Animations for Architects

Eric Mitchell
KlingStubbins a Jacobs Company

Class Summary

Animations typically have a polished and time-intensive connotation. However, increases in computing power and program interoperability have begun to bend this notion. This class will focus on the benefits of quick animations—animations that help designers form, shape, understand, and present a design. We will explore the methods that are required to take Autodesk® Revit® software models and move them into Autodesk® 3ds Max® software in ways that allow designers to make active design decisions. We will show quick, functional animation workflows, covering a variety of topics, including solar glare, form, constructability, programming, scheduling, and more through animation. This class hopes to show that designers can effectively study and explain their designs through fast-production animations. We will show start-to-finish methods through case studies.

Learning Objectives

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

- Demonstrate the benefits of animations as a design tool
- Make design decisions through quick animations
- Explain concepts and information to clients and managers through animation
- Implement real project examples in your firm

Class Outline

- Standard Setup/Procedures
- Case Study1: Sustainability
- Case Study2: Constructability
- Case Study3: Sequencing
- Case Study4: Programming
- Q&A

What are Quick Animations?

Quick Animations

- Animation A

- Animation B

Quick Renders

- Render A

- 10 second animation
- 10 sec*30fps = 300 frames
- 300 frames*2min/frame=600min

- 10 HOURS!

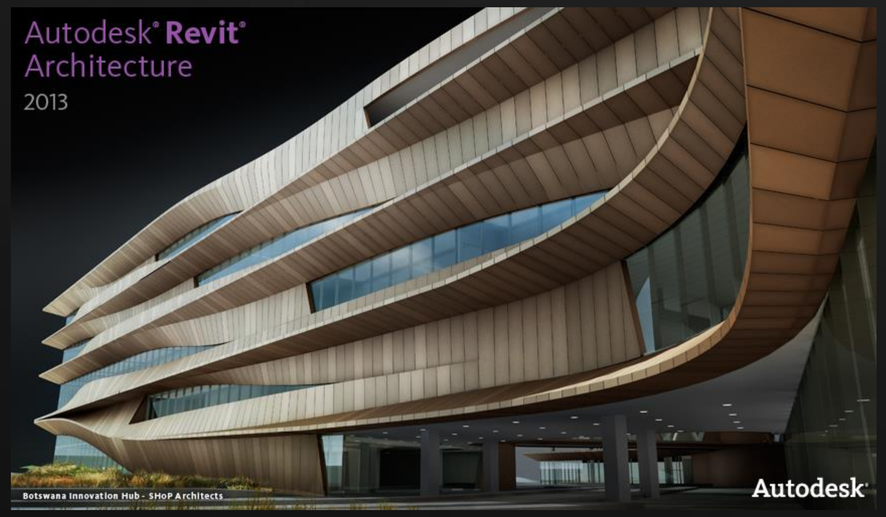
- Render B

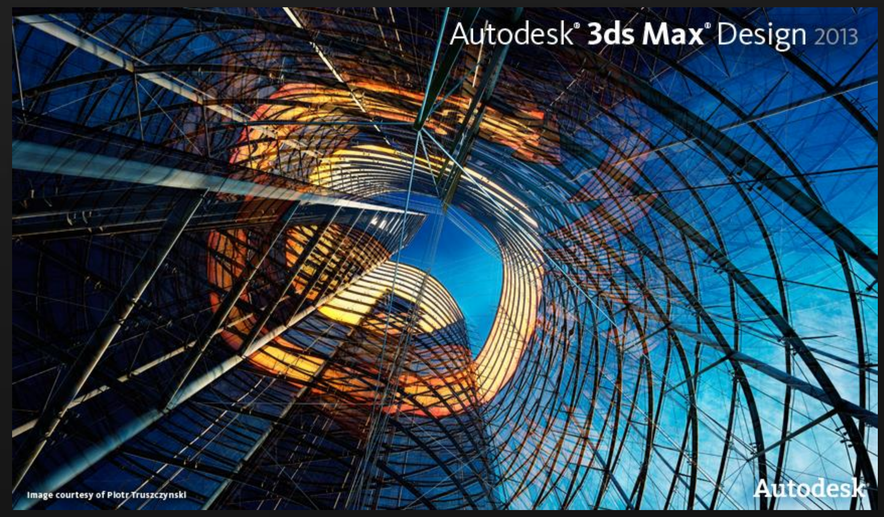
- 10 second animation
- 10 sec*30fps = 300frames
- 10 frames*2min/frame=20min
- Post Process 1hr

- 1.5 HOURS!

Standard Setup

While there are a variety of geometry creation programs this tutorial will give preference to a Autodesk® Revit® to Autodesk® 3ds Max® workflow.

