AUTODESK UNIVERSITY 2013

Every Point Cloud Has a Silver Lining When You Use Autodesk® InfraWorks™

Speaker Keith Warren – VTN Consulting
Co-presenter Mark Dwillis

CI1892

Introduction

3D Digital Cities have been around for a while, but what are they and what can they be used for? In this lecture we are going over a number of ways to use existing data you might have and easy ways to find what you need. Then show how to import that data into Autodesk Infrastructure Modeler

Conceptual designs for:

- Civil Engineering
- Transportation
- Urban Planning
- Infrastructure Proposals
- Land Development
- Others

Save time on conceptual design workflows by building 3D models of existing infrastructure from readily available GIS, Building Information Modeling (BIM), CAD, and raster data.

- Speed the design process—Share proposed infrastructure models to give designers a head start.
- Communicate visually rich infrastructure proposals— Facilitate faster decision making and communicate design intent to stakeholders more effectively.
- Depict the local environment more realistically—Create models of the existing natural and built environment quickly and easily.
- Manage infrastructure proposals—Create and manage multiple alternatives in a single model.
    - Overlay GIS data—Create 3D thematic maps to help make more informed decisions.

About the Speaker

Keith Warren has over 25 years accomplished professional experience with a variety of AEC projects that include Commercial/Residential developments, Public Works, Virtual Design and Construction. He is a passionate leader in BIM, IPD, Subsurface Utility Engineering and Reality/Data Capturing. He strongly believes in the benefits these advanced modeling technologies deliver to the industry.

He formulates initiatives and programs that support business objectives that will align with organizational cultures. He is responsible for pioneering 3D Infrastructure Designing, as well as guiding initiatives to support the advancement of 3D utility design. Keith forged processes and constructed facility management systems that are used in 3D As-Built SUE technology. These cutting edge technologies are transforming Las Vegas into a modern sustainable city. These processes include Ground Penetrating Radar, HDS Laser Scanning, Facility Management, and 3D City Modeling.

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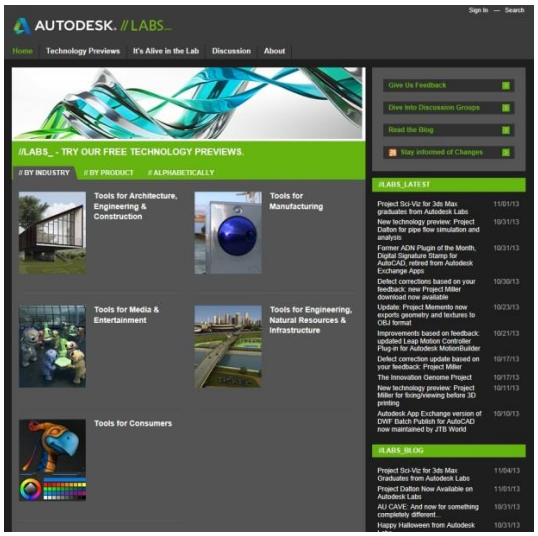
You Tube: http://www.youtube.com/user/VTNmodel

Autodesk Labs

Autodesk Labs is home to innovative new technologies and collaborative development. Its mission is to involve you, the customer, in the progress of design technology solutions. We're not a beta program (although Autodesk does have an active beta community), or a usability team, because the technology we work with is too new to be a product. The user feedback that you provide to Labs is really on product ideas, while they're still in an early conceptual stage."

- Project Galileo Before it became (Autodesk Infrastructure Modeler)



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Learning Objectives

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

- Learn how Infrastructure Modeler can help your business
- Find data to create compelling models
- Create compelling stories for your stakeholders
- How to share models in the Cloud


Model Explorer
Feature Themes
Feature Themes
View: View All
Active Only
Theme
Range
Roads by Class
COLLECTOR
INTERSTATE
LOCAL
MAJOR STREET
RAMP
US HIGHWAY
Parcels by Assessor Acres
0.000 - 0.733
0.73 - 2.33
2.33 - 5.28
5.28 - 10.75
10.75 - 20.81
20.81 - 38.80
Expand All
Collapse All
Import
Export
Update All
Parcel Information
APN Number: 16203401001
Assessor Acres: 0.62
Description: Acreage 200
Owner Mail: W2007 STRATOSPHERE PROPCO L L C

Where Do I find the Data

Elevation Data & Imagery

The USGS website is an excellent source of free data. However, you can also use your web browser to find and download terrain data. A good search string includes the following:

GIS + data + DEM + terrain + download + [your area name]

Or visit the USGS National Mapviewer site at: http://viewer.nationalmap.gov/viewer/.

