



Using InfraWorks to Bring Revit to Life!

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AB6212

Class Description

This course is designed to show architecture, engineering, and construction (AEC) professionals the advantage they will gain in learning the workflow between Revit software and InfraWorks software. InfraWorks software is a tool that helps to create models that simulate our design concepts within the surrounding environment. InfraWorks software is known for its infrastructure capabilities, but this course will show AEC professionals that they are missing out. With the new Revit software import tool, architects can take advantage of an intelligent environment and incorporate their designs into existing scenes. Learn how design changes become easy to accomplish by updating the Revit software model and obtaining the ability to sketch new conceptual design elements directly in InfraWorks software. This course will guide you through the steps of creating high-quality conceptual models and visually compelling 3D planning proposals from Revit software to InfraWorks software.

Learning Objectives

At the end of this class, you will be able to:

- Learn how to import Revit Software models
- Learn how to add massing and site detail to your InfraWorks software model
- Learn how to create design alternatives on a site plan
- Learn how to generate animations producing visually compelling 3D planning proposals

About the Speaker

Ms.Rhein is a technical specialist and instructor for U.S. CAD of Hawaii. She has experience working with a variety of industry members as she provides training, consulting, and implementation for Autodesk Revit Architecture, Navisworks, AutoCAD, Showcase and 3ds Max Design. As a member of the technical team, she also provides technical support, which includes software installation support and product troubleshooting. She continues to be actively involved in CAD and Revit user group meetings and is working on developing and expanding her industry knowledge with a focus in sustainable design. Prior to joining U.S. CAD, she earned her Bachelor of Arts degree in interior design at Michigan State University.

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What's all the Buzz about InfraWorks?!

Over the past few years the AEC Autodesk users have started to hear the “buzz” over the coolest product ever, InfraWorks! The Autodesk InfraWorks software is a powerful BIM program that helps create models that simulate our design concepts within the surrounding environment. The BIM process supports the ability to coordinate, update, and share design data with other team members throughout the entire life cycle of the project. This product initially star stuck the infrastructure world, as it was created to streamline the workflow of infrastructure projects with a 3D model, but after its release other Autodesk users were realizing the powerful capabilities of the product and saw just how easy it was to use.

Throughout this handout you will learn helpful tools within InfraWorks that can help first time users incorporate their designs into an existing scene of rich data. You will learn how to import Revit models and how to update changing designs within a project. You will also gain valuable insight on how to create dramatic visuals that will be sure to blow any client away. This course will guide you through the steps of creating high quality conceptual models and visually compelling 3D planning proposals using your Revit designs while taking it a step further and covering basic tutorials on generating the model into animations and still images.

