

Publishing I-Models for OpenRoads Navigator

User Frequently Asked Questions

General information	3
What is an i-model?	3
Why can't I just use my DGN file in OpenRoads Navigator or other mobile apps?	3
What is the difference between an .i.dgn and an .imodel?	3
Can I use more than one i-model per project? How do I break up the data into multiple i-models?	3
Is there a "Civil" Publisher?	3
How does the publisher work?	4
Does my data need to be OpenRoads data?	4
What do I need to use the station / offset tools?	4
Can I append to an i-model?	4
Software	4
What version of the publisher is needed?	4
How can I tell what version of the publisher I am using?	6
What versions of OpenRoads products do I need to create i-models for ORN?	6
Do I need OpenRoads products to run the publisher or can I use generic MicroStation?	6
What new options have been added to OpenRoads products that I would benefit in updating?	6
Is the Publisher loaded in the OpenRoads folder structure? What is the default path? ..	7
Configuration Variables.....	7
What configuration variables do I need to set in OpenRoads?	7
Do I need any configuration variables in the publisher? If so, what file are they in and what are the options?	8
ICM and I-models	9
Can I use the same i-model for ORN and Trimble Business Center?	9
Do I have to create the ICM file before publishing so it is included in my i-model?	9
Civil Data, Settings and Views.....	10
Does my data need to be 3D? What about horizontal geometry that is only 2D?	10
What are the underlying rules that determines what is displayed off / on in the .i.dgn and subsequently the .imodel?	10
Can I use display set views to produce rendered i-models?	10
Can I create an i-model from a Scalable Terrain Model (STM)?	10
Can I include raster images in my i-model?	11

Corridor Models publishing for Openroads Navigator - does the calculated top mesh automatically get included?.....	11
Do I have to create Saved Views prior to publishing? Why?	11
Can I publish cross sections? How?	11
Do I-models support materials?	11
What is not supported?	11
How do I get non-DGN files into my i-model? Or do I download them separate from the i-model?.....	11
Can I use customized MicroStation fonts in my i-models?	12
SUE / SUDA Data.....	12
How can I include SUE / SUDA data in my i-model? Or does it have to be in its own i-model?	12
What is the best practice workflow for creating an i-model containing both SUE and ICM data?.....	12
If you create the i-model from a civil product (not SUE) with just the SUE data attached via dgn, not via i.dgn, then you will not get all the rich SUE meta data. Is that correct?	13
If you create the i-model from within SUE, will you get the icm data?.....	13
Non-OpenRoads Data	13
Can I only use i-models created by OpenRoads? Or can I use i-models created by other programs?	13
Can I create an i-model from a Civil3D file?	13
Can I create an i-model from Revit?	13
Can I create an i-model from a DWG file?	13
Troubleshooting Tips.....	13
Troubleshooting: I'm getting an error message outdated publisher when opening an i-model or using the station / offset tools?	13
Troubleshooting: I don't see any text in my i-model, just the linework.....	13
Troubleshooting: If I have an element ID (such as in a log file), is there an easy way to find that element in the dgn file?	13
Troubleshooting: Mismatched Appearances.....	14
Is there a global statement we could add to not merge any of the levels?	14
Troubleshooting: Can I prevent level merging globally rather than by individual level?	15

GENERAL INFORMATION

WHAT IS AN I-MODEL?

- I-models are a medium for information exchange within projects associated with the lifecycle of infrastructure assets.
- I-models enable information to flow easily, completely, and accurately between and within design, construction, and operations environments
- I-models handle all component information, including business properties, geometry, graphics, and relationships.
- I-models are open, providing standard interfaces for business, engineering, construction, and operations applications from multiple vendor

WHY CAN'T I JUST USE MY DGN FILE IN OPENROADS NAVIGATOR OR OTHER MOBILE APPS?

I-models are an “all-in-one” package and includes the reference files (even nested), cells, fonts, linked files, etc., so you don’t have to worry if you have all the components when you get into the field. The file is also optimized for mobile apps.

WHAT IS THE DIFFERENCE BETWEEN AN .I.DGN AND AN .IMODEL?

There are three files within the discussion of i-models.

