Autosign

by **CGS Labs**

BIM Workflow for Traffic Signs and Road Markings

Tutorial

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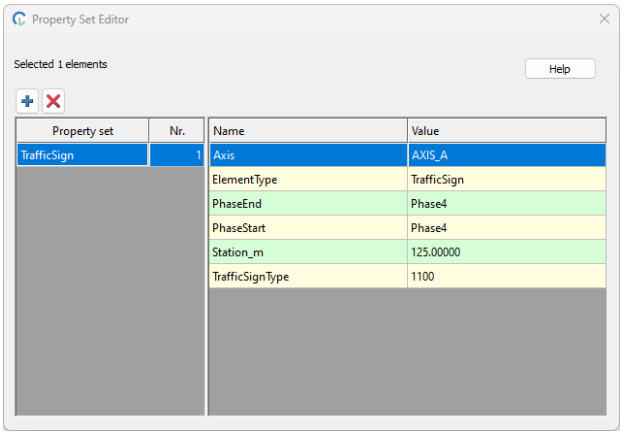
INTRODUCTION

In this tutorial, we will demonstrate the BIM workflow for traffic signs and road markings. Follow these four steps to transform your 2D drawings into a comprehensive BIM model:

1. **Draw Traffic Sign in 2D:** Begin by inserting each traffic sign or road marking in 2D using Autosign commands.
2. **Convert 2D to 3D Model:** Use the command "Draw 3D Signs and Markings" to convert the 2D drawing into a 3D model. This tool is very powerful, as it can also convert custom traffic signs into 3D.
3. **Attach Attributes:** After creating the 3D model, attach relevant attributes to it. These attributes can include information such as the type of sign, material specifications, installation date, maintenance schedule, and any other relevant data. This step transforms the 3D model into a BIM model (Building Information Model).
4. **Export to IFC Format:** Finally, export the BIM model to the IFC (Industry Foundation Classes) format. This standardized format allows for interoperability between different software platforms and ensures that all relevant data is preserved and accessible.

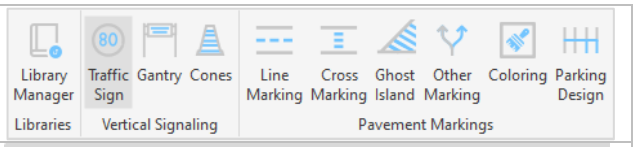
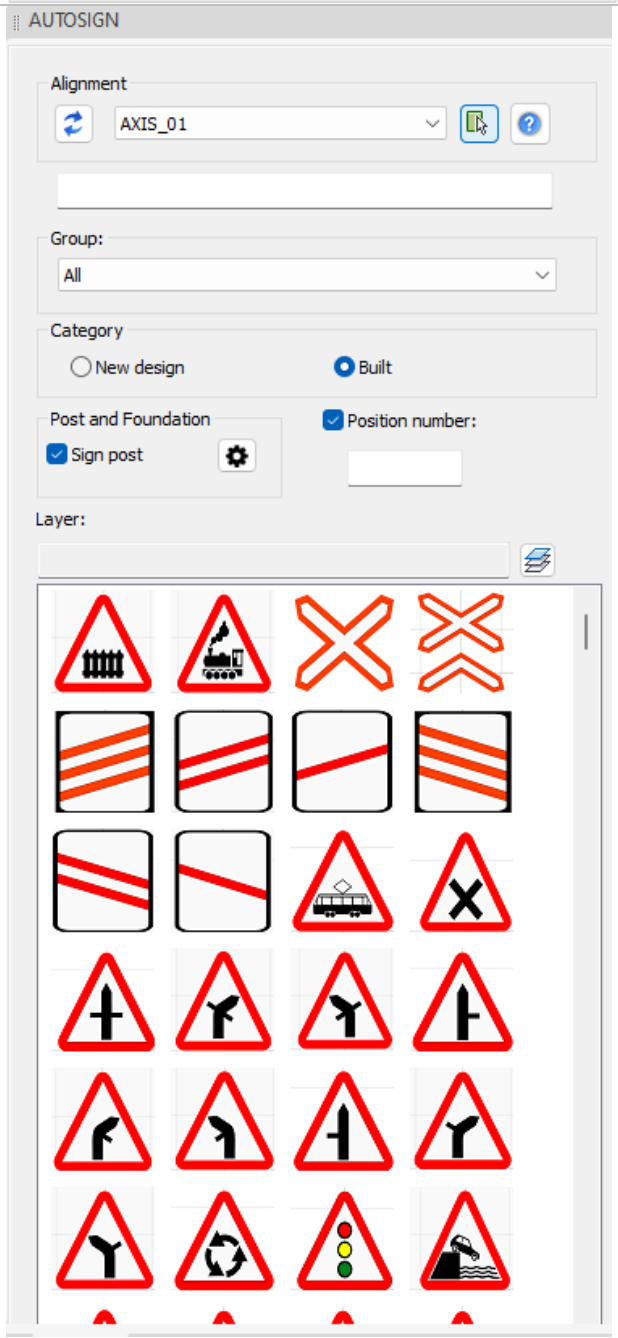
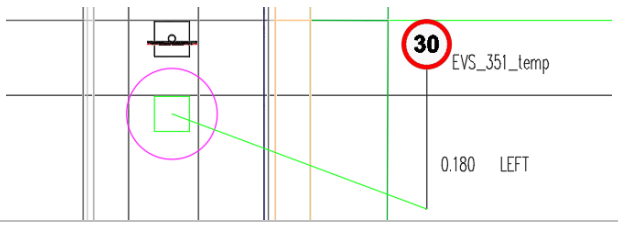
Why is BIM Important?

