting delivers significantly higher visual fidelity, capturing fine details, soft edges, thin structures, and complex surfaces in a way that appears far more true-to-life and closer to the original captured scene. In TerraExplorer, 3D Gaussian Splatting is supported as a dedicated 3D layer, alongside other formats such as terrain, imagery, point clouds, 3D meshes, vector layers, and object models. This allows 3DGS content to coexist with other geospatial layers and objects within a single project, preserving geo-referencing and scene context.

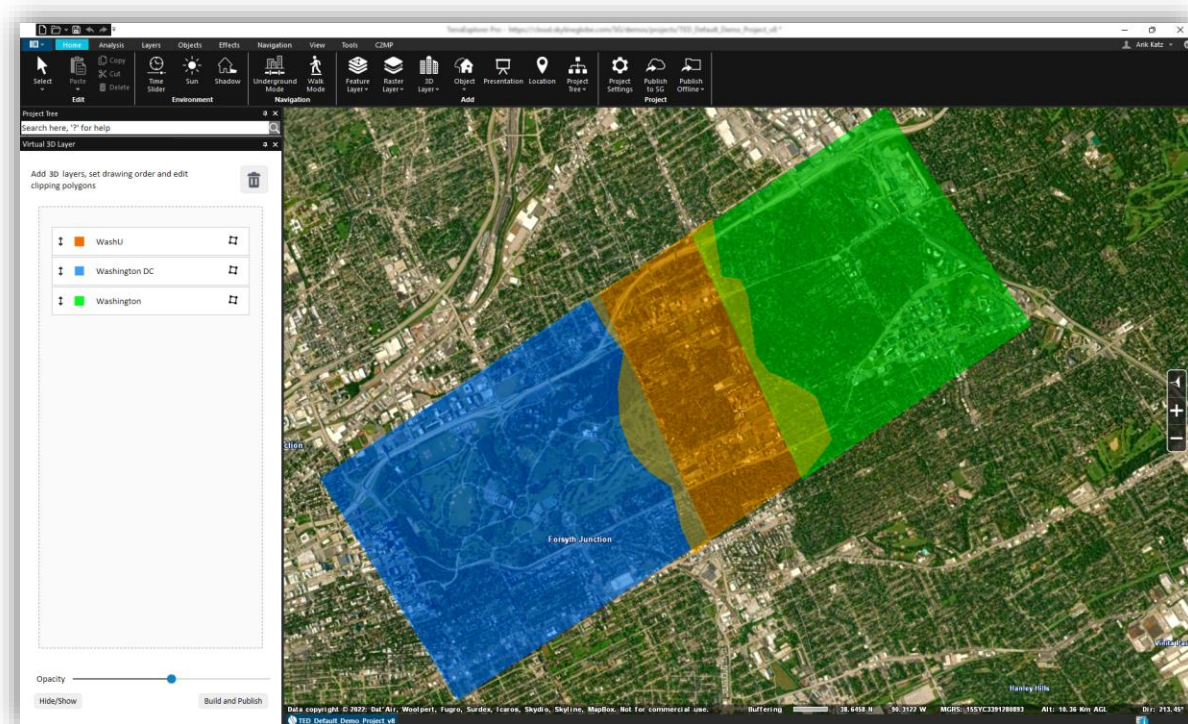
TerraExplorer supports viewing 3D Gaussian Splatting (3DGS) layers in **o3DML** and **3D Tiles** formats, as well as 3DGS objects in several formats, including **PLY** and **GLB**. The application also provides basic measurement and limited analysis capabilities for 3DGS content. As this is the initial release of 3DGS support, some functionality is still evolving, and TerraExplorer currently provides more limited analytic workflows for 3DGS compared to its mature support for mesh and point-cloud data.



## Virtual Layer - Enterprise 3D Data Management

The Virtual Layer provides an **enterprise-scale 3D data management** capability that allows organizations to logically aggregate and manage large, distributed, and heterogeneous 3D geospatial datasets based on **3D Mesh** data, without duplicating the underlying source data. Virtual Layers are created and maintained using the TerraExplorer Pro Virtual Layer tool and are streamed by SkylineGlobe Server.

The Virtual Layer tool allows operators to combine multiple 3D layers published on a SkylineGlobe Server into a single unified layer by defining the draw order between layers and specifying a per-layer clipping polygon to control spatial precedence and visibility. Once these relationships are defined, the unified Virtual Layer is published back to the SkylineGlobe Server and made available to TerraExplorer and other compatible 3D viewers through the standard 3D Tiles format. Similar in concept to DirectConnect for 2.5D layers, the Virtual Layer references existing 3D data sources and rebuilding only the connection blocks between different layers. The Virtual Layer can be easily updated over time by adding additional data sources, enabling continuous and scalable enterprise workflows.