GIS	A Geographic Information System stores, manages, and analyzes geographical information
DEM	A digital elevation model is a 3D representation of a terrain's surface
download	Include this term to avoid sites that merely display terrain data without the ability to download it.
Your area name	Start with a small area and expand from there. For example, specify your city or county name. Include the state name to make sure you get the right data.

Make sure that you download both the image and the corresponding world file, if required. This table shows which formats require such files:

File Format	Picture File Extension	World File Extension
ArcInfo ASCII	*.asc	
Digital Elevation Model	*.dem	
Erdas Imagine	*.img	*.igw
JPEG	*.jpg/*.jpeg	*.jgw
MrSID	*.sid	*.sdw
TIFF	*.tif/*.tiff	*.tfw

Some sites tile the data, to make each download a more manageable size—for example; a city may be divided into multiple tiles. Some local sites link to USGS data, but have their own method for finding, selecting, downloading, and viewing the data. You can also download data directly from the USGS National Map Viewer.

Street Data

While the ground cover aerial photo might show roads, rails, and bike paths, GIS data associates information like road names, rail operators, number of lanes or tracks, and so on with the transportation geometry.

Transportation data is always in **vector** format, and is often stored in **ESRI Shape files**. Shape files come in sets, and you must have these three:

File Extension	Purpose
SHP	Geometry. For roads and railways, this is linear geometry, and usually represents the center lines of the roads or railways.
DBF	Attribute information
SHX	Links together and indexes the other two files.

Downloads may also include a PRJ file, which contains projection and coordinate system information.

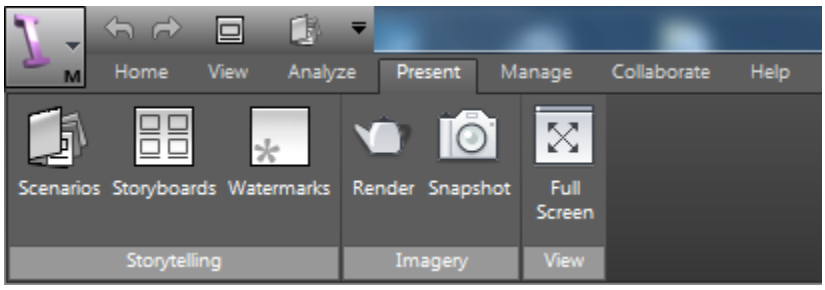
Note: If possible, download transportation data in SHP format, but DXF is also supported.

Alternate sources for road and transportation data include state, county, or municipal GIS sites that include many data types such as streets by class. This will vary from location to location but this is often a rich set of source data with good attribution available for the local area.

Openstreetmaps.org is also a free source of road centerline data with limited attribution. This will at least provide context to your model.

Storytelling Features

Storytelling Overview



1. Scenarios – provides a window to create and manage scenarios, including publishing them to AIM 360 to be viewed on AIM 360 Mobile and AIM 360 Web
2. Storyboards – create camera paths, and animations along a timeline. Annotate positions on the timeline with captions, and introduce your concepts with titles.
3. Watermarks – Display identifying information with your design such as your company logo or project information
4. Render – produce high quality renders of your model in HDR and LDR format for better presentations
5. Snapshot – create an image of the current view of the model

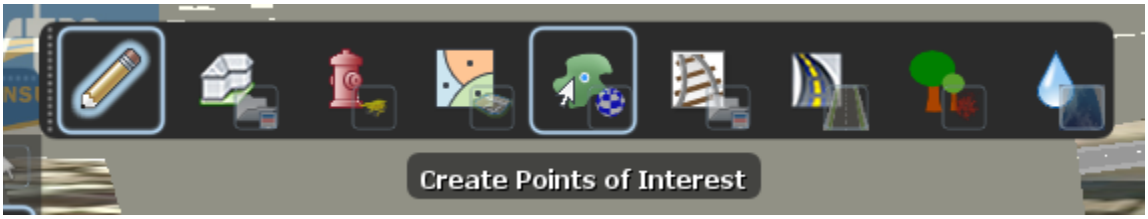
Adding Points of Interest (POI)