Building Information Modelling (BIM) is crucial in modern infrastructure projects due to its ability to enhance collaboration, efficiency, and accuracy. BIM allows for the integration of all relevant data into a single, coherent model that can be shared and updated by all stakeholders throughout the lifecycle of a project. This reduces errors, minimizes rework, and improves decision-making processes. Additionally, BIM helps in visualizing the project in a 3D environment, identifying potential issues early on, and optimizing construction and maintenance operations. By utilizing BIM, we ensure a higher quality of infrastructure development and management.



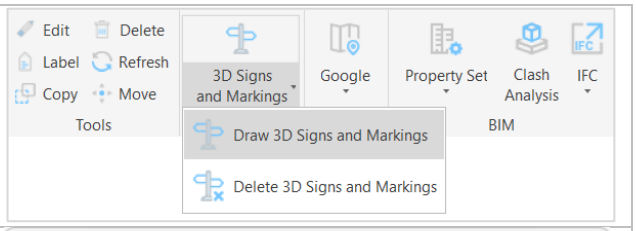
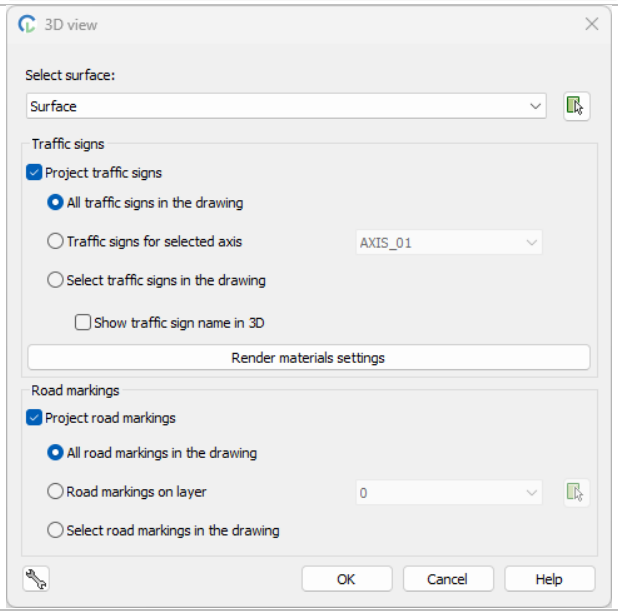
1. Inserting Traffic Signs in a Drawing

In the first step, we insert the traffic sign.

