AS502948

Visualization in Minutes: Exploring Twinmotion's Bag of Tricks

Sam Anderson
Epic Games

Learning Objectives

- Learn how to use Datasmith Direct Link to streamline Revit visualization workflows
- Enhance realism with assets from Twinmotion, Quixel, and Sketchfab
- Improve stakeholder communication with storytelling techniques
- Learn when to bring designs into Unreal Engine 5 for bespoke experiences
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Description

Instant feedback transforms ideas—especially during the design stage. But only when it's accessible. In this class, you'll learn how to elevate Revit models in a matter of minutes, using an ecosystem that's surprisingly simple. Twinmotion for real-time visualization, Sketchfab/Quixel for assets, Unreal Engine for when you want to run wild—see how each element comes together to help designers explore more "what ifs?", without compromising intent or quality.

Speaker(s)

Sam Anderson

Technical Marketing Manager, Epic Games

Sam Anderson is a technical marketing manager at Epic Games developing visual and technical content in Unreal Engine and Twinmotion. A designer and 3D artist based in New York City and Los Angeles, Sam has a focus in real-time rendering. Previously, she was a visualization specialist at SHoP Architects where she focused on research and development, promoting the use of real-time technology to improve design processes.

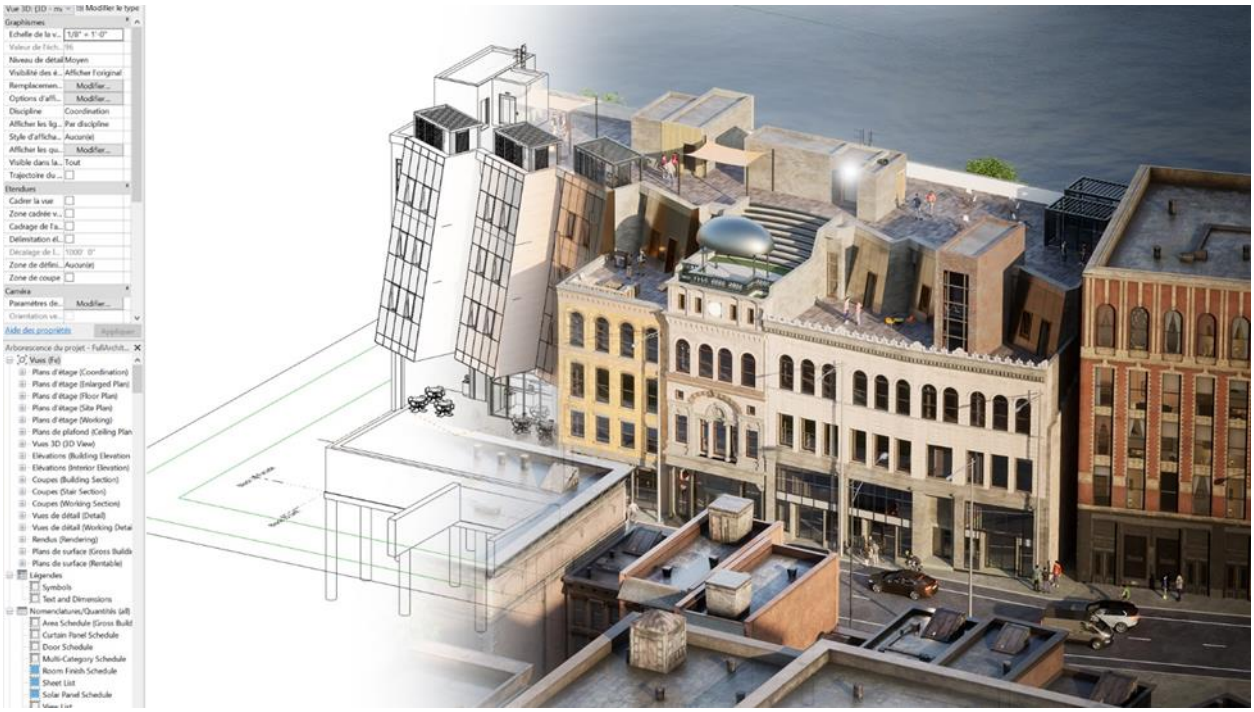
Introduction

What is Twinmotion?

Twinmotion is an intuitive, real-time, immersive 3D visualization tool. With an easy-to-use icon-driven interface and the power of Unreal Engine running under the hood, it empowers architecture, construction, urban planning, and landscaping professionals to produce high-quality visualizations and easily share them using Twinmotion Cloud.

Agenda

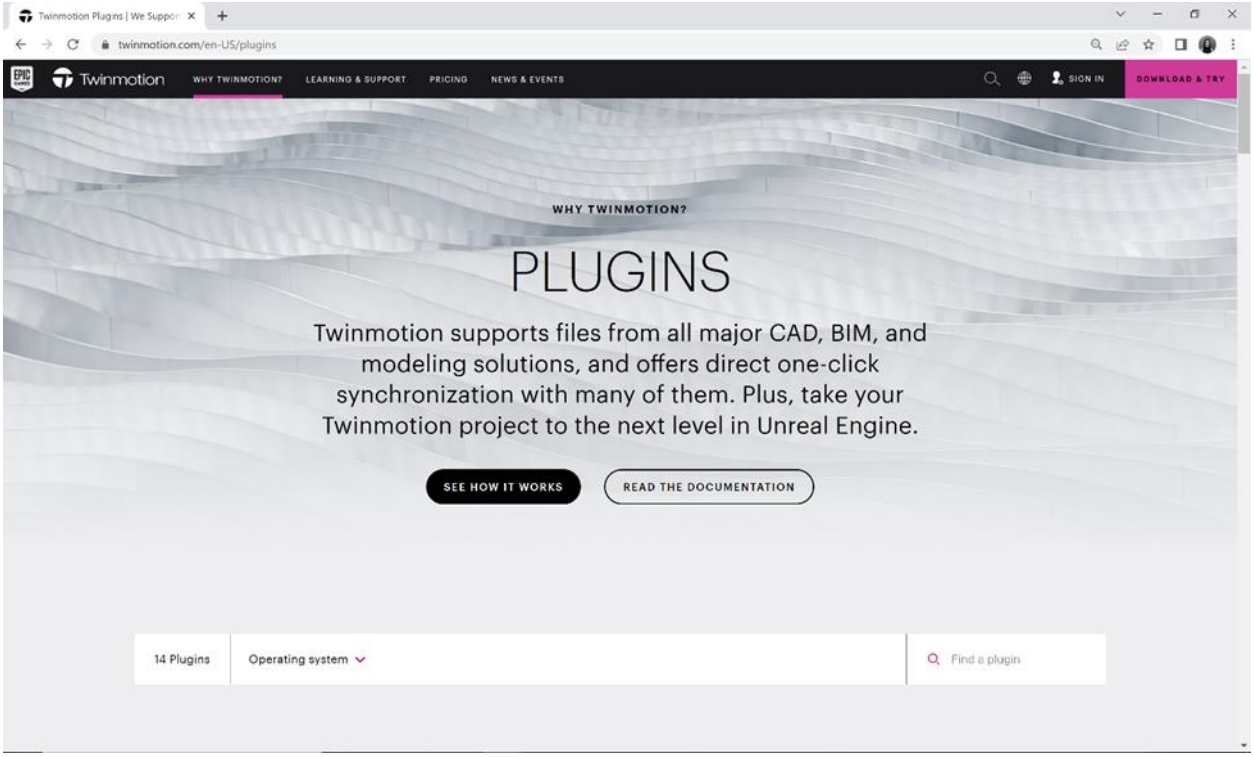
This example will walk through how to bring a BIM model intoTwinmotion and later develop that model further in Unreal Engine if desired. For more information on the steps featured in this example, please refer to the Twinmotion documentation resource online.



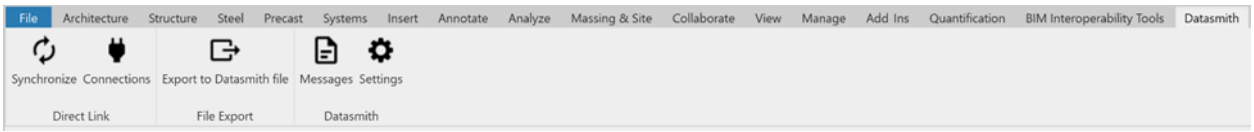
Use the Datasmith Direct Link to streamline Revit visualization workflows

Download plugin

The first step to getting your BIM models into Twinmotion is to download the Datasmith plugin by visiting Twinmotion.com/plugins. Choose your modeling solution and select **Download**. This handout will specifically highlight Revit, however similar workflows apply to other modeling tools.

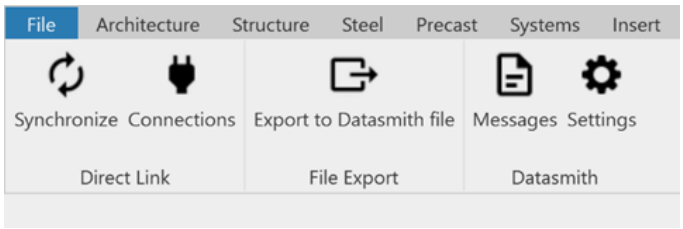


Once the plugin is downloaded, restart Revit. The user interface will have a new toolbar named Datasmith.



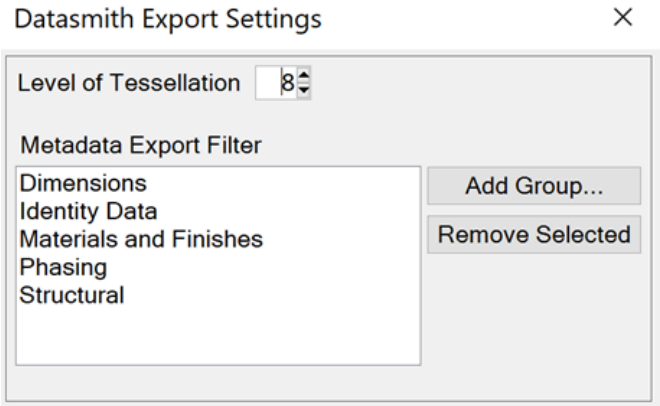
Toolbar

The new toolbar will have five icons. Select **Settings** to take a look at the Datasmith export options. A new feature of the Datasmith plugin for Revit is the ability to change the **Level of Tessellation** here. By default this is set at 8. If you wanted to optimize your model before taking it into Twinmotion, you could lower this number. For instance, if you need high-fidelity geometry you could keep this number at 8 or increase it. However, if high-fidelity geometry is not important, you can lower the number which will optimize the building before bringing it in. Test out which tessellation number works best for your model at this point in the project.



