CityEditor

3D City Models in SketchUp
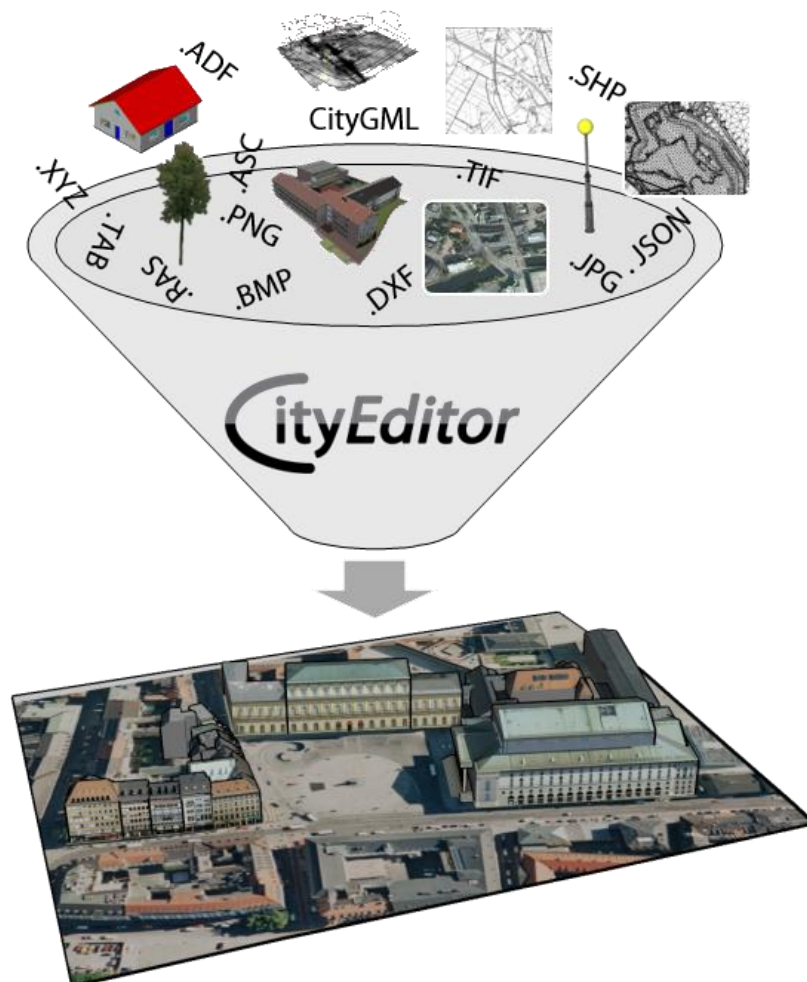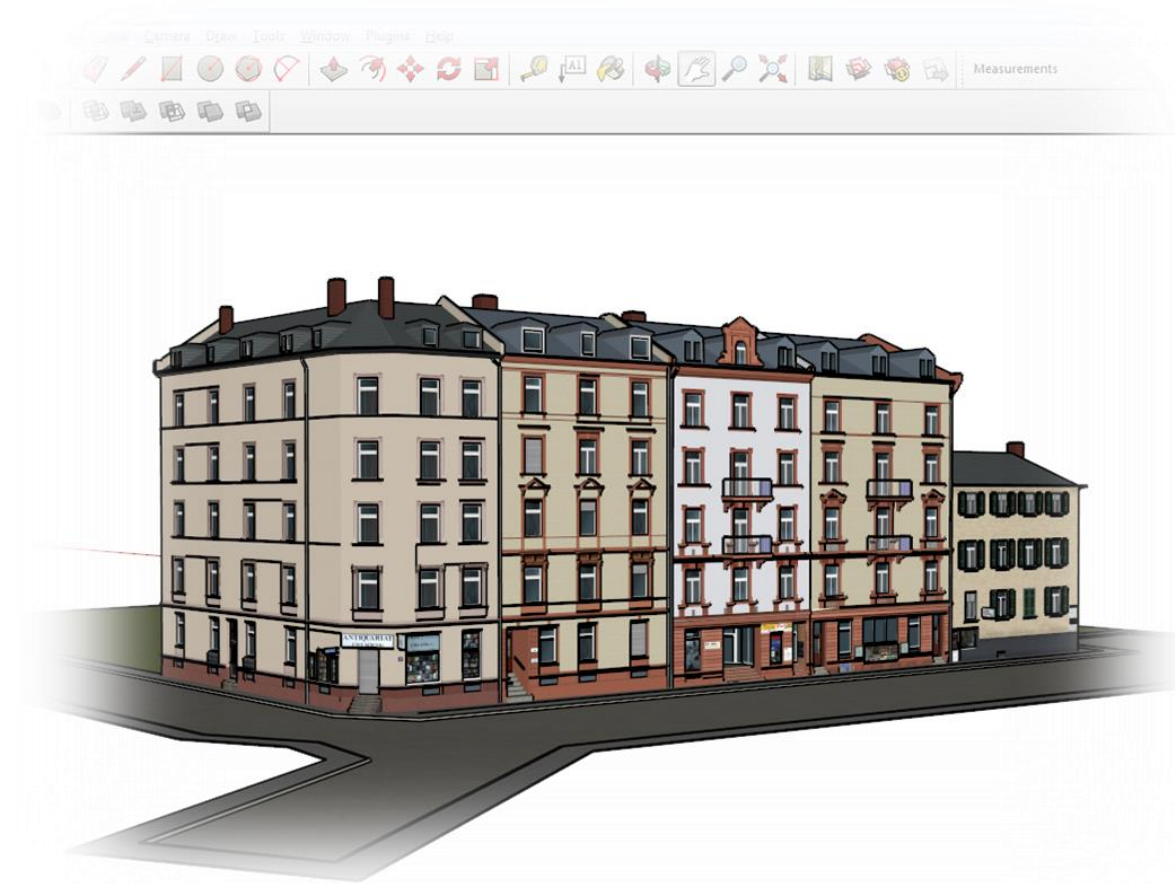

