# ArcGIS Pro – 3D Editing

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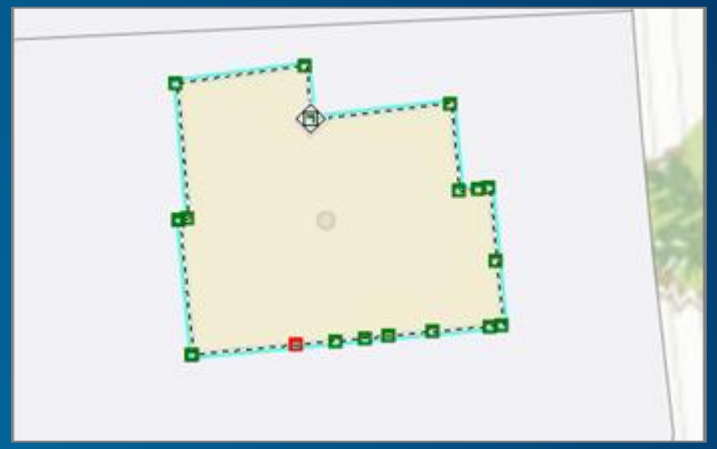
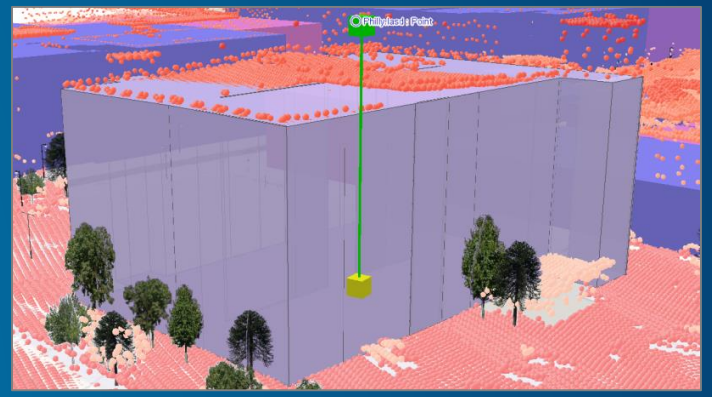
# ArcGIS Pro Editing – Overview

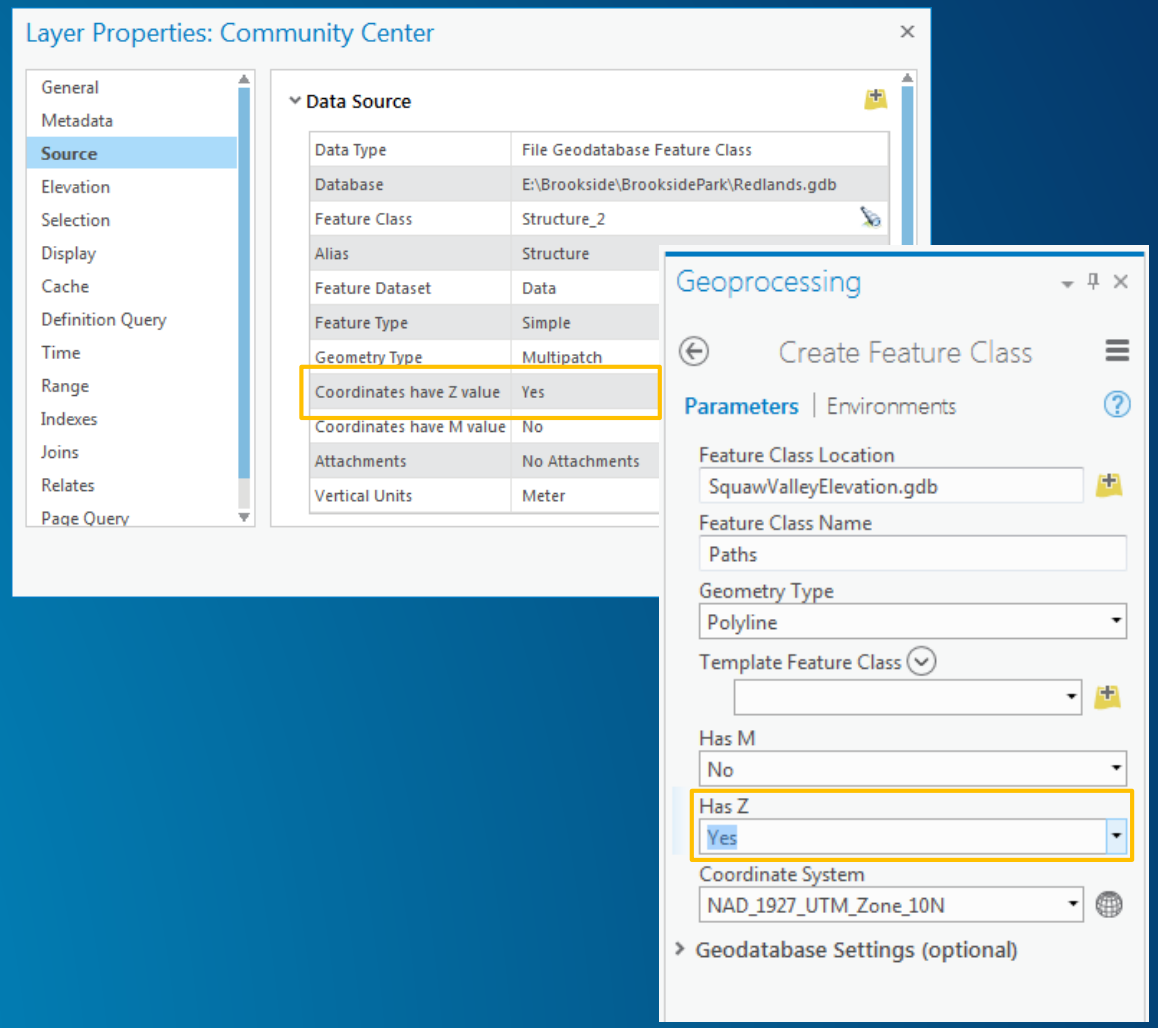
- **Provides tools that allow you to maintain, update, and create new data**
  - Modify feature geometry, create new features
  - Add and update feature attributes
- **Supports editing features in 2D maps and 3D scenes**
  - View and edit features at their true elevation
  - Construct features on surfaces and at a constant elevation
- **Edit multiple workspaces simultaneously**
  - File GDBs, Enterprise GDBs, Feature Services, Shapefiles
  - Set layer editability, configure autosave





# Working with Z-enabled Layers

- Z enabled property reported in Layer Properties window
  - Sometimes referred to as a ‘3D Layer’
- You can Z enable a layer when creating new feature classes
  - Set Has Z = Yes
- Z enabled layers allow:
  - Editing of Z coordinate values
  - Setting layers at an absolute height