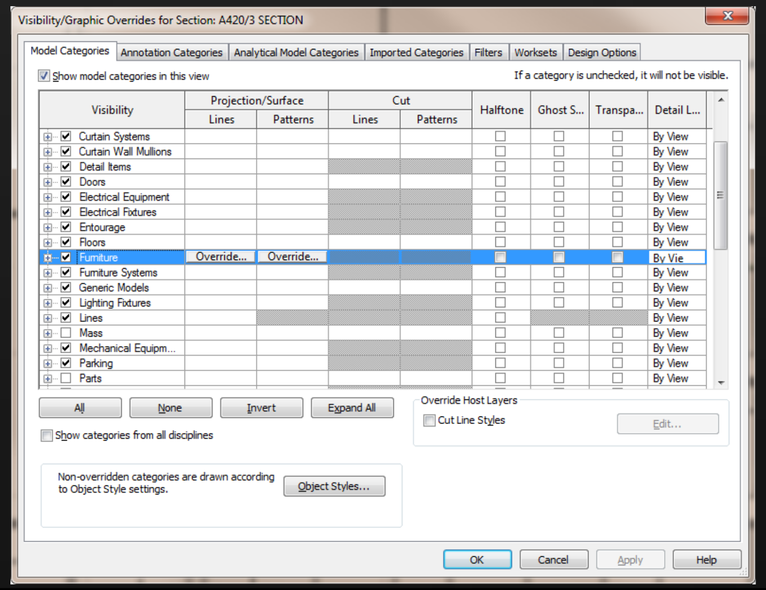




Create

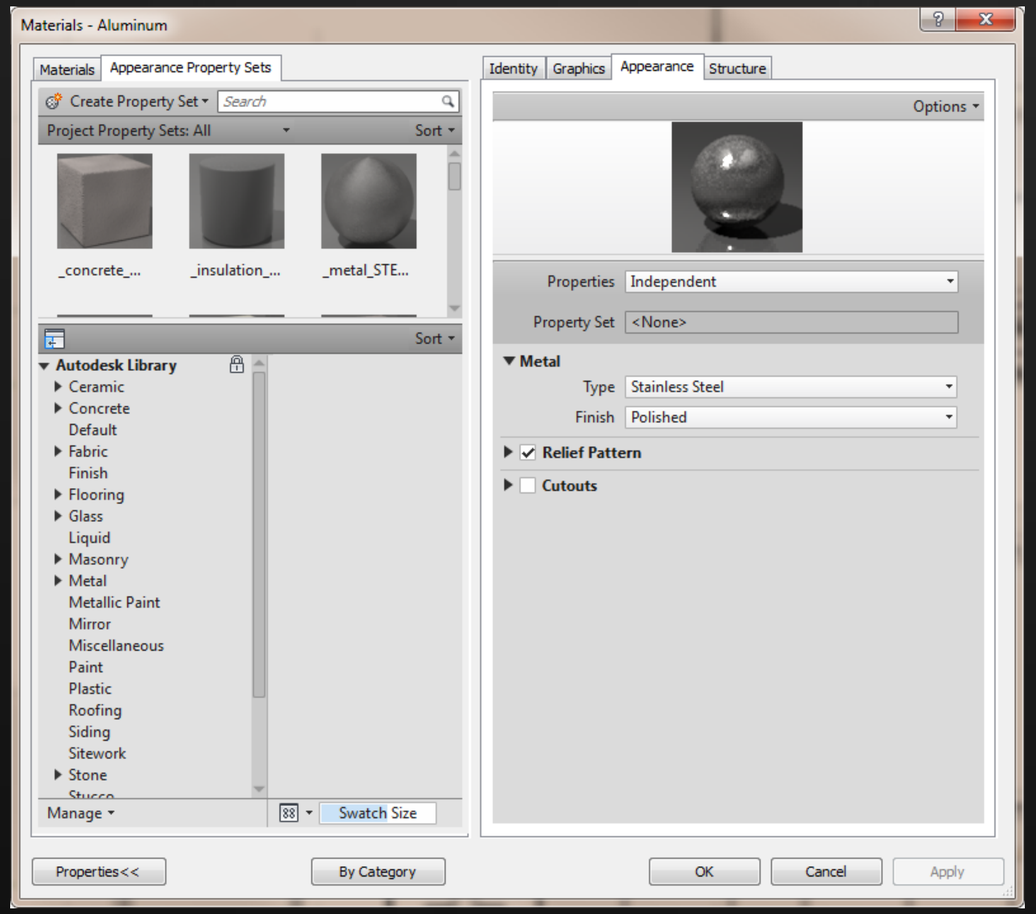
Geometry can be created in a variety of programs (Revit, AutoCad, 3DStudio Max, etc.). As you model, consider the level of detail (LOD) required.

Run your Revit project file and your 3ds Max file in parallel and use filtering and visibility to manage LOD.



