esri | THE SCIENCE OF WHERE

# ArcGIS Pro Editing

Jennifer Cadkin & Phil Sanchez

ArcGIS Pro Editing – Overview

- Provides tools that allow you to maintain, update, and create new data
  - Modifying geometry, drawing new features
  - Entering and updating feature attributes

- Supports editing features in 2D maps and 3D scenes
  - View and edit features at their real-world 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
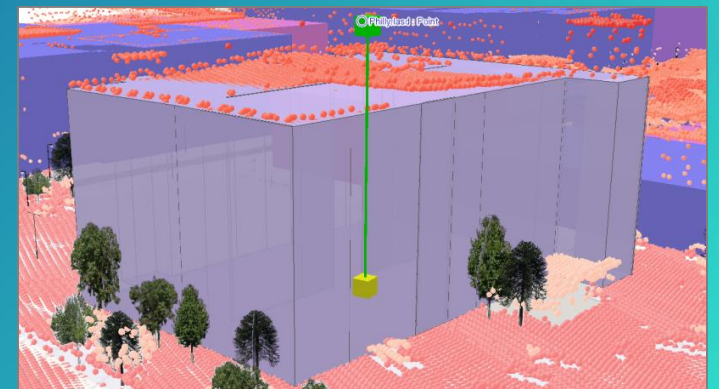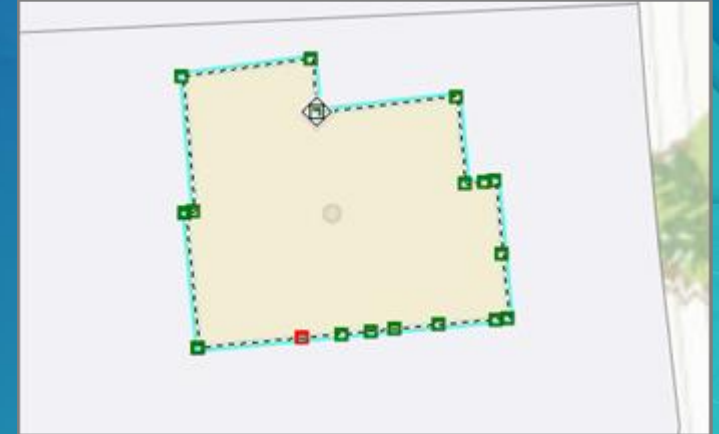
Data Creation

- Relies on feature templates to create new data

- They are layer based, matching the symbology authored in the map

- Default attributes and attribute overrides provide efficient ways for pre-populating newly created features
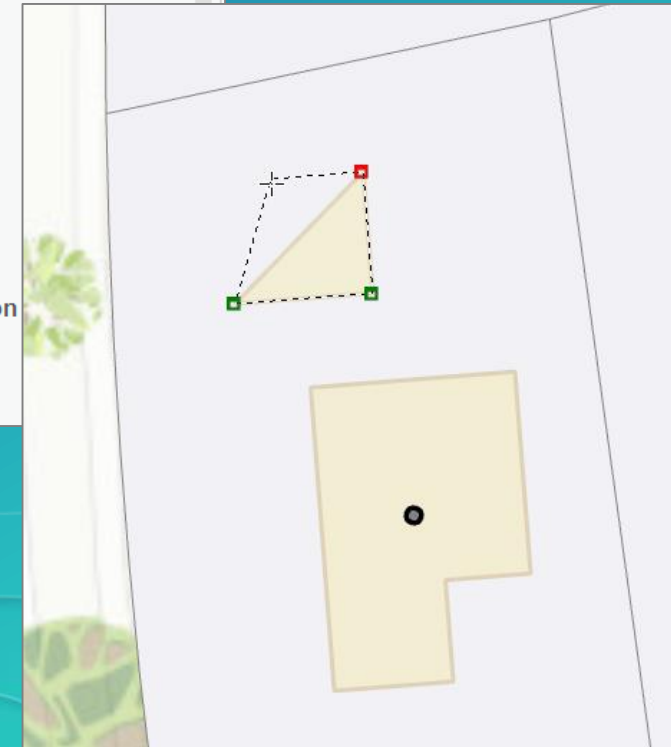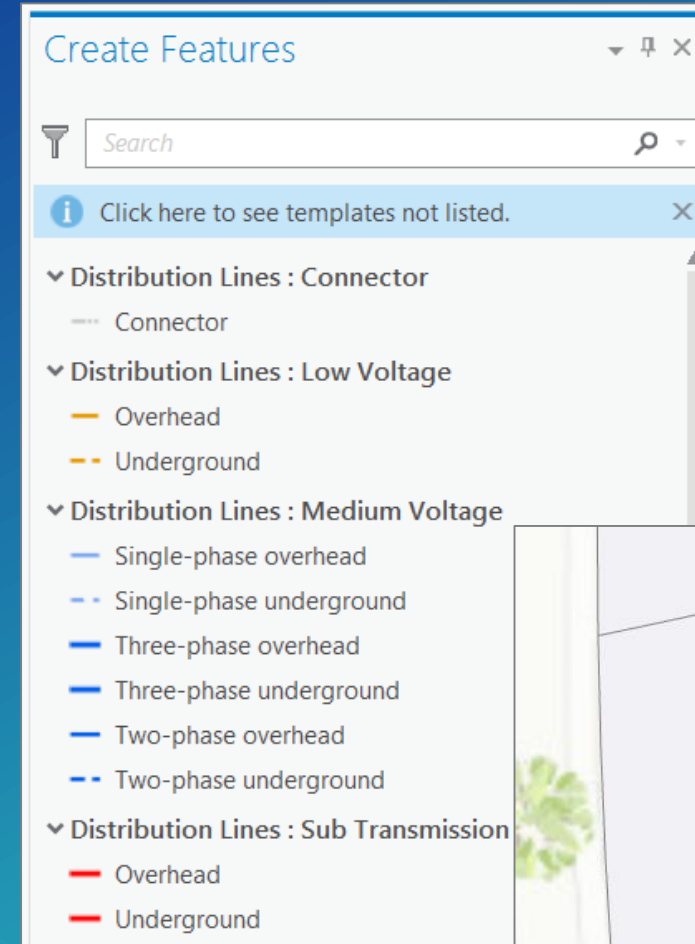
Data Modification

- Core edit operations such as…
  - Move/Rotate/Scale
  - Edit Vertices
  - Reshape
  - Split
  - Merge