Features & Pricing

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1   Features

The **CityEditor** is not an independent program but an extension for Trimble SketchUp allowing the import of CityGML models and other model data into SketchUp .

During the file import, the **CityEditor** does not only take over the geometry and materials of the source files but also imports object attributes. Moreover, editing mechanisms for those attributes in the CityGML-specific attribute scheme as well as a feature for the export of edited models to CityGML are available.

After the editing of imported model data in SketchUp they can be exported from SketchUp as

- CityGML models,
- 3D-PDF documents,
- interactive 3d web presentations that can be displayed by the **CityBrowser**
- as well as 3D models in the 3D Studio (`.3ds`), Alias Wavefront (`.obj`), OpenInventor (`.iv`), OpenSceneGraph Binary (`.ive`, `.osgb`), OpenSceneGraph ASCII (`.osg`), AC3D (`.ac`), 3D Manufacturing Format (`.3mf`) and Stereolithography (`.stl`) format.

1.1   Import

The **CityEditor** imports

- CityGML models, building models (other than CityGML) from `.dxf`, `.ply`, `.cco`, `.3mf` and `.stl` files and `.shp` files,

- Terrain models from `.asc`, `.ras`, `.xyz`, `.adf`, `.tif`, `.dem` and `.dxf` files,
- Terrain textures from `.jpg`, `.png`, `.bmp`, `.tif`, `.ecw`, `.jp2` files and OpenStreetMap or WMS web sources,
- Point, line, and polygon elements from `.shp`, `.dxf`, `.gml`, `.json`, `.geojson` and `.tab` files,
- point clouds from `.xyz` and `.csv` files
- as well as triangulated surface models from `.ply` and `.obj` files.

The import takes place via the external module CityEditorImporter that is integrated in the extension menu of the **CityEditor**.