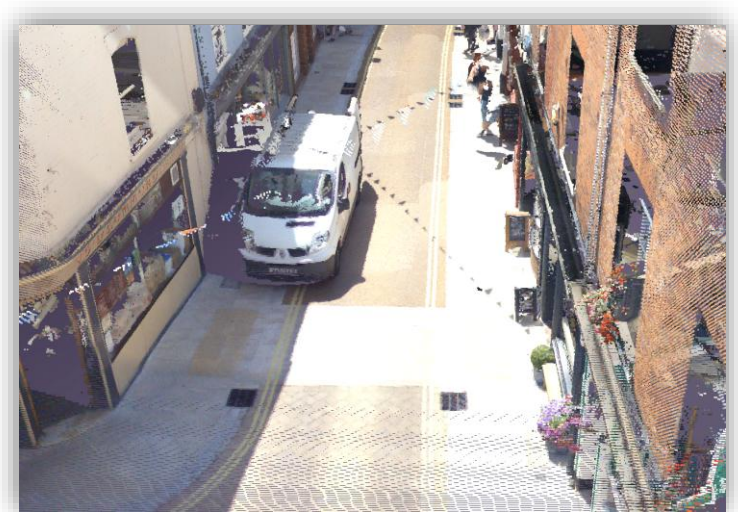


## Data Layer Improvements

TerraExplorer Desktop 8.1 introduces broad improvements to data-layer performance, scalability, and compatibility, ensuring faster loading, smoother rendering, and better interoperability with modern geospatial formats. These updates enhance both real-time visualization and server-based streaming across large or complex datasets.

Key enhancements include:

- **3D Tiles v1.1 compatibility** - Expanded support including **KTX2** texture compression and improved handling of 3D Tiles generated by **Esri** and **Google Earth**.
- **Point Cloud (CPT) upgrades** - A new **compression** option significantly reduces CPT file size and boosts streaming speed, and CPT layers can now be generated **in memory** via the API and CPT reprojection now supports **elevation transformation**
- **BIM layer enhancements** - Support for **IFC 4x3 ADD 2**, including positioning BIM models based on their embedded IFC **coordinate information**.
- **Faster feature-layer streaming** - Improved performance when loading and interacting with large feature datasets.
- **GeoPackage imagery with transparency** - Added support for RGBA GeoPackage (GPKG) imagery, enabling more flexible and accurate visualization.

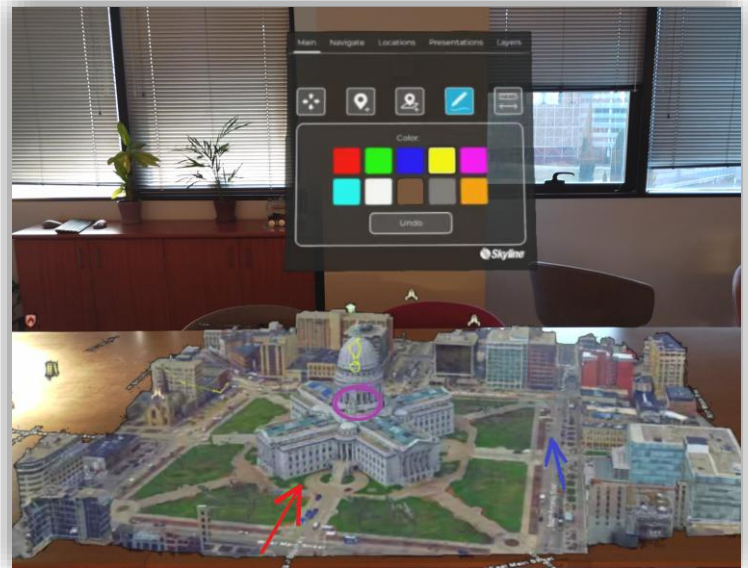


## Augmented / Mixed Reality (HoloLens) Enhancements

Version 8.1 enhances its **Mixed Reality** experience by expanding the floating virtual control panel with additional TerraExplorer functionality directly within the immersive environment. The updated interface enables intuitive, gesture-based interaction with holographic 3D models and supports collaborative exploration and presentations in shared mixed-reality sessions.