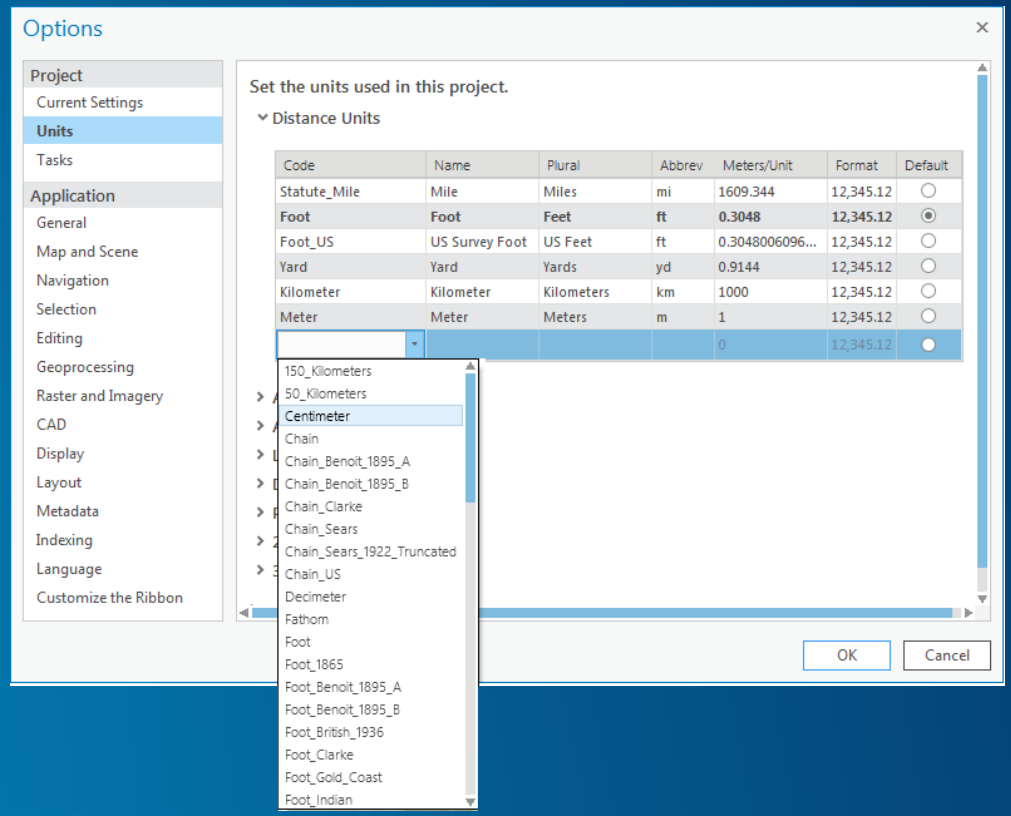


# 3D Editing Overview

- **Create new features in 3D**
  - On the surface or at a constant elevation
  - Draw vertical lines or lines with pitch (at any angle)
  - Duplicate features vertically
- **Modify features in 3D**
  - Respotion features along XYZ axis or freely in 3D space
  - Edit the Z coordinates of individual vertices or all vertices (batch)
  - Use editing tools to divide, reshape, and construct features

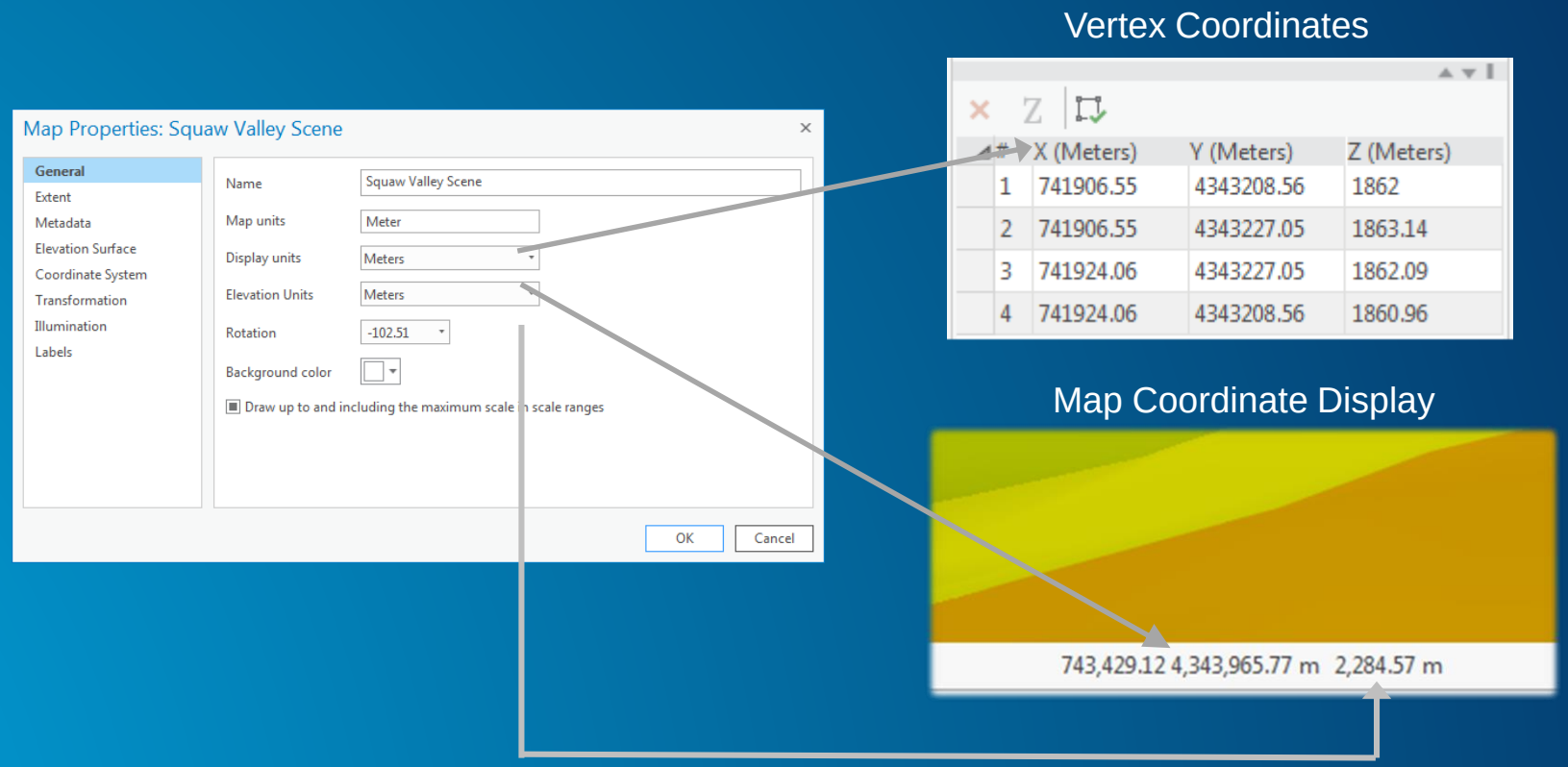
# Working with Units

- Units are set at the project level (made available to maps and scenes)
  - In the Options window in the backstage
- Several types of units are available for working with distances, location, direction, etc
- By default, a map's map units are the primary unit