- Update feature attributes in grid/cell format
  - Use of Domains to constrain valid data
  - Apply edits instantly or use batch mode to reduce number of transactions
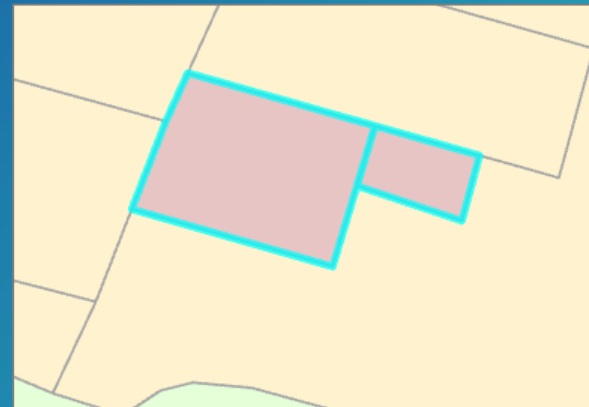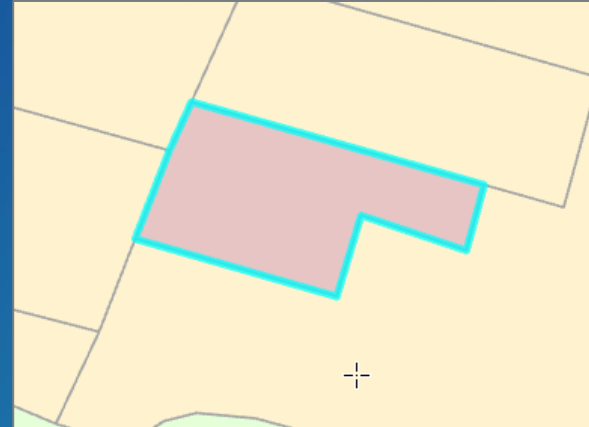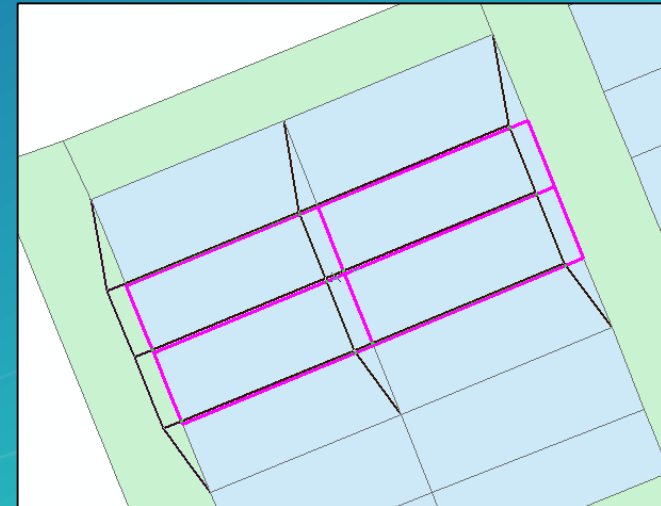

Attributes

▲ Road Centerlines
    12th Ave

Attributes | Geometry

OBJECTID	8669
Centerline ID	RD-368
Left From Address	109
Left To Address	117
Right From Address	104
Right To Address	120
Full Road Name	12th Ave

☑ Auto Apply

Topological Editing

- Map Topology enables users to preserve contiguous data through topological editing
  - Work with the entire feature or with individual edges

- Geodatabase topology allows you to detect errors based on defined rules
  - Use Error Inspector window for managing errors
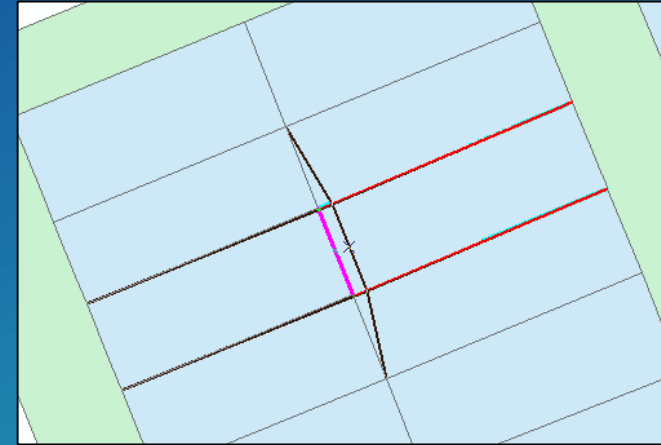
Moving an node; connected edges reacting