Key new capabilities include:

- **Use hand gestures to navigate** – Navigate the scene, adjust altitude, and zoom in or out directly within the immersive view.
- **Draw markers, locations, and shapes** – Add markers to the 3D map, save locations, and use freehand drawing tools to highlight areas or create custom shapes.
- **Measure distances** – Measure distances between multiple points using a simple gesture-based interface, with easy addition and deletion of line segments.
- **Display layers** – Select and toggle the visibility of individual layers or groups of layers.
- **Better control the holographic table** – Set the hologram height and enable an option to lock the view to geographic north.



## Calculated Viewshed & Calculate Multiple Viewsheds

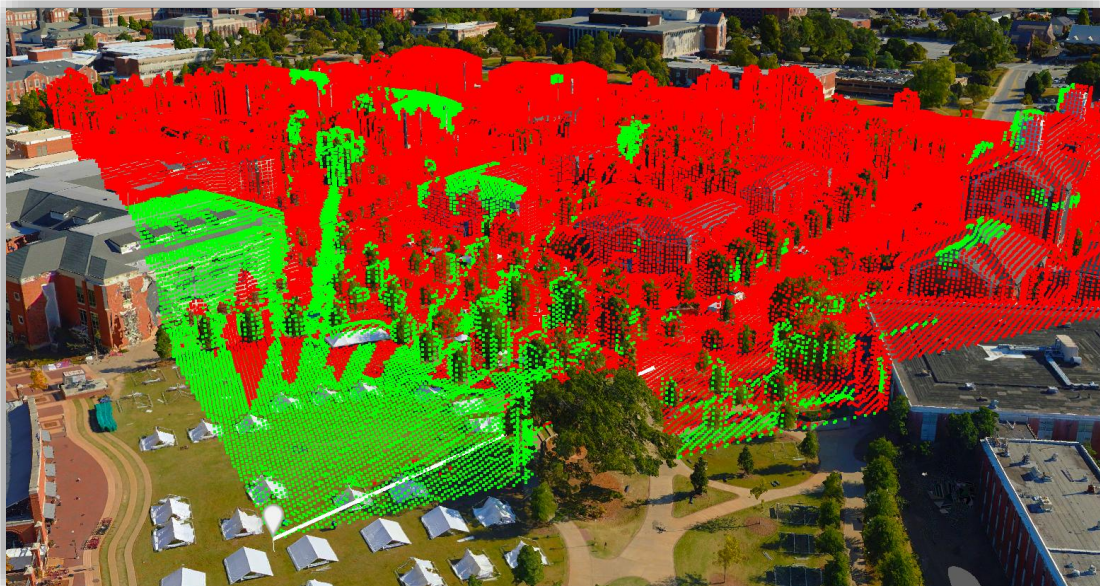
Viewshed analysis capabilities have been updated and refactored to support more flexible, accurate, and scalable analysis workflows. The viewshed tools now offer two distinct analysis modes.

The **Calculate Viewshed** (single viewshed) mode automatically defines the analysis area based on the viewshed extent, providing a streamlined workflow for rapid, focused visibility analysis from a single observer location.

The **Calculate Multiple Viewsheds** mode enables analysis over a user-defined line or area, allowing broader visibility studies. In this mode, the tool can automatically identify and include all viewsheds within range, eliminating the need for manual selection and significantly improving efficiency when working with large viewshed collections.

Both modes use a new, **more accurate** viewshed calculation engine capable of producing reliable results at extended ranges. To achieve this, the tools dynamically load all relevant terrain and 3D layers within the analysis area while optimizing performance to reduce calculation time.