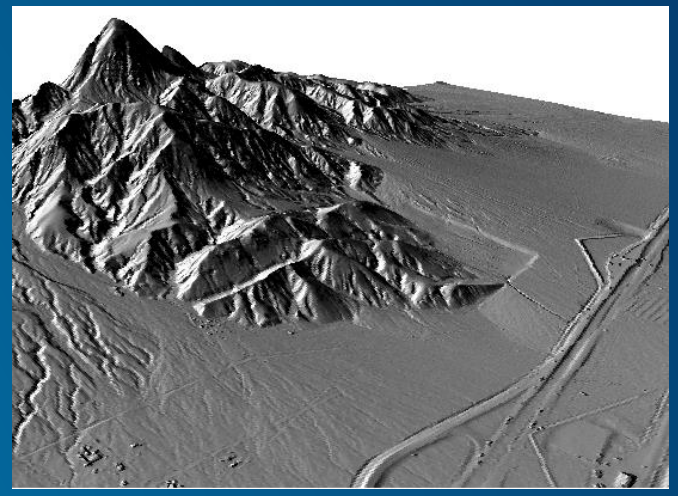
# Units and Editing

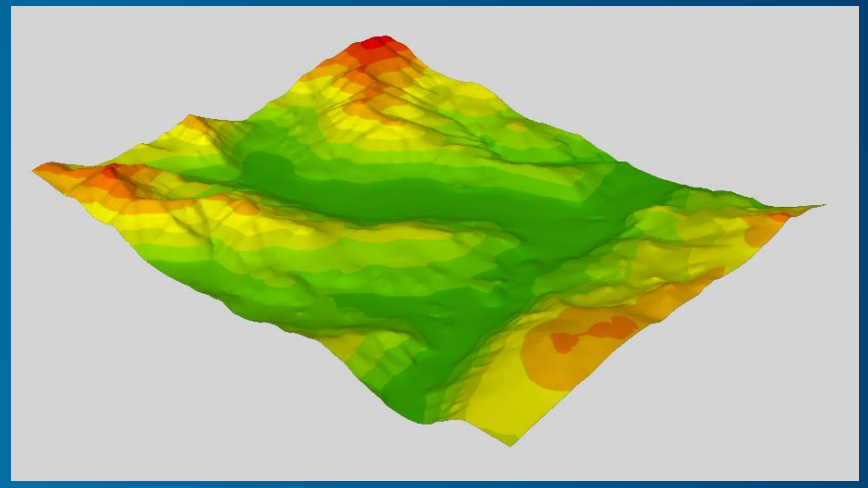
- **Coordinate values are reported in the map's 'Map unit'**
- **Distance constraints are displayed in the project's Distance unit**



# Working with Surfaces

- Elevation surface is a digital representation of features in three-dimensional space
- For editing, a surface can be used to get accurate elevation values (Zs) when creating new features
  - Data can be on, above, or below the surface
- Scenes have ground surface by default from ArcGIS Online (Terrain 3D)
  - You can add your own custom surface
  - DEM, TIN, Terrain, LAS, Raster, LERC

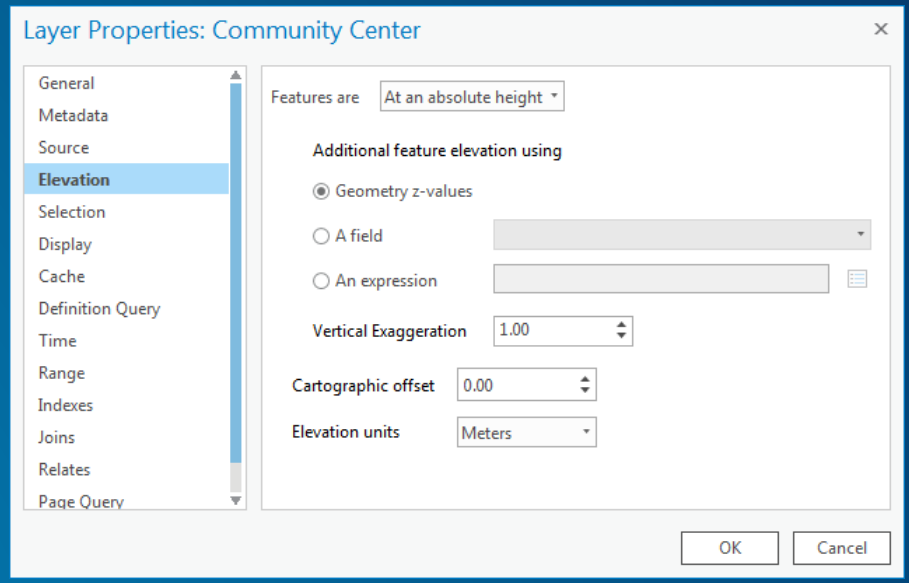


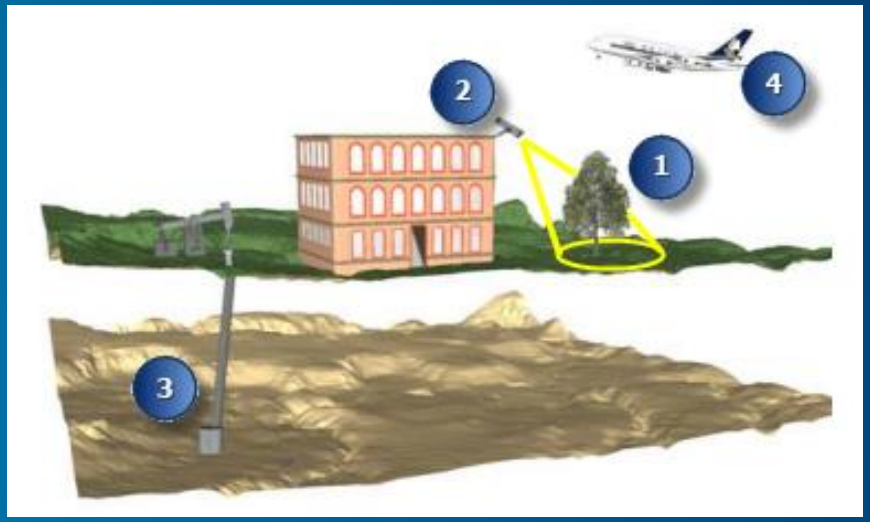


# Layer Elevation – Base Heights

- 3D layers display at different elevations each with unique behavior/capabilities:
  - On the ground
  - Relative to the ground
  - At an absolute height