Moving multiple features with the move tool

Editing User Interface

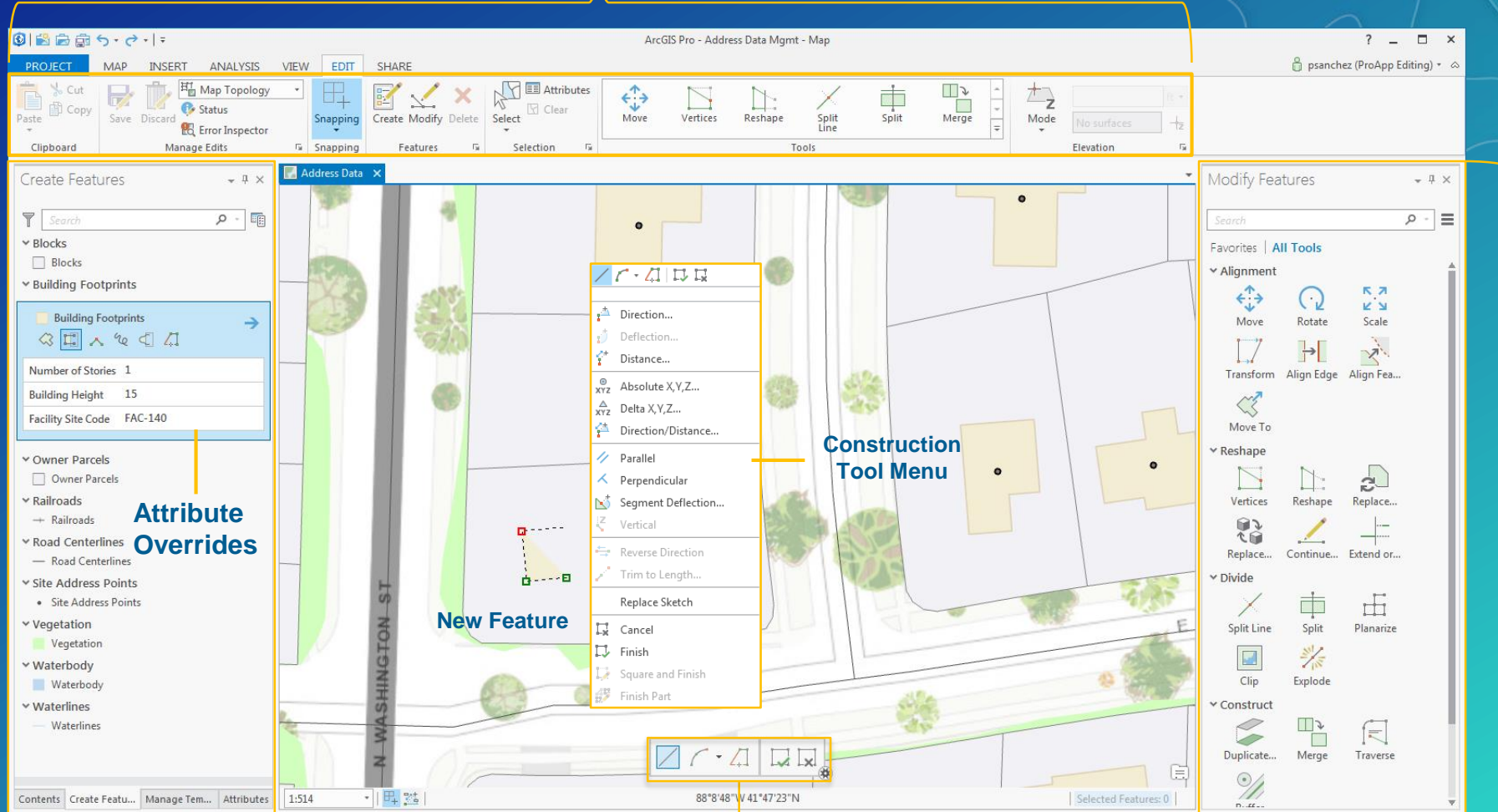**Edit Ribbon Tab**

Create Features Pane

Attribute Overrides

Construction Tool Menu

New Feature

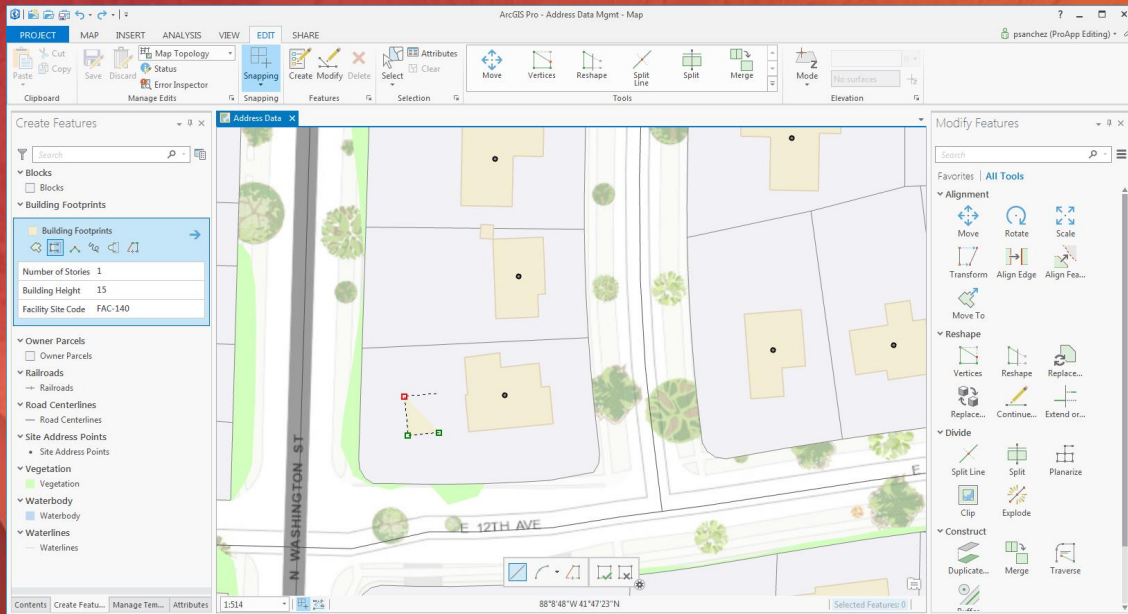**Editing Toolbar**

Modify Features Pane

ArcGIS Pro Editing – Session Demos

- Creating Features
  - Templates: Feature, Group, Preset
- Modifying Features
  - Topological and non-topological editing
- Editing Guides
  - Grid, Constraints
- Editing in 3D

- Note: this content is covered in the presentation slides

# Demo – Overview of the Editor

Supporting Text

Creating Features - Overview

- There are three ways to create new features with the editor:
  - Feature Templates
  - Copy & Paste
  - Output from modify tools

- You can create the following feature types:
  - Points, Polylines, Polygons
 - Multipatch
  - Annotation

Templates Overview

- Templates are used to create new features and records
    - Hosted in the Create Features pane
    - Can be configured to meet your workflow requirements

- They store references to attributes
    - Default values (defined in the Geodatabase)
    - Attribute Overrides
        - Set through Template Properties window
        - On the fly in the Create Features pane (as shown in the graphic)

- They also store references to tools
    - Templates can be configured to only show tools that apply to the edit
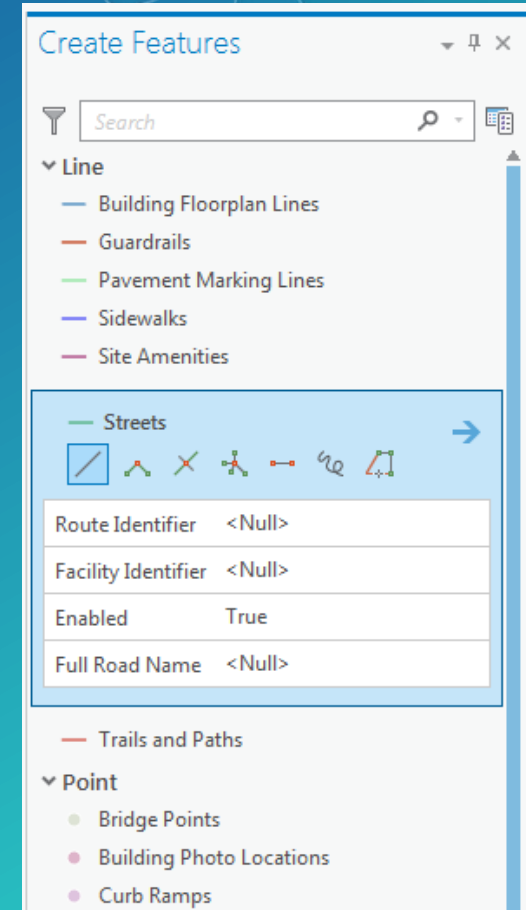
Managing Feature Templates

- The Manage Features pane allows you to create, duplicate and delete templates
  - Displays lists of all templates associated with a layer

- You can also access template properties from this pane

- Manage Templates is also the entry point for creating Group Templates and Preset Templates
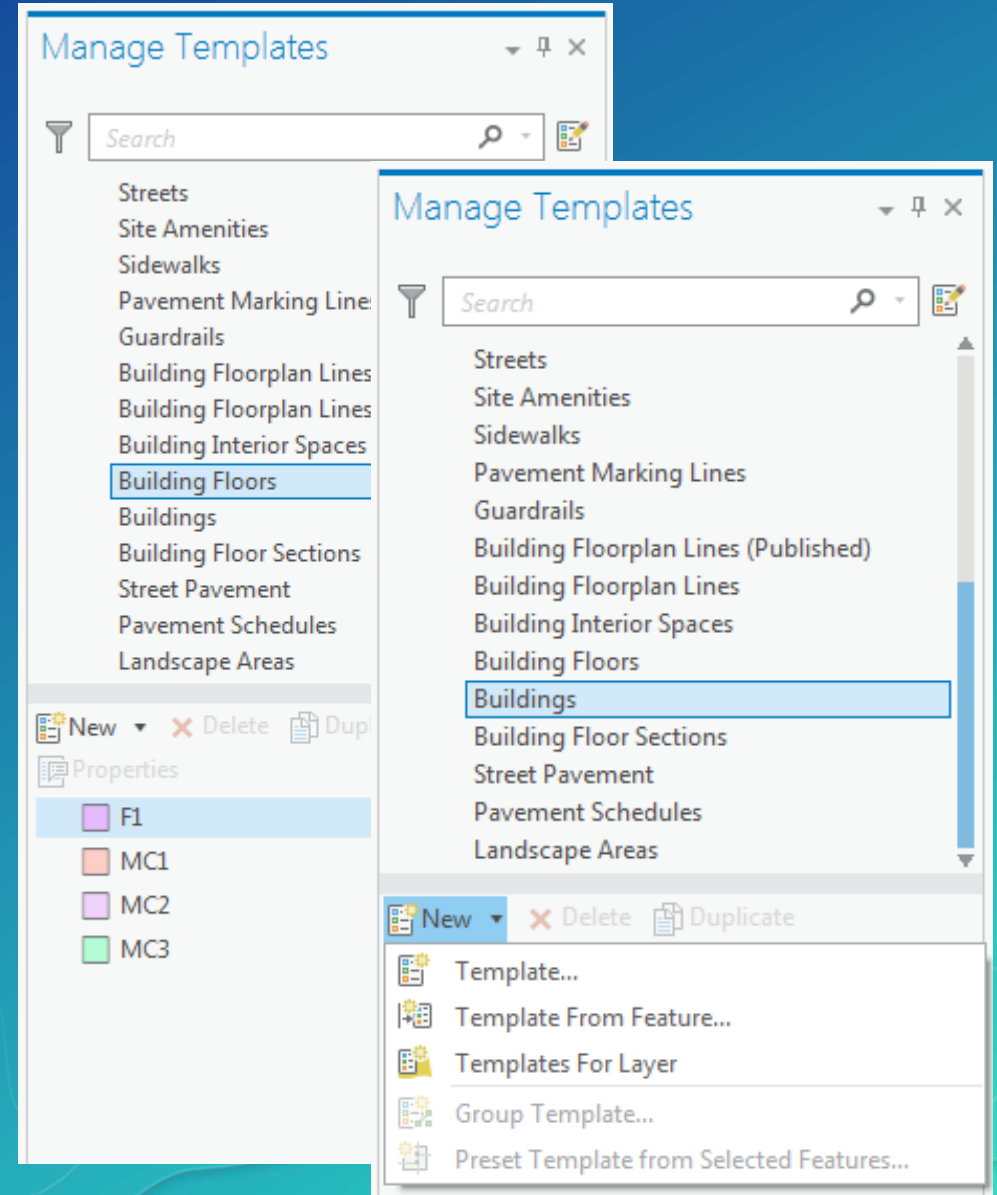
Feature Template Properties