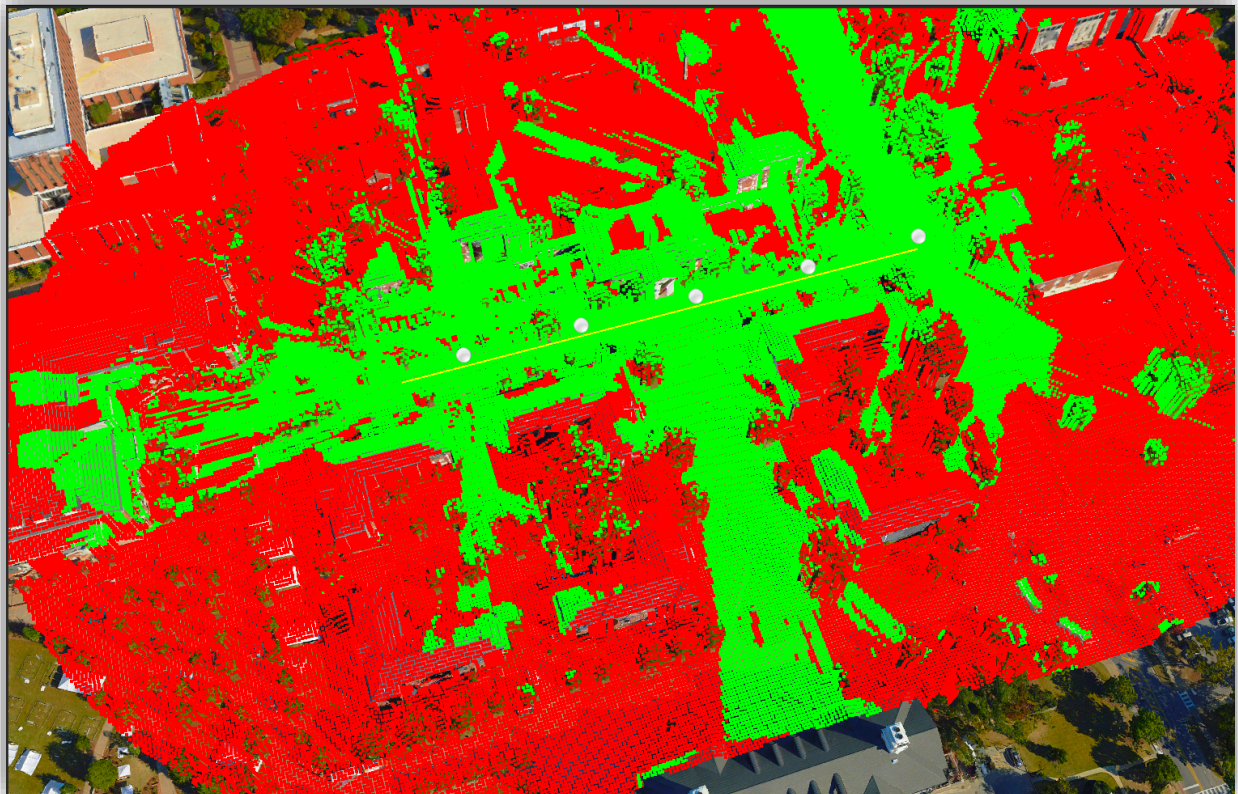
The updated tools also generate a **point-cloud-based result** layer, enabling smooth interaction and visualization even when handling very large numbers of visibility points. In single mode, users can click any visible (green) or non-visible (red) point to display the **line of sight** between the observer location and the selected point, providing immediate visual insight into obstruction and visibility conditions.



## Viewshed on Route Enhancements

The Viewshed on Route tools in TerraExplorer Desktop 8.1 have been updated to align with the refactored viewshed analysis framework. **Viewshed on Route - Query** now incorporates the same modern calculation engine and technologies introduced in the Calculate Viewshed tools, including improved accuracy, optimized loading of terrain and 3D layers, extended effective ranges, and high-performance point-based result layers.

The **Viewshed on Route - By Time** and **By Speed** tools received targeted refinements, including integration with the Data Library for model selection and updated styling consistent with the new TerraExplorer Desktop 8.1 design language, delivering a cleaner interface while preserving their existing dynamic observer workflows.



## Flood Analysis

The All-New Flood Analysis tool analyzes land areas impacted by water under different flooding scenarios and generates polygons representing flooded regions. It can be used on both 2.5D terrain projects (imagery + DTM/DSM elevation) and **3D mesh and Gaussian Splatting** models, and includes advanced 3D behavior such as identifying areas where water can flow beneath bridges. Supported scenarios include Single Instance (one-time rise from a user-defined initial level) and Continuous Rise (water increases at a constant hourly rate and is analyzed per hour). The analysis can start from a single source location (bounded by a search-distance box) or be driven from a line (multiple sources along a drawn polyline).



## Best Path

The Best Path tool has been fully redesigned and now operates across all supported layer types, including full 3D datasets such as 3D mesh and other 3D layers. The updated tool introduces advanced path-planning constraints that allow users to more accurately model real-world movement conditions, including maximum climb slope, maximum descent slope, maximum side slope, and minimum path width. These capabilities enable more realistic and operationally relevant route analysis in complex environments, particularly in urban and 3D scenarios, and significantly expand the applicability of Best Path for engineering, defense, and infrastructure workflows.