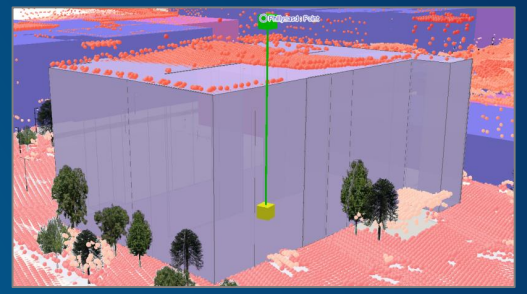
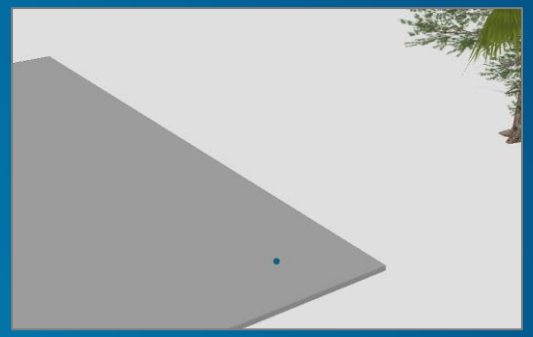
- Elevation surfaces enable you to view layers on, above, or below them



# 3D Geometry vs 3D Symbology

- All features can participate in 3D – even if they are not Z enabled
  - E.g., 2D points as Realistic Trees
- 3D symbology can be applied to 2D layers
  - Extrusion
  - 3D models (points)
  - Rule Packages (RPK)
- 3D symbols can be connected to attributes
  - Fields for height, width, size can drive appearance

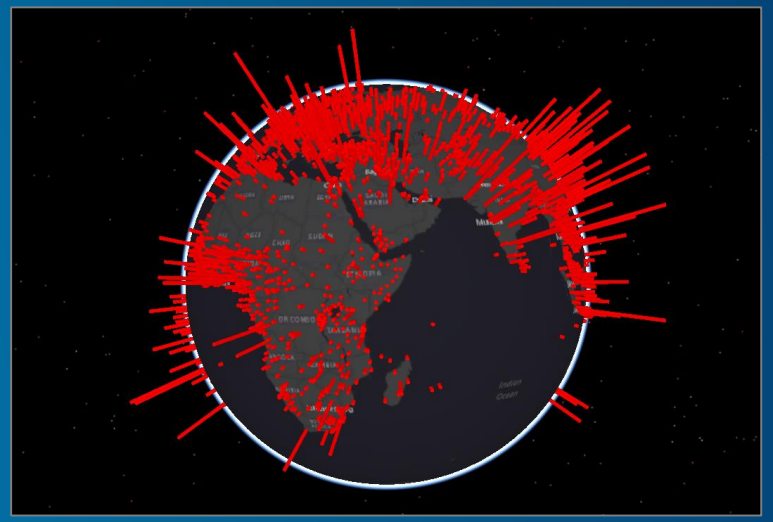



# Local Scenes vs Global Scenes

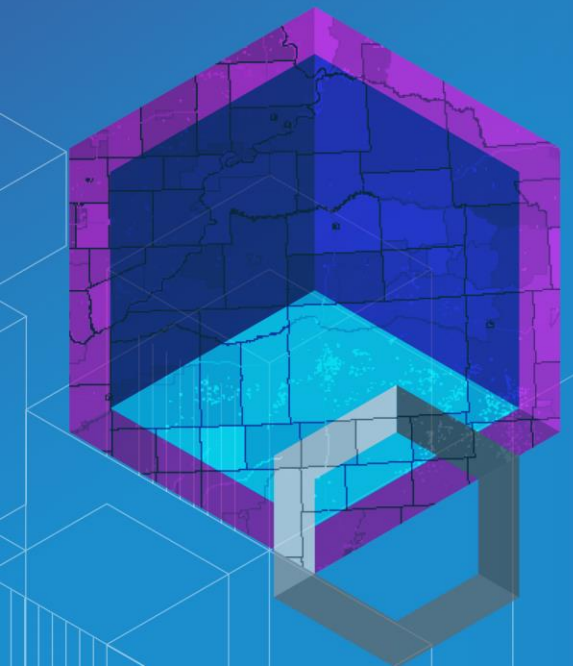
- **Benefits of Local Scenes**
  - use a projected coordinate system and linear units
  - manage data below the surface
  - use your own ground elevation source

- **Use Global Scenes when you need to…**
  - work in a fixed geographic coordinate system (WGS 84)
  - work in large, multiple geographic areas
  - use enhanced illumination and time effects

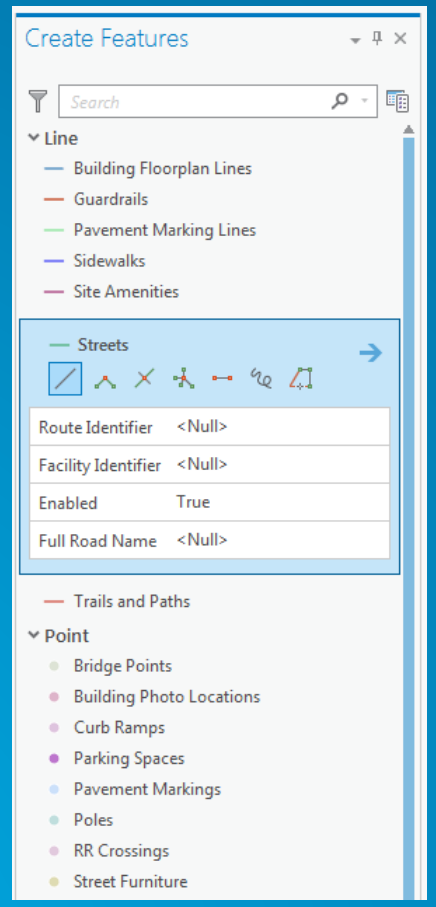
- **You can easily switch between these scene types**