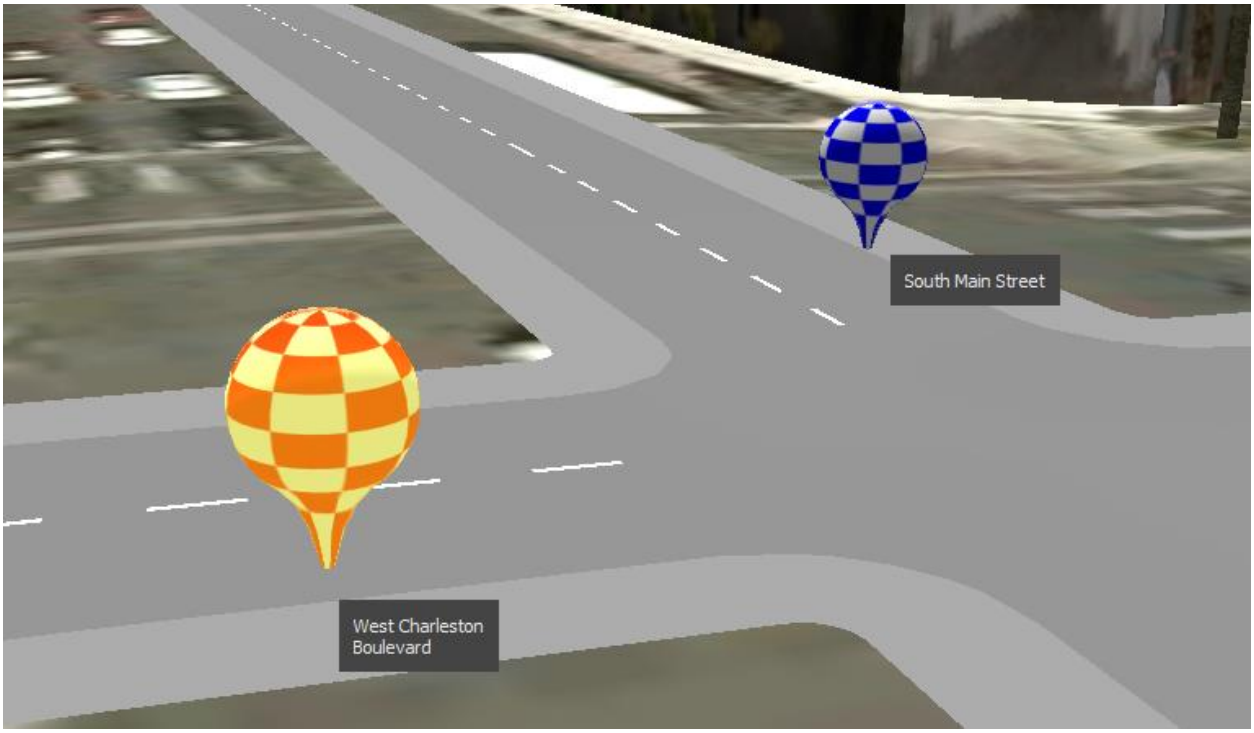
POI are comprised of geo-referenced markers to indicate a place in the model, tooltips, and a proximity setting that automatically displays the tooltip to the user based on their distance (in model space) from the marker.

1. Markers may be added by sketching them into the model or by being imported as points
2. Tooltips can be created for each point in properties or as part of the import dialog
3. Proximity can be set in properties as well

How the tooltip window looks can be authored with a few tricks. You can control the look of the content as well if you know a little HTML or can use an HTML tool like Dreamweaver.

Note: Images included in your tooltips will need to be referenced from a public Web site in order for them to appear on the AIM 360 Web and Mobile Viewers.