FILE EXTENSION	DESCRIPTION
.i.dgn	A container for open infrastructure information exchange.
.imodel	i-models (graphic elements and properties) that are optimized for mobile device apps.
.icm	Integrated Civil i-models – enhanced meta data information.

If you want an i-model for OpenRoads Navigator, you need the .imodel file. However, if you want to use an i-model as a reference to a DGN file (such as SUE or Bridge data), then create the .i.dgn file, attach as a reference, then create the .imodel. When the .i.dgn is attached as a reference, the metadata is brought forward.

CAN I USE MORE THAN ONE I-MODEL PER PROJECT? HOW DO I BREAK UP THE DATA INTO MULTIPLE I-MODELS?

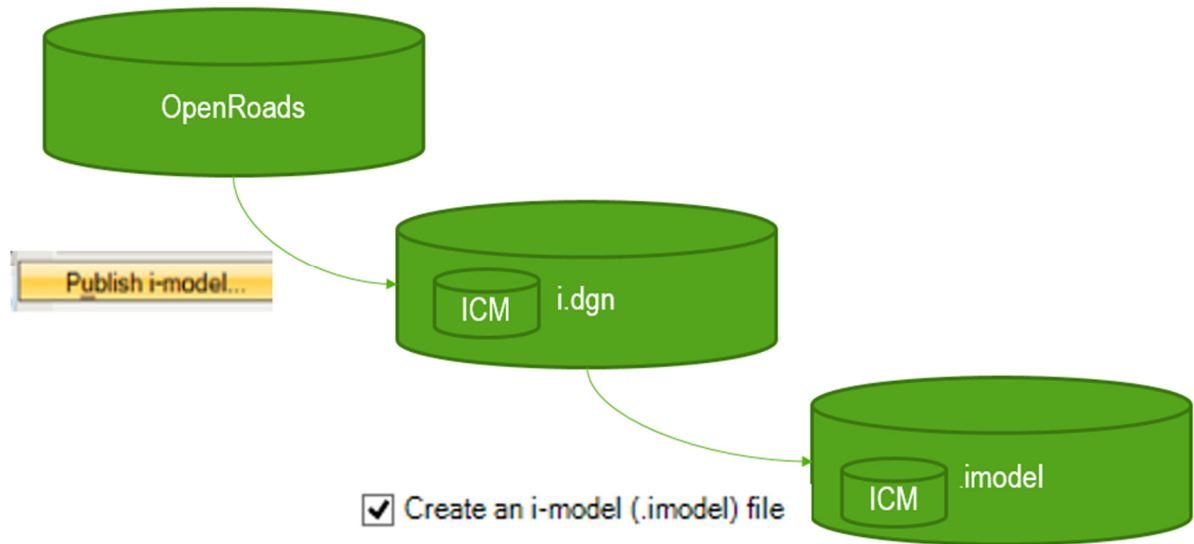
Yes, you can use multiple i-models per project. It’s more a discussion of your organization file set-up, what is wanted by field personnel, project size, etc. ORN can utilize one or many i-models per project.

IS THERE A “CIVIL” PUBLISHER?

The OpenRoads products use the MicroStation / Power Platform publisher. However, OpenRoads does embed the civil data to the publishing if the configuration variables are set.

HOW DOES THE PUBLISHER WORK?

When publishing, the civil metadata (known as ICM data) is embedded within the i-model assuming the [configuration variable](#) is set to 1,2, or 3. It includes the source DGN file, reference files (including nested files), saved views and MicroStation models. Your data can include geometry, terrains, corridor models, and MicroStation elements.



I-model Publishing Under the Hood

DOES MY DATA NEED TO BE OPENROADS DATA?

No, you can use legacy data, however, you get more information from OpenRoads data (in the form of properties) than you get with generic data.

WHAT DO I NEED TO USE THE STATION / OFFSET TOOLS?

The station / offset tools utilize OpenRoads civil horizontal geometry. Therefore, you must have a minimum of one OpenRoads horizontal alignment to use the station / offset tools. None of the native geometry files (GPK, ALG, or FIL) are used. In addition, you must have the configuration variable set within OpenRoads to support geometry publishing. See [OpenRoads config](#). You must also have a publisher 01.05.06012 or higher.