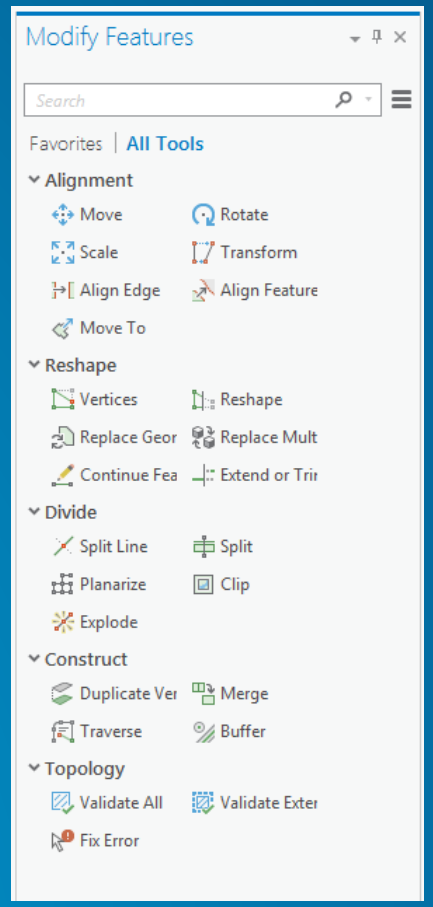
# Demo – Key Concepts



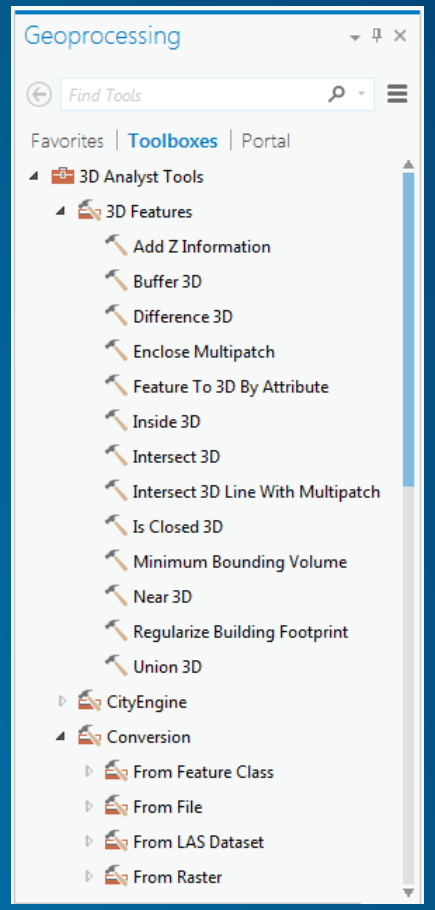
# Using 3D Layers in Pro




Data Creation

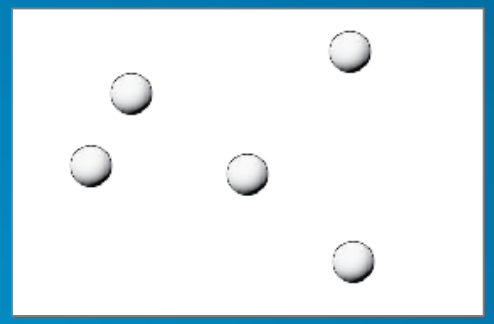



Maintenance

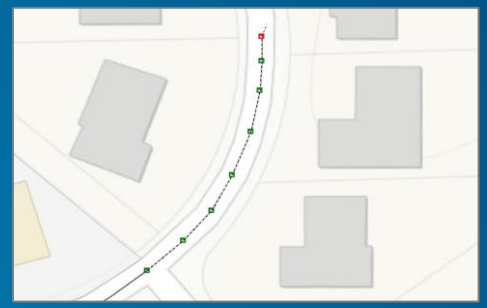


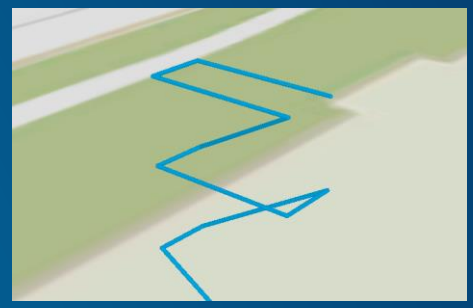

Analysis

# Feature Geometries

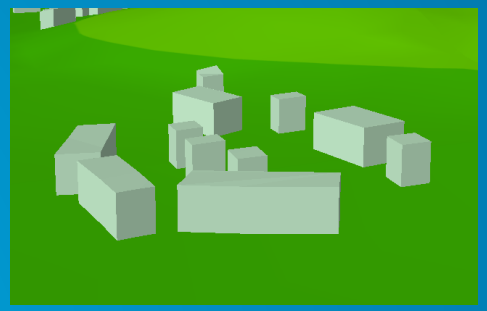


Points





Lines

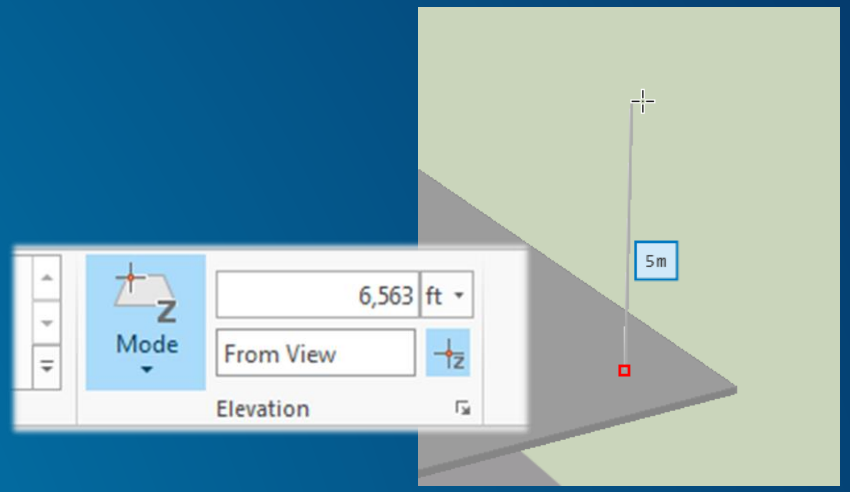


Polygons

Multipatches

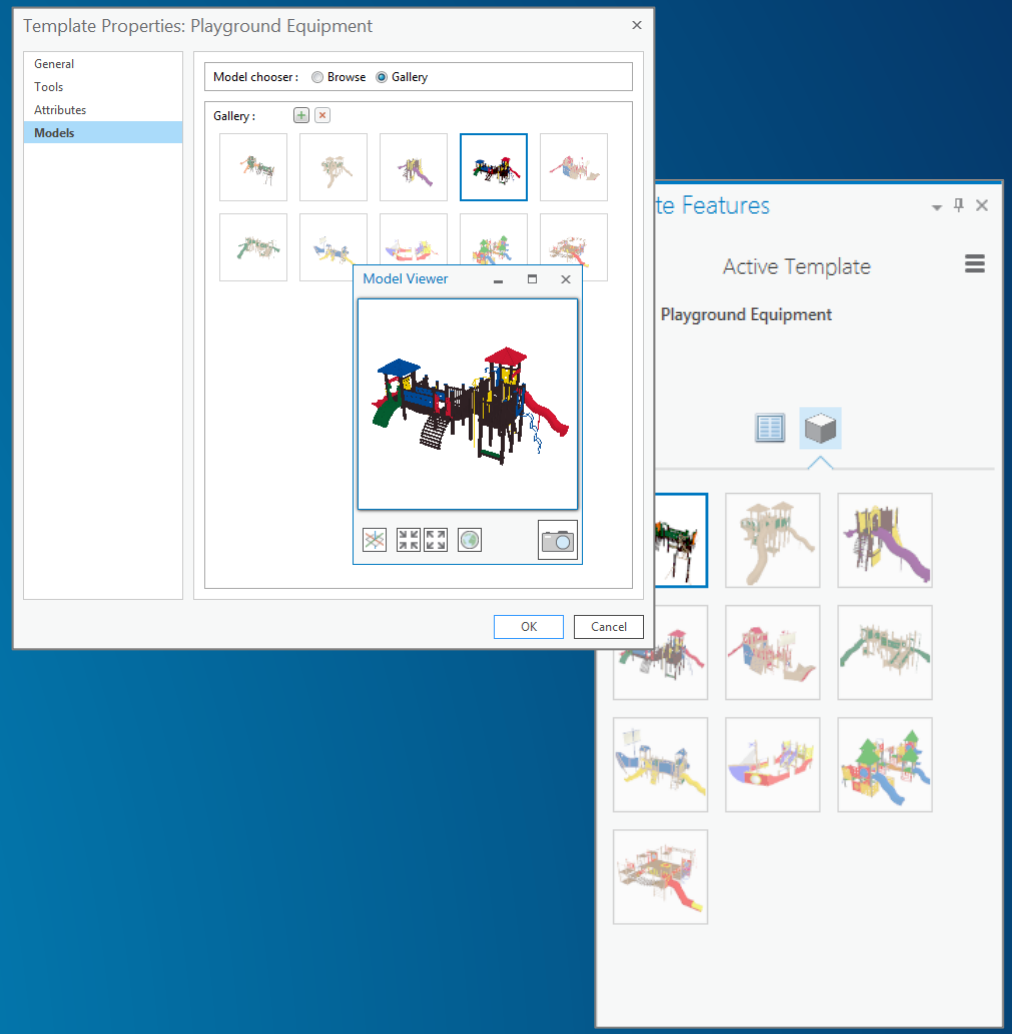
# 3D Data Creation Tools

- Constant Z allows you to set the elevation so new features inherit Zs
  - Can get Zs from surface or vector features
  - Set elevation by entering a value and units
- Draw lines in 3D space
  - Vertical or with a pitch
  - Snapping to other 3D features in scene
- Duplicate features vertically to easily create multiple instances at various heights
  - Specify number of copies and distance between them



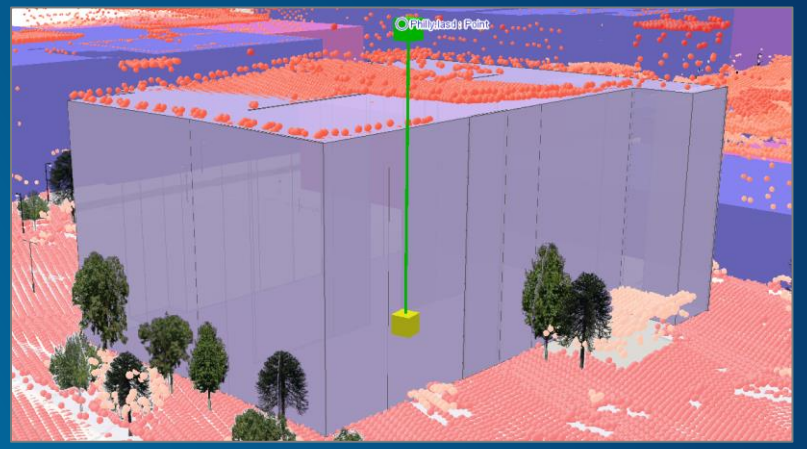
# Working with 3D Models

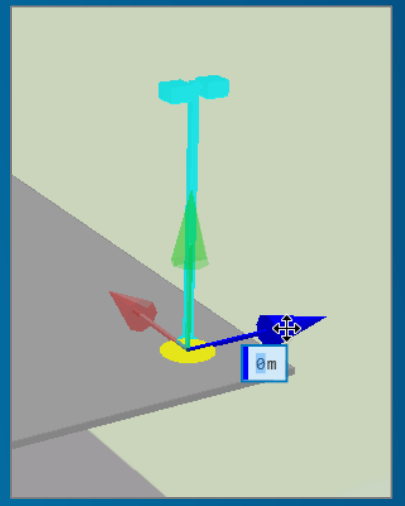
- Multipatch layers can store 3D models through feature templates
