

Rendering Pipeline

Model Prep • Coordination & Links • Scene Setup • Content Development & Standardization
Rendering Procedures • Hardware Requirements • Video Editing

Revit/CAD to 3Ds Max

Revit Model Prep (1-2 days)

- Create an empty file and link detached files
- E-Transmit.
- Purge unnecessary Components, Views, and Links.
- Model management, Clash detection, Coordination,
- Organize materials
- Share same coordinates across all programs

CAD Model Prep (1 day)

- Delete consolidate unnecessary layers
- Re-name objects and layers
- Purge lines & Blocks
- Reduce the distance to project 0,0,0

Link Revit (1/2 Day)

- Save to Project folder
- Convert Scene
- Delete lights & cameras
- Change materials to desired render engine

Create Scene from existing content & developed template (1-3 days depending on comments and review)

- Place Cameras
- Place Lights
- Time/location settings
- Edit timeline and output
- Make Keyframes
- Low quality video and screen shots for design review
- Corrections/adjustments

3Ds Max Templates (2 weeks initial company standard setup)

- Folder structure
- Custom material library
- Bump, displacement, and topo maps
- Panorama and context assets
- Interior assets

- Exterior assets
- Animated objects
- Custom Cameras
- Render settings
- Lights
- **Content development time fluctuates drastically depending on how much and complexity!**

Additional Image/Video Editing Software required (1-3 days)

- Adobe After Effects (Video development) (1/2 day for basic, 1-3 days for highly custom video)
- Adobe Media encoder (Video compression) (1hr)
- Adobe Photoshop (Texture development and Image Sequence conversion)

Rendering Image sequence (Depending on prior company setup 1-8hrs)

- A single computer will render each image for 10-15min
- 30 Frames Per Second minimum required for a video (1800 frames per min)
- Use Photoshop to convert image sequence into a video
- Render farms can use a single 3ds Max license on up to 999 nodes
- **Every node in a render farm needs an Arnold license**
- **Every node in a render farm needs additional render node licenses with V-Ray**

Third Party Rendering Services (Completed within hours depending on speed/cost selected)

Make sure they support the rendering engine you've developed your scene in

- Garage Farm - <https://garagefarm.net>
- Pixel Plow - <http://www.pixelplow.net>
- Super Renders - <https://superrendersfarm.com/>
- TurboRender - <https://turborender.com/>
- Anima Render - <https://www.animarender.com>
- Render4you - <https://www.render4you.de/renderfarm.html>
- ForRender - <https://en.forrender.com/>

Recommended System Requirements and Set up

- Both Arnold and V-Ray are CPU or GPU capable
- Software
 1. Windows 10
 2. Chrome or Firefox
- Browser (Recommended to get more than minimum)
 1. CPU – 64-bit Intel or AMD multi-core processor with SSE4.2
 2. GPU - <https://knowledge.autodesk.com/support/3ds-max/downloads/caas/downloads/content/3ds-max-certified-hardware.html>
 3. RAM - 8GB or more
 4. Disk Space – Recommended to have as much disk space as possible, some operations can take more than 100GB and prevent you from completing the tasks.

GPU vs CPU

- GPU is more memory intensive, requires significant upgrade
- CPU is easier to expand the render farm
- <https://knowledge.autodesk.com/support/3ds-max/learn-explore/caas/sfdcarticles/sfdcarticles/System-requirements-for-Autodesk-3ds-Max-2020.html>

Arnold vs V-Ray Rendering Software Comparison

- Arnold is a real-world physical renderer
- V-Ray is not limited to physically realistic settings, highly customizable renderer
- Arnold is easier to pick up and can easily be standardized
- V-Ray requires more training, experience, and requires quality oversight

Overall, V-Ray is complicated for new users because it has more parameters and more ways to mess up. For an advanced scene, more buttons give the advanced artist complete control on a still frame. As an initial set up it will take you longer to get your scenes ready to go, but you may require that level of detail. If you are using multiple nodes, starting your project from scratch, constantly changing settings, you could be wasting a lot of time.

While V-ray focuses on COMPUTER rendering time, Arnold's ethos is to save the USER time. Your set up will have a minimal initial process since it does a lot of the work for you. Most of your time will be spent on managing the noise in the rendering. You can easily use AOV's to single out the Sample types and adjust the toggles in the general tab to quickly pinpoint the cause of the noise without increasing every adjustment. They both have active shaders for a real-time scene set up, they each have their own lights, materials, and so on that work with their own generators.

<https://www.autodesk.com/products/arnold/overview>

GPU vs CPU

Both Arnold and V-Ray are capable of both. Deciding which renderer to use for this might be up to the way your company is set up. Many large AEC firms based out of the US tend to build better CPU capable computers, while some in the UK might have better GPU, etc. It will be beneficial to decide which one you want to go with early on and plan accordingly, well before the rendering time.

<https://www.arnoldrenderer.com/news/whats-new-with-arnold-gpu/>