1.1.1 Buildings/CityGML

The current version supports the following CityGML object types:

- `Building`
- `BuildingPart`
- `BuildingInstallation`
- `IntBuildingInstallation`
- `Window`
- `Door`
- `BreaklineRelief`
- `TINRelief`
- `RasterRelief (with the terrain grid as QuantityList)`
- `LandUse`
- `GenericCityObject`
- `Track`
- `Road`
- `Square`
- `Railway`
- `PlantCover`
- `SolitaryVegetationObject`
- `WaterBody`
- `CityFurniture`
- `TrafficArea`
- `AuxiliaryTrafficArea`
- `Bridge`
- `BridgePart`
- `BridgeInstallation`
- `IntBridgeInstallation`
- `BridgeConstructionElement`
- `Tunnel`
- `TunnelPart`
- `TunnelInstallation`
- `IntTunnelInstallation`
- `Room`

- `BuildingFurniture`
- `BridgeRoom`
- `BridgeFurniture`
- `HollowSpace`
- `CityObjectGroup`
- `TunnelFurniture`

CityGML attributes and the IDs of `Polygon-`, `LinearRing`, as well as of the object types listed above will be retained during import. Imported faces within the listed object types can be distinguished as follows:

- `RoofSurface`
- `WallSurface`
- `GroundSurface`
- `ClosureSurface`
- `CeilingSurface`
- `InteriorWallSurface`
- `FloorSurface`
- `OuterCeilingSurface`
- `OuterFloorSurface`
- `WaterSurface`
- `WaterGroundSurface`
- `WaterClosureSurface`
- `OrientableSurface`

When importing buildings from `.dxf`-files the DXF versions

- AutoCad2000
- AutoCad2004
- AutoCad2007
- AutoCad2010
- AutoCad2013

are supported. Objects of the types

- `3dFace`
- `Insert`
- `Mesh`
- `PolyfaceMesh`
- `Solid`

will be processed. Other object types will be ignored. Objects may be grouped as groups or blocks.

If .shp files serve as building data source, objects with the geometry types

- `PolygonZ`
- `Multipatch` (`Ring`, `OuterRing`, `TriangleStrip`)

can be imported from these data sources.

1.1.2 Terrain

Terrain models may be adopted as terrain grids from `.asc`, `.tif`, `.dem` and `.adf` files. If point quantities are imported from `.ras` or `.xyz` files they will be rendered into a regular grid if necessary. Afterwards it will be adopted into a SketchUp model. When importing a terrain model from a `.dxf` file it has to contain `3DFaces` (a triangulated terrain model).

1.1.3 Terrain Textures

Terrain textures may be read from the file system as `GeoreferencedTexture` elements from CityGML or as singular files (with related Worldfiles or integrated geo reference). Web based services such as OpenStreetMap or any WMS can also serve as sources for terrain textures.

1.1.4 Vector Data

Point, line and polygon elements from `.shp`, `.dxf`, `.gml`, `.json`, `.geojson` or `.tab` files – if available – will be imported considering three-dimensional coordinates. If the vector data formats only contain two-dimensional coordinates, the elements will be placed flatly (at height 0).

1.1.5 Point Clouds

Point clouds can be imported from `.xyz` and `.csv` files that may contain the coordinates of a point as well as an RGB color value (0-255).

1.1.6 Triangulated surface models

Triangulated, colored surface models, e. g. generated models based on UAV data, can be imported from `.ply` and `.obj` files.

1.2 Model Editing

1.2.1 Editing of CityGML Attributes

The **CityEditor** offers tools for the displaying, editing, adding, and deleting of standard attributes for buildings and surfaces, as well as of generic attributes for buildings.

1.2.2 Editing of Model Geometry

Faces may be furnished with one of the CityGML surface types e.g. `WallSurface`) as well as with a LoD. For grouped elements the CityGML object type can be applied.

1.2.3 Rule-based classification of surfaces

Featuring a rule-based classification engine the **CityEditor** allows for the automatic classification of surface based on their normal orientation.

1.2.4 Correction Functions

A correction function can be applied to faces that interchanges their front and back sides while maintaining their materials. The faces will optically not change in SketchUp . This correction aims at reducing the models to actually visible elements and assigning the front and back sides properly for the CityGML export.