Apply Materials

It is faster to apply materials as you model



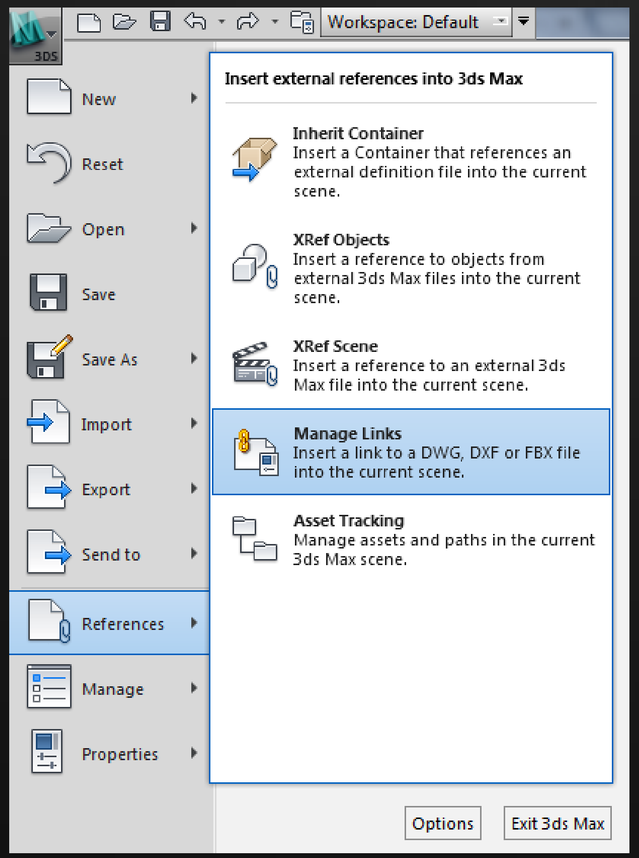
Export

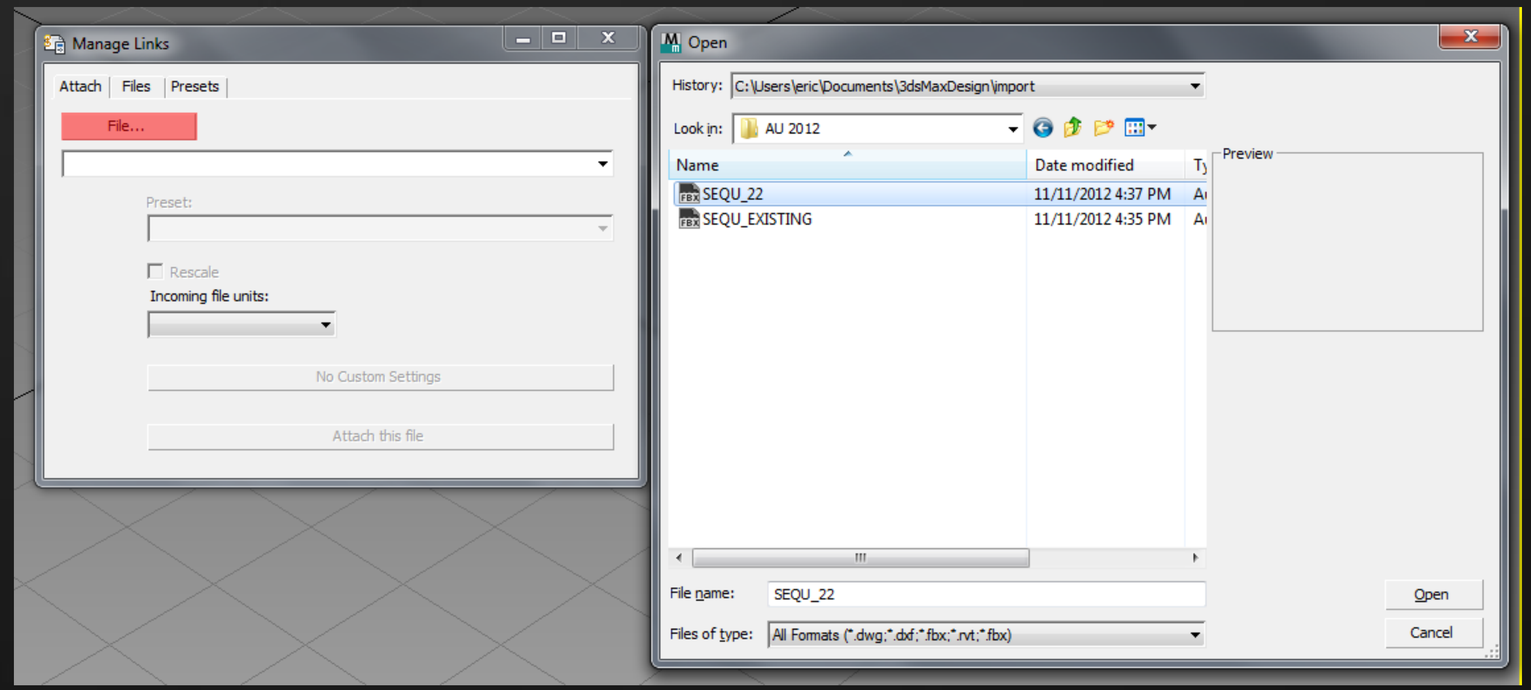
Geometry formats: **dwg**, **fbx**, direct import (2013)

TIP: When using Revit utilize the view cube to quickly orient 3d views to specific plans or sections for animated floor plans or sections.

Link Geometry

Files should be **linked** and NOT imported.

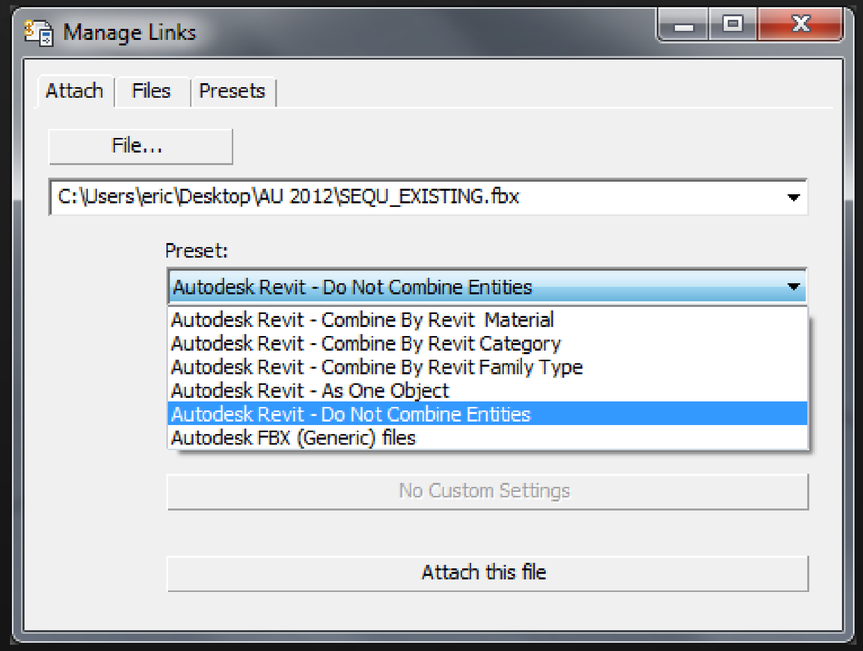


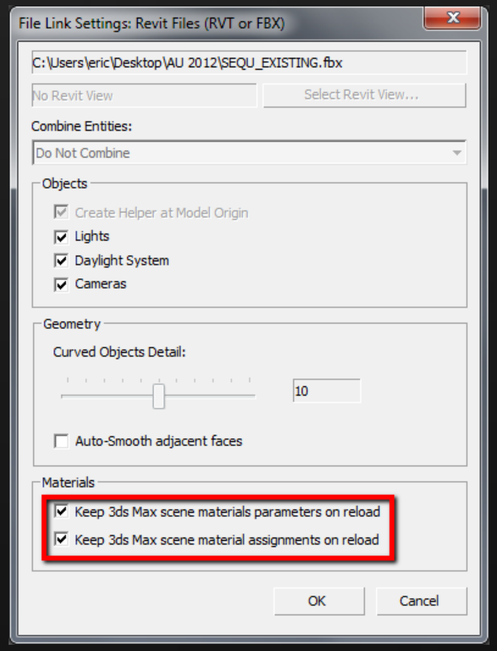


Link Presets

If you have been diligent with material application while building your geometry then you can import “via material from Revit”.

When re-linked insure that the “keep materials on reload” option is checked.





Case Studies

Case Study 1: Sustainability

Case Study 1: Sustainability

Glare Control and Shading

Project: Public Safety Center

Design Challenge: How do various exterior and interior shading options affect glare in an office building?

Approximate Animation Production Time: Three (3) days

Workflow:

1. Develop your floor plan and insert desired furniture.

“Non-essential” elements should be placed on a separate “default off” workset.

Workflow:

2. Create a new workset and model your design options in Revit using the design options tool set.

Create a primary option without any geometry named “blank” or “empty”.

Generate any options you want to test.