## Clear Path

The Clear Path tool provides fast, high-level indications of areas that meet user-defined visibility and clearance criteria within a specified search radius. It helps users quickly identify suitable locations for specific purposes - such as **helicopter landing zones** or **vehicle pathways** - by highlighting potential unobstructed areas directly on the 3D map. Available under the Best Path submenu, Clear Path follows the updated TerraExplorer 8.1 design language for a clean, streamlined workflow

## High and Low

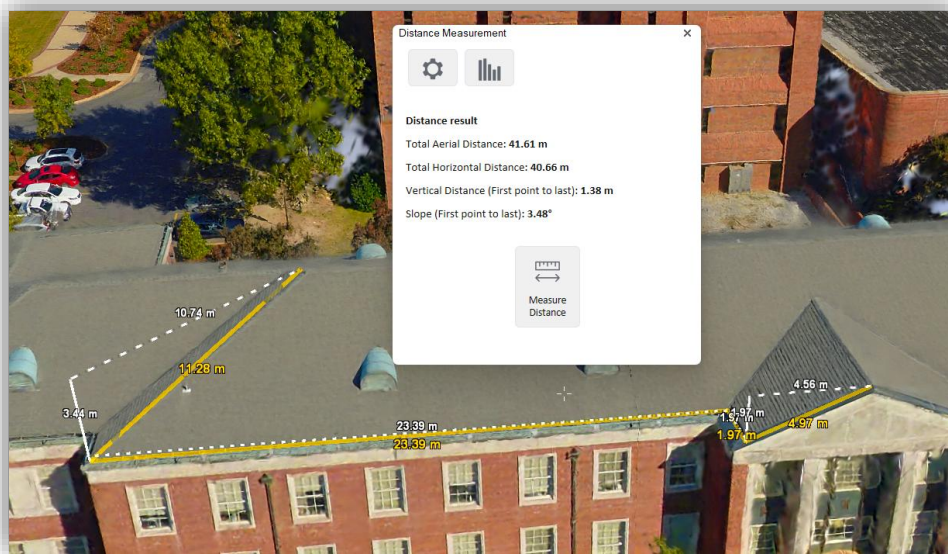
The High and Low tool identifies elevation differences within a selected area of interest and visualizes them by coloring the highest and lowest regions based on user-defined percentage thresholds. This tool helps ground forces quickly identify **high ground** - areas of tactical advantage - and **low ground**, which may be tactically disadvantageous, supporting more effective maneuver planning within the area.

## Distance Measurement

The Distance Measurement tool has been **redesigned** as part of TerraExplorer's modernized measurement and analysis toolset. The updated tool allows users to select **measurement units** directly within the tool and to choose between **single-line** and **multi-line** distance measurements, providing greater flexibility when measuring complex or segmented routes. In addition, the tool introduces modernized **visual styling** for measurement elements in the 3D view, improving clarity, readability, and overall user experience while maintaining consistent behavior across TerraExplorer's redesigned analysis tools.

## Area Measurement

The Area Measurement tool has been redesigned as part of TerraExplorer's updated measurement and analysis toolset. The refactored tool now automatically detects whether the user intends to perform a **horizontal area** measurement or a **plane-based area** measurement, reducing manual configuration and improving workflow efficiency. In addition, the tool introduces a built-in **unit selector**, allowing users to easily switch between measurement units directly within the tool. These enhancements improve usability and accuracy when measuring areas in complex 3D environments, while maintaining consistency with TerraExplorer's modernized measurement tools.



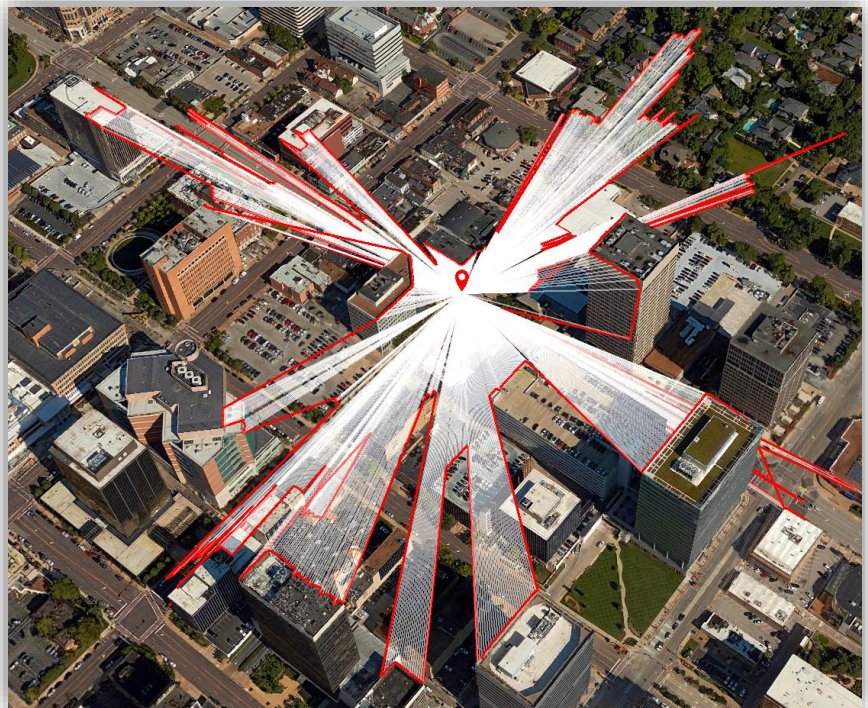
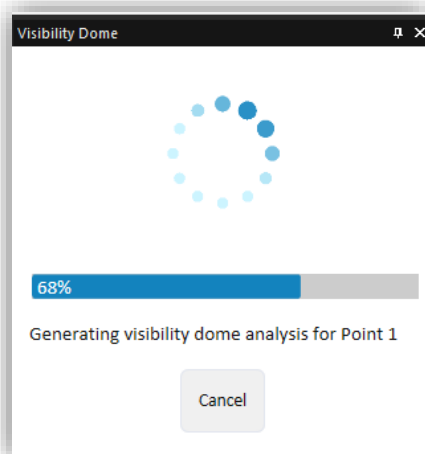
## Coordinate System Tool