- Allows authoring of feature templates for editors
  - Assign name, description, and tags

- Tools
  - Choose which tools should be available to editors

- Attributes
  - Choose which attributes should be available as overrides
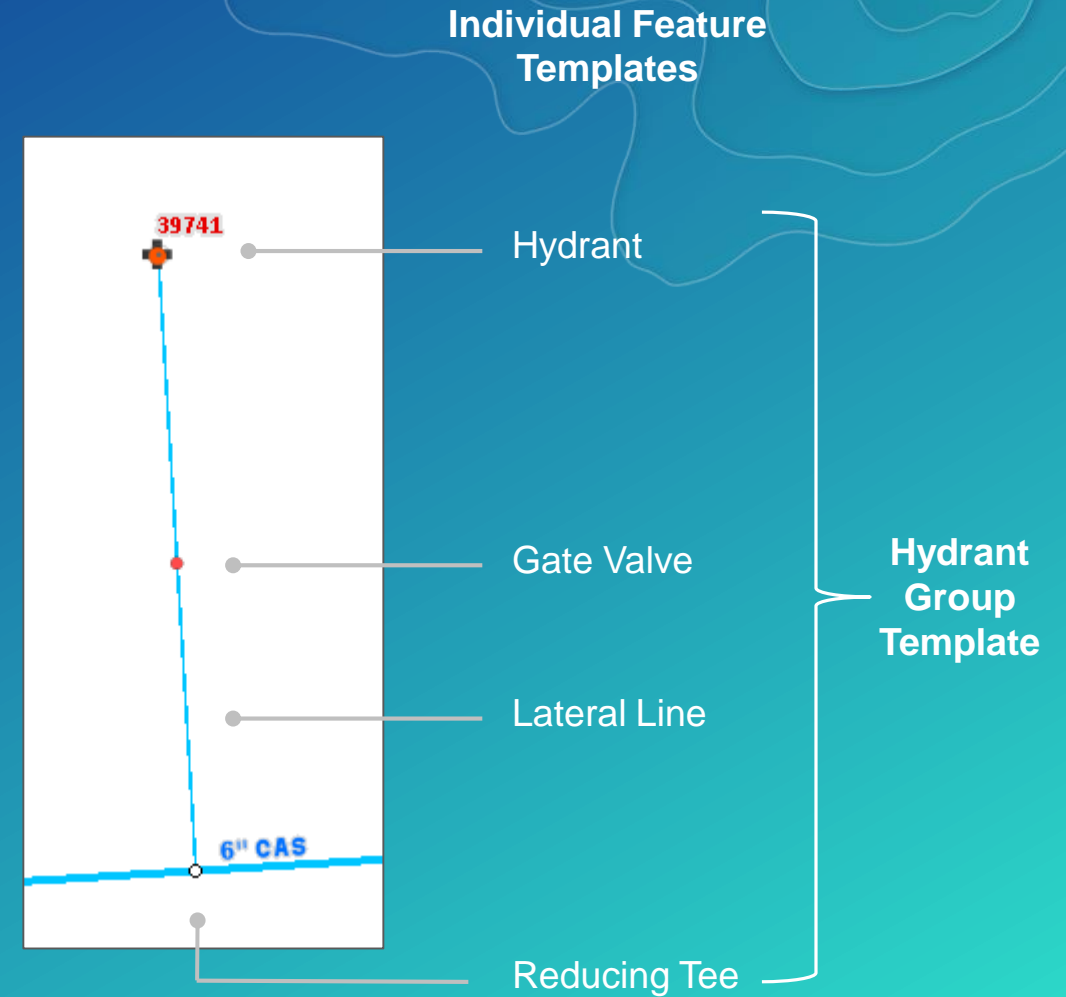
Feature Templates

- Feature Templates can be used to create features for a single layer
  - One or more templates can reference the same layer

- Automatically generated when a layer is added to a map or scene
  - Can be modified, deleted, recreated

- Usees the layer's symbology
  - Will automatically update when rendering method is changed

Single Symbol Rendering

Single feature layer

Single feature template for layer

Unique Value Rendering

Single feature layer

Three feature templates for layer
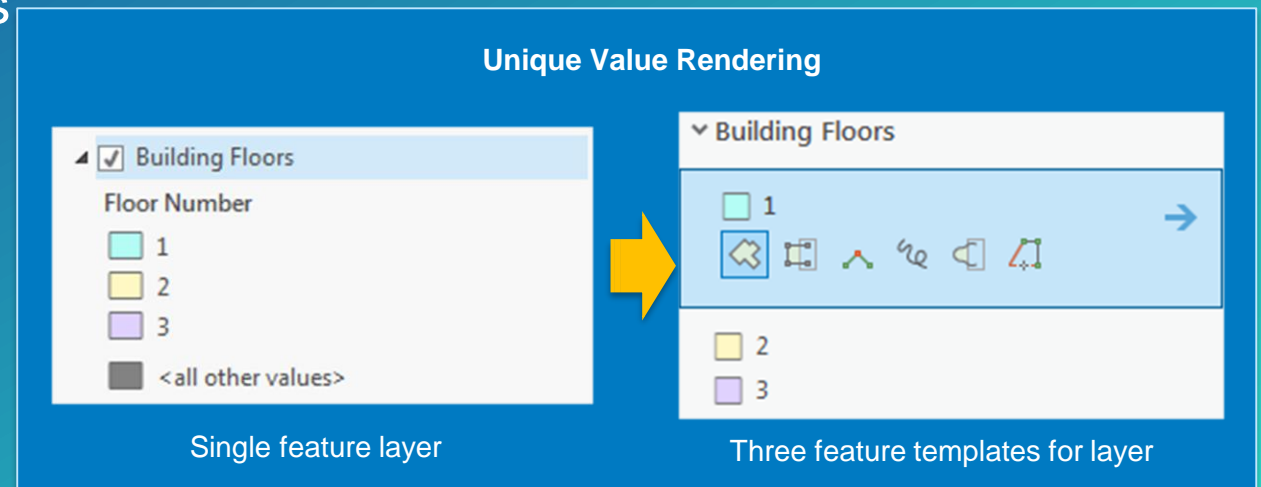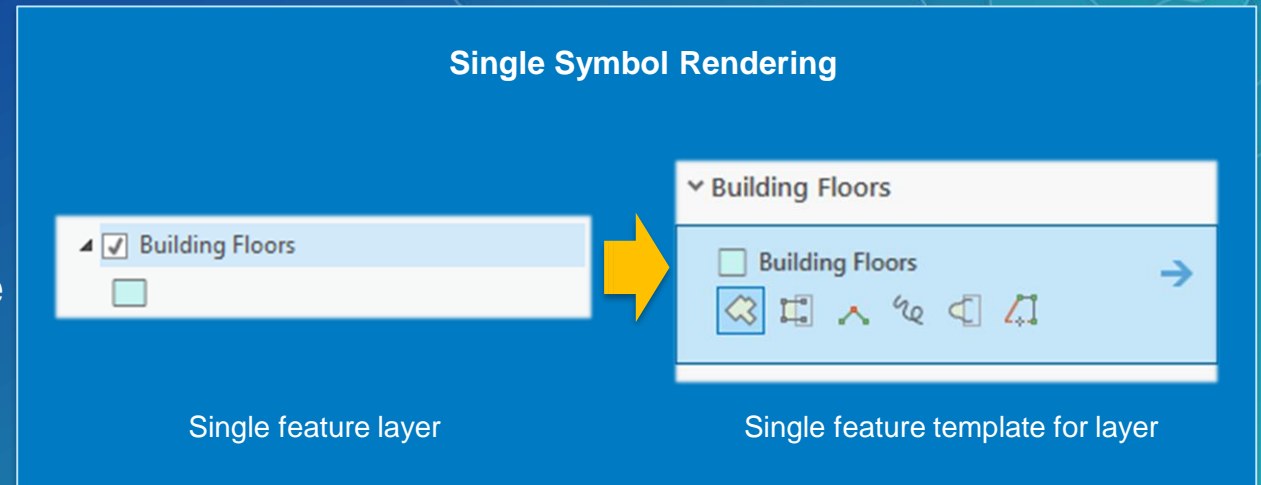
Group Templates