Workflow:

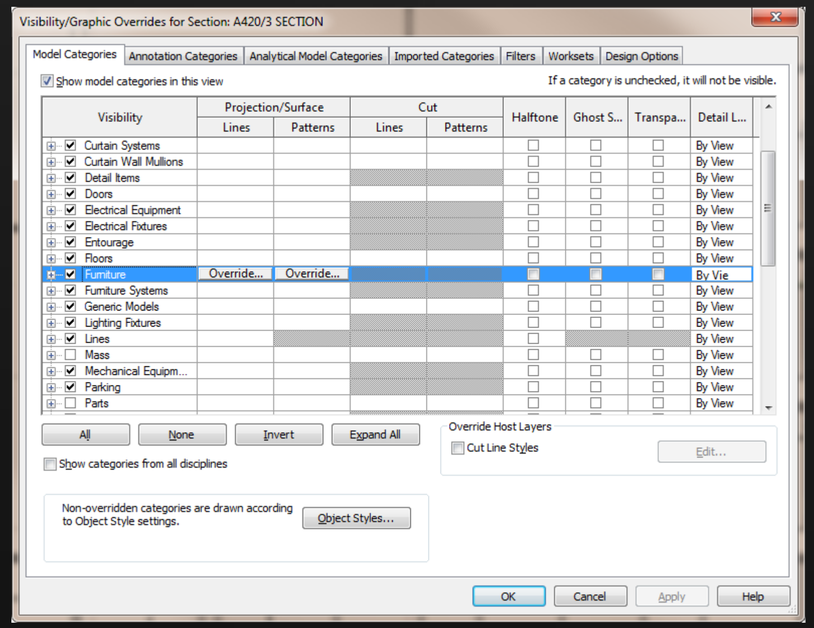
3. In Revit, set up a 3d view and utilize the view cube to orient the view to your desired floor plan.

Adjust the section box to include an entire level of the building.

Workflow:

4. Use visibility graphics and selection sets to remove unnecessary elements.

While in visibility graphics set the design option to “blank”.



Workflow:

5. Export the view to your desired file format and name the file “base”.

Workflow:

6. Within the same 3d view in Revit modify the visibility graphics to show the first design option.

Hide all other worksets so that only the design option is showing.

Export the file naming it “Option A” or similar.

Workflow:

7. Repeat until all options are exported.

Workflow:

8. In 3DS Max start a new project and select “Manage Links”.

Link the “Base” file into your 3DS Max project using the instruction at the start of this tutorial.

Workflow:

9. Apply and/or sub-out materials as desired.

The materials need to be accurate in regards to diffuse and reflectance properties.

Workflow:

10. Link the “Option A” file into your 3DS Max project. By default 3DS Max will assign all elements onto a new layer.

Apply desired materials to the new link.

Repeat these steps for all other options.

RESULT

SUSTAINABILITY VIDEO

Practicality

Forethought

Usability

Design to Building

Case Study 2: Constructability

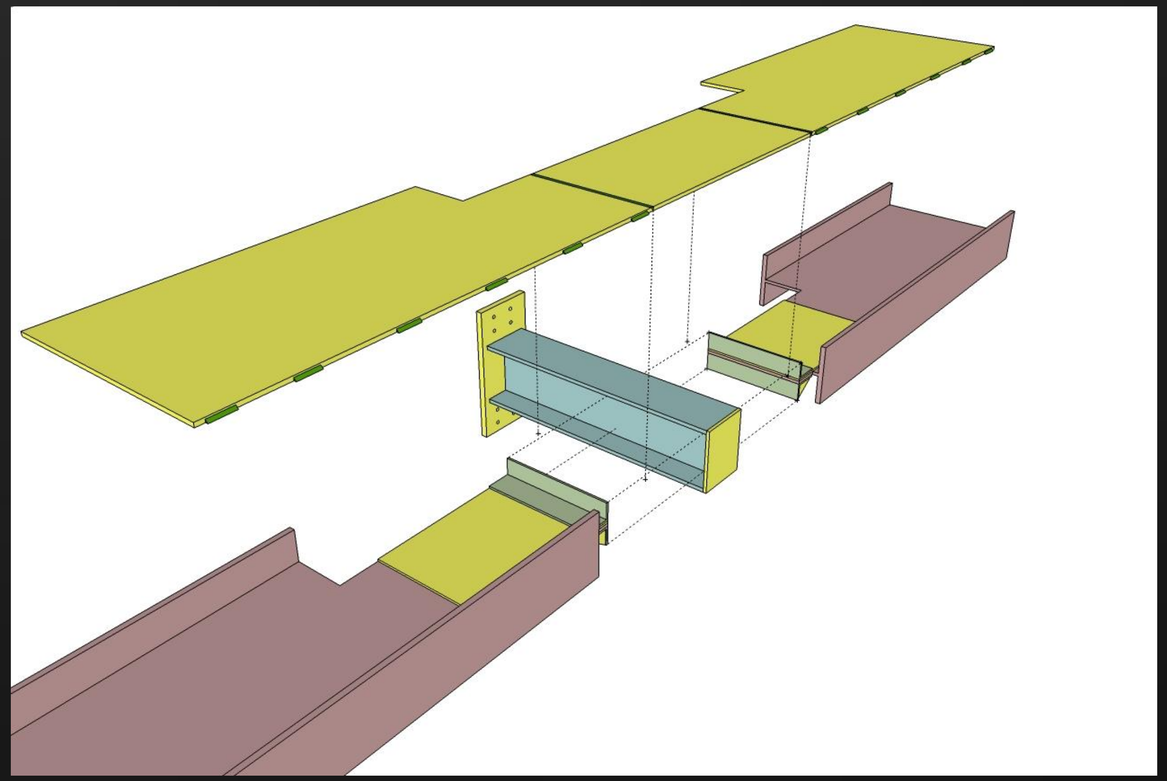
Case Study 2: Constructability

Curtain Wall Detail

Project: Office High-Rise

Design Challenge: How to best detail a complex curtain wall assembly and insure smoke penetration is limited?

Approximate Production Time: Four(4) days



Workflow:

1. Develop your floor plan and insert desired furniture.

“Non-essential” elements should be placed on a separate “default off” workset.