The Coordinate System tool in TerraExplorer Desktop 8.1 has been updated with a redesigned interface and improved transformation accuracy. The tool now uses the ReprojectEx API based on **GDAL 3**, providing more reliable and accurate coordinate conversions, including full **3D support**. Users can directly enter X, Y, and Z values to navigate to precise locations, with units automatically matching the project settings. A refreshed design aligns the tool with the new TerraExplorer Desktop 8.1 look and feel, and an accuracy warning is now provided when older GDAL versions are detected.

## Additional Improved Tools

TerraExplorer Desktop 8.1 introduces a refreshed visual design and updated user interface across all tools, delivering a cleaner and more consistent user experience. In addition, several tools include further enhancements:

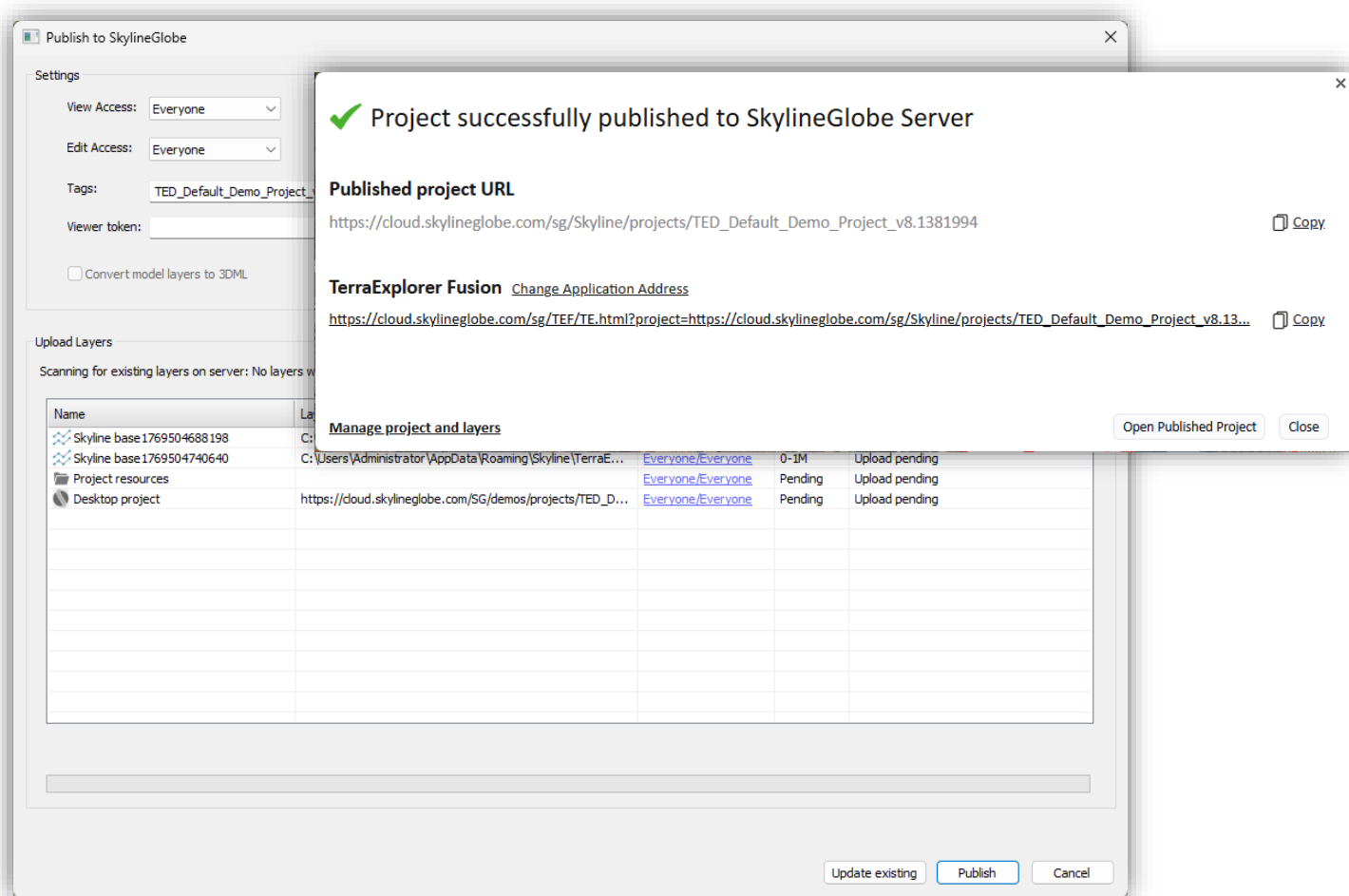
- The **Manual Retouch** tool has been enhanced with support for water polygon importing and editing; for detailed workflows and processing information, please refer to the PhotoMesh v8.1 release notes.
- The **Visibility Dome** tool (formerly known as Threat Dome) features a modernized look and feel aligned with the new design language.
- The **Volume Analysis** tool now provides more accurate results over large areas and uses an updated result-layer technology that improves performance when working with complex or extensive datasets.
- The **Elevation Comparison** tool has been enhanced to support analysis over larger areas while preserving result accuracy