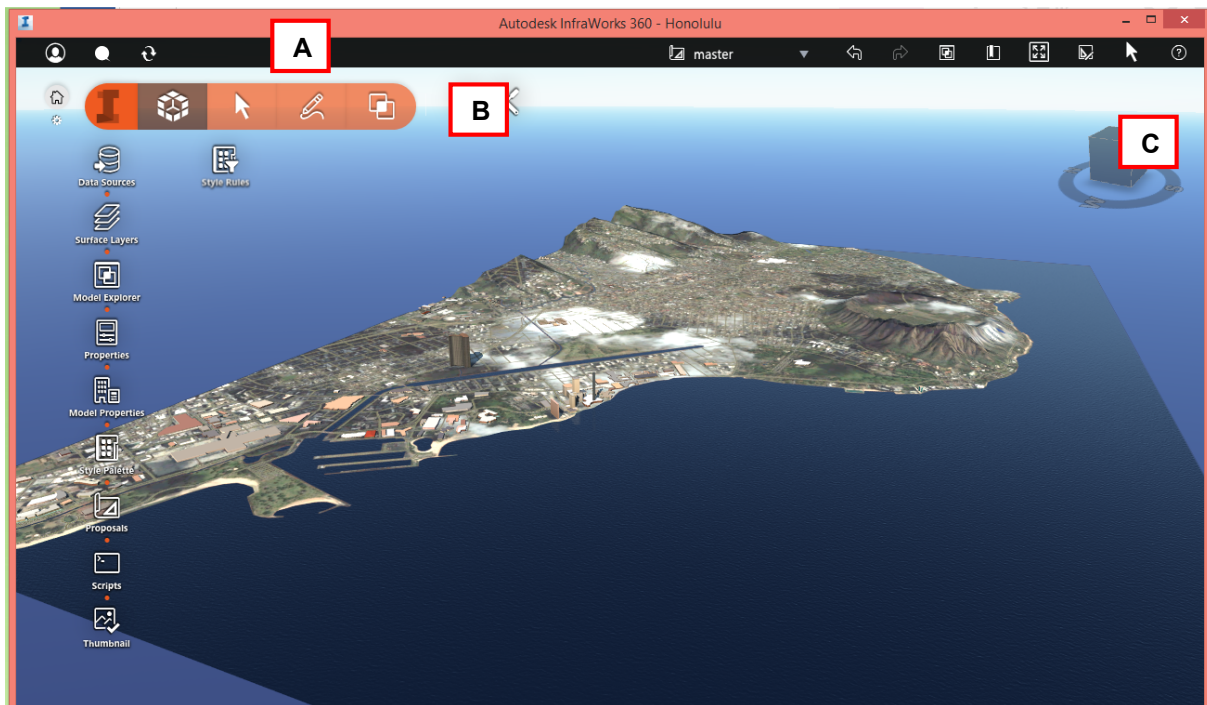
InfraWorks vs InfraWorks 360

When comparing InfraWorks and InfraWorks 360 it is important to start with the products you currently have. InfraWorks software is only available in the Building Design Suite Premium or Ultimate, or the Infrastructure Design Suite Premium or Ultimate. InfraWorks360 is a separate application that includes vanilla InfraWorks as well as InfraWorks 360 cloud services and cloud credits. InfraWorks 360 is typically known for its bridge, roadway, and drainage design capabilities but it also has great tools for first time users of InfraWorks. If you are not familiar with GIS and an understanding of how to bring data in to InfraWorks this product is right for you. InfraWorks 360 has the ability to access GIS data from sources like USGS, OpenStreetMap, and more. It also has the ability to automate model creation and within 5 minutes you are up and running with an accurate 3D model of almost any city in the US.



Getting to Know the UI: Out with the Old in with the New

The user interface of InfraWorks was designed for easy and organized access to commands and views making it great for first time users. The latest version of InfraWorks had a UI overhaul giving it a completely different look from previous releases. One of the major differences of the UI is the replacement of the Ribbon. The standard Autodesk ribbon is no longer part of the application and was replaced with In-Canvas controls. The newest UI is clean, simple, and easy to navigate.



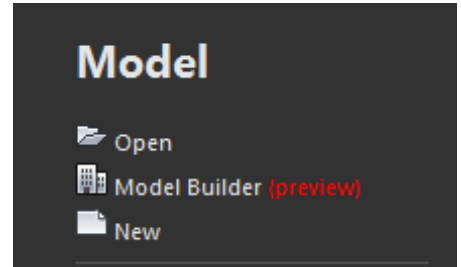
- A) **Utility Bar:** provides access to Autodesk 360 sign in, as well as general tools that will be useful during your project development. Bookmark locations and view your proposals are just a couple of the tools you will find in the utility bar.
- B) **Intelligent Tools:** provides the set of tools appropriate for the phase of work being done. You will locate your conceptual sketch tools and visual style tools in this panel.
- C) **View Cube:** a clickable, and draggable interface that you can switch between standard and isometric views of your model. You can also utilize mouse shortcuts. A left mouse click orbits the model. Holding down a left mouse click will activate pan mode, and the scroll will activate your zoom command.

Creating Models

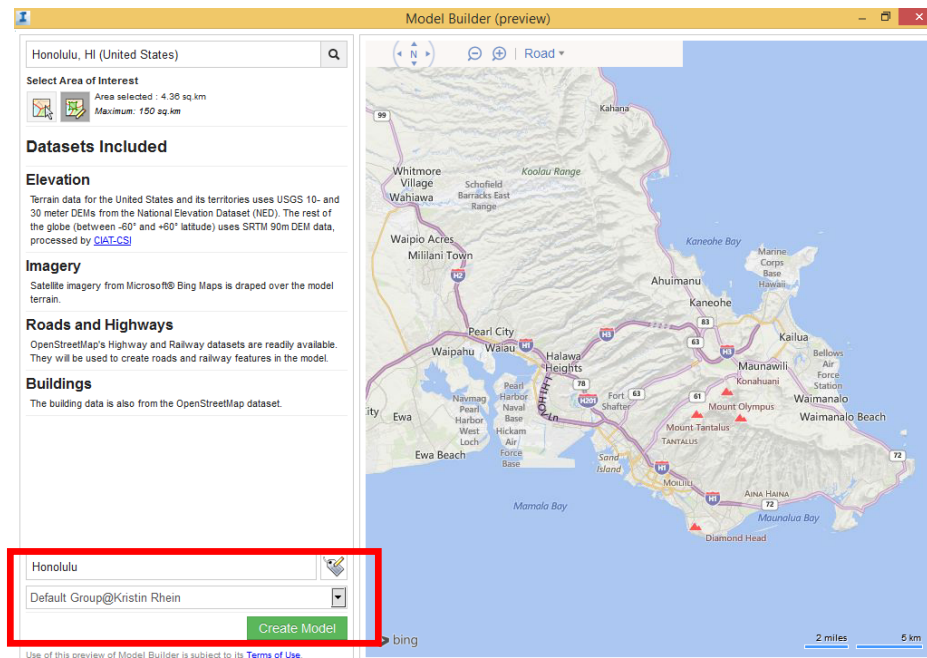
When you start InfraWorks for the first time, you will be prompted to open an existing model, or start a new model by manually entering information about your project location. Your base model should reflect the area of interest, before you add additional content to it. There are two ways to create a model; by using Model Builder, or by manually importing data sources into a base InfraWorks file.