RESULT

CONSTRUCTABILITY VIDEO

Case Study 3: Sequencing

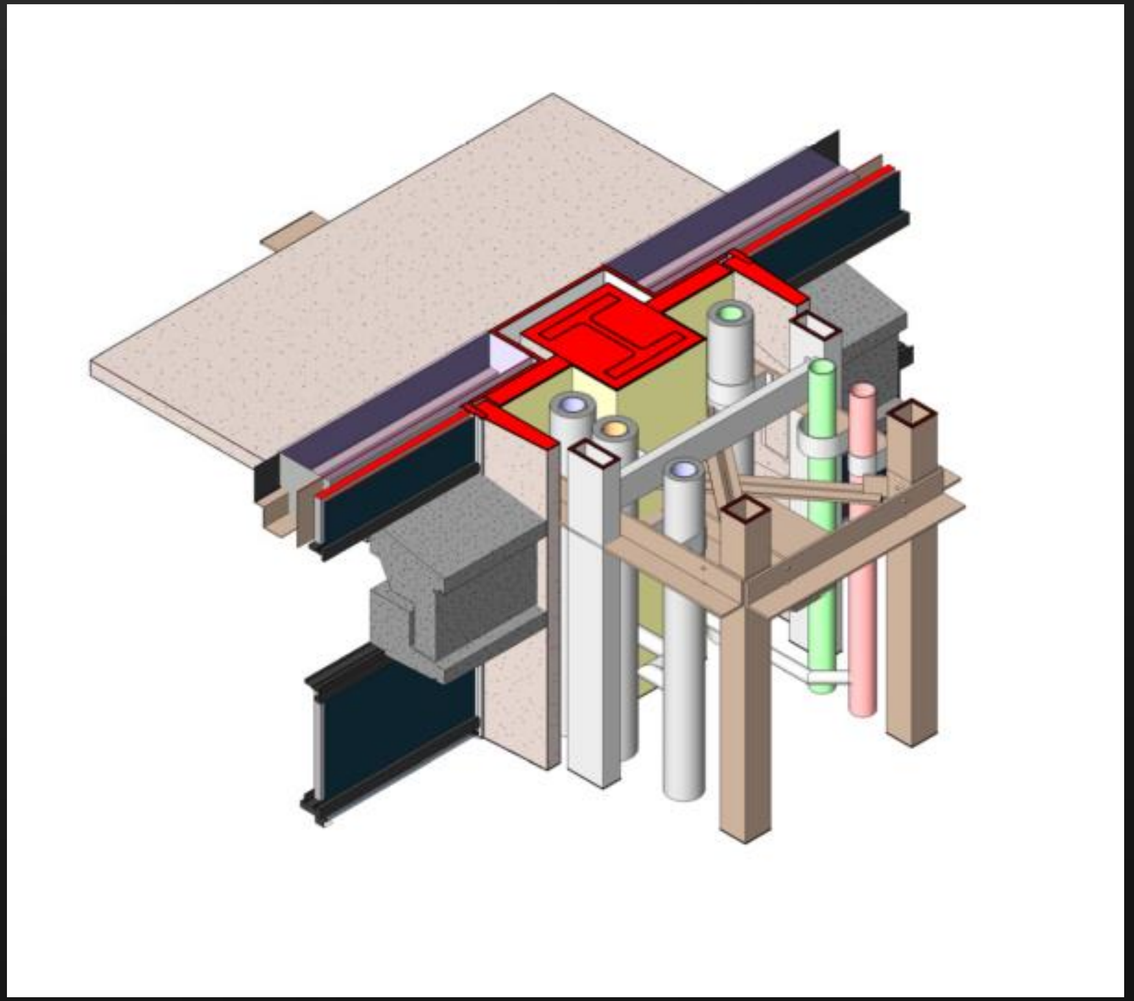
Case Study 3: Sequencing

- Construction Sequencing

  Project: Office High-rise

  Design Challenge: Choreograph the construction sequence in a complex vertical chase

  Approximate Production Time: Four(4) days



Workflow:

1. **Generate geometry**

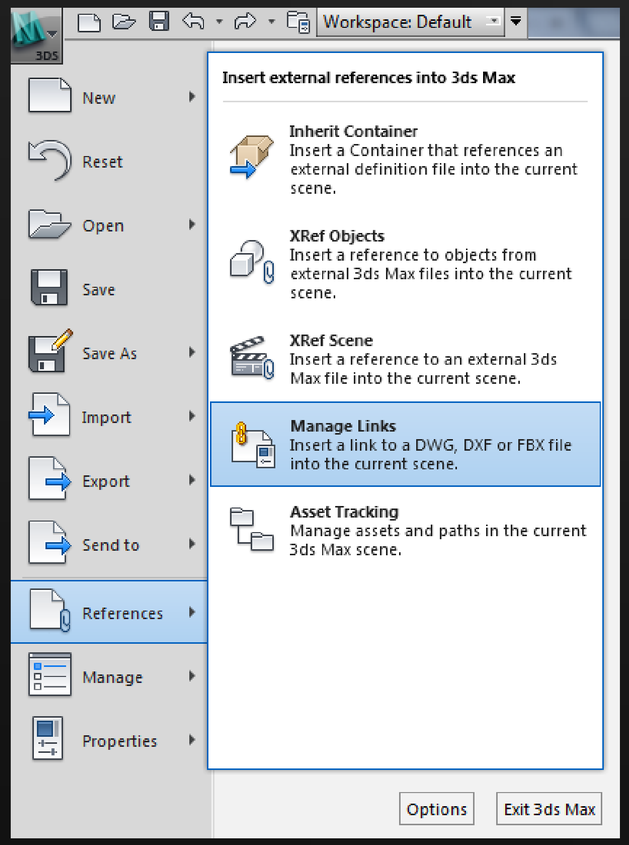
Tip: “Non-essential” elements should be placed on a separate “default off” workset.