1.3 Export

The **CityEditor** allows an export of SketchUp models

- to CityGML,

- as 3D-PDF documents,

- as **CityBrowser** projects and

- as 3D model in the 3D Studio (.3ds), Alias Wavefront (.obj), OpenInventor (.iv), OpenSceneGraph Binary (.ive, .osgb), OpenSceneGraph ASCII (.osg), AC3D (.ac), 3D Manufacturing Format (.3mf) and Stereolithography (.stl) format.

During the CityGML export, objects modeled in SketchUp will be exported as CityGML models with the inclusion of their CityGML -specific object and face classification and attributes.

For the purpose of a 3D-PDF export, SketchUp models may be newly generated or integrated into existing PDF documents.

Exported as a **CityBrowser** project, a SketchUp model can be presented in a ready-to-use, interactive 3D web presentation.

Using the **CityEditor**'s export capabilities to the 3D Studio (.3ds), Alias Wavefront (.obj), OpenInventor (.iv), Native OpenSceneGraph Binary (.ive), OpenSceneGraph ASCII (.osg), OpenSceneGraph Binary (.osgb), AC3D (.ac), 3D Manufacturing Format (.3mf) and Stereolithography (.stl) format enables users of SketchUp Make, who do not have access to SketchUp's Pro exporters, to export their models to other formats.

1.4 Miscellaneous Functions

1.4.1 Convex hull computation und hull volume

Through computing the convex hull of any model element selections the **CityEditor** allows for the (approx.) calculation of grouped objects which are no solid groups.

1.4.2 Extrusion of edges to cylinders

Selected edges can be converted to cylinders. The conversion process can be parameterized with the cylinders diameter and the number of segments from which the circular base of the cylinder is constructred.

2 System Requirements

The following system requirements must be fulfilled to allow a smooth operation of the **CityEditor**.

2.1 Working Memory

- At least 1 GByte, 2 GBytes are recommended

2.2 Software Environment

- Windows XP (Service Pack ≥ 2), Windows Vista, Windows 7, Windows 8, Windows 8.1, Windows 10
- .NET-Framework 4.0.3 Full (or later)
- Trimble SketchUp 8 (or later, 32- and 64-bit versions of later SketchUp versions are not supported)

Running the **CityEditor** in a version of SketchUp that has been packaged using VMWare ThinApp or any similar virtualizing/packaging solution is NOT recommended.

3   Versionen

CityEditor licenses are sold as a *lite*, *standard* and *professional* version. The following table shows what range of functions is provided by either version.

Function/Description		*lite*	*standard*	*professional*
Import				
•	File Formats			
	o Buildings	CityGML	CityGML, `.dxf`, `.cco`, `.3mf`, `.stl`, `.shp`	CityGML, `.dxf`, `.cco`, `.3mf`, `.stl`, `.shp`
	o Vektordaten	⊗	`.shp`, `.dxf`, `.tab`, `.gml`, `.json`, `.geojson`, WFS	`.shp`, `.dxf`, `.tab`, `.gml`, `.json`, `.geojson`, WFS
	o Terrain	CityGML	CityGML, `.asc`, `.adf`, `.tif`, `.dxf`, `.ras`, `.xyz`	CityGML, `.asc`, `.adf`, `.tif`, `.dxf`, `.ras`, `.xyz`, `.dem`
	o Terrain Textures	`.bmp`, `.png`, `.jpg`, `.tif` (if included in CityGML model)	`.bmp`, `.png`, `.jpg`, `.tif`	`.bmp`, `.png`, `.jpg`, `.tif`, `.ecw`, `.jp2`, OpenStreetMap, WMS
	o Pointclouds	⊗	⊗	`.xyz`, `.csv`
	o Triangulated surface models	⊗	`.ply`, `.obj`	`.ply`, `.obj`
•	Operations			
	o Terrain Optimization	⊗	✓	✓
	o Simplification of point clouds	⊗	⊗	✓
	o Tiled import of large datasets	⊗	⊗	✓
	o Automatic roof texturing/coloring	⊗	⊗	✓
•	Tools			
	o Local map tile databases as source for region	⊗	⊗	✓