CAN I APPEND TO AN I-MODEL?

No, you cannot append to i-models. To add data, you need to republish the i-model.

SOFTWARE

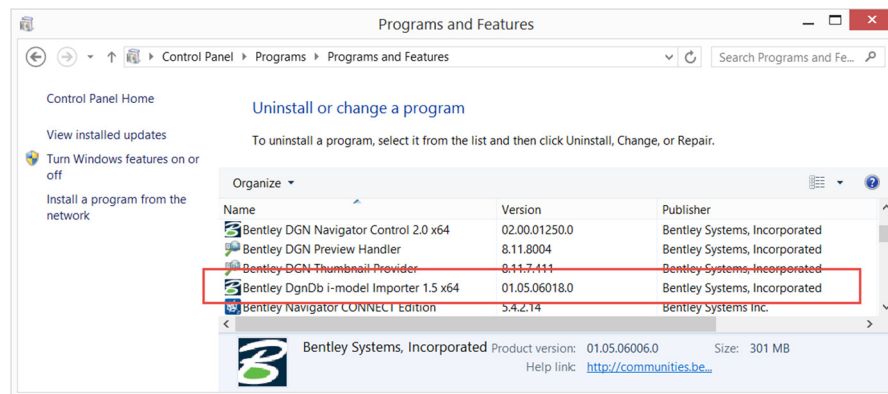
WHAT VERSION OF THE PUBLISHER IS NEEDED?

OPENROADS NAVIGATOR – USER FREQUENTLY ASKED QUESTIONS

You will need version 01.05.06012 or higher to publish i-models. This version incorporated the necessary programming to read and understand civil geometry. Earlier SS3 versions can be used, but will only have MicroStation metadata.

HOW CAN I TELL WHAT VERSION OF THE PUBLISHER I AM USING?

The publisher version is listed in the control panel. Note its name is the Bentley DgnDb I-model Importer 1.5.



Version 01.05.06.018.0

WHAT VERSIONS OF OPENROADS PRODUCTS DO I NEED TO CREATE I-MODELS FOR ORN?

In order to publish i-models with included stationing information, you need any OpenRoads SS4 Refresh 1 or newer product if you are using station / offset tools. If you are not using station / offset, then any OpenRoads SS3 or SS4 version can be used. Note that the files can be created in previous versions, so only the workstation used for publishing needs to be updated.

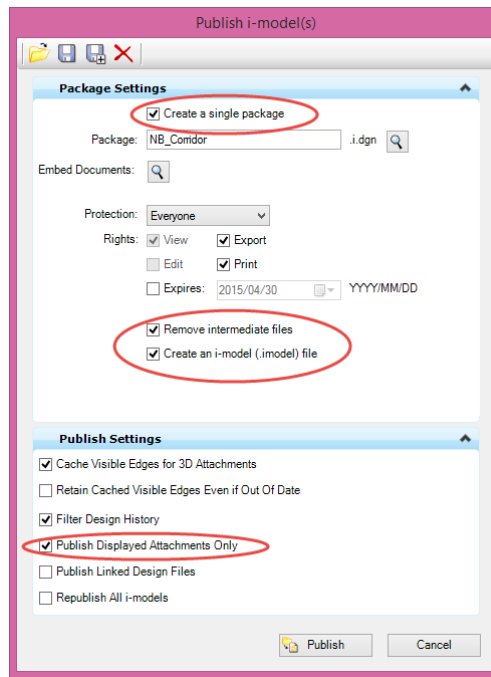
DO I NEED OPENROADS PRODUCTS TO RUN THE PUBLISHER OR CAN I USE GENERIC MICROSTATION?

While generic MicroStation can be used to create i-models, it is not desirable as the civil metadata will be missing. Therefore, the better practice is to use one of the OpenRoads products with the [configuration set](#) for publishing ICM metadata.

WHAT NEW OPTIONS HAVE BEEN ADDED TO OPENROADS PRODUCTS THAT I WOULD BENEFIT IN UPDATING?