## SkylineGlobe Server (SGS) Integration Enhancements

TerraExplorer Desktop 8.1 further strengthens its integration with SkylineGlobe Server (SGS), expanding publishing capabilities and improving deployment flexibility. The release adds support for publishing **o3DML** models, including **3D Gaussian Splatting** models, and is fully compatible with **SGS v8.5**, ensuring alignment with the latest server capabilities and workflows.

Project publishing has also been enhanced to better support server configuration changes. Published projects can now use **paths relative to the server URL**, allowing projects to continue functioning when the SGS public URL is changed or relocated. The Publish workflow itself has been refined, including a Select All option for using existing server resources and a redesigned Publish Finish dialog that provides clearer feedback and a more streamlined completion experience.

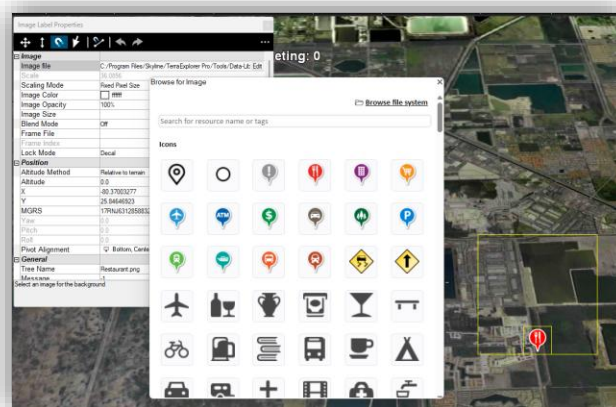


## Object Improvements

TerraExplorer Desktop 8.1 includes a series of enhancements to core TerraExplorer objects, improving consistency, usability, and integration with the updated design framework.