1. Run the "Traffic Sign" command.	
2. An Autosign dialog box with traffic signs appears on the left side. - Specify the **alignment** to which you want the traffic signs to be attached. Traffic signs inserted with Autosign can be automatically linked to the information of the alignment used. This means that the sign will automatically recognize which side of the alignment it is placed on and at which station it is inserted. Autosign supports various types of alignments, including Civil 3D alignment, BricsCAD alignment, Plateia alignment, and a simple polyline that can be defined as a basic alignment. *To use a custom polyline, click on the*  *icon, then select the polyline in the drawing and name it. Then, follow the instructions in the command line.* - Then, select the group. - After that, select the category of the sign: New sign in the drawing or existing traffic sign on the road. - Next, define the dimensions of the post and foundation.	
3. After defining all the parameters, select the traffic sign from the list and specify its position in the drawing.	

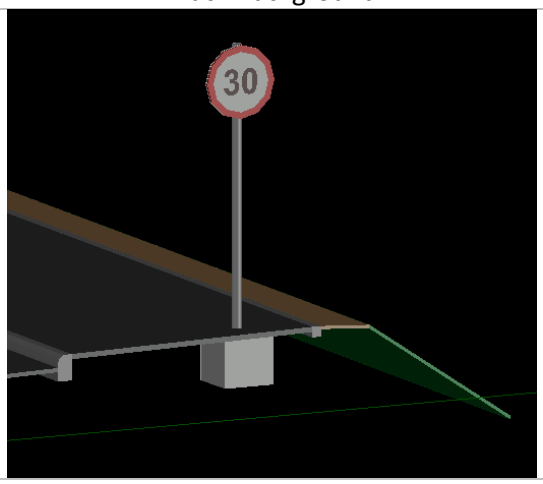
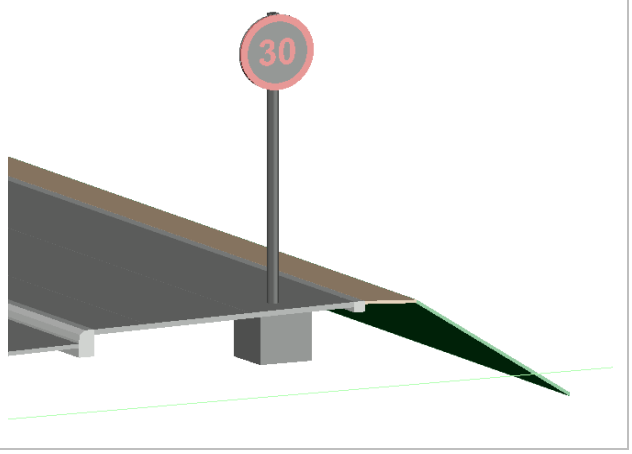
2. Convert 2D to 3D Model

In the next step, we convert the 2D traffic sign into a 3D model. This process is very simple, and all we need is a surface onto which the traffic signs and road markings will be projected. The surface recognized by the Autosign program can be a TIN surface from Civil 3D, a CGS Labs surface, a BricsCAD surface, or ordinary 3D faces.

1. Run the "Draw 3D Signs and Markings" command.	
2. Select the surface from the drop-down menu. On this surface, traffic signs and road markings will be projected. 3. Check the box for the "All traffic signs in the drawing" option. 4. Click OK.	

All traffic signs that were inserted into the drawing with Autosign are automatically created as 3D models. This tool in Autosign is very powerful and saves the user a lot of time, while also allowing them to create any type of traffic sign.

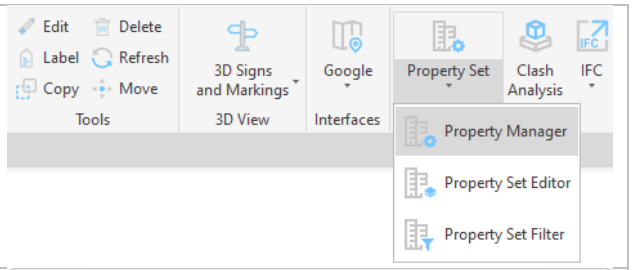
Note: White colour appears darker on a white background. This is only a visual effect; on the layer, it remains white.