Metadata

In the same **Datasmith Export Settings** window, there will be an option for editing the metadata information that is brought in. You may see a few groups automatically register. You can curate this list for your needs by selecting a group and hitting **Remove Selected** or hit **Add Group** for additional metadata options.



Messages

Left of the **Settings** tab is the **Messages** icon. Text displaying errors or missing texture information will appear here if applicable during the export process.

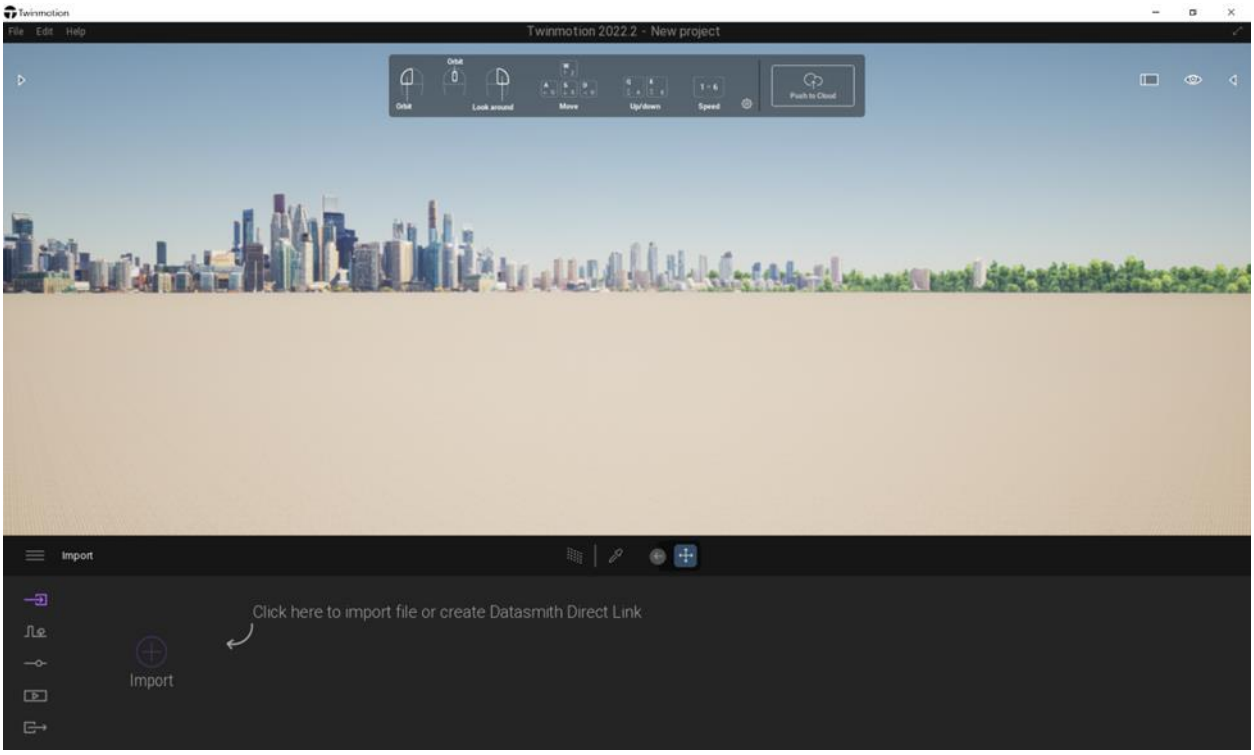
Standalone Datasmith

Left of the **Messages** there are two separate sections of Datasmith file functions, **File Export** and **Direct Link**. The **File Export** option here is going to export a stand-alone file that can then be imported into Twinmotion. This can be helpful if the file is sent to another agency or if the user developing the project in Twinmotion does not have access to the original modeling program.

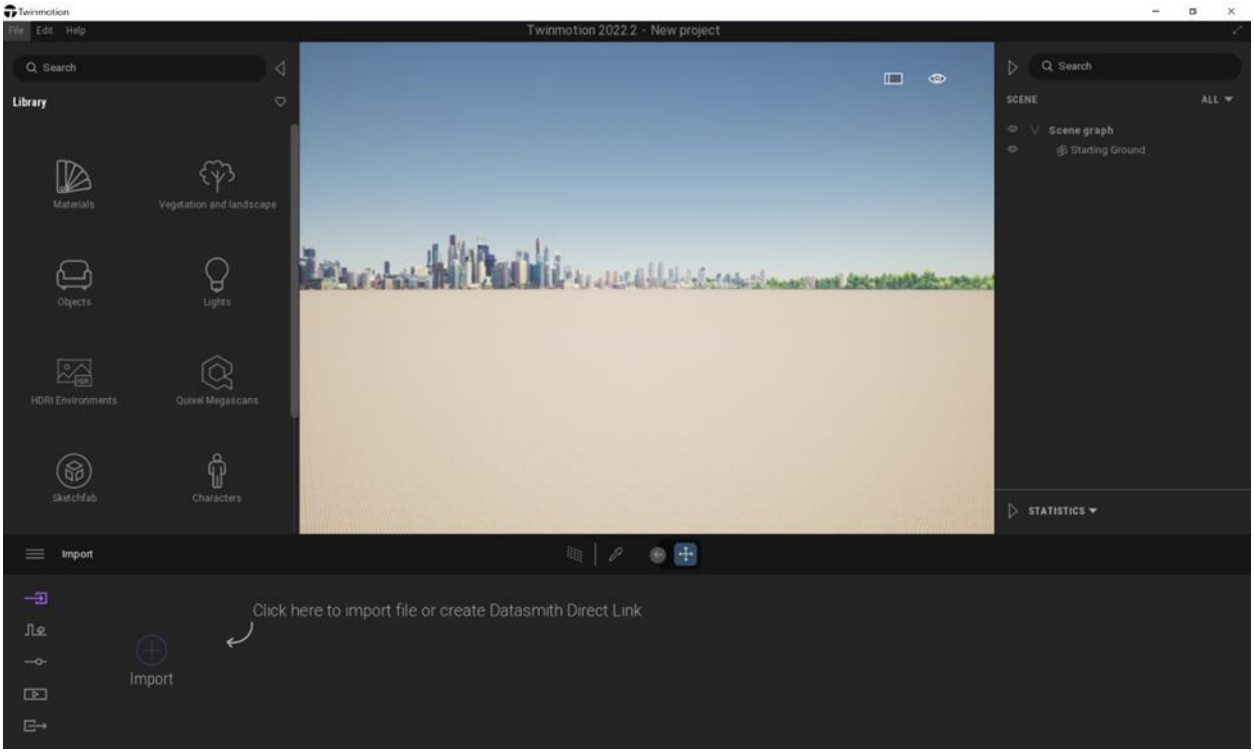
Establish connection

The **Direct Link** icons are going to synchronize the Revit model with Twinmotion. To do this, first establish the connection inside of Twinmotion.

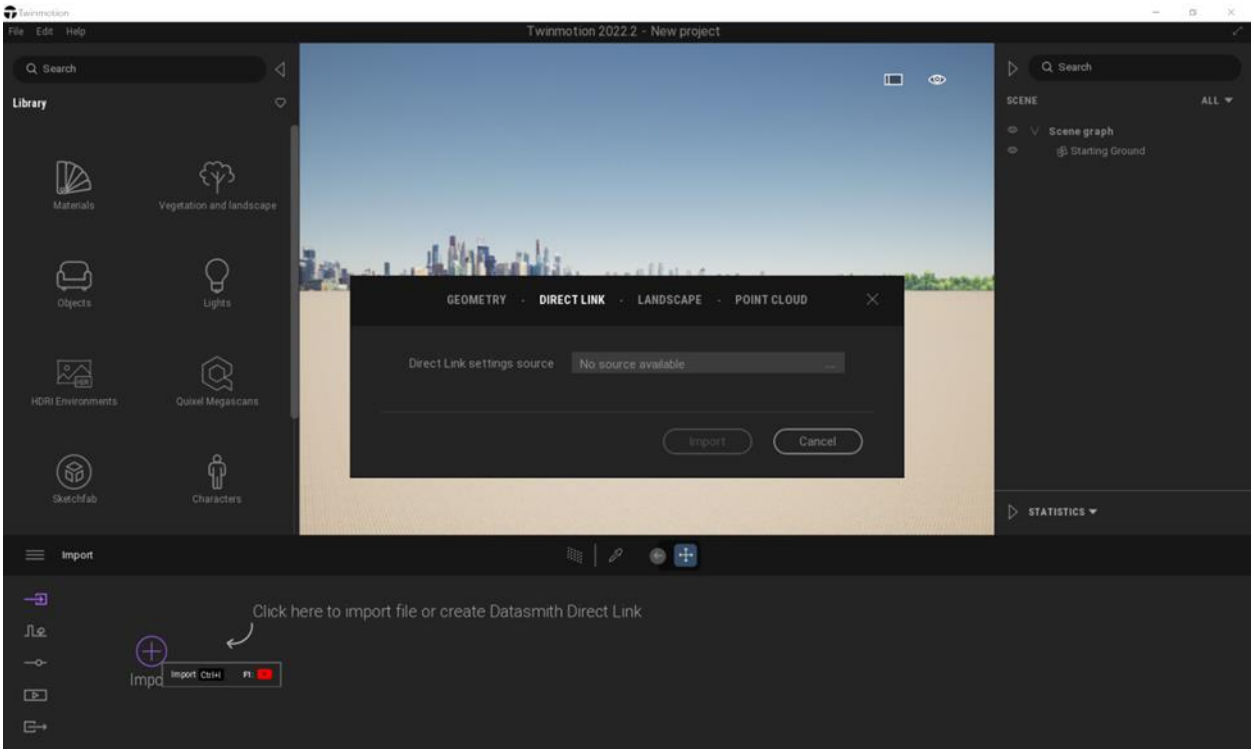
Open the Epic Games launcher to download or launch Twinmotion. This handout features Twinmotion 2022.2. If this is your first experience in Twinmotion, take some time to explore the user interface. At first launch, a bar at the top of the screen will have tips for navigating the scene.