- Create multiple features with a single sketch

- Examples:
  - Pole at every vertex of electrical line
  - Address point at center of building
- Options depend on primary template
  - Polygon – add other polygons, lines, and points
  - Line – add other lines and points
 - Point – add other points (can use line sketch)

Individual Feature Templates

39741

Hydrant

Gate Valve

Lateral Line

6" CAS

Reducing Tee

Hydrant Group Template

Preset Templates

- Preset Templates are generated from a collection of selected features

- Can contain multiple features from multiple layers
  - Geometry type = point

- Useful for workflows that require replicating collections of features throughout a map
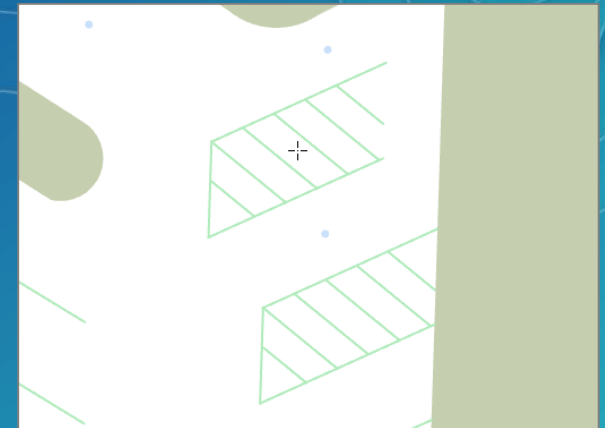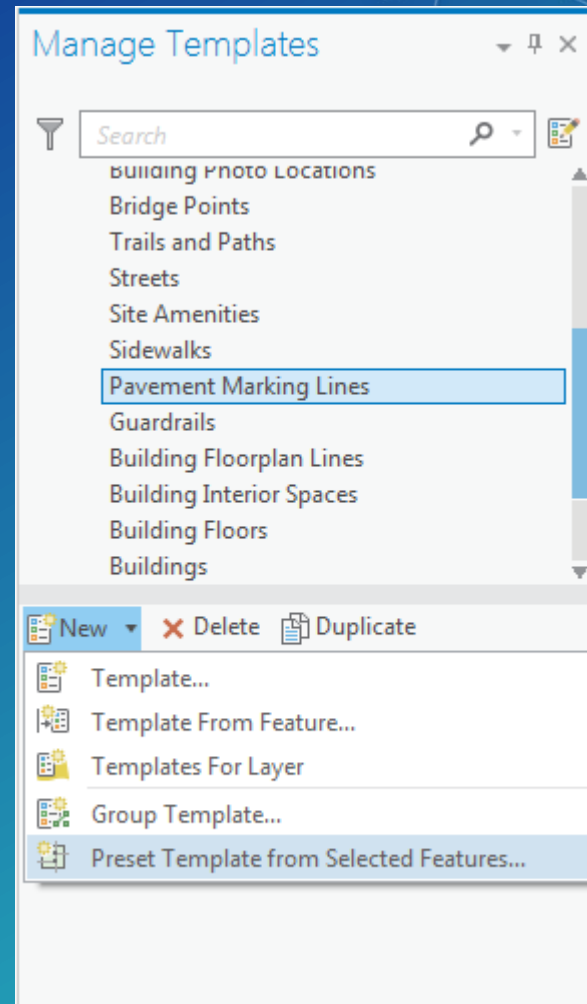
Placing features with a preset template
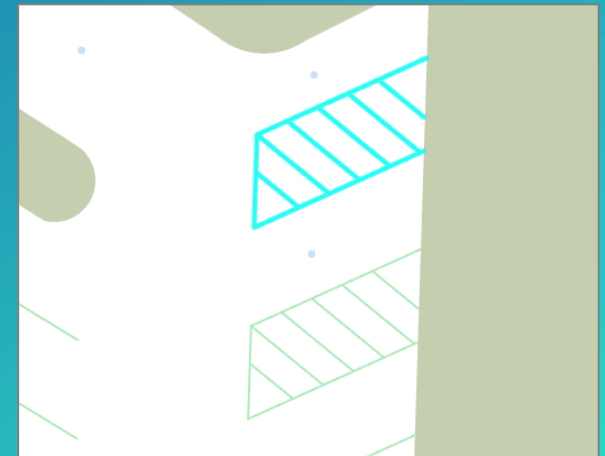
Multiple features created

Copy & Paste

- Copying and pasting features is a quick way to create new features
  - Features will be placed in the same location as the original feature
  - Move mode will be automatically invoked to reposition feature