Model Builder

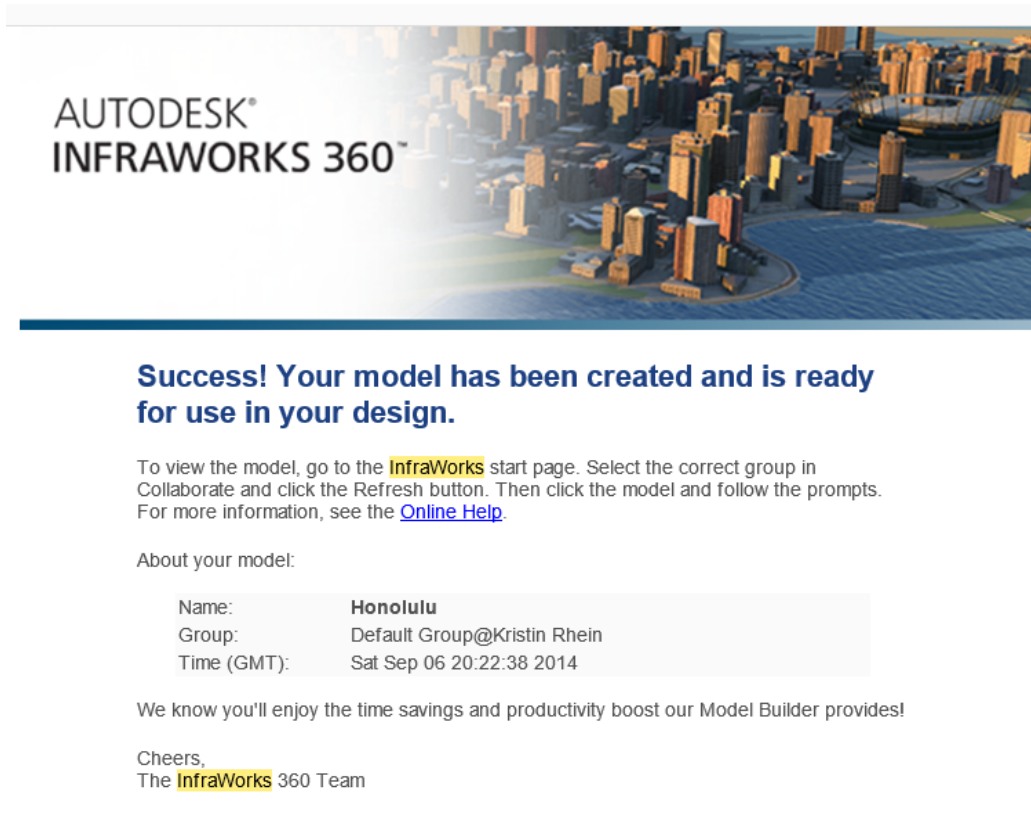
If you are looking for a tool that searches for data for you, Model Builder is the tool for you. Model Builder is a free technology preview that goes out to the web to grab data sources that automatically create an InfraWorks model. This tool gives you the ability to select a model area on a map. The map has recently improved with the latest update of InfraWorks 360 and now includes international! Model Builder combines multiple data sources from USGS terrain, aerial imagery, and vector data for roads, railways, buildings, and moving water.



Once you have your given area chosen, simply enter a name for model and choose the 360 group associated with your account. You must select a group or model builder will not work correctly.



Once you select your area select the Create Model tab. Within a few minutes you should receive a similar email to the one below. Note, this may take some time depending on the size of the model. Once your file is created it should appear in your InfraWorks start page under the group you are associated to. Select the icon for the model and your new model will appear.



Creating a Model Manually

When starting InfraWorks, you will be taken to the Start Page. From this page you can create a new model by manually selecting New.

1. Select New from the Start dialog box.
2. In the New Model dialog box set the extents of your model: Location, Name, Description, Area, Coordinate system.
3. Click OK and begin importing data into your model.