On the left is the **Library** with access to assets and tools. On the right-hand side is the **Scene graph** where the project assets will be displayed. The bottom of the screen has the import options, tools for developing the scene, as well as media export options.

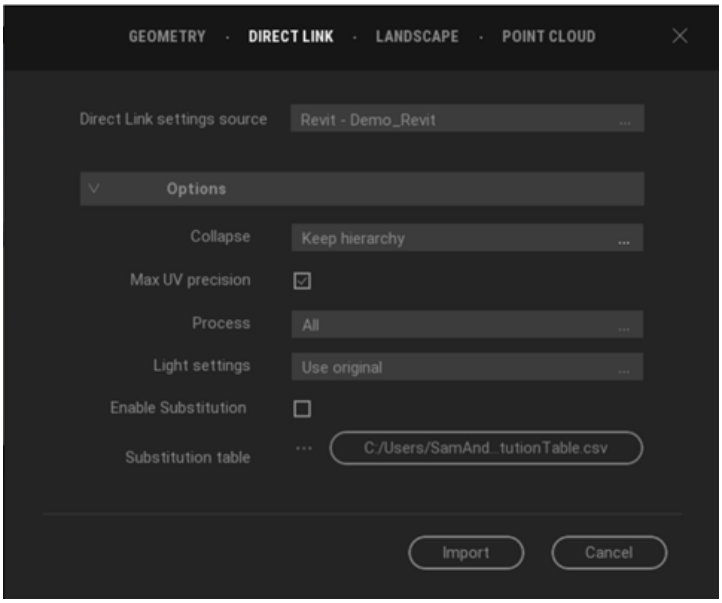


To establish the Datasmith Direct Link connection, select the **Import** icon on the left-hand side of the dock and hit the **+** button. Here you have four import options: **GEOMETRY, DIRECT LINK, LANDSCAPE**, and **POINT CLOUDS**. With the first **GEOMETRY** option, you can import many different file formats including **FBX, OBJ**, or standalone Datasmith files. For this example, we will use the **DIRECT LINK** option to connect to the Revit Datasmith file. If the Revit model is open on the computer, Twinmotion will recognize the Revit file as the source file. Select **Import**.



Import settings

A window will pop up with additional import settings to control. The default settings work well for beginners and enable experienced users to better optimize the imported model. For example, users can **Collapse by material**, **Collapse all** or **Keep hierarchy** of the Revit project structure. For this example, I will select **Keep hierarchy** to demonstrate how Revit model structures are imported.



Sync project

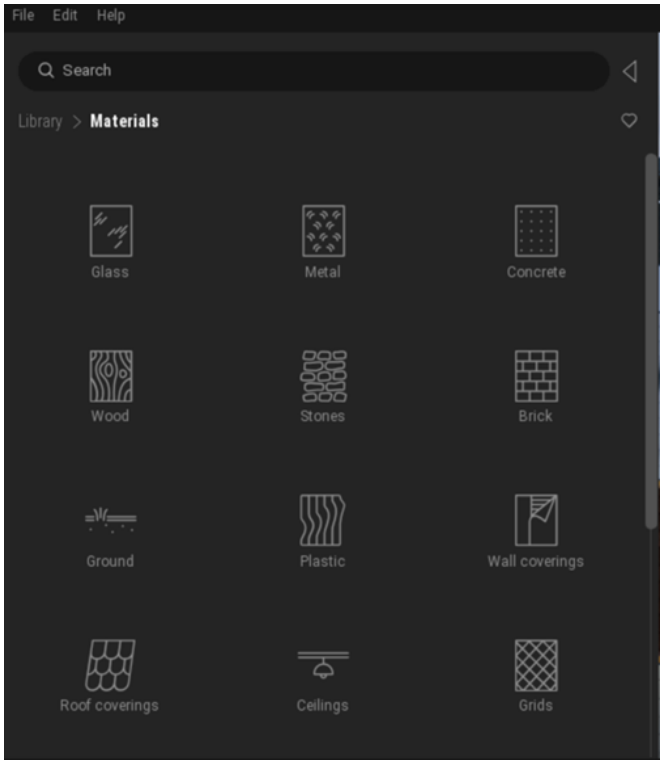
After selecting the **Import** button, a new icon will appear in the dock with the name of the Revit model. By clicking the **…** ellipses on top of the icon, you will see the actions that are available as the project progresses. To bring the project into the viewport and **Scene graph**, the model will need to be synchronized from Revit.

At this point, switch over to the Revit model and hit **Synchronize**. A green update bar will pop up in the bottom left-hand corner showing the status of the export process. Now jump back into Twinmotion. A window will pop up with a status bar of the Direct Link import process. Import times will be dependent on the size of your project. The Revit project will now be visible in the viewport and **Scene graph**. If it is not visible, select an item from the **Scene graph** and hit **F** on your keyboard to zoom into the selected item. If any changes are made in Revit, hit the **Synchronize** button again to update Twinmotion with the Revit changes.

Enhance realism with assets from Twinmotion, Quixel, and Sketchfab

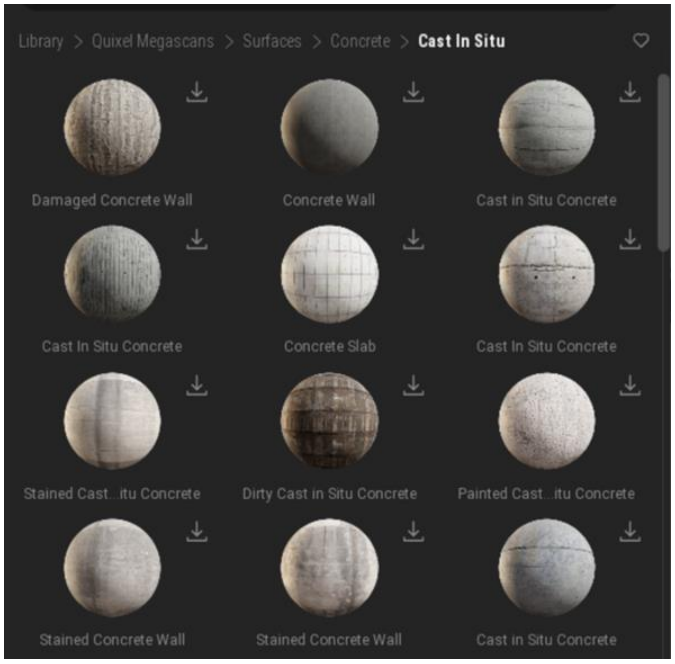
Apply materials

If the Revit model had materials applied, those materials will be present on the model inside Twinmotion. To edit those materials, select the **Material picker** on the middle toolbar on the dock. The material will appear in the material graph. Here you have the ability to change the color, scale, bump, and more. If you'd like to create your own material, select the icon on the bottom right-hand side of the material graph to toggle the grid layout to see multiple thumbnails. Select the **+** button. Here you can add in custom images and set up your material as desired. If you would like to use pre-made native Twinmotion materials, you can do so by going up to the left-hand side, opening up the **Library** tab, and browsing the **Materials** section.



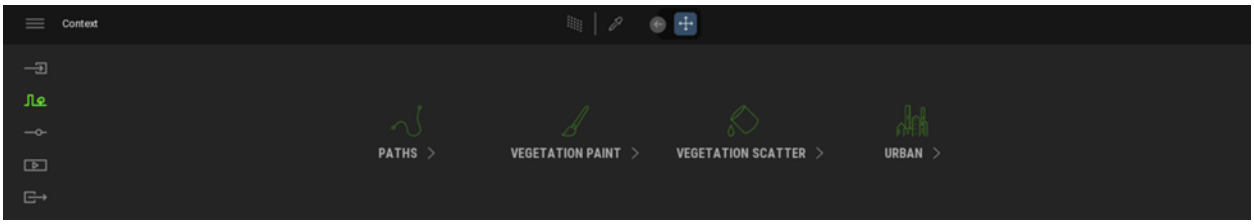
Quixel Megascans Surfaces

Additional materials assets are available through the Quixel Megascans integration inside Twinmotion. Quixel Megascans is an immense scan library with thousands of 3D assets, tileable surfaces, vegetation, decals, and more. With your Epic Games account, you have access to Megascans assets in Twinmotion's **Library**. Select the **Quixel Megascans** icon in the Library. For material options, browse the **Surfaces** section for scanned textures. To use the assets in your project, hit the downward arrow in the top right-hand corner of the asset thumbnail. If this is grayed out, it is informing you that Twinmotion is not successfully connected to your Epic Games account. To sign in, go to **File > Sign into Epic Games** and follow the proceeding steps. Once signed in, the arrow will light up when you hover over it. After the download of the asset completes, you can drag and drop the asset onto the geometry in the viewport.

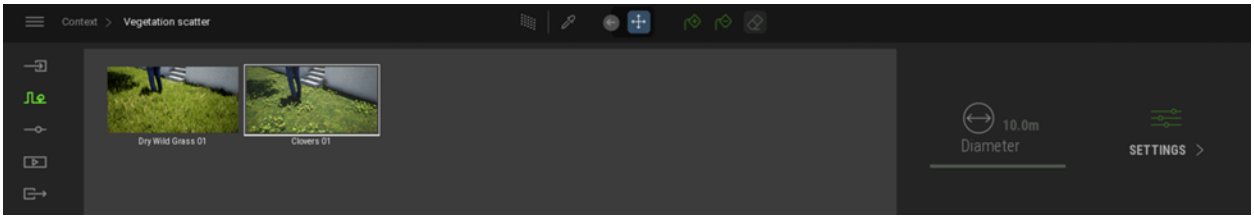


Landscape tools

To further develop your project, you have the option to apply trees and vegetation to your model. The tools can be found by clicking the **Context** icon on the bottom left-hand side of the dock.