  - .dae, .3ds, .flt, .wrl
- Two methods for adding models through the Create Features pane
  - Single model through a file browser
  - Choose from a gallery of models
- Template properties window allows you to add models to the gallery
  - Can change the size and orientation and update snapshot



# Feature Modification

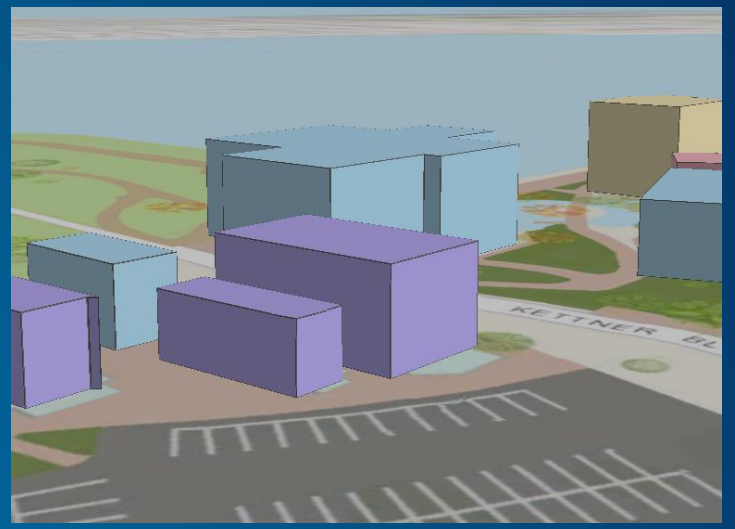
- **Move, rotate, and scale features**
  - Interactively with handles or by value with constraints
  - Perform a 3D affine transformation of features or entire layers
- **Edit vertices of features**
  - Interactively with the Edit Vertex tool (Move, Add, Delete)
  - Update XYZ vertex coordinate values in grid
- **Replace models directly in a scene**
  - Choose a different model from disk with the Replace Multipatch tool

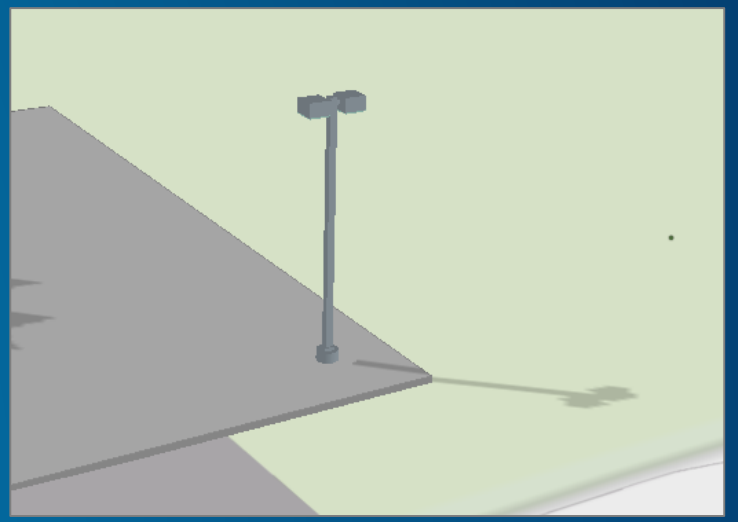




# Layer Effects

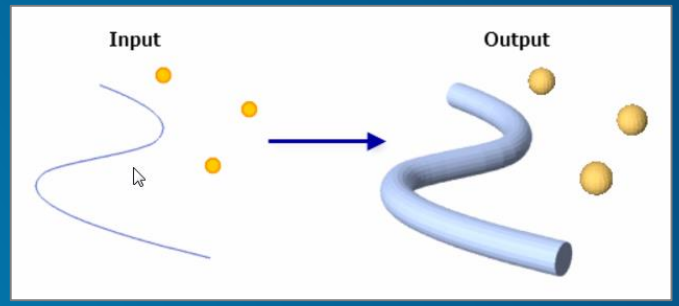
- Extrusion is one of the easiest ways to create 3D visualization
  - Specify height value
  - Calculate height
  - Use field values
- 3D visualization
  - Enhanced with shadows
  - Available in the Map Properties window