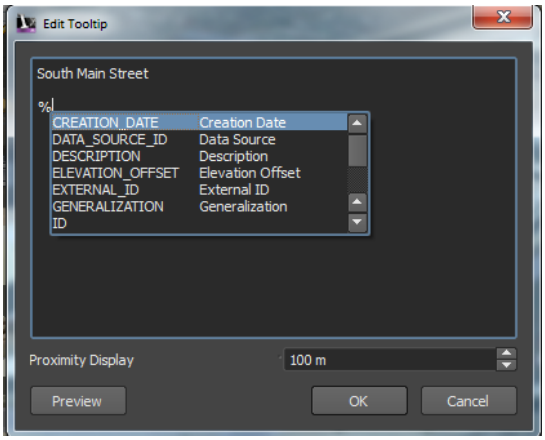
Tips for Tooltips:

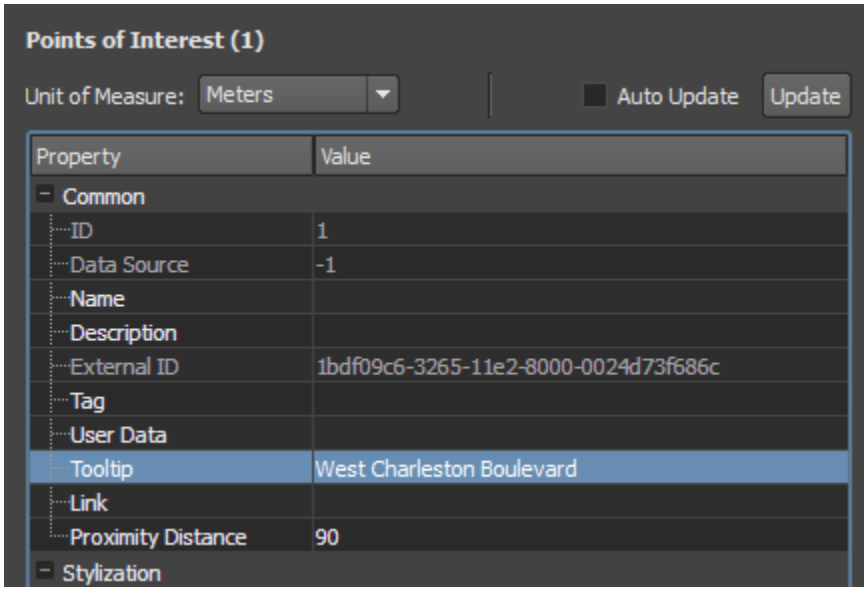
Information for formatting tooltips, both the tooltip window display and the content inside is outlined on the Autodesk Wiki Help site:

http://wikihelp.autodesk.com/Infrastructure_Modeler/enu/2013/Help/0031-User_s_G31/0055-Procedur55/0085-Style_Fe85/0100-Create_T100

Also note that when you are creating a tooltip from an imported data source you have access to the attributes that were imported with that data source (if you set them up).

You can access the attribute variable list by typing "%" and the attribute will filter from there, so if you type "%a" the attributes that start with a will display.