The following are supported in the OpenRoads applications with SS4 MR 1:

- Publish Displayed Attachments Only
- Great way to reduce size of the published i-models



Two known issues have also been fixed. These include:

- Inclusion of custom MicroStation fonts
- Geometry comprised of “trimmed” elements were not trimmed.

IS THE PUBLISHER LOADED IN THE OPENROADS FOLDER STRUCTURE? WHAT IS THE DEFAULT PATH?

Although the publisher is loaded simultaneously with the OpenRoads products, it is loaded to a different location, depending on the Operating System. There are two versions, one for 64 bit and one for 32 Bit. During installation, the OS is determined and only the publisher for that OS is loaded. The default locations are:

64 bit: C:\Program Files\Bentley\ItgDgnDbImporter 1.5\

32 bit: C:\Program Files (x86)\Bentley\ItgDgnDbImporter 1.5\

CONFIGURATION VARIABLES

WHAT CONFIGURATION VARIABLES DO I NEED TO SET IN OPENROADS?

CIVIL_iMODEL_INCLUDE_ICM is the only configuration set in OpenRoads. It was introduced in SS4 Service Pack 1. If the variable does not exist, no civil metadata is included. Three values are supported:

VALUE	DESCRIPTION
1	Design models
2	Terrain models
3	Both

In the initial release, only geometry from the ICM data is utilized. Therefore, as long as the variable exists and is set to 1, 2, or 3, geometry data is included. Note the civil workspace has this set (in SS4 update 1) and above for you.

The configuration variable is used ONLY in the Publish I-model tool. When creating an i-model, we want some of the civil metadata such as linear referencing, which uses sync IDs. So when the user initiates the OpenRoads MicroStation Publish i-model tool, it checks the variable. If the variable does not exist, then the ICM data is not embedded into the i-model. If the value is non-zero as noted above (1,2,or 3) then a temporary ICM file is created and embedded within the i-model file. Since the ICM file is temporary, the user will not see it in their folder. They do not have to create the ICM file ahead of time. The user will only have to create the ICM file if they want to feed out to Trimble Business Center or other application using the ICM data structure. If there is an ICM file in the directory at time of publication, it is not overwritten, it is ignored.

DO I NEED ANY CONFIGURATION VARIABLES IN THE PUBLISHER? IF SO, WHAT FILE ARE THEY IN AND WHAT ARE THE OPTIONS?

The publisher has its own configuration file *importconfig.xml* found in the [default publisher folder](#). It can be edited with any XML or text editor, but be sure to maintain the XML format.

Two configuration variables need to be changed from the default. They are at the bottom of the file (approx.. line 50). By default, they are set to False, you need to set to True. Even if you are using an earlier version of the publisher, you should have the first line and should change that to True.

```
<OptionBool name="ConvertSeedDrawingsTo3d" value="true" /> <!--convert drawing models in seed file into physical models-->
```

```
<OptionBool name="ConvertNonSeedDrawingsTo3d" value="true" /> <!--convert drawing models in other (non-seed) files into physical models-->
```

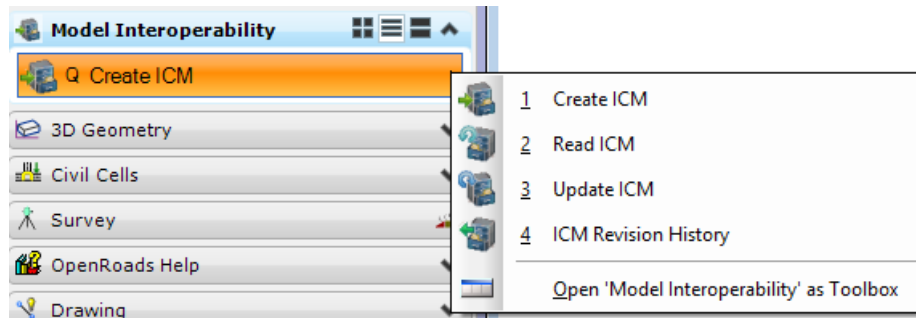
Note that changing the value of the second variable is potentially unsafe for files using hypermodeling, and does not support that workflow at this time.

These variables change your 2D data to 3D data with 0 elevation, so it is viewable in ORN.