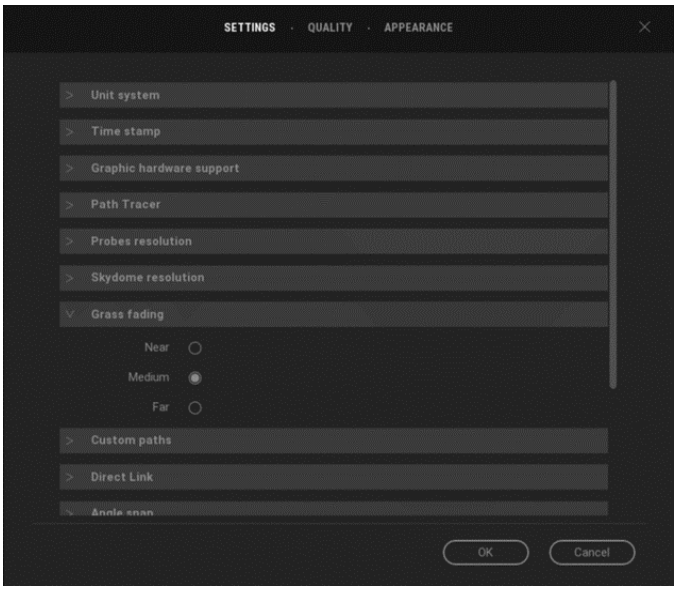


Here you will have access to **PATHS, VEGETATION PAINT, VEGETATION SCATTER**, and **URBAN**. This point of the example will cover **VEGETATION PAINT** and **VEGETATION SCATTER**. Select the **VEGETATION SCATTER** paint bucket. The library will automatically appear with access to various grasses. Select a few you'd like to use and drag and drop them into the dock. Select those assets inside of the dock and hit the **+** button in the navigation tools on the dock. Now, select the geometry you would like to apply grass to. Each click will increase the density of the grass. After it is applied, you can make changes to the grass by selecting the **SETTINGS** tab.

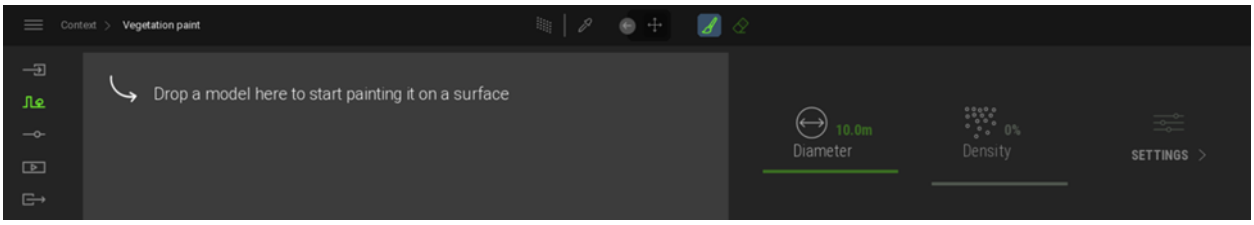


Grass preferences settings

When you are adding grass into the scene, you may notice the grass fades away as the camera moves. This is due to a performance setting in Twinmotion preferences. To access this, go to **Edit > Preferences > SETTINGS > Grass fading** and select **Near, Medium,** or **Far**. **Near** will have better performance and **Far** will display more grass in your scene. Regardless of the setting chosen here, all grass will render and be present in media output from Twinmotion.

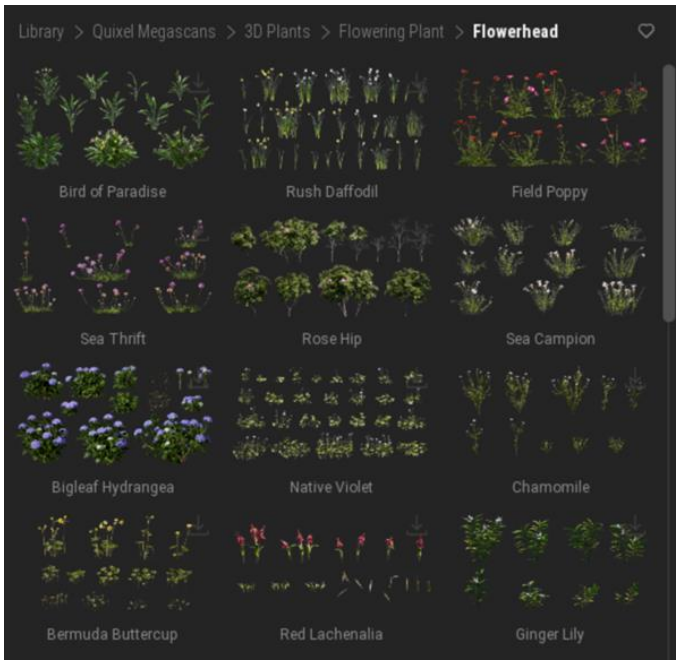


Now use **VEGETATION PAINT** to add trees using a similar workflow to the scatter tool. Instead of selecting the **+** button, you can use the paint brush to paint areas of the geometry where the selected trees will be applied. In the **SETTINGS** tab, you can change the size and color tint of the trees.



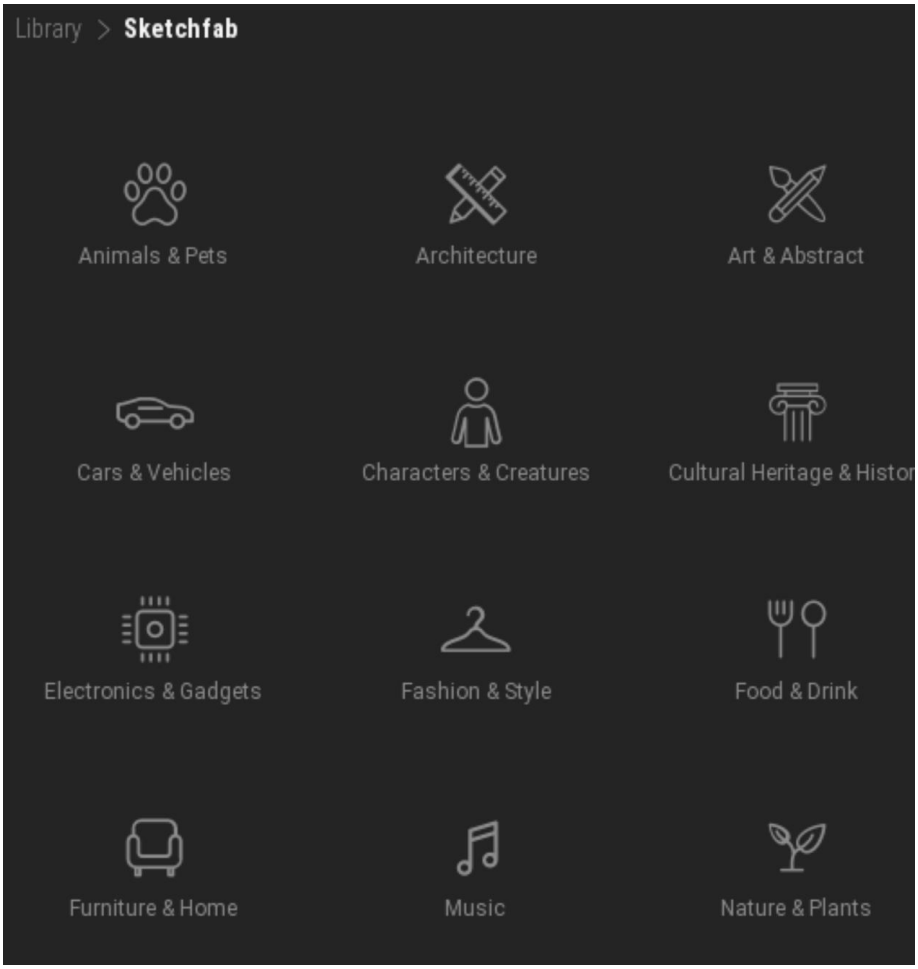
Quixel Megascans 3D assets

To further add 3D elements to your model you can use native Twinmotion objects in the library or utilize some of the new integrations such as the Quixel Megascans library referred to earlier in this example. Browse the **Library** and import flowers, food, props and more. The download and drag and drop workflow will be similar to the process of bringing Quixel Surfaces into the model.



Sketchfab integration

To expand library options even further, users with Epic Games accounts also have access to Sketchfab libraries. Sketchfab is another tool within the Epic ecosystem. Sketchfab is a platform for creators to share and embed 3D models anywhere online. Browse the Sketchfab libraries to add assets as you wish. If you click on an asset, it will give you access to its license information, size, and name of the creator. You can also pull up the Sketchfab browser to get more information. The workflow for downloading and bringing the assets into the project is similar to the Quixel Megascans process.



glTF for Sketchfab

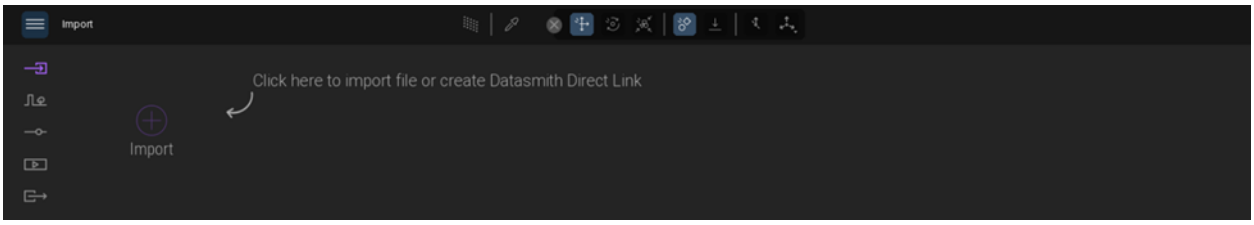
If you would like to import assets you have previously downloaded on Sketchfab, you can do so by exporting the asset as a glTF on your Sketchfab website and importing the glTF into Twinmotion.