selection			
Model Editing			
• Attribute Editing	✅	✅	✅
o Advanced Attribute Editing, Import & Export	❌	❌	✅
• Object Classification	✅	✅	✅
• Surface Classification	✅	✅	✅
• LoD Classification	✅	✅	✅
• Correction Functions	✅	✅	✅
• Rule-based Surface Classification	❌	❌	✅
Export			
• CityGML	✅	✅	✅
• 3D-PDF	✅ („unlicensed" watermark, no export of object metadata, no export of SketchUp viewpoints)	✅ („unlicensed" watermark, no export of object metadata, no export of SketchUp viewpoints)	✅
• **CityBrowser**	✅ („unlicensed" watermark, no export of object metadata, no export of SketchUp viewpoints)	✅ („unlicensed" watermark, no export of object metadata, no export of SketchUp viewpoints)	✅
• 3D Studio (`.3ds`), Wavefront Alias (`.obj`), OpenInventor (`.iv`), OpenSceneGraph Binary (`.ive`, `.osgb`), OpenSceneGraph ASCII (`.osg`), AC3D (`.ac`), 3D Manufacturing Format (`.3mf`), Stereolithography (`.stl`)	❌	✅	✅
Miscellaneous			
• Convex hull computation	❌	❌	✅
• Extrusion of edges to cylinders	✅	✅	✅

4 Pricing

4.1 New Licenses

Using the **CityEditor** requires the (one-time) purchase of a seat license. License prices are listed in the table below.

Version	License Price per Seat*
lite	200€

standard	400€
professional	600€

In case multiple licenses (of the the same or a lower version) are purchased, a <u>rebate of 50%</u> with regard to the original license price is granted <u>beginning with the first follow-up-license</u>.

*All prices are net prices excluding any value-added tax at the statuatory rates applicable at the time of purchase.

4.2   Upgrading Existing Licenses

When upgrading an existing license to a higher version the price difference between the higher and the current version is charged as upgrade cost.

If a customer already owns another license of the same or higher version than the one he wishes to upgrade a license to, <u>a rebate of 50%</u> is granted with regard to the original upgrade cost.

*All prices are net prices excluding any value-added tax at the statuatory rates applicable at the time of purchase.

4.3   Update Service Fees

<u>No additional fees</u> for an update service are charged.

4.4   Rebate Options

<u>Educational institutions</u> as well as <u>students</u> (enrollment verification required) are eligible for a <u>rebate of 50%</u> based on the above listed prices.

5   License Request & Activation

Seat licenses required to activate the **CityEditor** can be requested using a license client that is integrated into the **CityEditor**. This process requires as internet connection. If no internet connection is available, the information displayed by the license client that are required for generating a license can be send to 3DIS via e-mail.

A license is always bound to a specific computer's hardware and therefore cannot be used to activate the **CityEditor** on another system.

If the computer's hardware is changed, a license may become invalid. In such cases a modified license can be requested by sending us an e-mail containing a brief explanation for the license request. A maximum of 5 modified licenses can be requested annually.

6   Evaluation Licenses

First time users of the **CityEditor** can request a time limited license using the internal licensing mechanism in order to evaluate the **CityEditor**'s features.

While using an evaluation license an internet connection is required, as the **CityEditor** constantly checks with the 3DIS license service whether the evaluation license is still valid.

7 Training & Support

Professional Services

You need support in taking first steps with the **CityEditor** or training regarding certain topics or processes? Please feel free to contact us! Of course we are offering additional service agreements with regard to training and support.

Free Support

You want to get support without closing an additional service agreement? You may use the 3DIS-Forum as a source of information and a platform to exchange questions and answers with other **CityEditor** users.

8 Further Information

You can find further information about the **CityEditor** on our website at `www.3dis.de`.

In case of concrete questions you may send an e-mail to

`info@3dis.de`

or call

`+49 (0)2861 891980`.