Black Background	White Background
	

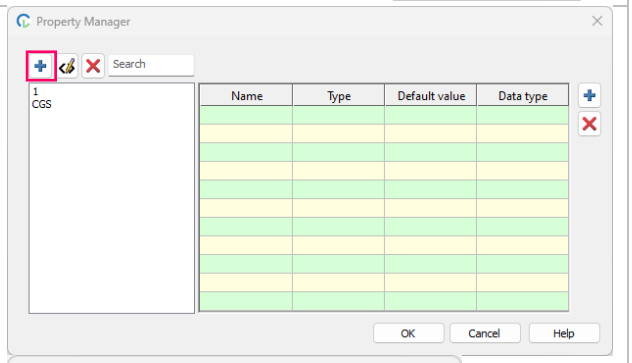
3. Attach Attributes

Defining Attributes

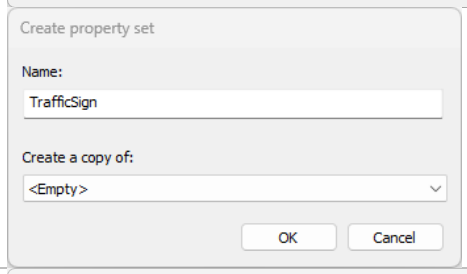
1. Run the "Property Manager" command, which is used to create property sets.



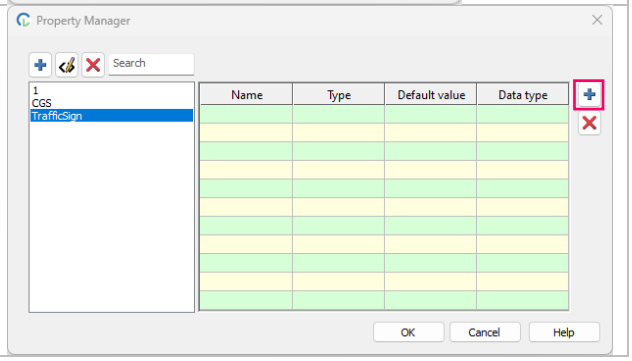
2. Click the plus icon on the left section of the dialog box to create a new property set.



3. After that, the "Create Property Set" dialog appears, where the user types the name of the property set and, if desired, selects an existing property set (e.g., CGS) as a template for the new property set or leaves the option "empty."



4. Then click the Plus button on the right to add attributes. *(The list of property sets and their attributes is usually included in the BIM Execution Plan.)*

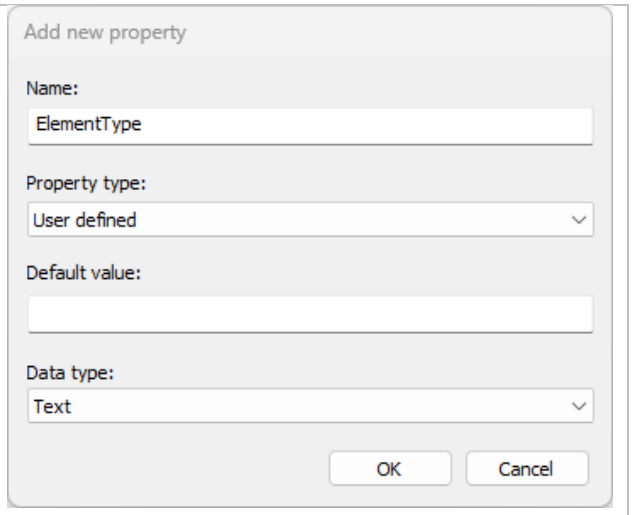


- First, define the name of the attribute.

- After that, define the type. If you select "user-defined," it means you will manually enter the value. If you select "Volume," it will be calculated automatically.