### Key improvements include:

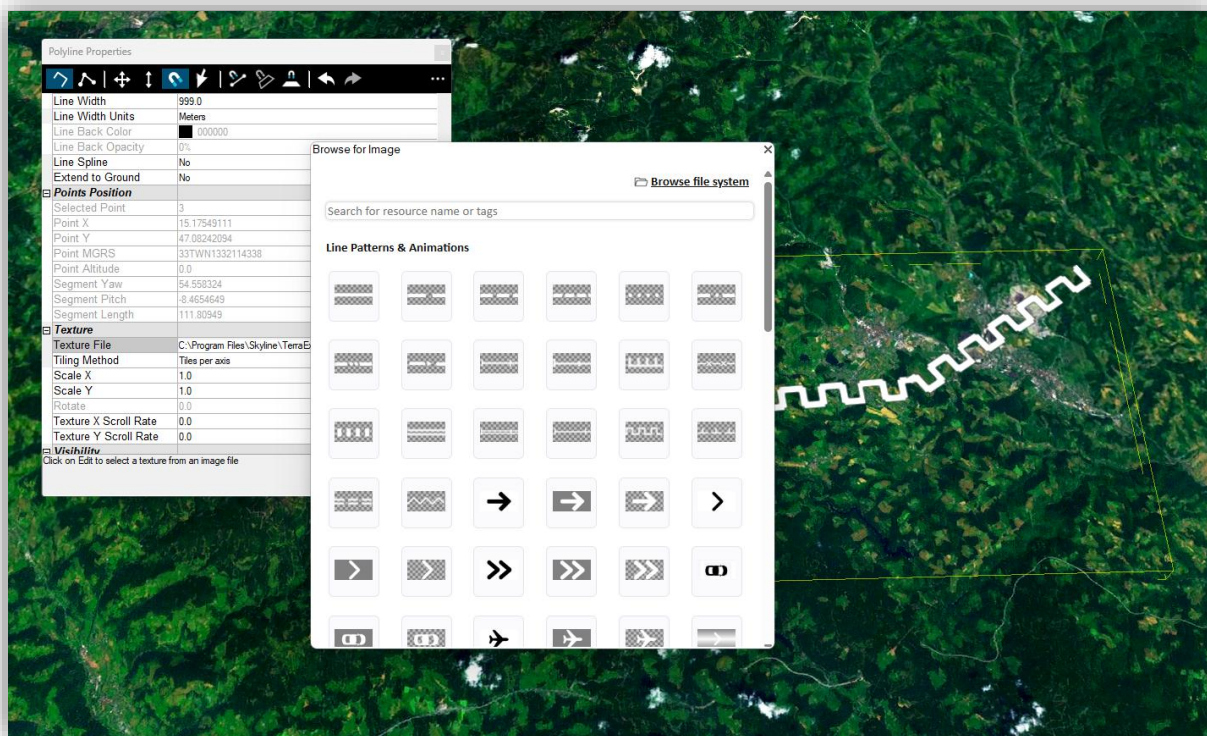
- **Text and Image Labels** - A new Viewing Distance method allows users to define the visibility range of labels with greater precision. Property names and organization have been updated for clarity, and the Properties Sheet has been reordered for improved usability. Labels that reference external resources (icons or images) are now directly linked to the Data Library, enabling easy selection and replacement of visual assets.
- **Polyline Objects** - Polylines now support line textures, enabling advanced, data-library-based line patterns. This new approach replaces the previous Line Pattern selection box, while fully maintaining backward compatibility.
- **Data-Linked Objects** - All TerraExplorer objects that use external resources (such as models, icons, textures, and images) now include an integrated link to the Data Library, streamlining the selection and management of visual assets.
- **Dynamic Objects** - Dynamic objects now include an option to reverse the route direction, automatically swapping the waypoint order to invert the movement path.
- **Capture Project Tree** - A new capture option enables TerraExplorer to automatically perform a Capture Project Tree State operation whenever the project is saved, ensuring the project structure is consistently preserved without requiring manual action.



## Data Library

The Data Library has been expanded and redesigned in TerraExplorer 8.1, becoming a core, **workflow-integrated resource manager** rather than a standalone tool. It can now be opened directly from multiple locations in the user interface, allowing users to select assets in context, with the library automatically filtered to show only relevant resources. The Data Library now includes a **new and expanded set of graphic resources**, including map icons, symbols, line patterns, textures, and additional visual assets.

The Data Library is integrated into key workflows such as line patterns and animations for labels, polylines, polygons, and 2D/3D shapes; tools that require external graphics, such as Duplicate Objects and the Urban Design tool, are selected from a centrally managed library. The redesigned Data Library also adds a **search capability** and an option to open the **file browser** to select external graphic resources, significantly improving usability and asset management across complex projects.



## Urban Design

The Urban Design tool has been refactored and redesigned as part of the overall modernization of TerraExplorer's toolset. The redesign focuses on improving usability, consistency, and integration with the updated user interface and drawing workflows, while preserving the tool's existing capabilities for creating and managing urban and infrastructure design elements directly within the 3D environment. The updated Urban Design tool aligns with the redesigned Data Library and modern drawing tools, providing a more streamlined and cohesive user experience for urban planning, engineering, and infrastructure design workflows.

# REQUIREMENTS

Operating System	Windows® 10 (64-bit) / 11
System Memory	4 GB RAM (8 GB or more recommended) For 4K render mode - 8 GB of RAM.
Video Card	1GB of video memory (2GB or more recommended). Pixel and vertex shader v3.0. For 4K render mode - 2 GB of video memory (4 GB or more recommended).
Processor	4 cores (8 cores recommended).
Additional Software	.Net Framework 4.8 required.

For additional information, check out the [TerraExplorer section](#) of our knowledge base



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