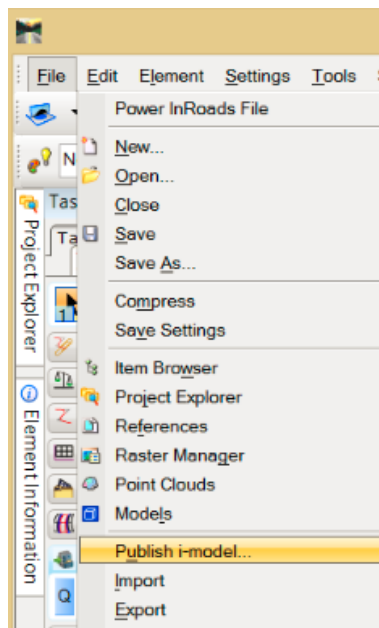
ICM AND I-MODELS

CAN I USE THE SAME I-MODEL FOR ORN AND TRIMBLE BUSINESS CENTER?

No, an ICM file is used for the Trimble Business Center or other applications using the ICM data structure, while an i-model is used for mobile apps. Therefore, different tools are used for creation of each type of file. To create the ICM, use the Create ICM tool located in the Model Interoperability toolbox.



To create an i-model for mobile apps, use the Publish I-model tool located on the MicroStation File pulldown menu.



DO I HAVE TO CREATE THE ICM FILE BEFORE PUBLISHING SO IT IS INCLUDED IN MY I-MODEL?

No, if the configuration variables are set, the ICM data is automatically included. Any ICM in the current working directory is ignored.

CIVIL DATA, SETTINGS AND VIEWS

DOES MY DATA NEED TO BE 3D? WHAT ABOUT HORIZONTAL GEOMETRY THAT IS ONLY 2D?

OpenRoads navigator uses hybrid data, i.e., either 2D or 3D or combination of both (within one i-model).

In order to view both 2D and 3D data simultaneously, the 2D data is drawn at 0 elevation, while the 3D data utilizes its elevation. Be sure to have the [publisher configuration variables](#) set or you won't get the 2D data.

WHAT ARE THE UNDERLYING RULES THAT DETERMINES WHAT IS DISPLAYED OFF / ON IN THE .I.DGN AND SUBSEQUENTLY THE .IMODEL?

For example, if we have a model turned on in the DGN at time of publishing, it may be turned off in the .imodel. The same is true of levels. Levels that are turned on in the DGN are turned off in the .i.dgn and .imodel. When it gets to reference files, it seems very random. What should I expect to see?

The “saved” settings for levels and models should be honored when published to i.dgn. The same is true for publishing to .imodel, but when the dataset includes references, there can be conflicts which can cause these settings to be changed. For example, you may have one reference file with a level turned on, but in another reference file that level is turned off.

All Levels that are ON in the source\referenced V8 DGN are published. But there may be some cases when levels become duplicate and publishing has to merge all similar ones and take the display attributes of a certain level to an .imodel. This is actually a WAD (working as designed). The user may eliminate the problem either by design changes in the source DGN or in the ImportConfig.xml. The required configuration changes are outlined in the ImportConfig.xml file and also mentioned in the generated issues.log file along with the .imodel.

```
<Levels>
<ImportRules
<If name="0">
<Then merge="true" />
</If>
```

Set this to **False** if you don't want to merge certain Levels.

CAN I USE DISPLAY SET VIEWS TO PRODUCE RENDERED I-MODELS?

Yes, ORN supports display set views. Set one of the views to the desired displayset, then create a saved view.

CAN I CREATE AN I-MODEL FROM A SCALABLE TERRAIN MODEL (STM)?

Yes, you can create an i-model which includes a scalable terrain model.

CAN I INCLUDE RASTER IMAGES IN MY I-MODEL?

Almost all the raster formats are supported during publishing, with the exception of .xwms and Bing Maps. The exception rasters won't be embedded and the publisher will report warnings about them in Message Center.

CORRIDOR MODELS PUBLISHING FOR OPENROADS NAVIGATOR - DOES THE CALCULATED TOP MESH AUTOMATICALLY GET INCLUDED?