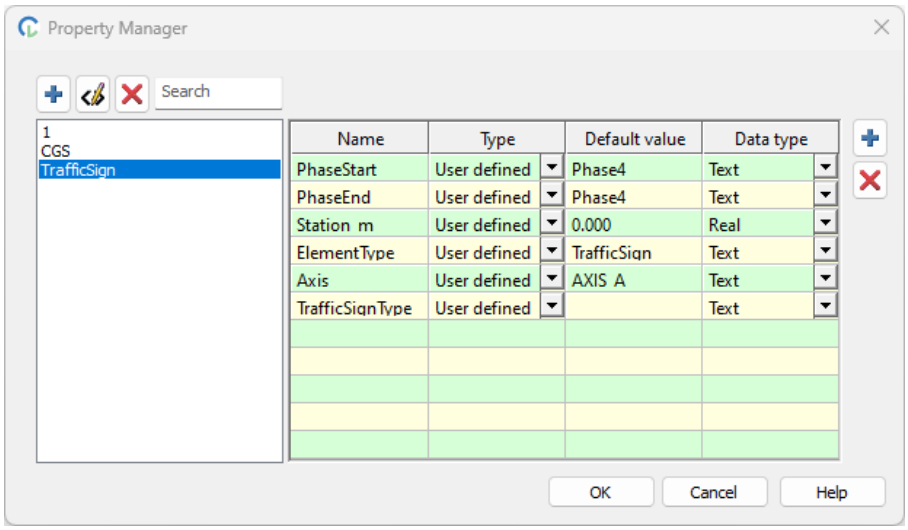
- Then define the default value. If you know that this value will always be the same, you can enter its value now. In our example, we will attach this property set to traffic signs, so you can enter "Traffic Sign" as the default value. However, if you have an attribute like TrafficSignType, the value will vary depending on the type of traffic sign. Therefore, leave this field blank and manually enter the type of traffic sign later.

- Then select data type from drop-down menu and click OK.

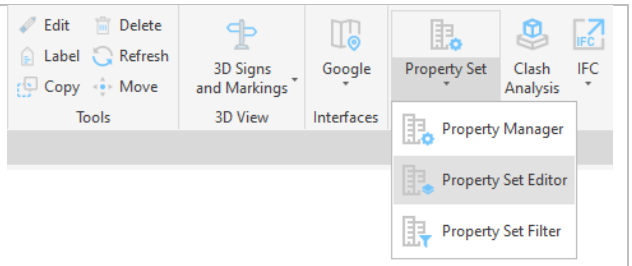
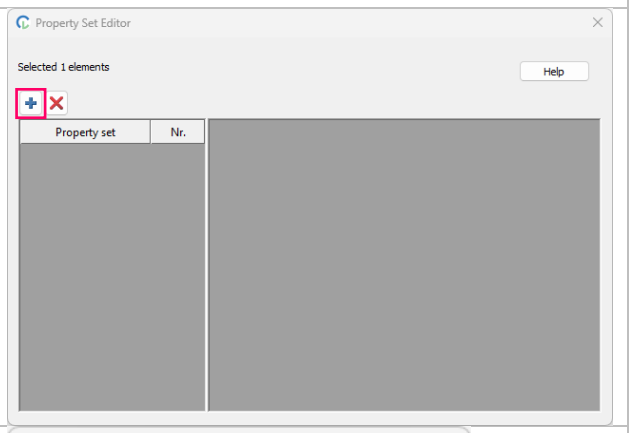
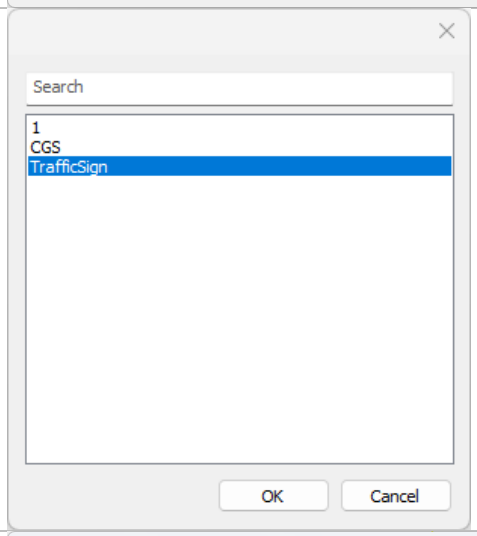
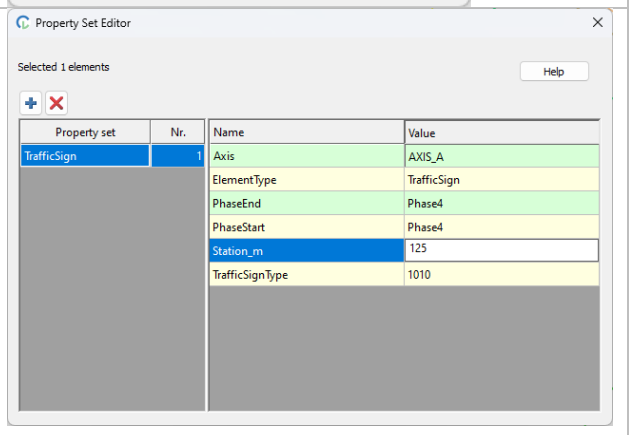


Note: Property types Axis, Start station, End station, Material, and Code work automatically in Plateia software, not in Autosign.