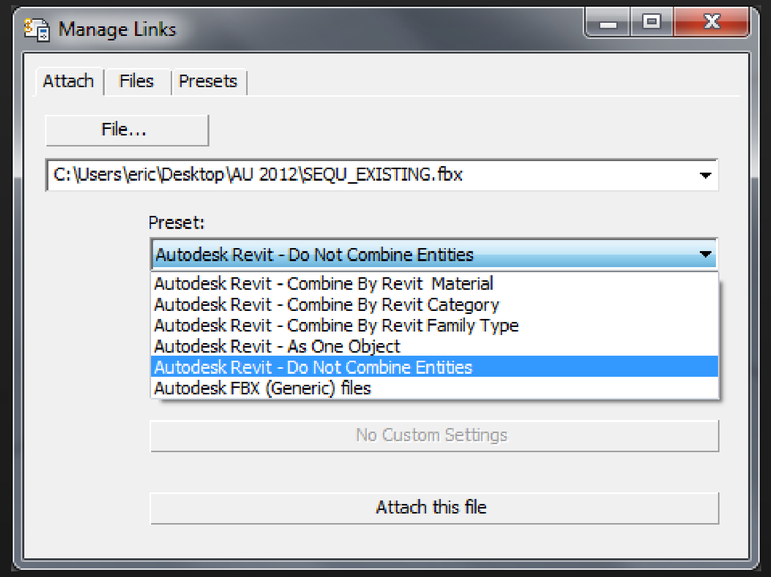
Workflow:

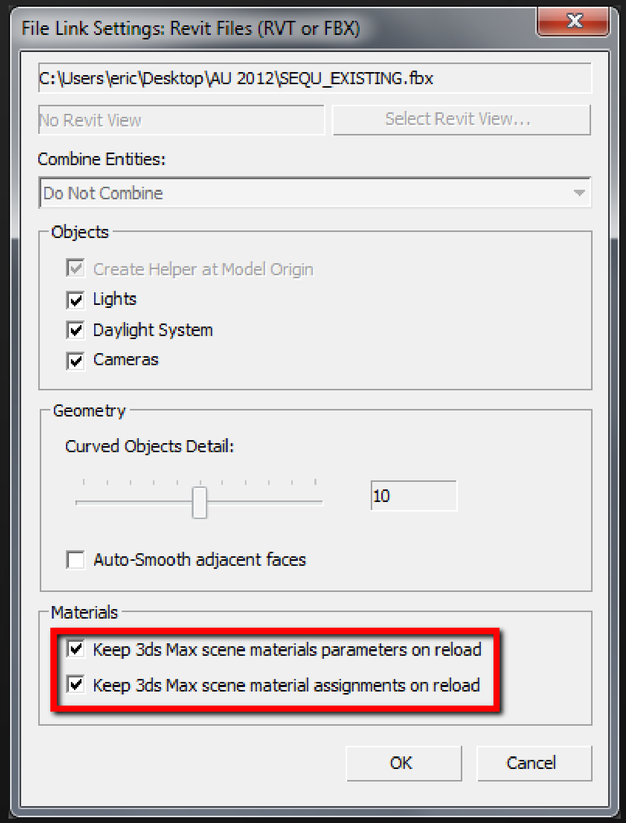
2. **Create an export view and export geometry**

Workflow:

3. Link geometry into 3ds Max







Workflow:

4. **Separate geometry using layers**
Setup one layers per phase

Workflow:

5. **Apply materials to geometry**

Workflow:

6. **Create a camera, daylight system and modify render settings**

Workflow:

7. **Render phases**

Use animation timeline for large sequences

Start at “existing” and turn on phases/layers one by one

RESULT

SEQUENCING VIDEO

Case Study 4: Programming

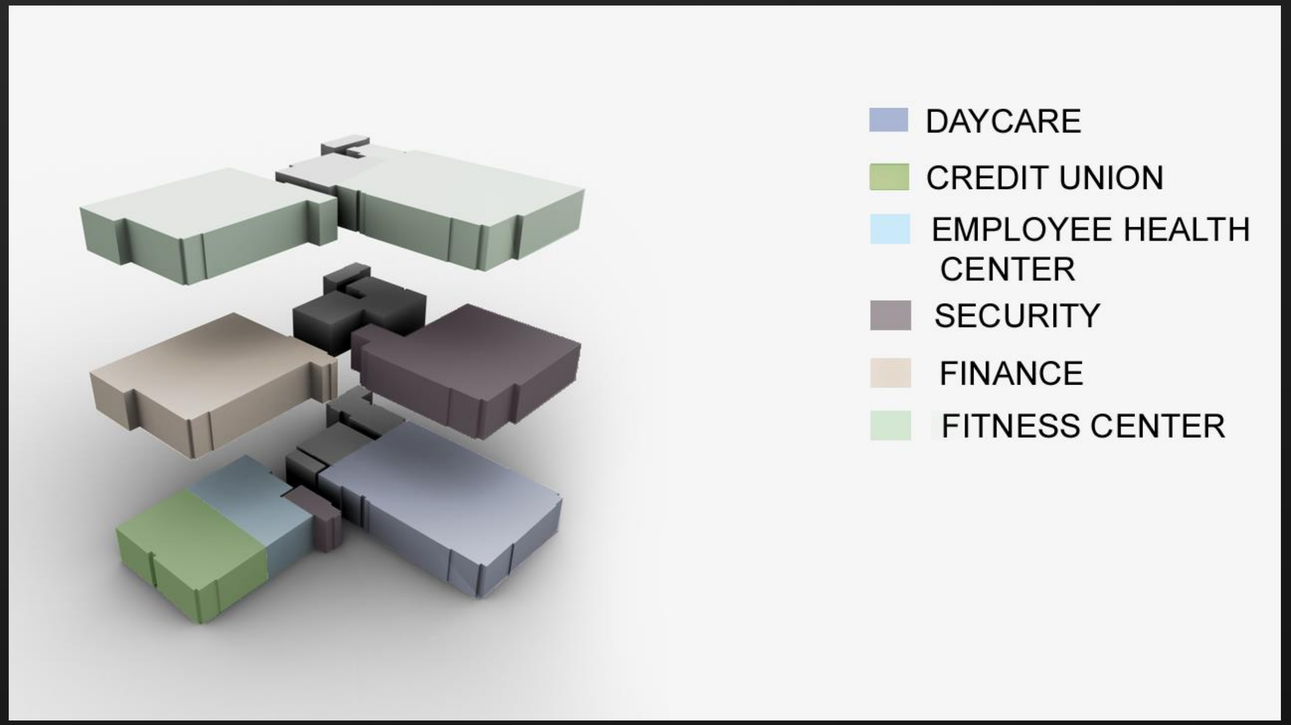
Case Study 4: Programming

Programming Diagram

Project: Campus Master Plan

Design Challenge: Explain programmatic shifts in plan throughout various campus buildings

Approximate Production Time: Four(4) days



Workflow:

1. Generate Masses:

Simple extrusions using plans to generate footprints
Creating entire building footprint then individual spaces

Tip: Use 3D text instead of footprint masses

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Simple extrusions using plans to generate footprints
Creating entire building footprint then individual spaces