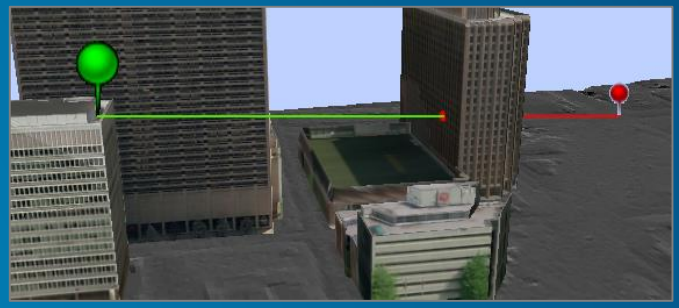


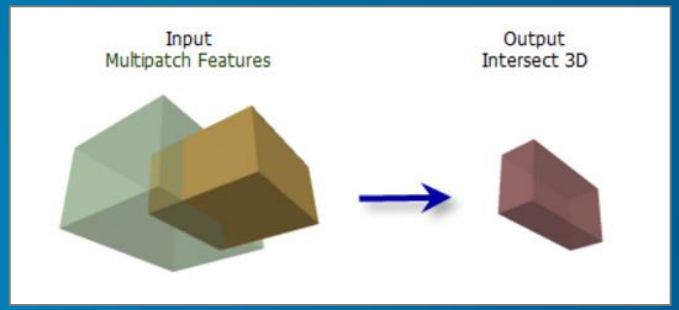


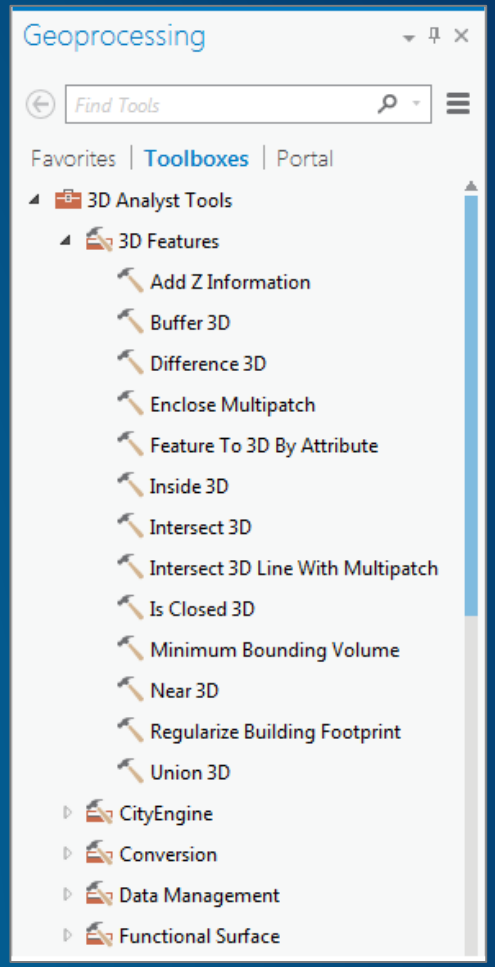
# 3D Geoprocessing Tools

- **Many 3D Analyst tools available in Pro**
  - **Proximity**
  - **Conversion**
  - **Data Management**
  - **Surface-based**

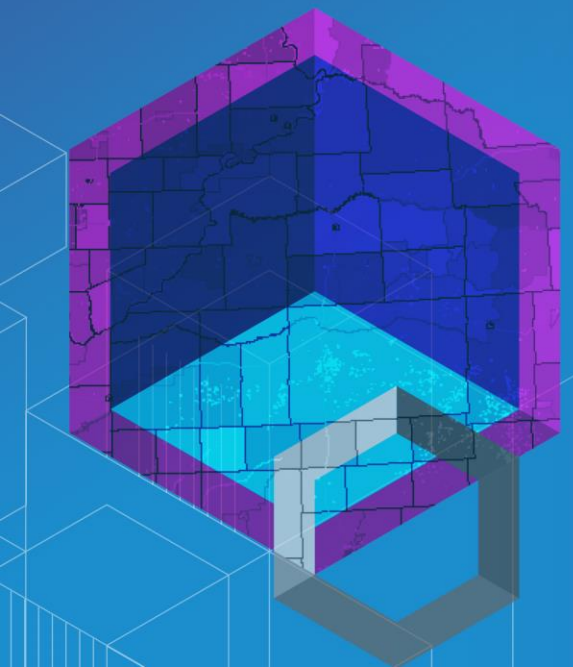




# Demo - 3D Editing Workflows

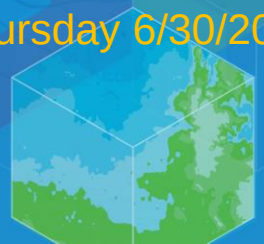


# Release Schedule

- ArcGIS Pro 1.2  - current release
  - Released Feb 2016
- ArcGIS Pro 1.3 – final stages of release
  - Will be available early July 2016
- ArcGIS Pro 1.4 – starting development next week
  - Will be available Q4 2016

# ArcGIS Desktop Editing – Technical Workshop Schedule

- **ArcGIS Pro: Editing**
  - Tuesday 6/28/2016, 10:15 AM – 11:30 AM, Ballroom 20 D, SDCC
  - Wednesday 6/29/2016, 10:15 AM – 11:30 AM, Ballroom 06 B, SDCC
- **ArcGIS Pro: 3D Editing**
  - Tuesday 6/28/2016, 3:15 PM – 4:30 PM, Ballroom 20 D, SDCC
  - Thursday 6/30/2016, 3:15 PM – 4:30 PM, Ballroom 06 A, SDCC
- **ArcMap Editing: Tips and Tricks**
  - Tuesday 6/28/2016, 1:30 PM – 2:45 PM, Ballroom 06 D, SDCC
  - Wednesday 6/29/2016, 1:30 PM – 2:45 PM, Ballroom 06 D, SDCC
- **Data Alignment and Management in ArcMap**
  - Wednesday 6/29/2016, 3:15 PM – 4:30 PM, Ballroom 07 A/B, SDCC
  - Thursday 6/30/2016, 10:15 AM – 11:30 AM, Ballroom 06 F, SDCC



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## Your feedback allows us to help maintain high standards and to help presenters