Sketchfab edits

Select your asset of choice, download and drop it into the scene. If you'd like to edit any of the materials, you can do so by clicking the **Material picker**, selecting the geometry and making changes in the dock below.

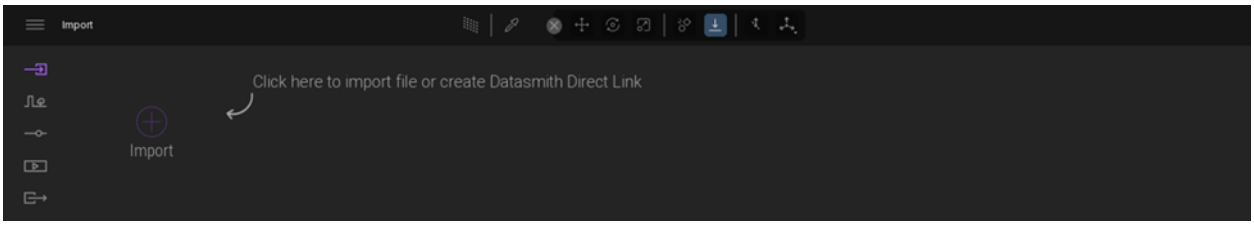
Collision mesh and placement

When placing assets you may have noticed the assets snap to a plane near the cursor. As you move and curate the entourage in your scene, there may be instances where you would like to have the asset aligned to a wall or floor. With Twinmotion 2022.2, there are new tools that can assist in geometry placement. These tools are the **Move with collision** and **Gravity tool** that are located in the navigation tools in the middle-top area of the dock.



Gravity tool

To test out these tools, first select an asset and move it above the ground floor. Now select the **Move with collision** icon. It will be highlighted and let you know it is applying convex collision meshes to the objects in your scene. Now as you move the asset down or to the side, the object will stop when it collides with another object. To test the Gravity tool, move it above the ground floor once again and then select the **Gravity** icon. The asset will fall to the ground.



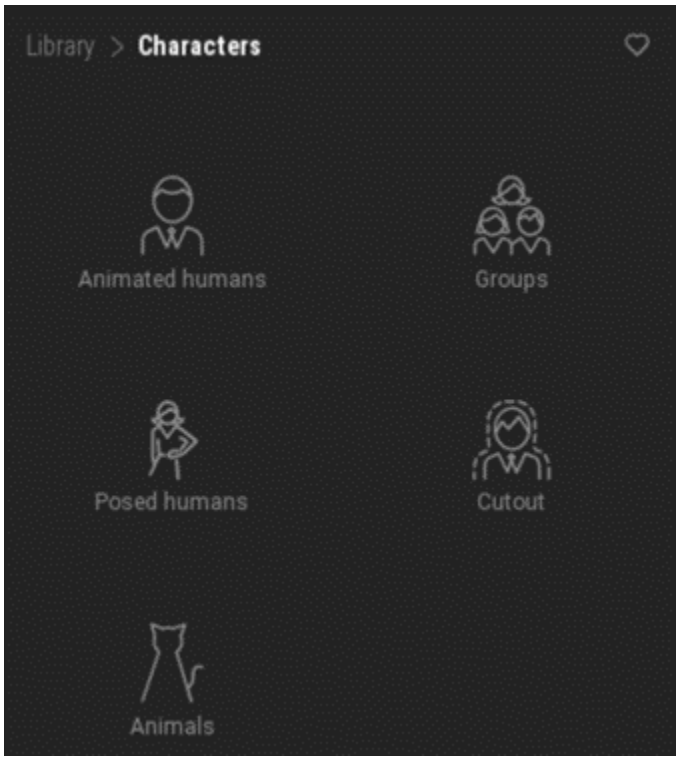
Improve stakeholder communication with storytelling techniques

Animated objects

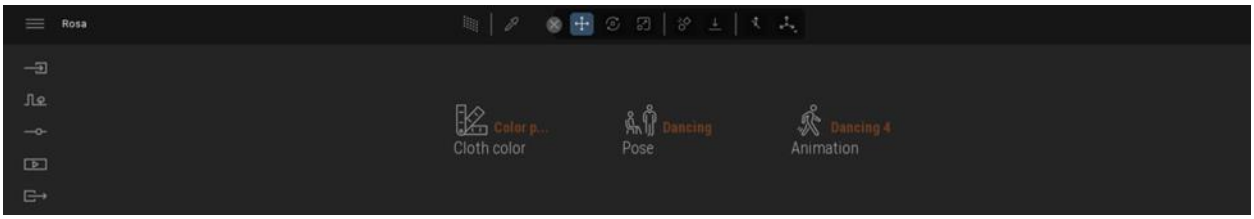
Now that materials are applied and objects are placed, you can start to layer in animated elements into your scene. This part of the example will cover animated characters, animated paths, and animated sun positions.

Groups

To explore the characters, go to **Library > Characters**. There you will find options for **Posed humans** which is great for high-fidelity characters and **Cutout** which is nice when low-poly characters are needed. For an animated experience, use **Animated humans** or **Groups**. Choose a group to drag and drop into the scene.

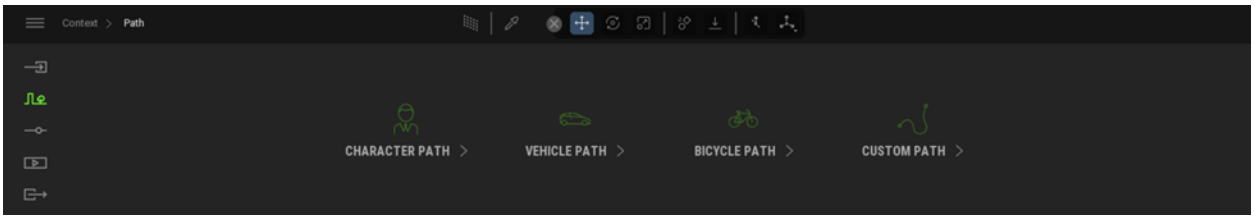


You can click on any individual in the group to change the character's **Cloth color, Pose**, or **Animation.**

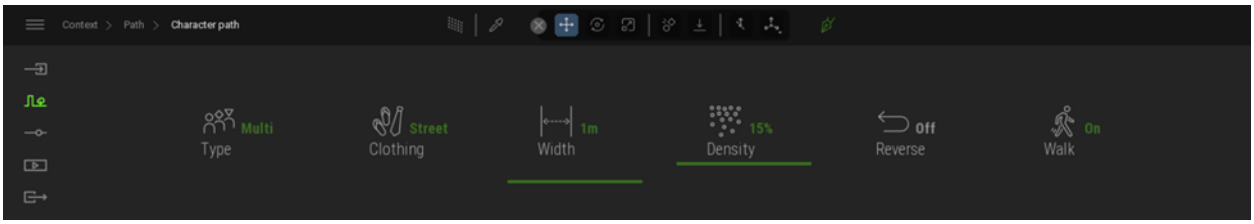


Paths

If you'd like to have characters walk along a pathway, you can use Twinmotion's **Path** tools in the **Context** section of the dock. Go to **Context > Path** to view path options.



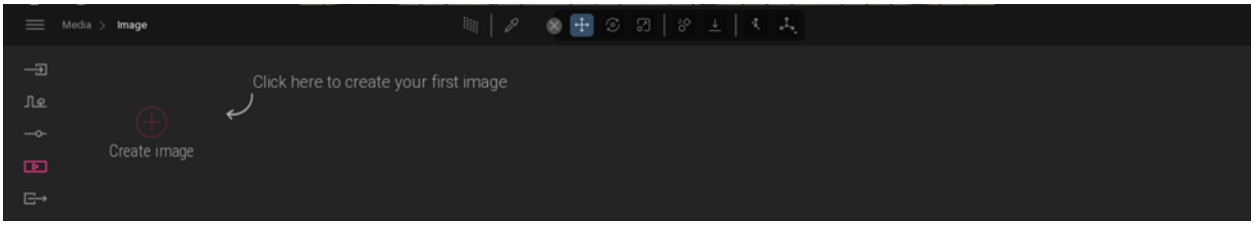
Select **CHARACTER PATH** and select the pen icon to start placing a spline on the sidewalk. To end the spline creation, hit the right mouse button. Now you can change the settings of this path to meet your needs.



You can apply this path workflow to vehicles, bikes, or customize your own with your object of choice.

Still image media

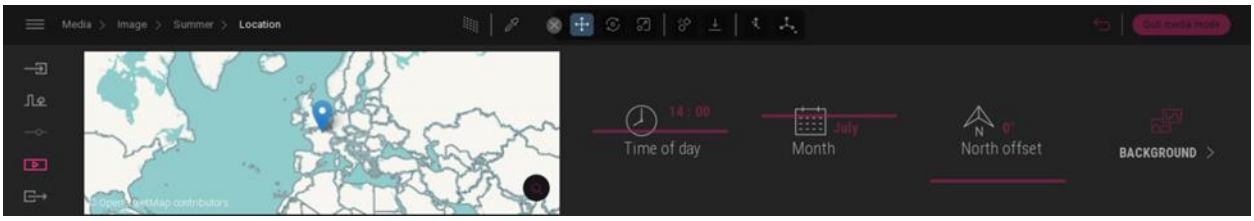
Twinmotion offers a variety of media outputs to capture and share animated and still elements. This part of the example will cover working with still media, videos, and Twinmotion Cloud. First explore the still image media option by selecting **Media > Image** in the dock. Hit the **+** button to save an image based on your viewport. You can continue to navigate around the scene and select the thumbnail of the image to jump back to the saved viewport. Changes to the image camera position can be made by selecting the refresh button viewable when you hover your mouse above the thumbnail.