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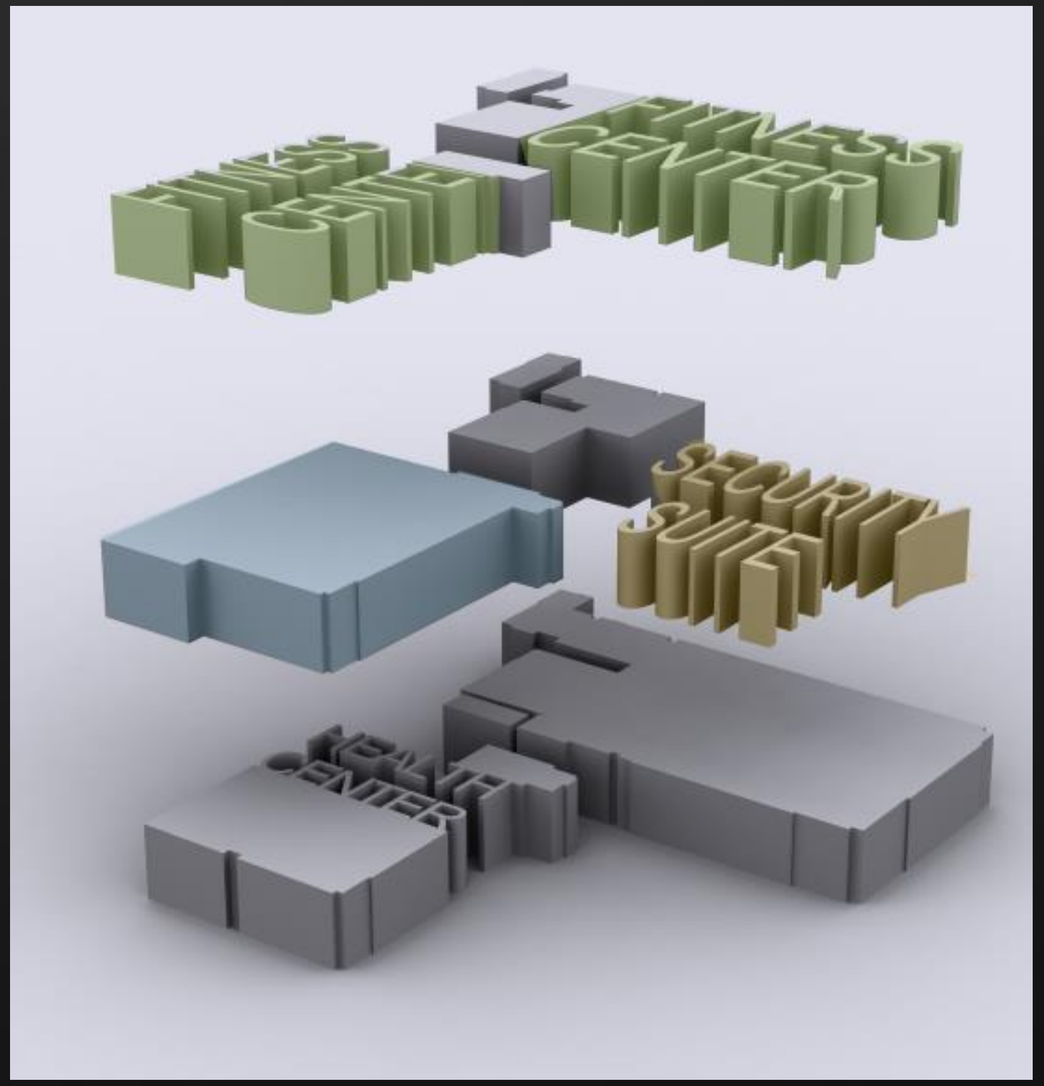


Workflow:

2. Create an export view

Workflow:

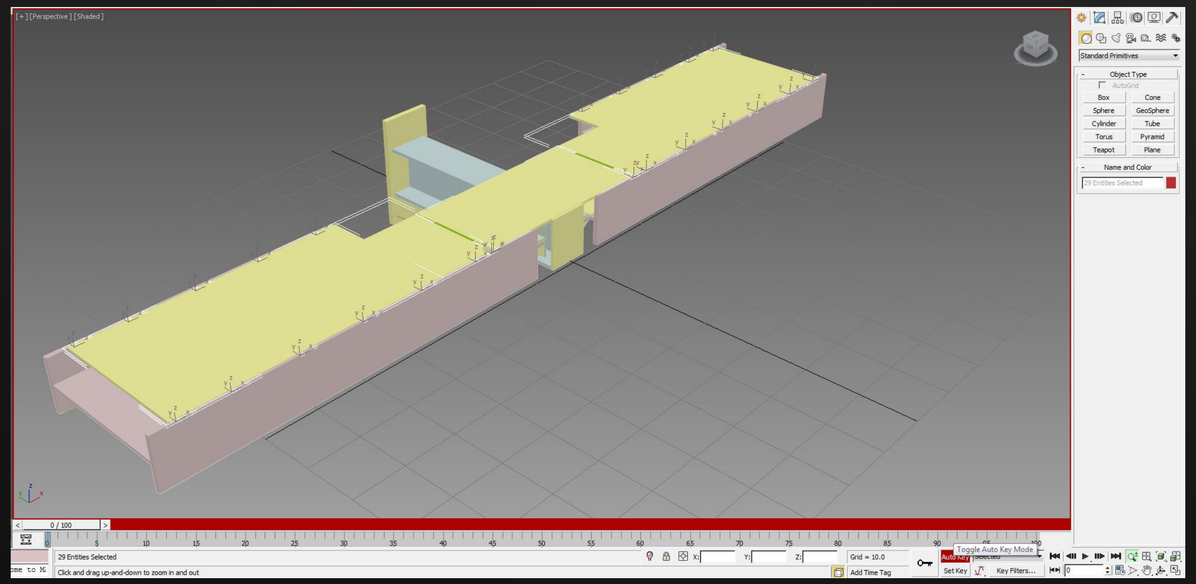
3. Start a new 3ds max file and import geometry