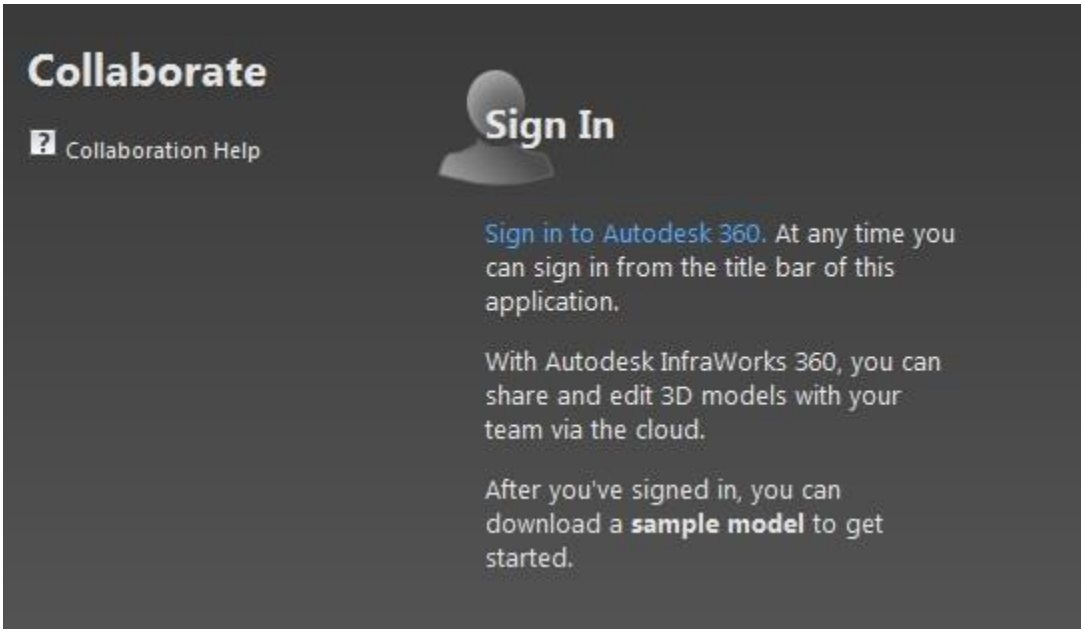




Collaborate

You must have an Autodesk account in (*Autodesk 360)* to be a to collaborate and share files.

1. Sign in to Autodesk 360

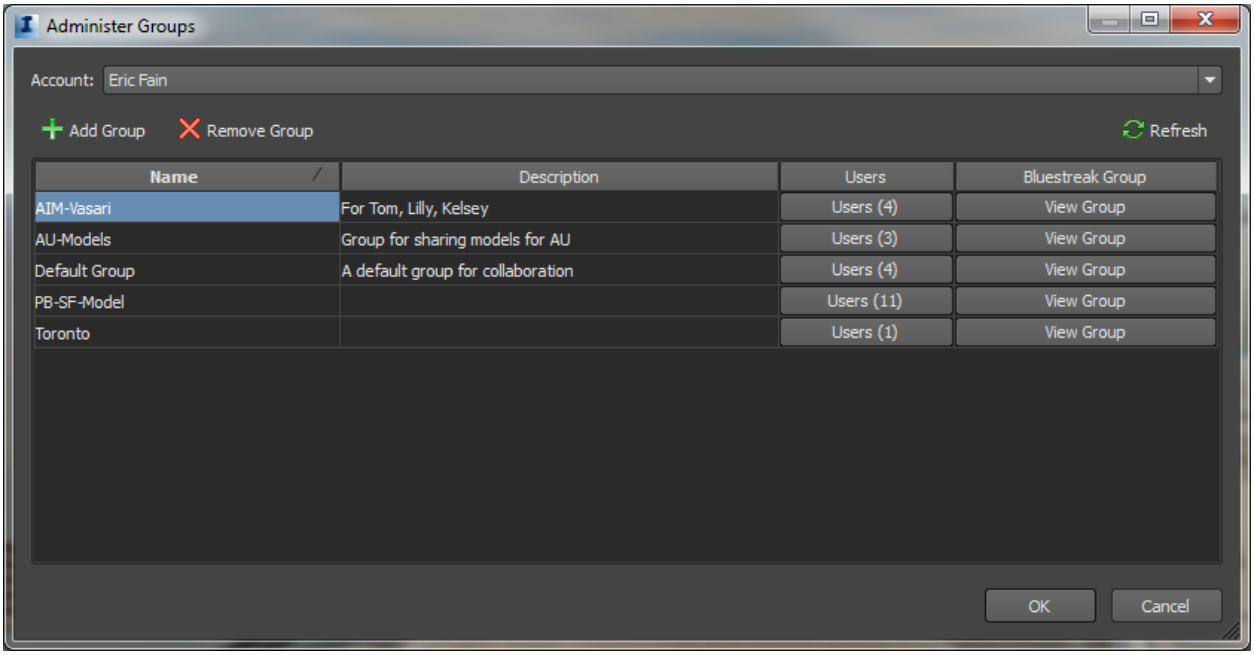


Once your login you will have a couple of options.