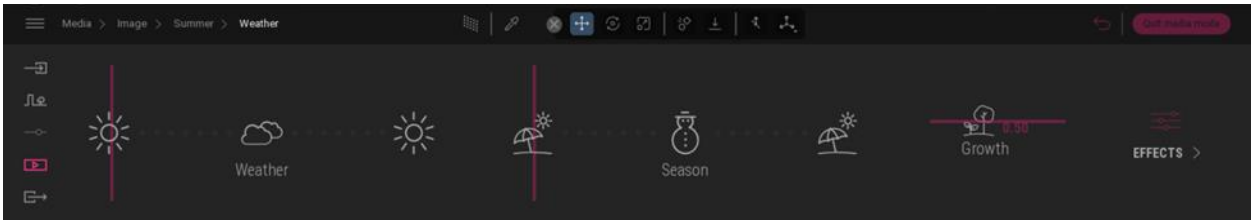
Create as many images as you like. For each image, you will be able to save individual settings.

Season set up

To further explore specific settings for each image, this example will cover the weather features inside Twinmotion. Duplicate one of your favorite images four times. Use the **…** ellipses on top of each thumbnail to rename each image “Summer”, “Fall”, “Winter”, and “Summer”. When hovering over an image you will see a **More** button. Select this to see all the different options you have for editing your image. First, select the **Location** icon. Here you can change the **Time of day**. This is using a dynamic sky sun which is the best sun to take advantage of Twinmotion’s real-time features.

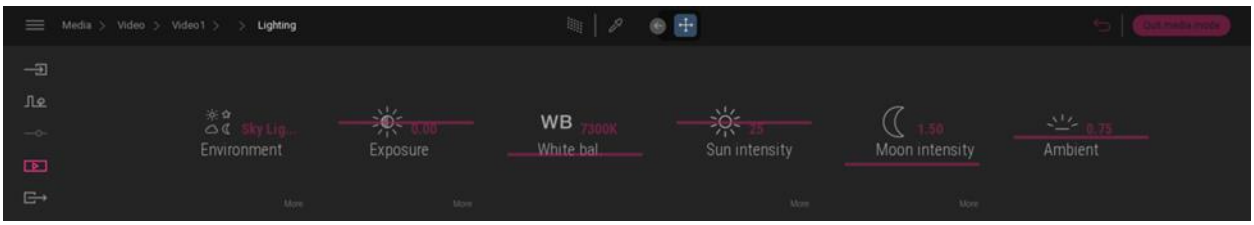


To test out some of those real-time features, go to **Media > Image > “Image name” > Weather.** As you move the slider, you will see that the viewport immediately is affected by the changing precipitation and colors for **Weather** and **Season.** You can add additional effects by selecting the **EFFECTS** icon and editing the **Wind speed** or **Smog**. Curate your desired combination of these effects for each image you created. As you work with Revit Direct Link, you will be able to update the geometry for all images without losing the visual settings for each view.



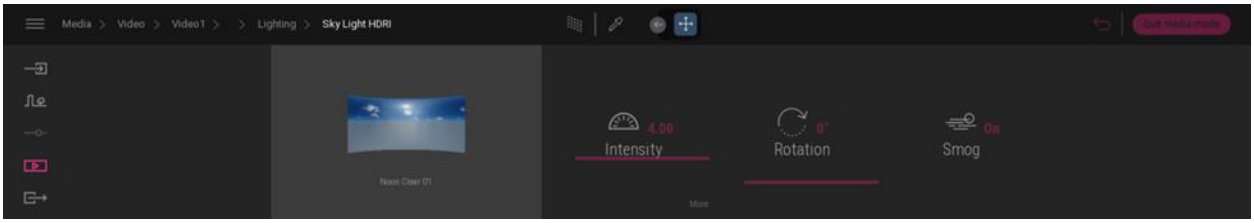
Video lighting

This part of the example will cover capturing the animated assets in Twinmotion as well as feature some techniques for lighting. First, go to the **Media > Video** and hit **+** to create a new video. This will automatically set the viewport view to be the first frame of the video. To explore the lighting options, select **More** on the right-bottom side of the video frame and then select **LIGHTING**. Select the pink text above **Environment**. This will show you the options for lighting the video. **Dynamic Sun** worked well for the weather feature in the series of images. To explore other options, select **Sky Light HDRI**. For this feature, Twinmotion uses a high dynamic range image to inform the lighting in the project. This example will not cover the third option, **Backdrop HDRI** which creates a new representation of the environment based on a hemispherical object in the scene. To further refine the settings to the chosen technique, **Sky Light HDRI**, select **More** and edit the settings as you'd like.



Sky environments

To replace the HDRI, select the thumbnail and hit **Go to library**. There, you will find many sky assets that are available to you with your Epic Games account. The workflow for using the assets is similar to the Quixel Megascans assets. Select your desired sky. Once downloaded, drag and drop the sky onto the thumbnail.

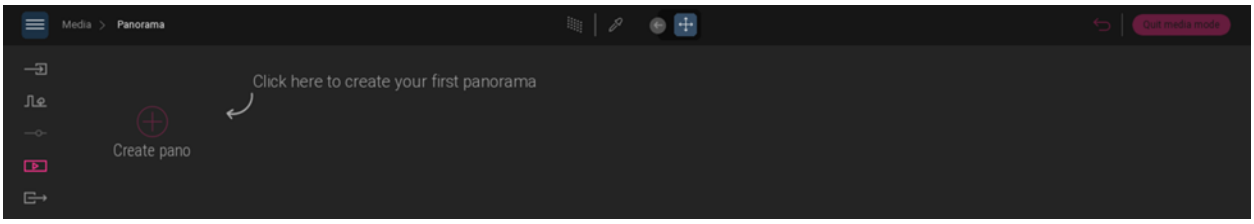


Video production

One option for using the Sky Light in a video is to create a new video frame with the Sky Light at a different rotation. To do that, go back to **Media > Video > "Video Name"** and select the **+** button. Now hit **More** for the new frame created and **select Lighting > Sky Light HDRI**. Change the rotation slider to a desired location. Go back to your video frames and hit the **Play** icon in the navigation toolbar to see how the keyed frames create nice cloud and lighting movement in the video. To add on to the video, select **New video part** in the toolbar. Add frames with various viewports to explore camera movement in Twinmotion.

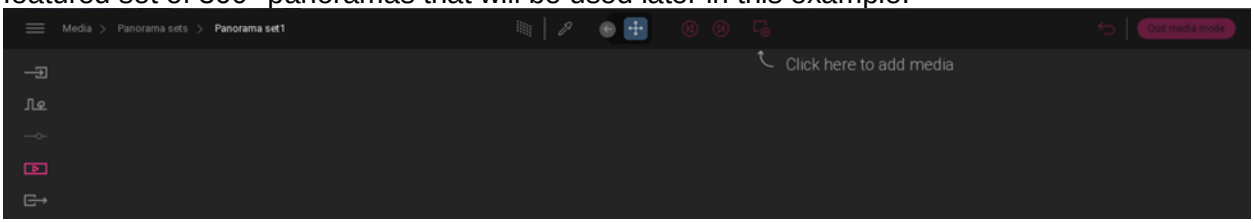
Panorama

To explore the other options beyond images and video, go back to the **Media** tab. You'll find an option to create 360° panoramas. Select the **+** button to create a few panoramas throughout your project. These panoramas will be used later in the example as a feature option for Twinmotion Cloud.



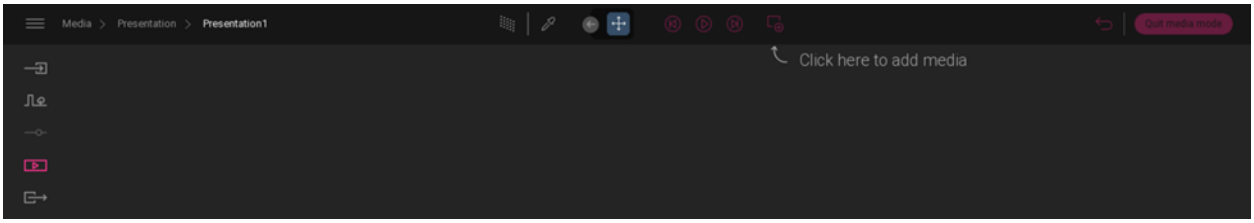
Panorama Sets

To create a set of the panorama images created, go to **Media > Panorama Sets**. Hit the **+** button to start a new set and then select the **Add Media to Panorama** set to build out a featured set of 360° panoramas that will be used later in this example.



Presentations

Twinmotion provides a way to organize the media assets created. To utilize this, go back to **Media** and select **PRESENTATION**. Select the + button followed by the **Add media to Presentation** icon in the navigation toolbar. With these tools, you can curate a presentation experience by selecting specific images, videos, or panoramas.

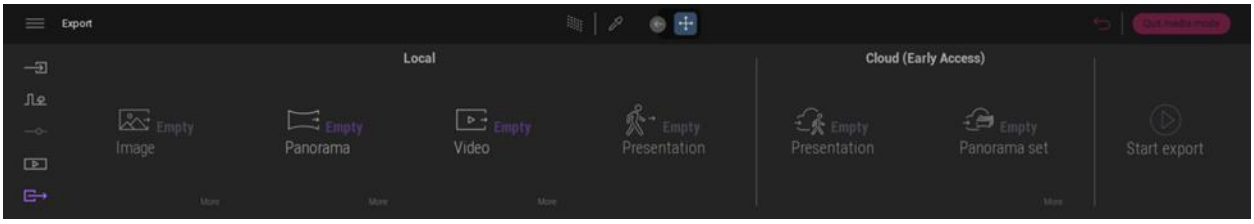


Cloud intro

There are a few different ways of using the Presentation media tool. This example will cover the cloud capabilities that Twinmotion offers in Early Access for Presentations and Panorama Sets. Twinmotion Cloud is a powerful cloud-based service that you can use to instantly share and present high-fidelity Twinmotion Presentations and rendered Panorama Sets on the web. Since the experience is browser based, you can show your projects to stakeholders regardless of the performance capabilities of their computers, tablets, or smartphones, and without the need for them to download large files.