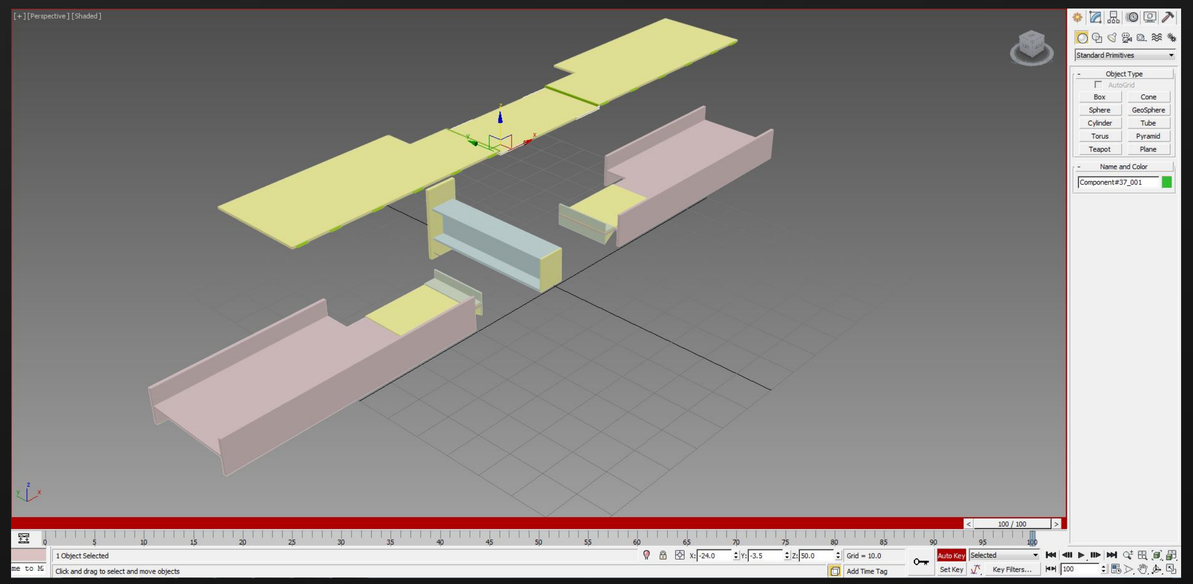
Workflow:

4. Apply materials
Basic ceramic or plastic material with modified diffuse color

Workflow:

5. Setup animation timeline
Stack individual spaces within exterior “skin”
Using autokey melt the exterior skin at frame 30
Progress to frame 100 and “explode” the parts





Workflow:

6. Create a camera, daylight system and modify the render settings Use the override material option and set the material to a white/grey clay or plastic material.

Workflow:

7. Render the final frame as a still with material override and without

TIP: Don’t spend too much time tweaking the colors of your spaces. Make sure that the colors are distinct as you will use the colors to quick select in Photoshop.

Workflow:

8. Use Adobe Photoshop to isolate the colors and make separate layers

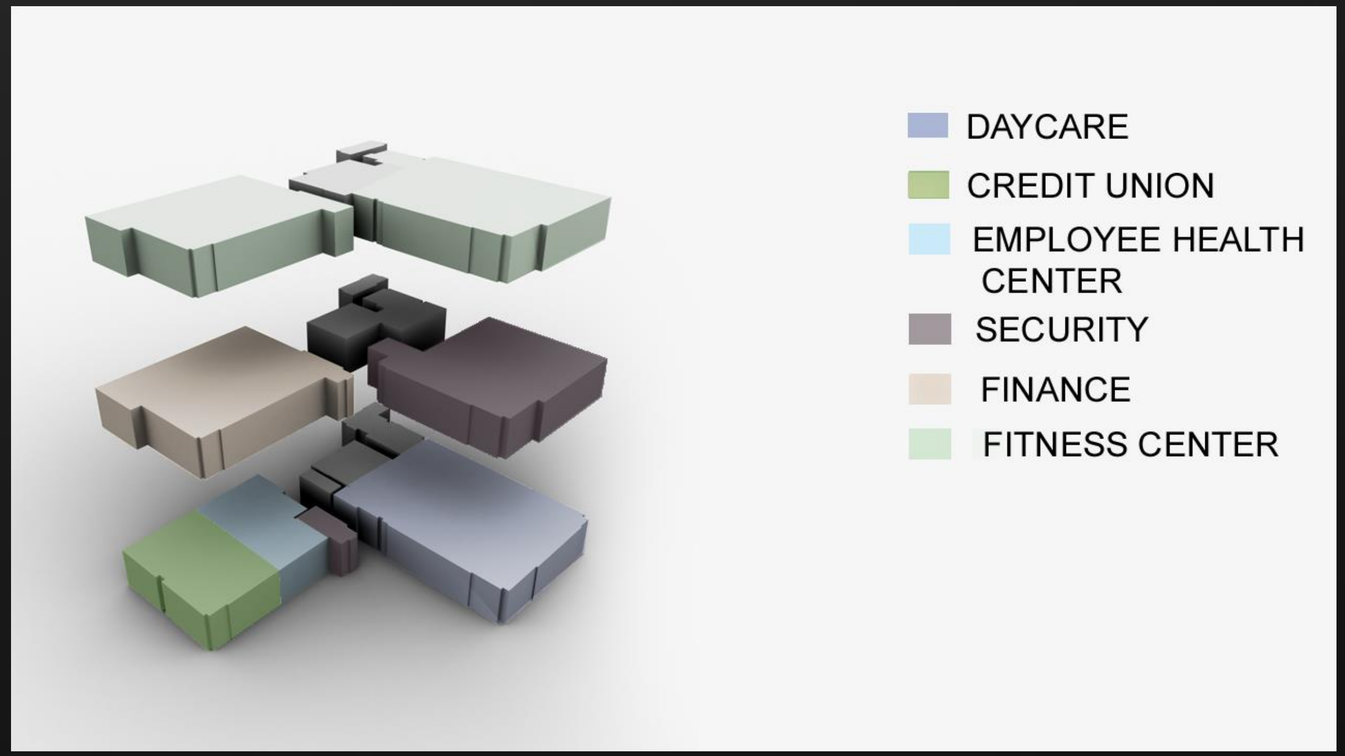
Workflow:

9. Overlay color layers onto clay still

Tip: Colors can now be changed without re-rendering

Workflow:

10. Create a legend
Enable layers one at a time and save out images



Workflow:

11. Compile video and still in post production
Use fade transitions between stills

Workflow:

12. Apply titles, text and music
Process video

RESULT

PROGRAMMING VIDEO