- Paste Special allows you to paste features from one layer to another layer
  - By Template or by Layer
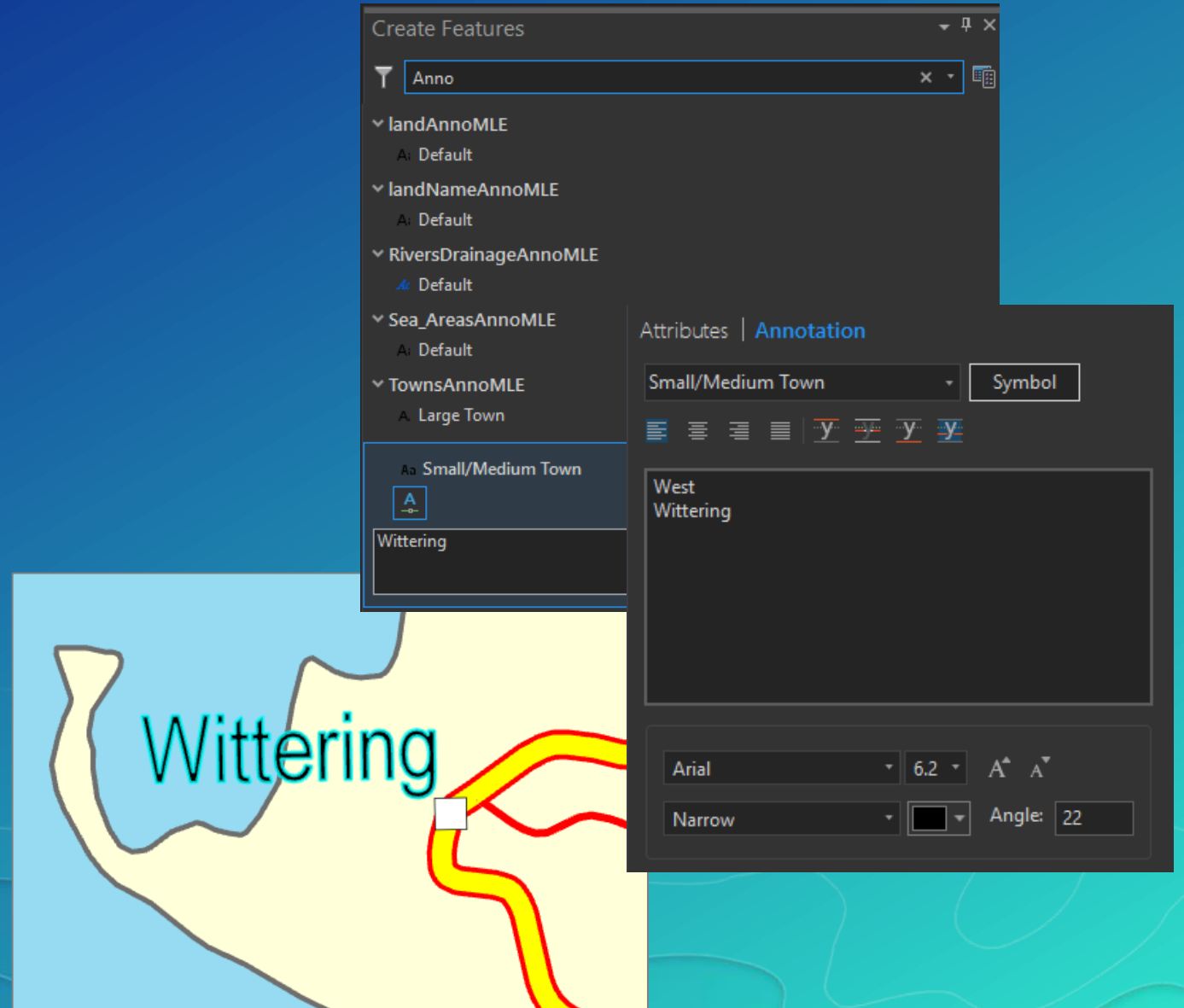 - Option to keep attribute values from the source feature
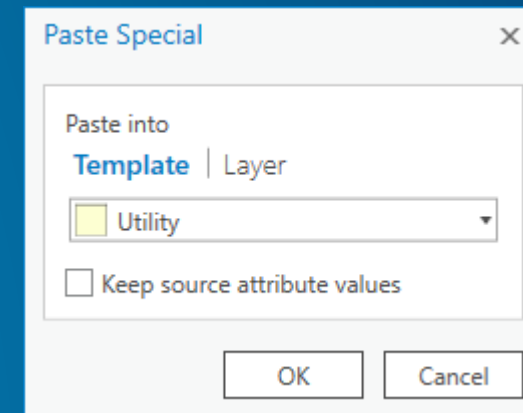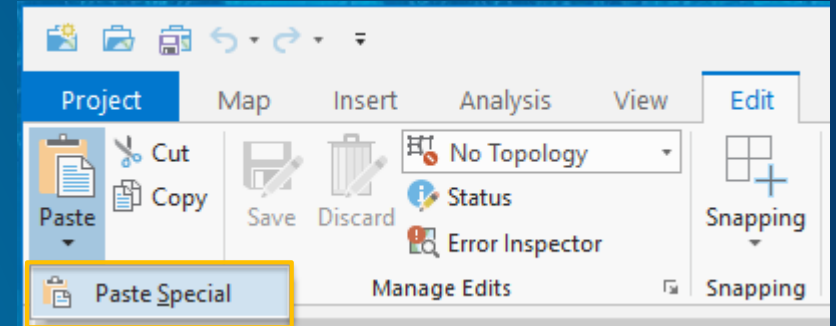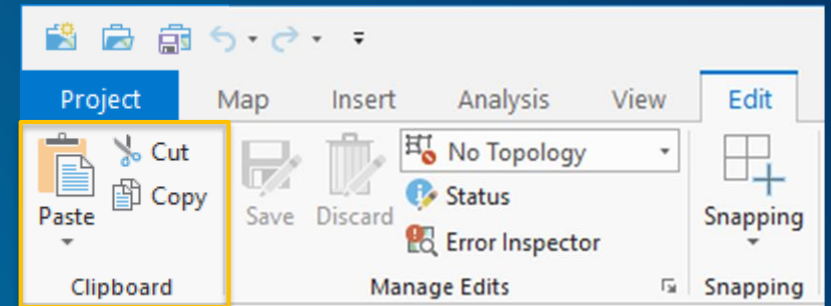
Annotation

SUBHEAD INFORMATION

Annotation

- Create via:
  - Annotation feature templates
  - Feature linked annotation
  - Copy/Paste

- Use Attributes pane's Annotation tab for updating text and formatting

Annotation Edit Tool

- **On-screen text editing**
  - Enter text strings directly on the map

- **Use standard transformation tools for repositioning text**
  - Move
 - Rotate
  - Scale

- **Edit the baseline using Edit Vertices tool**
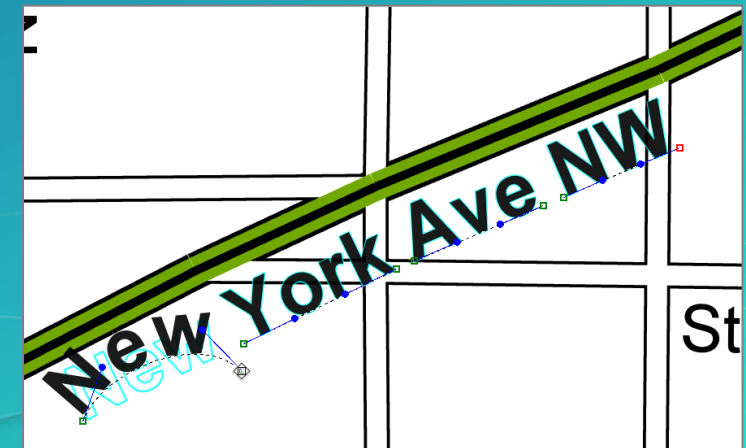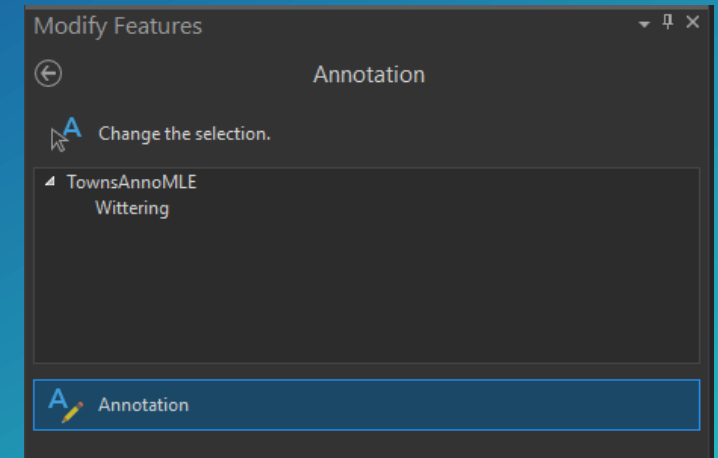
Modifying Features

SUBHEAD INFORMATION

Modifying Features

- Pro provides tools to update feature geometry and their attributes
  - You can modify an entire feature or the parts that comprise a feature
  - You can use other features to modify a target feature