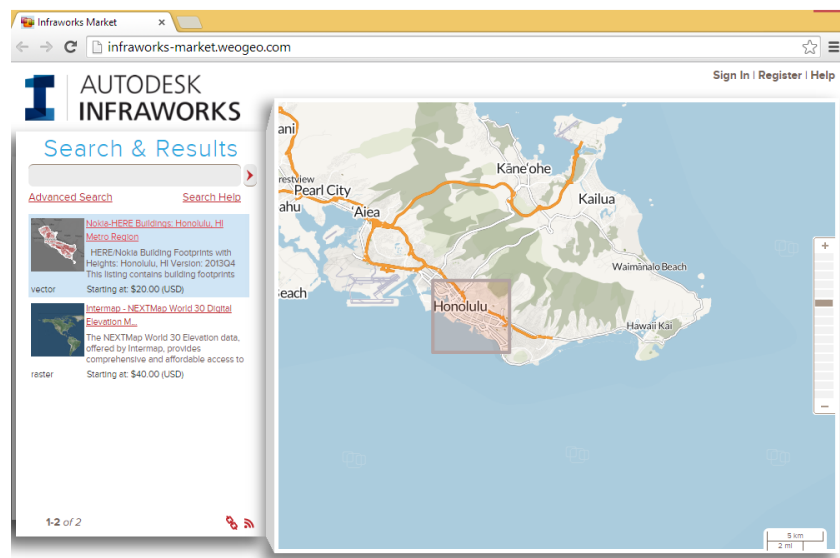
Bringing Data into InfraWorks

Bringing data into a project can be the most time consuming part of creating the entire model. It can be complicated and cause a lot of headaches for those who have no experience finding and importing GIS data. As a non-civil user, I found it easiest to take advantage of InfraWorks 360 specifically for importing data and getting my model up and running with little to no effort.

Where to find GIS Data

If you have vanilla InfraWorks and do not have access to the Model Builder tool, it is important to know how to import GIS data and where to find it. Internet sites provide free GIS data such as www.GISDepot.com and www.USGS.gov. Some websites offer packages of data that might include elevation data, orthoimagery, building footprints, roads, municipal boundaries, and other geospatial data. Be careful to download the most current data available. Many sites contain outdated sources.

Another great resource for GIS data is WeoGeo.com, which provides reasonably priced data sets to help you create a 3D environment.



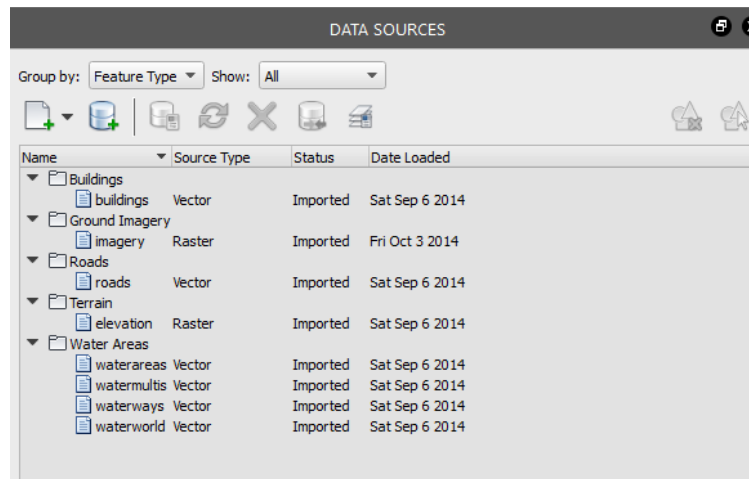
External GIS is imported into the model as layers using the Data Sources explorer. If you are pulling different sources in to the model, InfraWorks should automatically adjust the coordinate system to your project coordinates. When you are starting a new model, set the coordinates from the beginning and then being to import data. This will help coordinate and update data sources to your project coordinate system.


If you do not need elevation data, you can also import 2D arial imagry into your enviroment. This option is great for quick and accurate visuals for master planning.