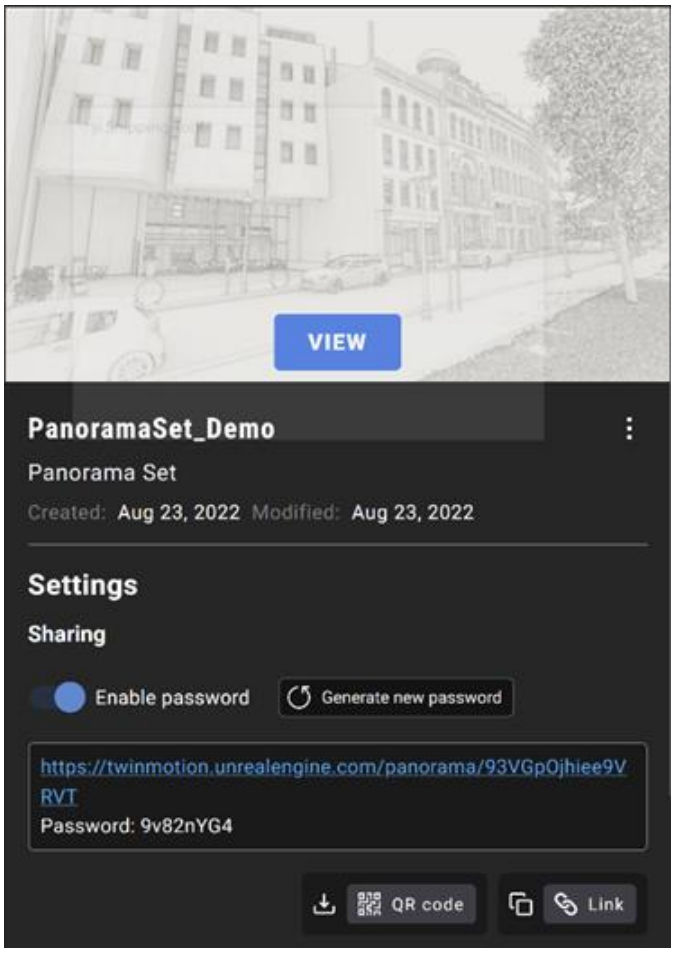
Upload to cloud

To prepare your Presentations and Panorama Sets for the cloud, go to the **Export** icon in the dock. Select **Empty** above **Presentation** and **Panorama Set** to add the media you've created. Select **Start export** to upload the content to the cloud. A window will pop up prompting you to open up Twinmotion Cloud.



Cloud library

A browser window will open with all of the projects you have uploaded to the cloud. Select a project to see the sharing options on the right-hand side. Hit **View** to open up the cloud experience.

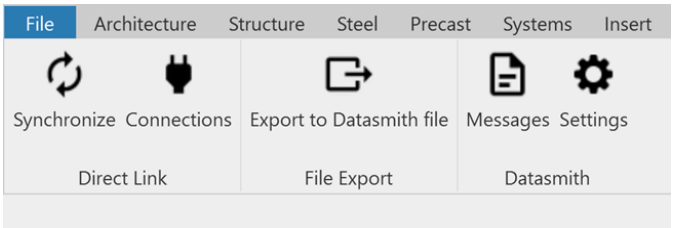


Revisit Revit workflows

Twinmotion Cloud provides a quick way of sharing your work with stakeholders. As designs change inside Revit, your Twinmotion Cloud experiences may need to reflect those changes. This portion of the example will cover how to use the Datasmith workflows in Revit to synchronize the latest changes.

Revit re-sync

To update the geometry inside Twinmotion, open your Revit project and hit **Synchronize**.



The green export status bar will once again appear in the bottom-right corner. Open Twinmotion to see a window with an import status progress bar. Once the update is complete, go to the **Imports** tab in the dock and select the **…** ellipses icon above the model you have imported. You will see additional settings for editing specific geometry and transformations.

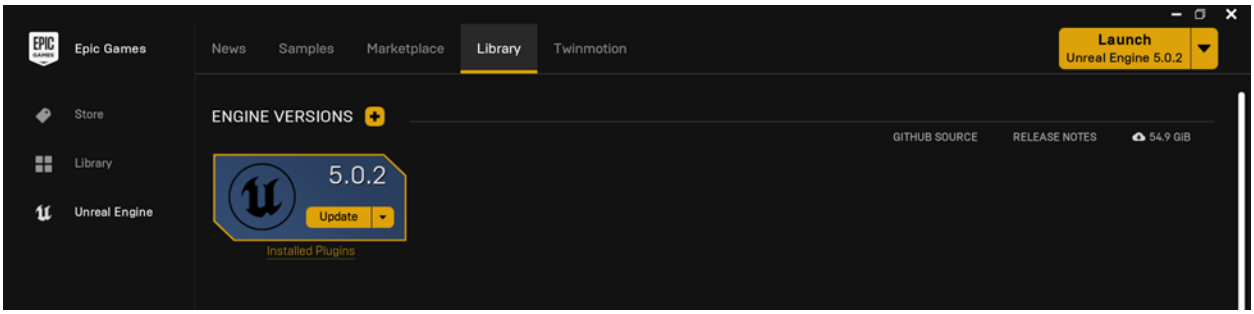
Next level

This example has covered a wide range of information starting with Revit workflows, building out a scene using the Epic ecosystem, and then developing and sharing a narrative for your project. The next part will cover how you can take your Twinmotion project to the next level if additional interactivity is needed. In many use cases, Twinmotion's toolsets are sufficient for a designer's workflow and deliverables. In some circumstances, bespoke experiences are needed for the project. Design configurators, augmented reality experiences, digital twins, virtual production, and custom interactive applications are a few examples of bespoke experiences that it's possible to create with Unreal Engine. The Datasmith workflows allow for Twinmotion projects to be imported into Unreal Engine so they can be developed further.

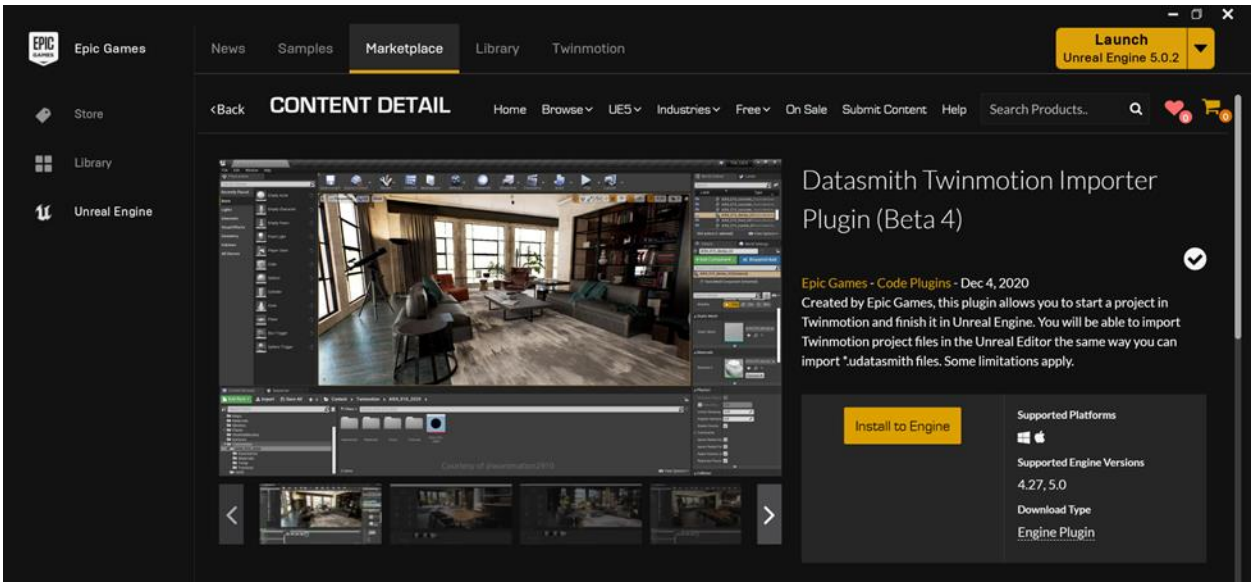
Bring designs into Unreal Engine 5 for bespoke experiences

Twinmotion to Unreal Engine plugins

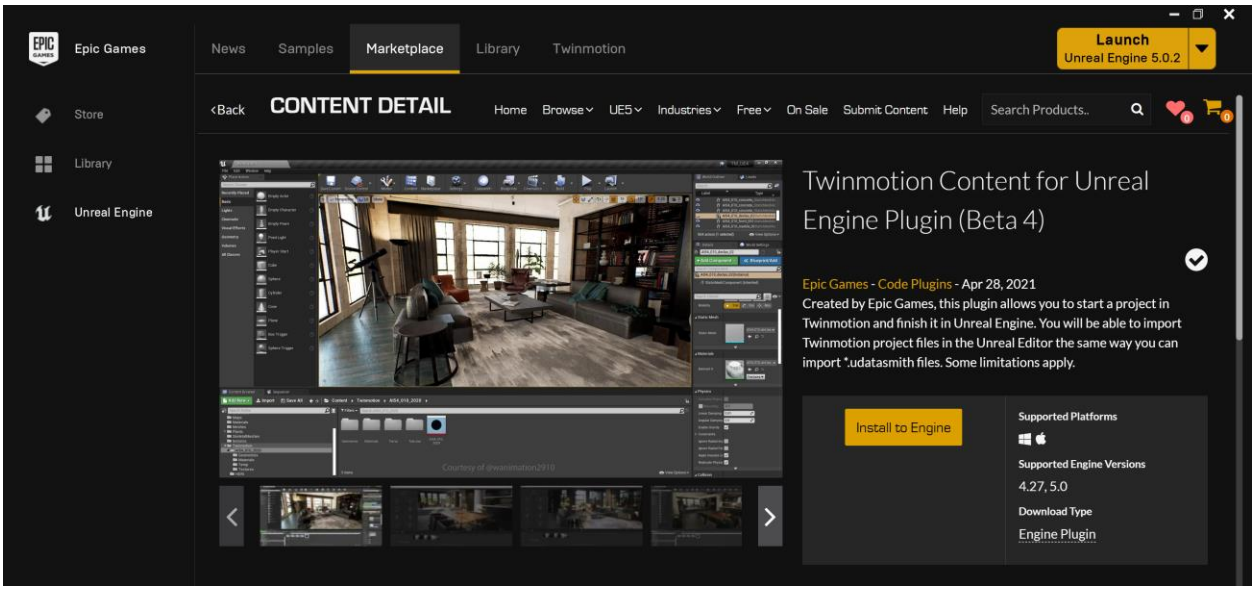
If you are new to Unreal Engine, you can download the engine from your Epic Games launcher under the **Library** tab. For a greater understanding of the basics, check out the Unreal Engine documentation resource online.