- Tools organized into the following categories:
  - Alignment
  - Reshaping
  - Division
  - Construction
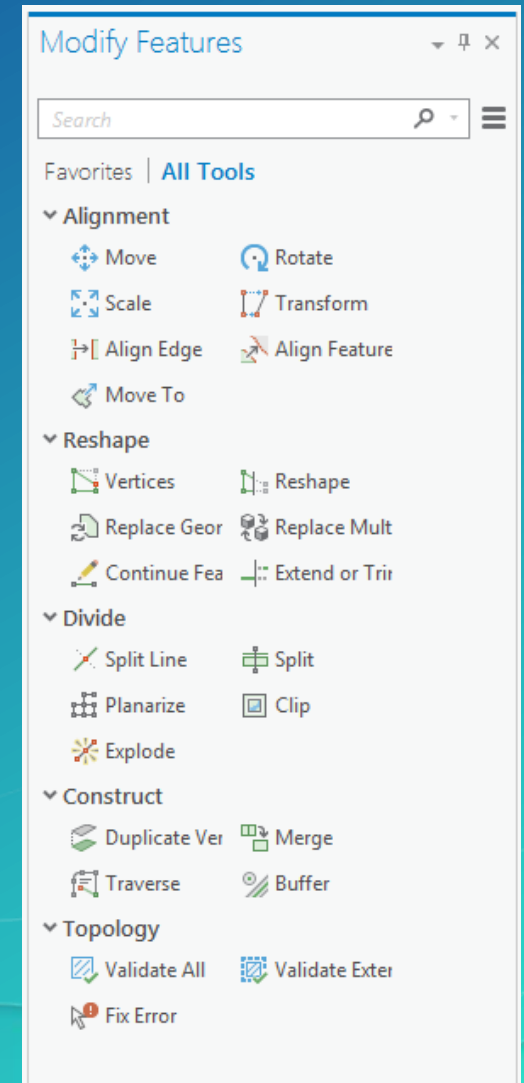
Modify Features Pane

- The Modify Features pane hosts the controls for the active tool
  - Types of controls vary between tools

- Select tool is hosted and always the top most control

- Tree view lists the currently selected features
  - Context menu allows you to manage items

- Additional parameters and input boxes
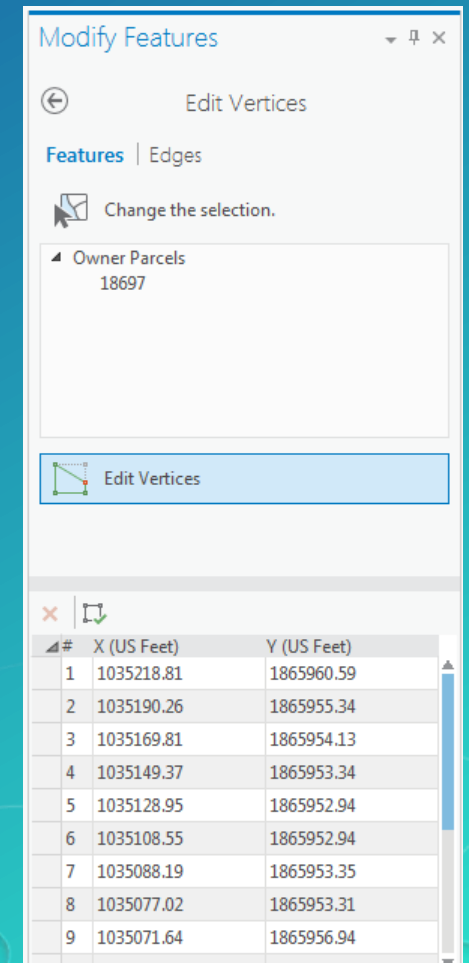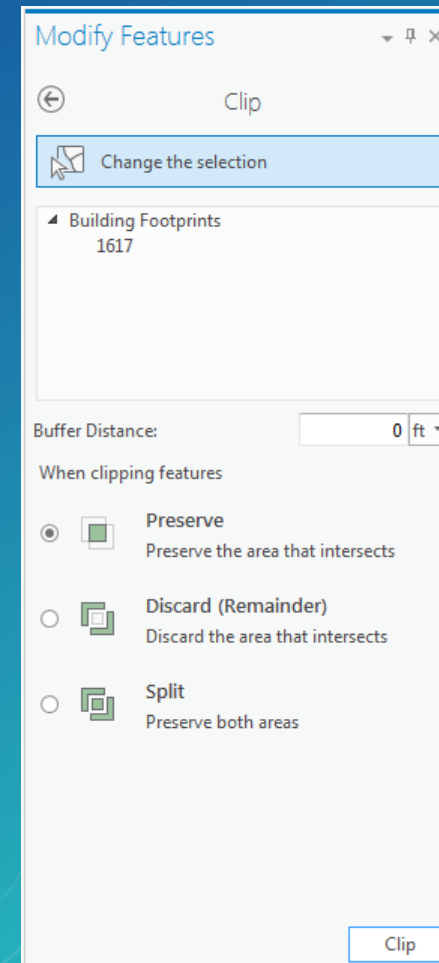
Aligning Features

- Tools for repositioning features and edges

- Can be performed using the following methods:
  - Interactively with the mouse pointer - Move, Rotate, Scale
  - By entering absolute coordinates or offset values 0 Move To
  - By defining source and destination coordinates - Transform

- Features can also be aligned to other features
  - Edges to edges - Align Edge
  - Features to features - Align Features
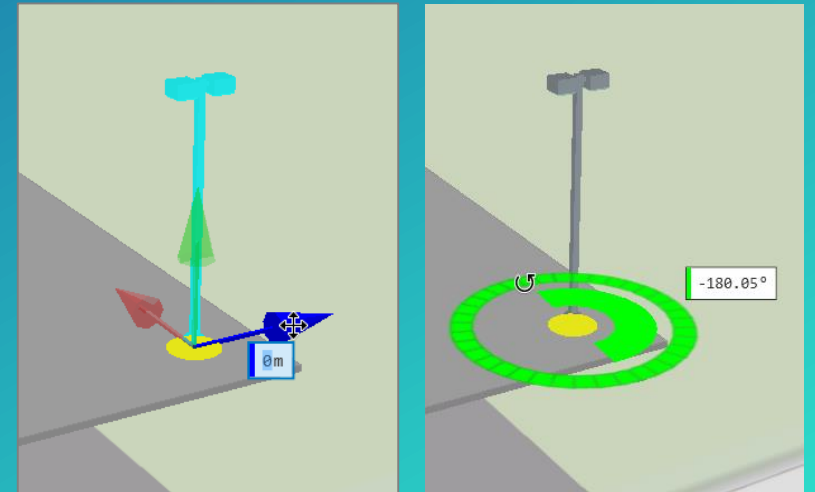
Reshaping Features