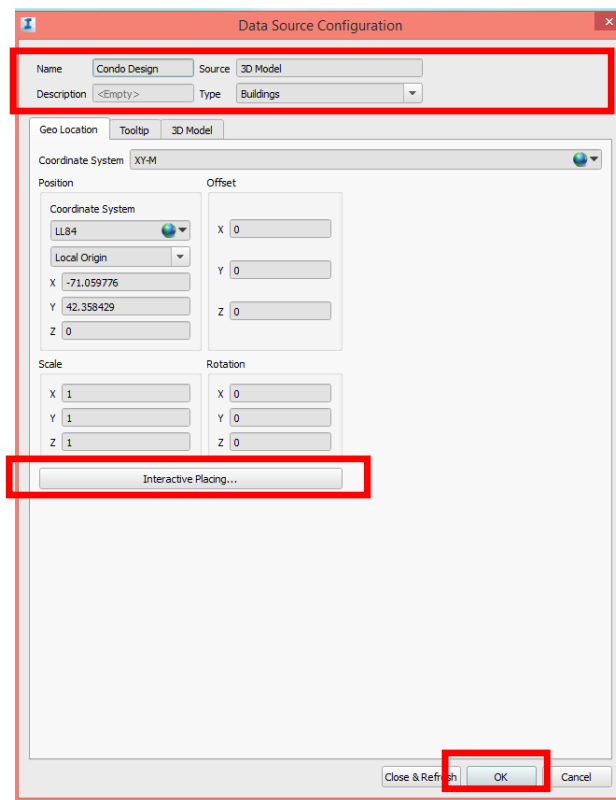
How to Import Data:

After you have found your data for import, navigate to the intelligent tools panel and select the big I to launch the data source dialog box.

1. Select  ,  ,  to open the data source dialog box.



2. Select Add File Data Source  and import.
3. After import, you must configure the data. It will not appear until you configure it. Right-click imported data and select Configure to display the Data Source Configuration dialog box.



- 4) Click the Geo Location tab and set the coordinate system of the incoming data (not the coordinate system of the model). It is also important to add a description and Type.

5) You can also place the model manually using Interactive Placement.

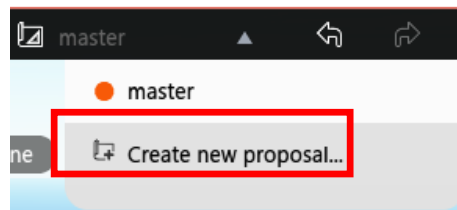
6) Click Close & Refresh.

Design Proposals

Once you have your model created and data imported you are ready to start adding design elements to your project. One of the best features of InfraWorks is its ability to create design alternatives which can be displayed at any point. Each model in InfraWorks stems from the master proposal, which shows existing conditions of the model. You are then able to create a new proposal (design alternative) for each new sketch of your design. You can merge proposals and delete proposals as you move along your design phase.

How to Create a Design Proposal:

- 1) Navigate to the Design Proposal Icon in the Utility Panel.
- 2) Select Create New Proposal from the drop down, and give the proposal a name.




- 3) Any new design elements added in this proposal become part of the design alternative. If you need to create a new design proposal switch back the master proposal and select create new proposal so you have a fresh slate.

Adding Conceptual Buildings to Your Model

We are now ready to add existing buildings to our existing conditions using our conceptual building tools. There are three categories of predefined 3D models:

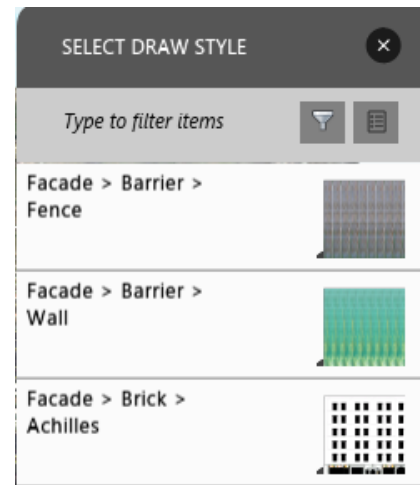
- **Furniture:** roof top items, such as solar panels.
- **Neighborhood:** common buildings types that you would see in a city, such as churches, gas stations, and post offices.
- **Residential:** Single-family home models.

How to Create a Building in InfraWorks

- 1) Navigate to the Intelligent Tool's palette, and select create conceptual design features .

2. A draw style palette will appear and ask you to pick a style of the building façade. Then begin to sketch out the perimeter of the building. On the fourth corner, double click to place to building. Once a building is created, the height can be adjusted using the Building Properties palette. Clicking and dragging enables you to reshape the building footprint.

You can also use <Ctrl>+<C> to copy selected buildings or homes and paste them using <Ctrl>+<V>. If you want to place more than one building at a time, single click and follow a path until the end, double click to place items along the path.

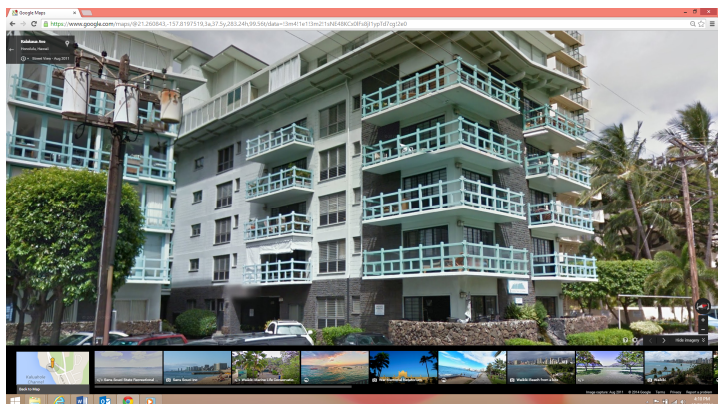


If you would like to change the façade at a later time, open the Styles Palette. Open the style type façade and search through existing materials. Click and drag new materials on the building and watch it update.