Once downloaded, open the **Marketplace** tab to download the Twinmotion plugins. Search “Twinmotion” in the search bar. You will be looking for the **Datasmith Twinmotion Importer Plugin** and **Twinmotion Content for Unreal Engine Plugin**. For more information regarding the limitations of the plugin, please read the information on the Marketplace plugin page. Download both plugins.



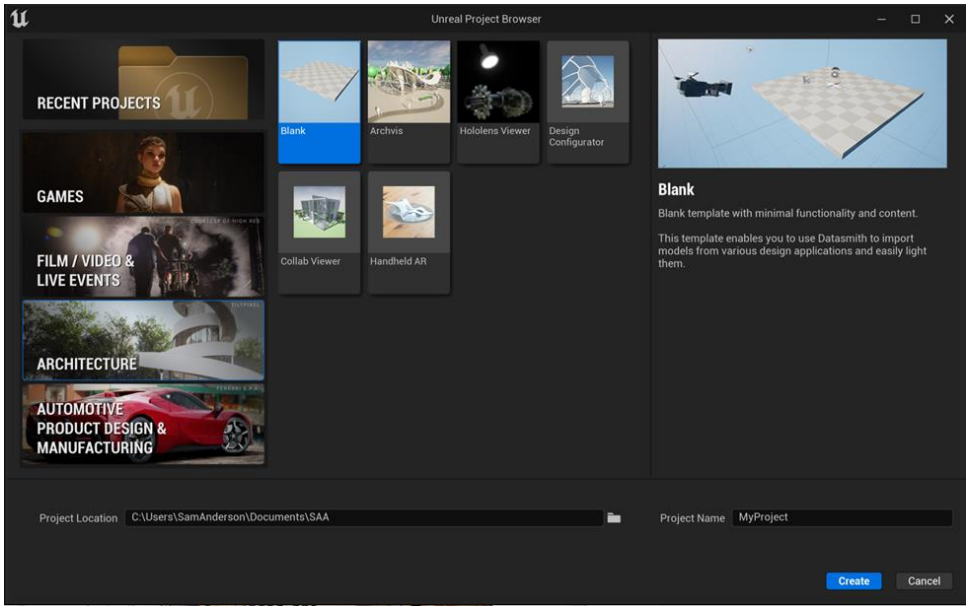
Datasmith Twinmotion Importer Plugin



Twinmotion Content for Unreal Engine Plugin

Project setup

To create a new Unreal Engine model, select **Launch** for the version downloaded. Navigate to the **Architecture** tab, and select **Archvis**. This is a great example project for getting started with architecture assets in Unreal Engine. Select the folder location, name your project, and select **Create**.

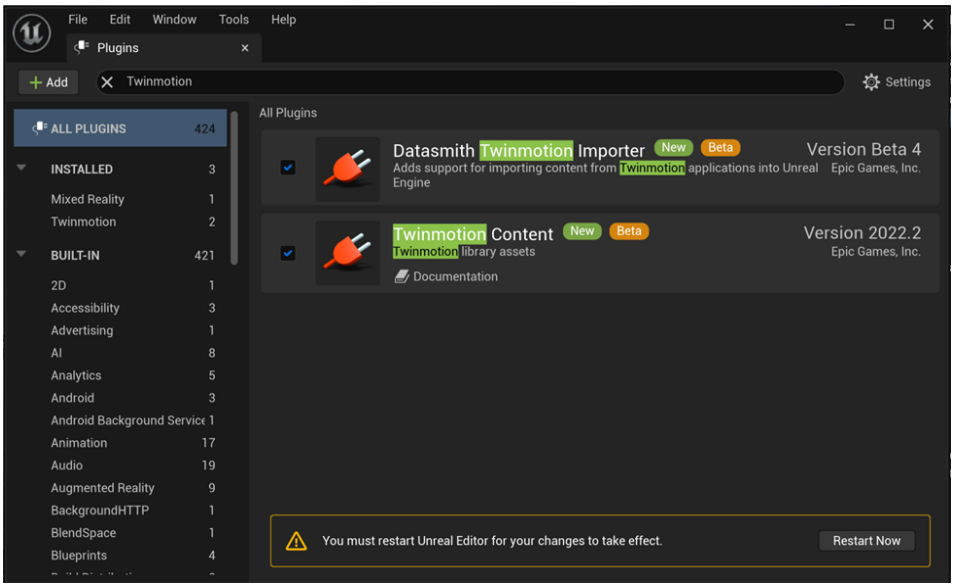


Once the project is open, create a new level by going to **File > New Level**. Pick **Interior** or **Exterior** based on your project assets. Explore the scene and the text notes so you are familiar with some of the tools available to you in Unreal Engine. After getting familiar with the project, select the **Geometry layers** and the **Notes** layers in the outliner and delete the assets to have a blank canvas.

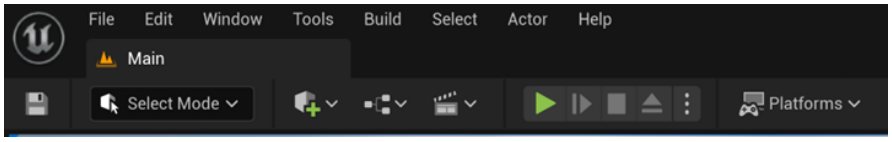
Import Twinmotion project

Next, you will need to add the downloaded plugins to the project. Go to **Edit > Plugins** and search for Twinmotion. Enable the **Datasmith Twinmotion Importer** and **Twinmotion Content** plugins. If a window pops up, read the information to get the latest information and hit **Yes**.

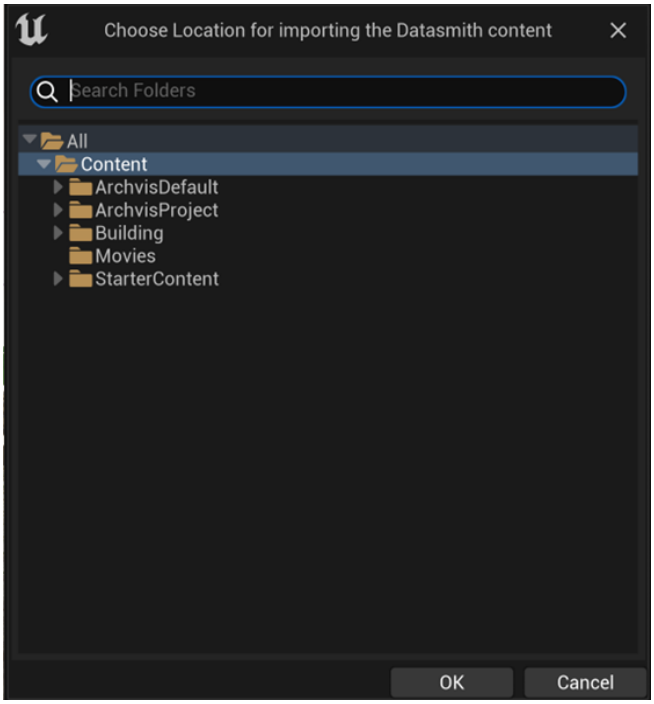
The project will need to be restarted for the changes to take effect. Select **Restart Now**.



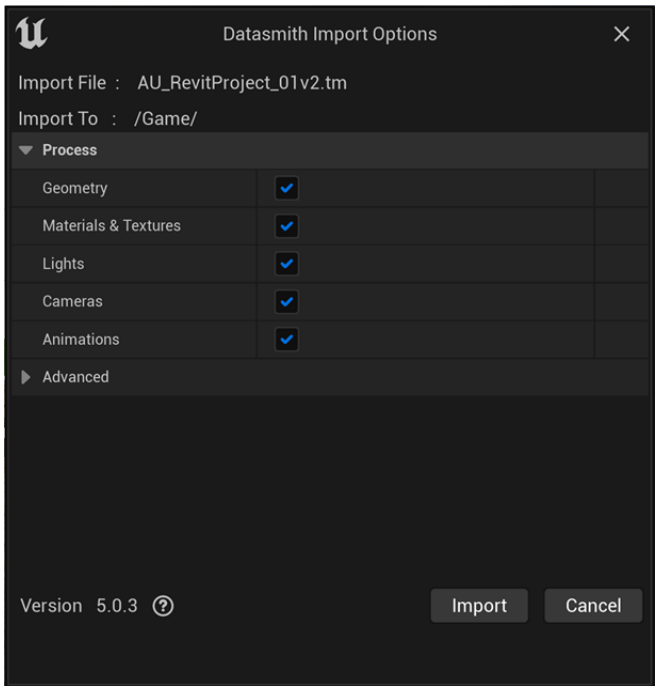
Now the project is ready to import the Twinmotion model. **Quickly add to the project icon**. Select **Datasmith > File Import** and navigate to find your Twinmotion project.



A window will pop up asking you which folder you would like to place your project. You can keep the default **Content** folder and select **OK**.



A new window will pop up with import settings. Here you have the ability to choose which assets you would like to import. Your Twinmotion assets will load. If there are any incompatible assets, a new window will pop up giving you more information.



Conclusion

This example concludes in Unreal Engine. You are now ready to develop your Unreal Engine model further. For more technical resources and inspiration visit the Epic Developer Community, dev.epicgames.com/community, where you will find tutorial videos, forums, and more.

Happy learning and exploring!