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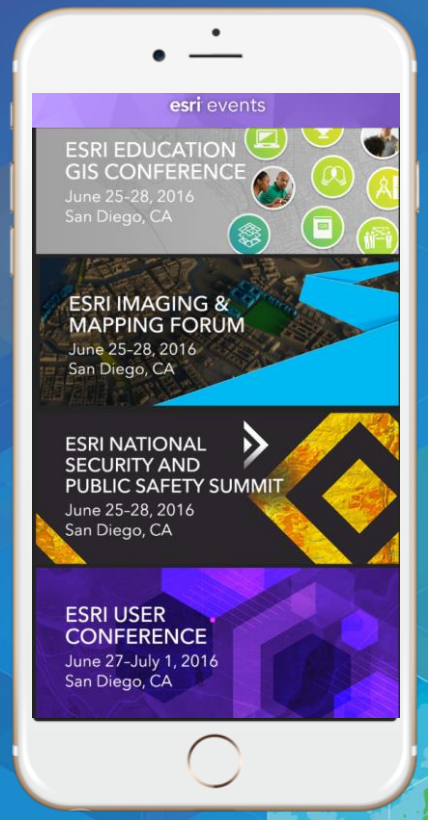
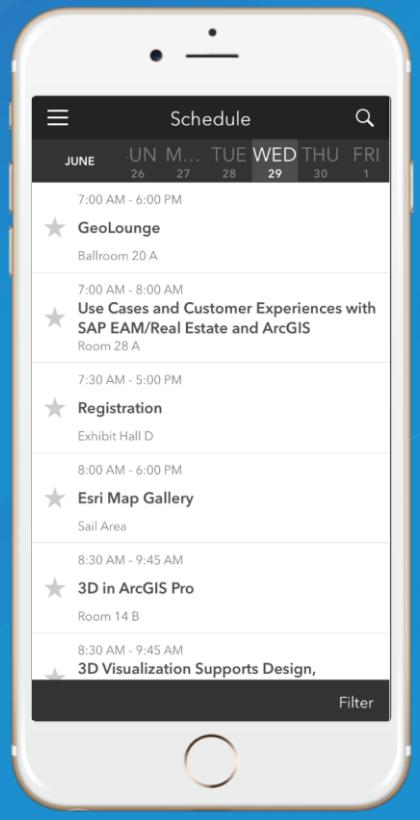



Find the session you want to review

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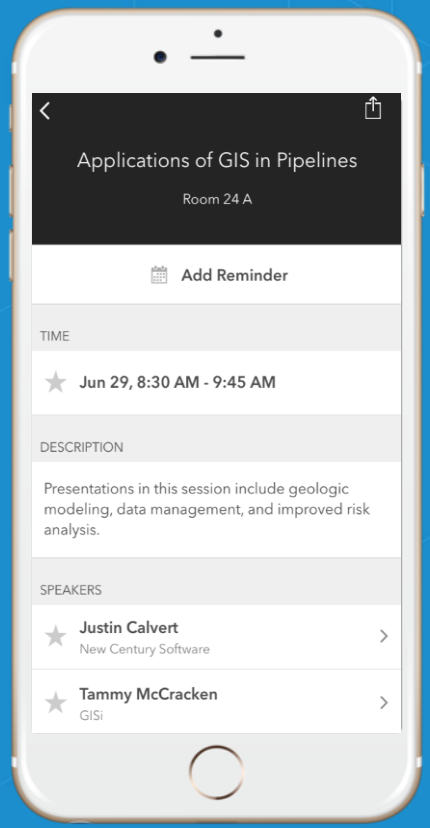
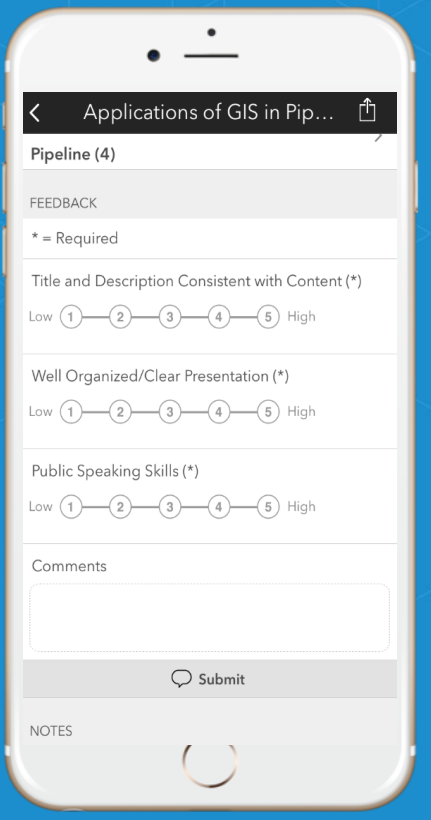
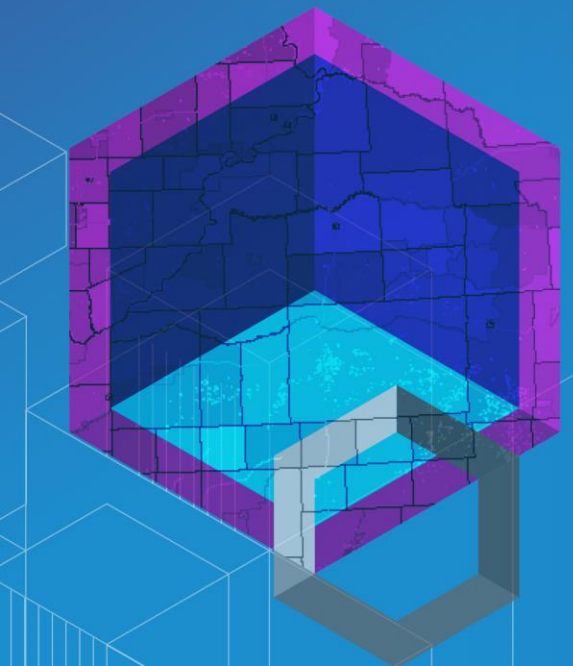
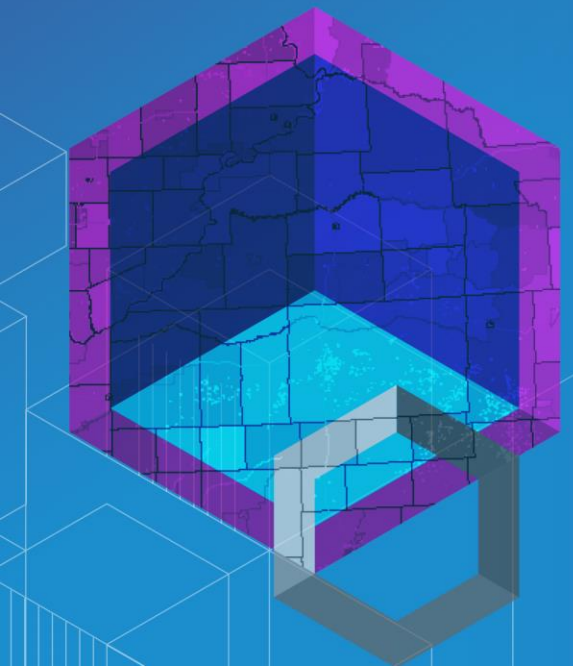



Answer survey questions and submit



# Questions



# Thank you for attending!