How to Create a Custom Façade on the Fly

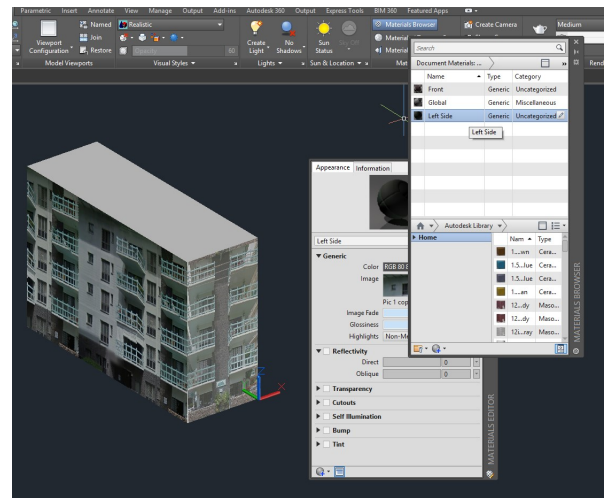
Creating custom façades in InfraWorks can be a difficult and time consuming process. You could take the route of duplicating façade styles in the styles palette and adjusting the properties to incorporate custom images, OR you could create custom façades in another software program and import them into InfraWorks. One option is much faster and much easier to complete.

- 1) The first step in the process is to gather your imagery for your custom façade. I started with google maps and jumped into street view to capture screen shots of a building façade. It is best to use actual photos if you are trying to make your building as realistic as possible. Make sure to capture all four sides of the building because you will need to create 4 different custom materials to apply to each side of the building. Once you have your photos, edit them to so that no background



imagery is visible. These images will become your custom material that you apply to your model.

- 2) You are now ready to sketch your 3D model. I used AutoCAD for this step, simply because it was easy and I knew I could export to FBX and apply materials quickly. Draw your building as close to the real building dimensions as possible. When you have finished your model, open up your materials browser from the visualize panel and select create new generic material.
- 3) As soon as you have created a new material, the material properties dialog box will appear. At this time you will assign your façade images to the material. You will need to create a new generic material for each side of your building, including the roof.
- 4) Once you have applied your image to your custom material you will need to scale the material image to fit the side of the building that you are applying the image. To scale the image double click on the image appearance in the material properties dialog. Adjust your scale value to the dimensions of your building. Make sure to unlock the X and Y value so you can adjust them without having the values auto-correct. When you have adjusted your image scale close out of the image, and material property dialog box. Hold down Ctrl and drag and drop the new material onto the face of the building side that you want to apply the image to. If you do not hold down Ctrl, the entire image will drape the building. The Ctrl key allows you to select 3D faces which is what we want to apply our custom material to.



- 5) When you are finished applying materials to your 3D model, save the file to FBX format. We are now ready to import into InfraWorks. With our FBX file set to the side, launch InfraWorks. In the Data Source dialog box select Import 3D Model. This import option includes FBX files. Configure the import and make sure to add Building Type to your import properties. After you have placed your new model you can adjust the scale and rotation of the model. If you modify the height of the new model your custom façades will stretch to the desired height.