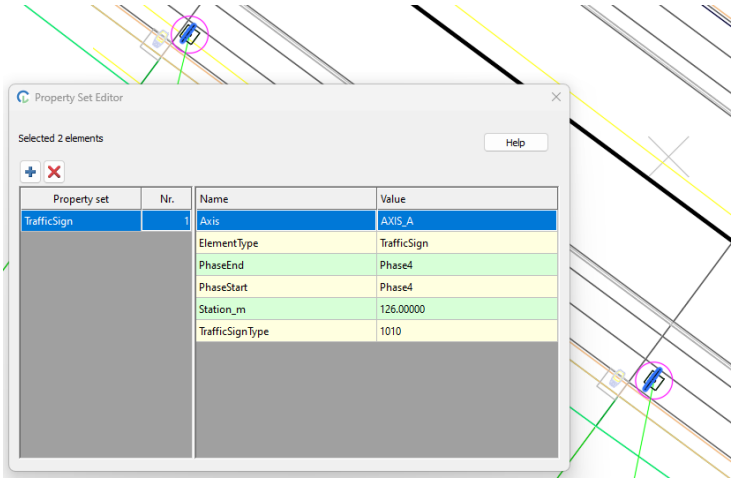
5. In this way, you then add other attributes that apply to this property set:



Attaching Attributes

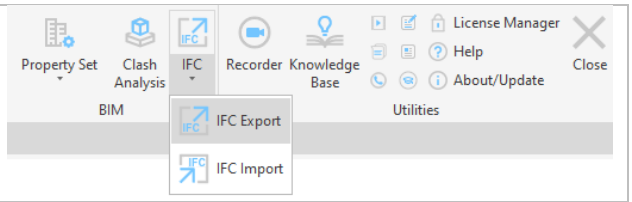
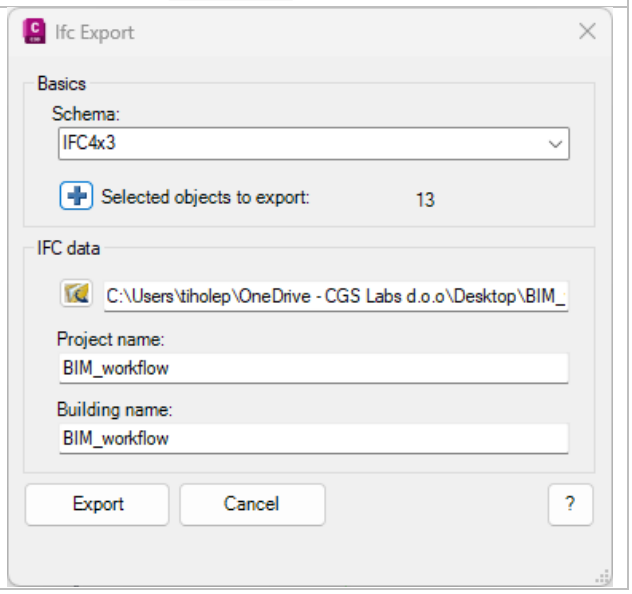
1. Run the "Property Set Editor" command.	
2. Then, in the drawing, click on the 3D model of the traffic sign or block to which you want to add a property set. When you select the model in the drawing, the dialog box will display "Selected X elements."	
3. Then, click the Push button and select the property set you want to add from the dropdown list and click OK. If necessary, you can select and add multiple property sets at once.	
4. This property set is now attached to the model. If you wish, you can **manually enter and edit the values** by double-clicking on the desired cell and changing the value. **This dialog box is modeless, which means it can remain open while you edit the drawing. This allows you to click in the drawing and then press Escape to deselect the current element. Afterward, you can select another 3D solid or block where you want to edit the property sets. If desired, you can also select multiple elements at the same time.*	

In the drawing below, you can see that two elements are selected. This is indicated at the top: selected 2 elements. However, the property set is added to only one of them. You can see this in the column number, which shows 1.