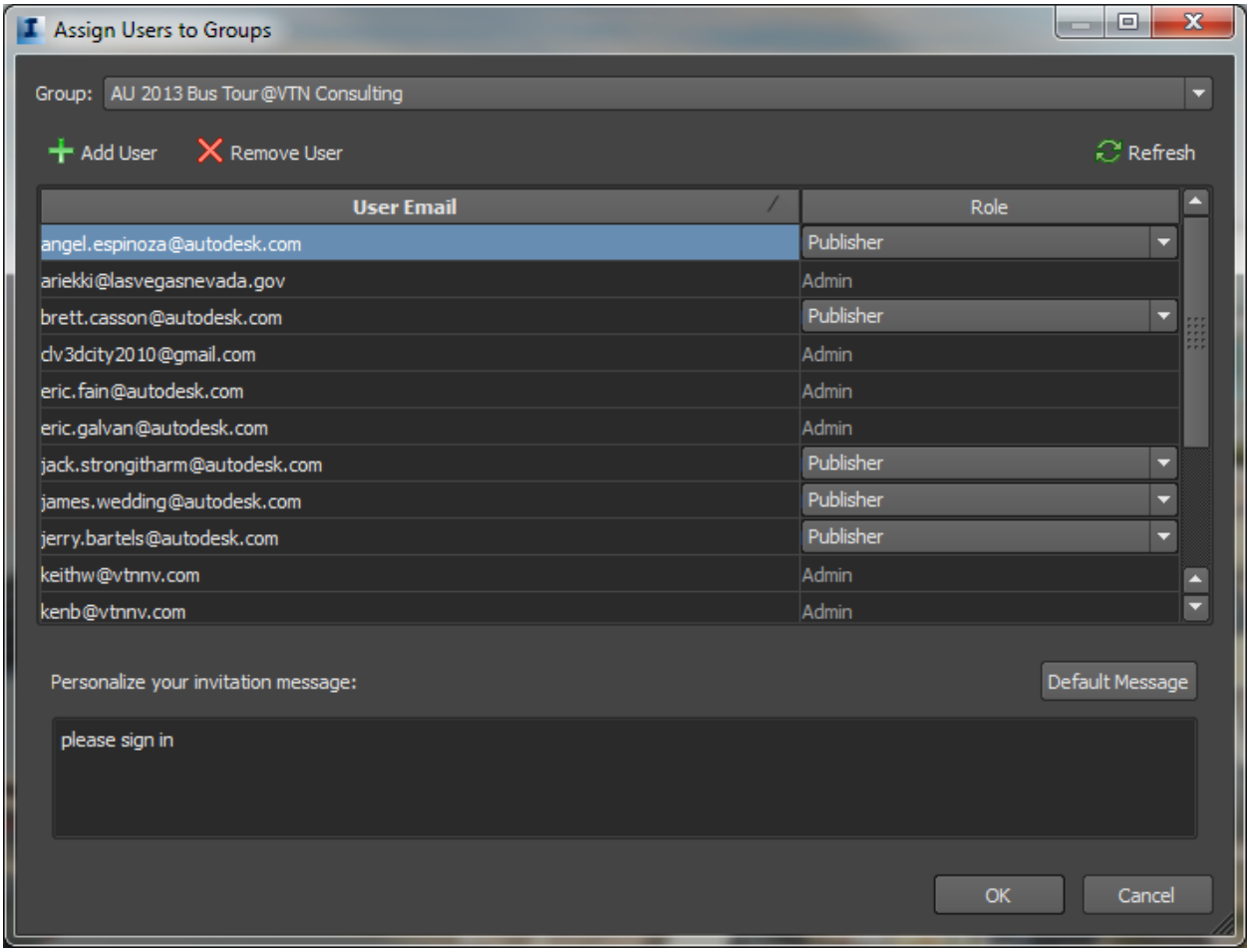
- Groups
- Manage Online Models
- Manage Online Scenarios
- Refresh
- Collaboration