How to Import Revit Models

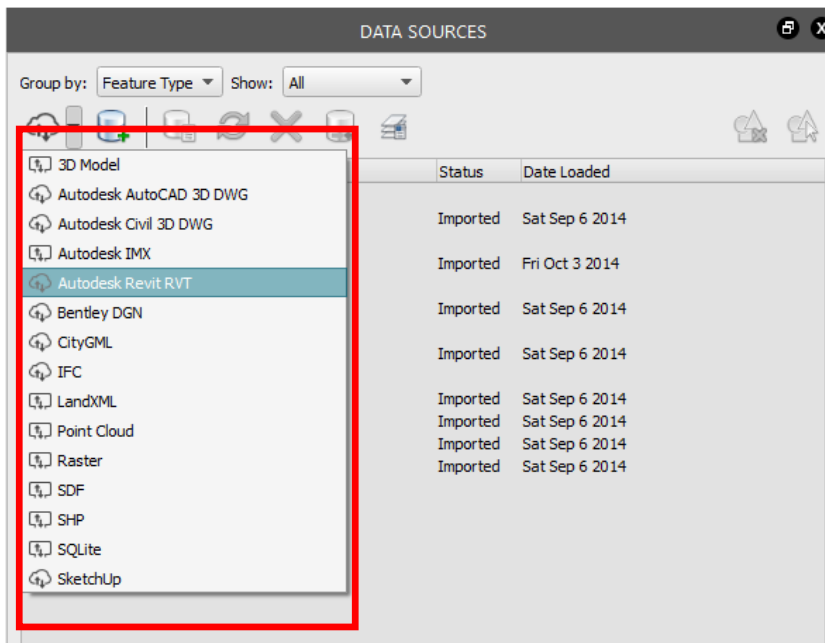
If you are using InfraWorks 360, you have the ability to directly import RVT data into your model. The 360 engine uses the cloud to translate the Revit files. Vanilla InfraWorks does not have the Revit import capabilities. Instead, users will need to save their Revit files to fbx format. If you have subscription, you can also download InfraWorks 2014 R2 from the subscription center which will unlock the Revit import capabilities through the cloud as well.

Once the Revit model is imported into InfraWorks you cannot do much in terms of modifying the building. Typical modifications like moving, rotating, and scaling can be applied. You will get two dialog warnings as you import the data. One warning will be to remind you to connect to the internet as the program uses 360 cloud to translate the Revit file. The second warning is a reminder that custom materials and links

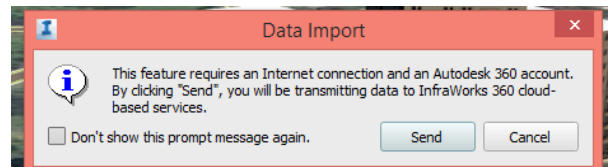
from Revit will not be imported. Materials from InfraWorks can't be applied to Revit models, even if it comes in as a massing object with generic materials. With this being said you must apply materials before the import process. It is best to use basic materials so they can be translated into InfraWorks. If the Revit model changes appearance, you will need to update the model from the data source dialog.

How to Import Revit Models using 360

- 1) Select , ,  to open the data source dialog box.
- 2) Select  (Add File Data Source).



- 3) Navigate to the RVT file, and select it. Importing an RVT file requires internet connection as it uses the cloud to translate the data. A dialog box will appear after you select the RVT file. Hit send. You will also get another dialog warning you that custom textures and links will not be imported. This is typical and hit ok.



- 4) Once the file has imported, double-click to configure the model. If the Revit model has coordinates applied to it, InfraWorks 360 can automatically position the model based on the data. You can also use interactive placement if the model does not have coordinate data.

In the 3D model tab, adjust the model render detail to preview how the model will look in InfraWorks. Make further adjustments and select Close & Refresh to update the model.

Working with Other Revit Friendly Applications

If you are thrilled over InfraWorks capability, but don't have the time to create an amazing Revit model, consider using a Revit friendly application to create conceptual models.

FormIt to Revit to InfraWorks

A newer Revit friendly application to check out is FormIt. Autodesk FormIt is a web and mobile app that helps create conceptual models on the fly.

Once the model is created, you simply save the model to the cloud where the file automatically converts to a RVT file.