You will need to set the design stage to include the top or bottom or both meshes as required before you publish. You don't need to create terrains for these as they are corridor artifacts and are included.

DO I HAVE TO CREATE SAVED VIEWS PRIOR TO PUBLISHING? WHY?

No, you do not have to create saved views prior to publishing. If you have no saved views, the publisher creates a default thumbnail. You can also create saved views within ORN later, if you decide they are helpful at a particular location.

CAN I PUBLISH CROSS SECTIONS? HOW?

Cross sections that are drawn into a MicroStation model in the active or reference file can be published. It is a best practice to have them in their own model and create a saved view for easy access. Since they are drawn a substantial distance from the plan view location, fitting the view produces dots in the view, so it is desirable to turn the model off when not in use.

Note dynamic cross sections are not supported in the current release.

DO I-MODELS SUPPORT MATERIALS?

Materials are published, but the textures associated with them are not embedded into the i-model. Importing of textures is not supported, mainly due to the fact that the images can get quite large, particularly in the case of draped satellite imagery.

WHAT IS NOT SUPPORTED?

The following are some major items currently not supported.

- Sheet models
- Callouts and Dynamic Views
- CVE and Hyper modeling
- Materials, level overrides and, lights
- Reprojection of coordinate systems

HOW DO I GET NON-DGN FILES INTO MY I-MODEL? OR DO I DOWNLOAD THEM SEPARATE FROM THE I-MODEL?

There are two ways to incorporate docs, xls, and pdf files into your i-model. If the document is related to an element, you can use the Design Link tool within MicroStation to "link" to the element (or multiple elements). One example may be linking the spec sheet for a Type F curb and gutter to all the elements that represent that type of curb. However, if you have a document that you do not want to "link" to an element, then the workflow is to use the Embed Document option on the Publish to i-model tool.

If you forget to include a document and do not want to republish, you can download the document via ProjectWise or third-party application, however, you will have to use the native viewer as it will not automatically appear in the ORN app.

CAN I USE CUSTOMIZED MICROSTATION FONTS IN MY I-MODELS?

Yes, you can use customized fonts in your publishing. Note it must be included within the MicroStation MS_SYMBRSC configuration variable.

You can use MS_SYMBRSC config to point to the .rsc font resources.

You can use MS_FONTPATH config to point to the .shx font resources.

For TrueType fonts, if you are using custom .ttf fonts, then you have to place them in the .i.dgn directory. Otherwise they won't be resolved and embedded in .imodel.

You don't need to set the following on your own as they are set for ItgDgnDbImporter during the .imodel publishing process. However, they may be useful in some custom workspaces as configuration variables in the "system" environment.

- BENTLEY_DGNDBIMPORTER_SEARCH_FONTS=1;
- BENTLEY_DGNDBIMPORTER_RSC_FONT_PATHS=<directory or file path here>;<directory or file path here>
- BENTLEY_DGNDBIMPORTER_SHX_FONT_PATHS=<directory or file path here>;<directory or file path here>
- BENTLEY_DGNDBIMPORTER_TTF_FONT_PATHS=<directory or file path here>;<directory or file path here>

SUE / SUDA DATA

HOW CAN I INCLUDE SUE / SUDA DATA IN MY I-MODEL? OR DOES IT HAVE TO BE IN ITS OWN I-MODEL?

SUE /SUDA information can be in its own i-model or incorporated within another i-model, based on user or organizational preference.

WHAT IS THE BEST PRACTICE WORKFLOW FOR CREATING AN I-MODEL CONTAINING BOTH SUE AND ICM DATA?

The best practice / workflow would be:

1. Using SUE, create an .i.dgn of pertinent data using the MicroStation Publish I-model tool.
2. Attach the .i.dgn file to a civil file as a reference.
3. Create the civil .imodel which will include the SUE metadata.
- 4.

If the user is the owner of both the SUE and civil data, the process can be streamlined.

1. Attach civil files to the SUE file as a reference.
2. Activate SUE, then publish the .imodel.

IF YOU CREATE THE I-MODEL FROM A CIVIL PRODUCT (NOT SUE) WITH JUST THE SUE DATA ATTACHED VIA DGN, NOT VIA I.DGN, THEN YOU WILL NOT GET ALL THE RICH SUE META DATA. IS THAT CORRECT?