2. Once you open a file image below shows the collaborate ribbon.

3. Under Administer Groups to +*Add Group*



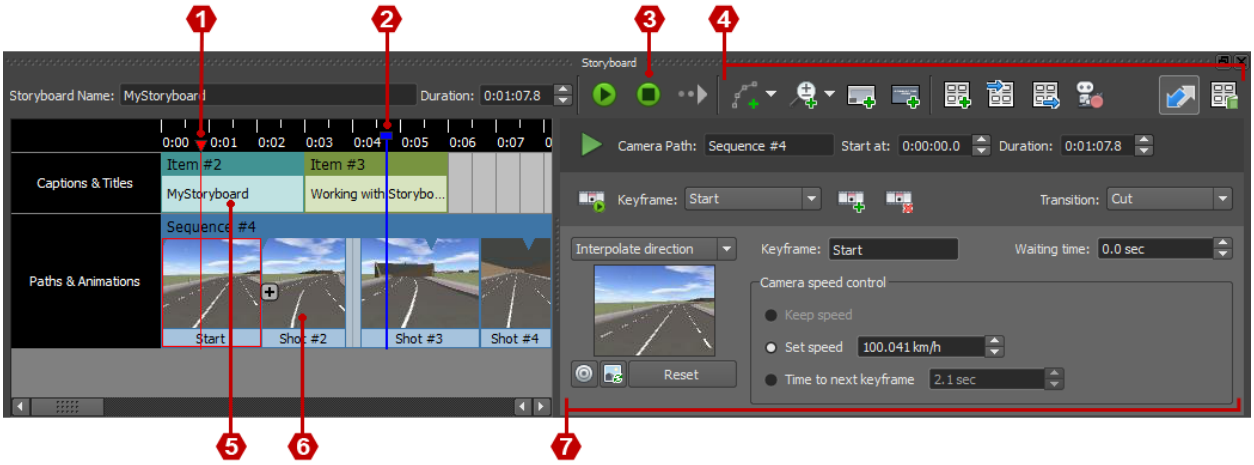
4. Assign User to Group +*Add User* Note: Set their role leve



5. Under the Present Pull Down Menu use the Scenarios to post and share file in the Cloud with team members, clients, and others.

Extra take away from class

Storyboard Layout



1. The marker (the red arrow) indicates the insertion point for new elements.
2. The play head indicator (the blue line) sets the starting point for playback.
   After you play the storyboard, the play head indicator moves to align with the marker.
3. The playback controls play the entire storyboard, starting from the play head indicator.
   Individual elements have their own playback controls.
4. The Storyboard toolbar contains controls to create elements and manage storyboards.
5. Captions and titles appear in the top track.
6. Camera paths and animations appear in the bottom track.
   Specify the duration and position of all elements by dragging and resizing them.
7. The settings for the selected item appear to the right.

Camera Path Creation

Camera paths define a path through your model. This path takes time to follow, and along that timeline captions and titles may be added.

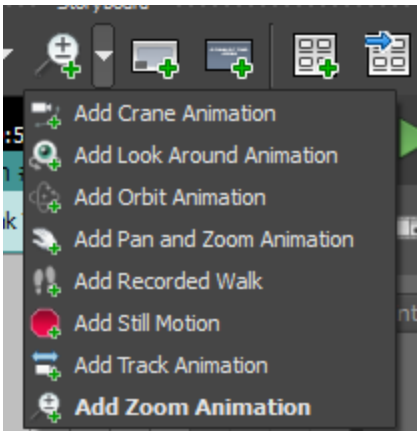
To define a path:

Clicking on the camera path tool will create a camera path and the first keyframe will be the position of the view when you create it.

You may add subsequent keyframes by navigating in the model and clicking add after the keyframe in the end of the active camera path. AIM will link these keyframes together to create a motion between the keyframes.

To define an animation:

Select the type of animation that you would like to use, and add it to the timeline.



- Crane will move the camera up and down
- Look around will circle an object or a defined pivot location
- Orbit will rotate the camera around a point
- Pan and Zoom moves the camera in two planes at once
- Recorded walk record as you navigate
- Track moves the camera left or right
- Zoom moves the camera toward or away from a position

Manipulating Camera Paths and Animations

Any feature that is added to the timeline can be altered directly. You can extend and reduce its duration in relation to the timeline. Or move its position along the timeline.

Right clicking a thumbnail will also provide a menu of options related to a keyframe. One of the most useful options is to go to the location in the model for a specific keyframe.

For more helpful tips go to Autodesk You Tube Channel:
http://www.youtube.com/watch?v=jBm-oT48inw&list=PLgYKCHjym6mQnRDgH-r24SP3tRoAwkoNM