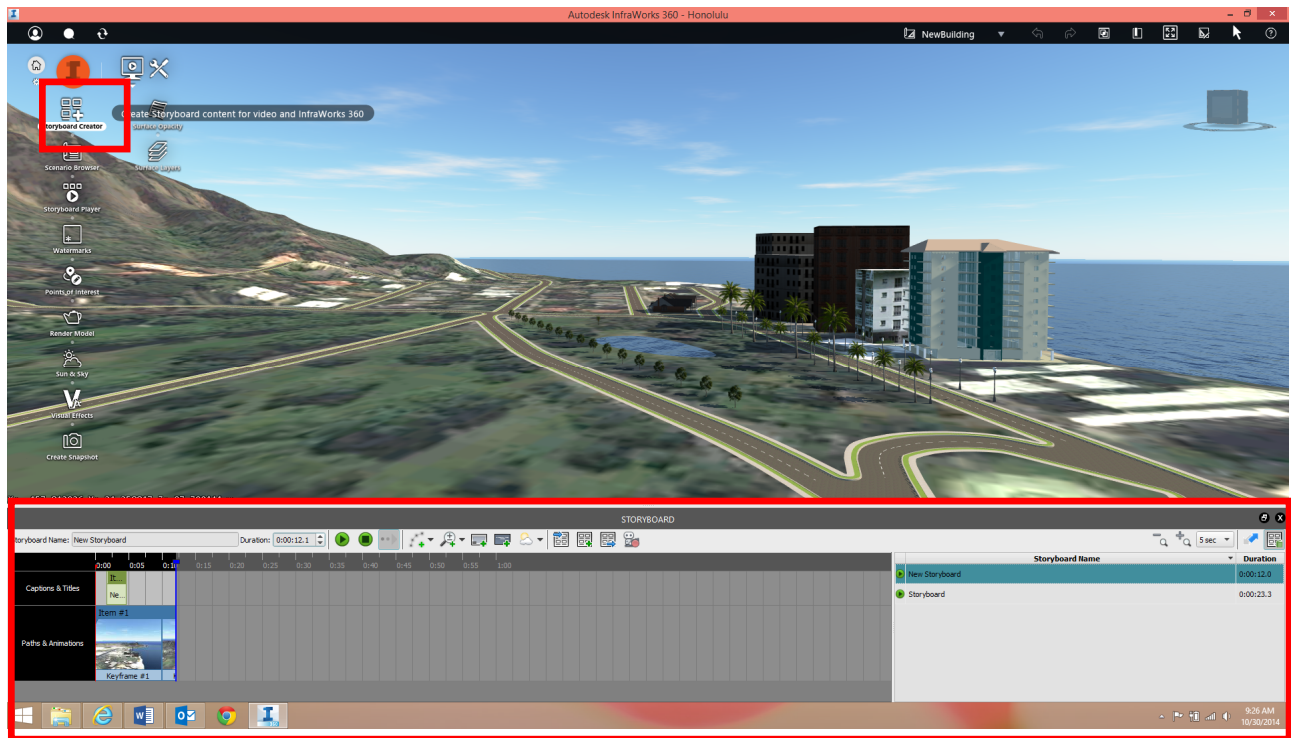
Once the RVT file is created, you can proceed to download and open the file in Revit. It will come into Revit as a mass object. From the mass, you can either directly import into InfraWorks or convert the mass to a building with Revit tools.



You can import the model using your Data Source tool in InfraWorks.


InfraWorks Animation

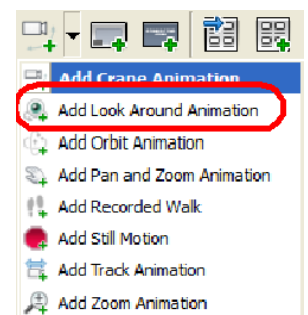
InfraWorks has the ability to create powerful animations in a matter of minutes. This tool alone is a reason to dive in and learn InfraWorks. You can create your animations using your own camera path or by using pre-defined animation movements that InfraWorks provides making it very easy to learn how to create animated presentations. You can publish your animations to AVI and send them to the cloud for other users to view. You can also take InfraWorks animations into other programs for editing and enhancements.



How to Create a Storyboard

A Storyboard in InfraWorks is very similar to the Storyboard tool in Autodesk Showcase. You create your presentations and package them up for publishing. The Storyboard feature replaces the ShowMotion functions available in previous releases. When you open a model that contains ShowMotion sequences, they are converted to storyboards. The Storyboard toolbar contains controls to create elements and manage storyboards. Camera paths and animations appear in the bottom track. Specify the duration and position of all elements by dragging and resizing them. When finished, open the storyboard in the sequence tool and publish them into an AVI or web video.

- 1) On the Design Presentation Tab, select  (Storyboards).
- 2) At this point you are provided a variety of options. If you would like to create a camera path or preset animation camera shots. A camera path moves from one keyframe to another, simulating a walkthrough. You specify the keyframes, the transition between each one, and the speed of the camera. Changes you make to camera path settings are reflected immediately in the storyboard.
- 3) Specify whether to cut or fade when entering and exiting the camera path frame. If you specify Fade from Black or Fade from White, specify how long the transition should last.
- 4) Specify the behavior of the camera. Select from the following:





- **Look Along Path**
- **Import a Camera Path**
- **Create from Design Road**

- 5) In the Camera Speed Control group, specify how the camera is controlled between shots in the sequence. To play the current keyframe, click the play button next to the plus sign. Use the animation controls to go back or move forward in the scene. To play the entire camera path, do the following: Select the camera path header or an empty area within the camera path. Click the green play arrow at the top of the settings pane.

Managing your Storyboard

Once you have created your storyboard you store it in a Storyboard Library. This allows you to have multiple storyboard packages per project. You can add and delete storyboards from the Storyboard Library.

1. Navigate to the Design Presentations icon, Storyboard Creator
2. From the Storyboard panel, click  (Storyboard Library).
3. Select a storyboard.
4. To play the storyboard, click .
5. The selected storyboard opens, replacing any storyboard that was open before, and plays.
6. Publish out as an AVI for customer presentations