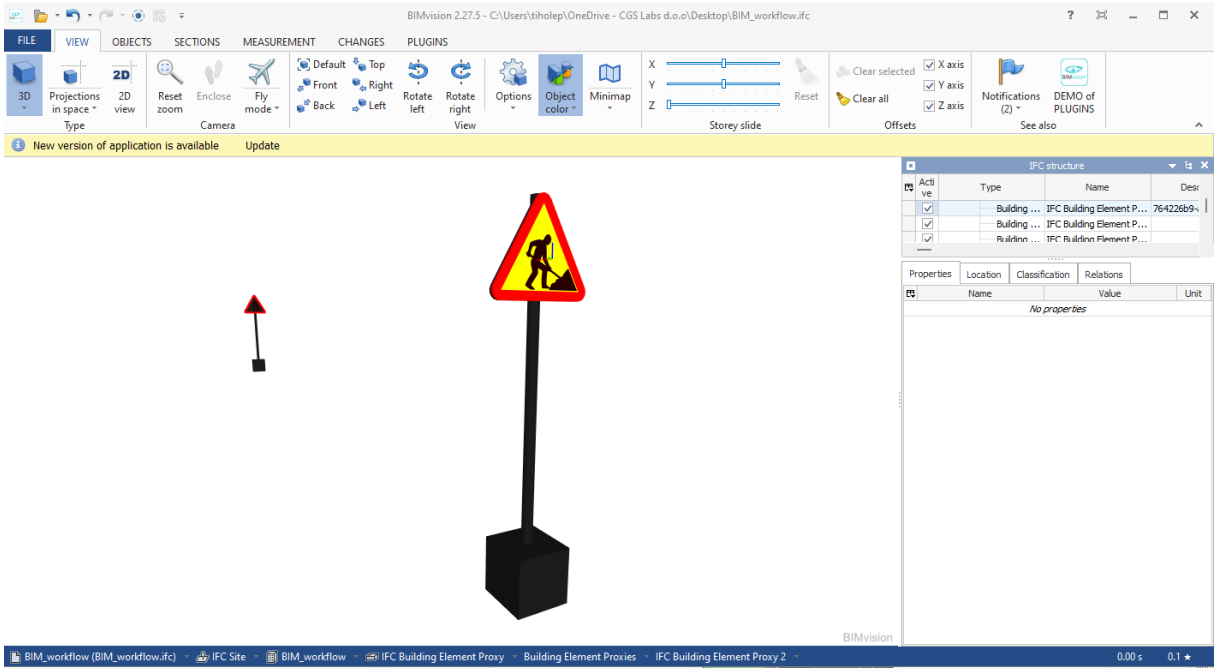


NOTE: When creating a 3D model, Autosign automatically generates 3D solids of foundation, post, and block of the sign. When attaching property sets, it depends on the BIM Execution Plan whether you will assign property sets to each element or just one property set to the entire traffic sign. If you want the entire traffic sign (foundation + post + sign), then you need to join the 3D solids and block into one block. To do this easily, define a new block (use BLOCK command) and select all three elements. The only thing you need to be careful about is that if you are using Civil 3D, there should not be a block within a block. Therefore, explode block of the sign and then join all 3D solids into a new block.

4. Export to IFC

1. Run the "IFC Export" command.	
2. Select the schema from the dropdown menu. 3. Next, click the Plus button and select the objects in the drawing that you want to export. 4. Then, define the name for the IFC file and specify the location where it will be saved. 5. Once everything is defined, click OK.	

IFC files can then be opened in any software that supports this format, such as Navisworks or BIM Vision.



Road Markings

The exact same procedure applies to road markings, except that in the first step, we use commands specific to road markings. These include Line Marking, Cross Marking, Ghost Island, Other Marking, Coloring, and Parking Design.