That is correct. The other option is to publish from the SUE file with the civil files attached as a reference.

IF YOU CREATE THE I-MODEL FROM WITHIN SUE, WILL YOU GET THE ICM DATA?

Yes, you will get the ICM data for station / offset tools in addition to the SUE metadata.

NON-OPENROADS DATA

CAN I ONLY USE I-MODELS CREATED BY OPENROADS? OR CAN I USE I-MODELS CREATED BY OTHER PROGRAMS?

You can use i-models created by other programs. Keep in mind the type of metadata will vary depending on what program was used to publish the i-model.

CAN I CREATE AN I-MODEL FROM A CIVIL3D FILE?

Yes, you can create an i-model from a Civil3D file, however it will only have the graphics, no metadata.

CAN I CREATE AN I-MODEL FROM REVIT?

Yes, you can create an i-model from a Revit file.

CAN I CREATE AN I-MODEL FROM A DWG FILE?

Yes, you can create an i-model from a DWG file. However, it will only contain graphics, no metadata.

TROUBLESHOOTING TIPS

TROUBLESHOOTING: I'M GETTING AN ERROR MESSAGE OUTDATED PUBLISHER WHEN OPENING AN I-MODEL OR USING THE STATION / OFFSET TOOLS?

Be sure you have [version12 or higher](#) publisher.

TROUBLESHOOTING: I DON'T SEE ANY TEXT IN MY I-MODEL, JUST THE LINEWORK.

This was a known issue in earlier versions of the Publisher, if the text was a customized MicroStation font. This has been fixed, so update your publisher.

TROUBLESHOOTING: IF I HAVE AN ELEMENT ID (SUCH AS IN A LOG FILE), IS THERE AN EASY WAY TO FIND THAT ELEMENT IN THE DGN FILE?

Use the MicroStation `analyzeelementsselectbyid` tool to find the element.

TROUBLESHOOTING: MISMATCHED APPEARANCES

In the i-model publishing, I'm getting statements like the following:

```
3,3,61277sp.dgn.i.dgn,"Level ""SV Util Power"" has a different appearance (color (0
vs. 16)) in different models. To make it possible to control the appearance of this level
for each model independently, add the following rule to the import configuration file: <If
name=""SV Util Power""><Then merge=""false""/></If>"
```

What does this message mean?

Your i-model is comprised of elements from the DGN file where you commenced publishing, plus all the reference files (depending on settings). This message means that the element (in this case SV Util Power) is displayed in more than one model and with a different appearance. This could be due to symbology overrides, etc. Since the same level from all models is merged into one level, the software is not sure which of the encountered symbologies to use. You can use either the single symbology that the software uses, or you can set the rule to not merge and use the varying symbology as found in each model. Note this gives you more granularity in your level listing, but depending on the number of levels, may make your list substantially longer.

This one calls out a specific level "0" to merge.

```
<Levels>
<ImportRules
<If name="0">
<Then merge="true" />
</If>
```

This one calls out a specific level "0" to not merge.

```
<Levels>
<ImportRules
<If name="0">
<Then merge="false" />
</If>
```

IS THERE A GLOBAL STATEMENT WE COULD ADD TO NOT MERGE ANY OF THE LEVELS?

It is very common for civil users to have a level difference between files, but having to call them out one by one is very tedious. It would be easier if there was a global "don't merge" statement...

TROUBLESHOOTING: CAN I PREVENT LEVEL MERGING GLOBALLY RATHER THAN BY INDIVIDUAL LEVEL?

```

<Levels>
  <ImportRules>
    <!-- must put rules for "0" before rules for default level, as "0" is the
default level in some cases. -->
    <If name="0">
      <Then merge="true" />
    </If>
    <If iDefault="true">
      <Then merge="false" newName="%model - default" />
    </If>
    <If name="*">
      <Then merge="true" />
    </If>
  </ImportRules>
</Levels>

```

If you change the last node (with name="*") to say <Then merge="false " />, then by-default, it will not merge any levels.