- Feature segments and vertices can be moved, reshaped, and/or replaced

- Edit Vertices allows the editing of individual vertices
  - Add, Delete, Move,

- Reshape allows you to modify a portion of a feature or edge
  - Can be faster than editing the segments
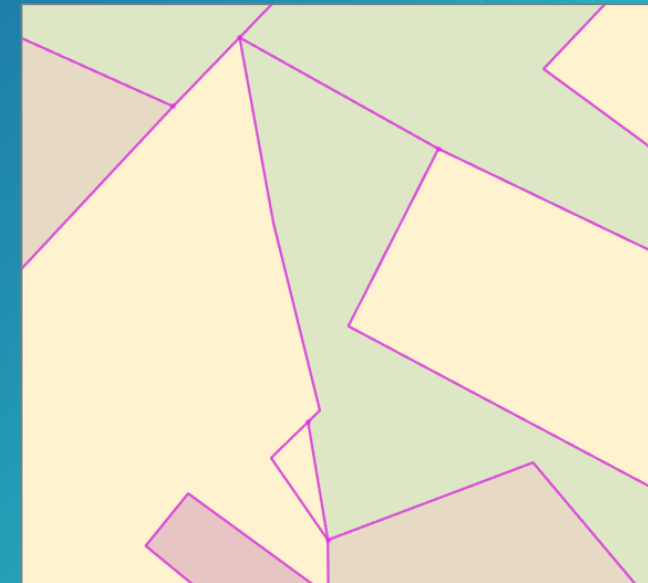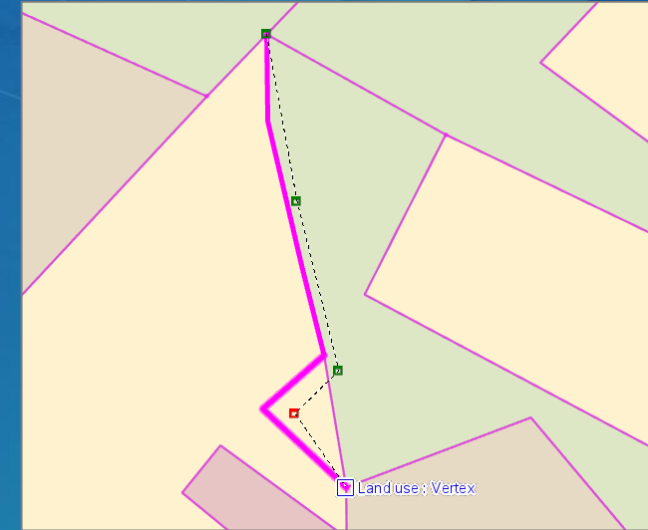
Dividing Features

- Tools that allow you to split, clip, and explode features

- Split allows you to create multiple features from a source feature
  - Split lines at a point
  - Split polygons by lines that intersect it

- Clip allows you cut holes in polygons based on overlapping and neighboring features
  - Options to preserve, discard, or split areas
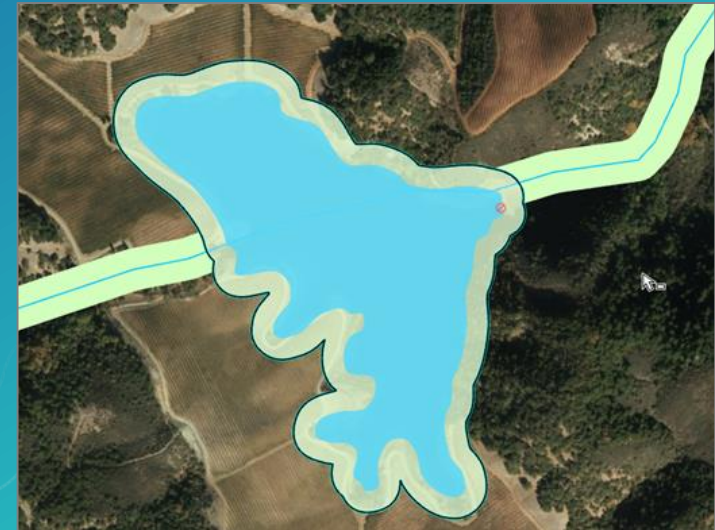
Constructing Features

- Tools that allow you to merge, buffer, and duplicate features

- Merge multiple features into a single feature
    - Option to merge into an existing feature or a new feature
    - Manage attributes for output feature

- Buffer features into existing layer
    - Options to generate rings and dissolve intersections

- Duplicate features vertically in scenes
    - Specify offset distance and units
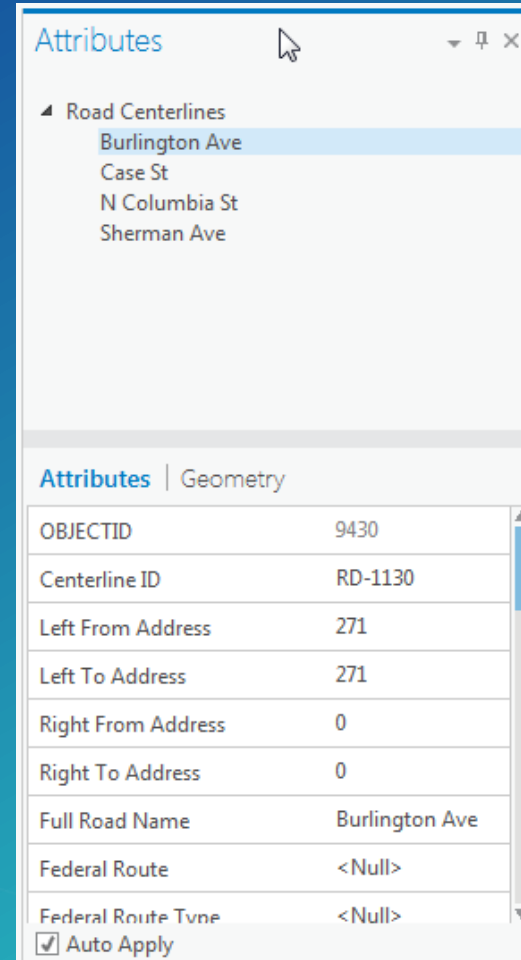
Merging two parcels into one
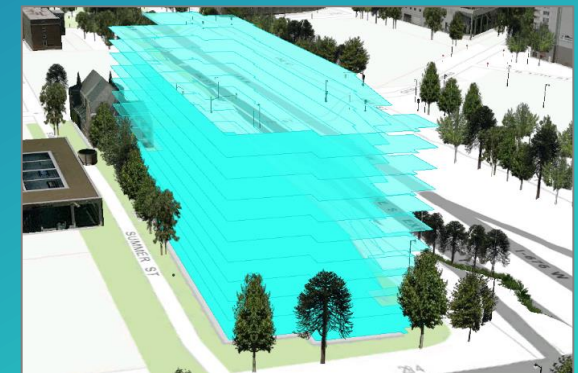
Duplicating a building floor

Updating Attributes
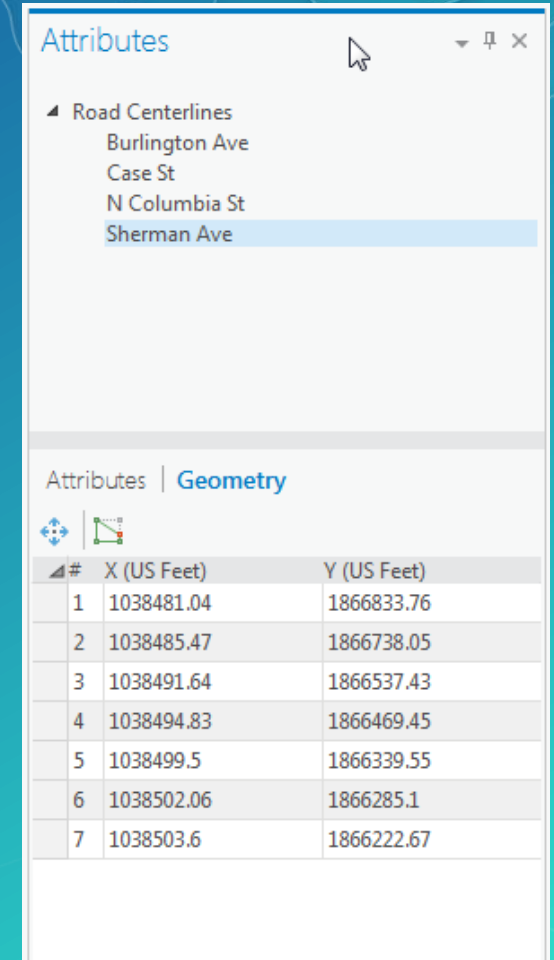
- You can update feature attributes with the Attributes Pane and the Attribute Table

- Tree view displays currently selected features
  - Iterate through each feature
  - Click the layer node to update attributes for entire selection
  - Auto Apply will commit changes as you edit them

- Geometry tab displays vertex coordinates for each segment

Using the Attribute Table

- You can edit feature attributes and stand alone tables with the Attribute Table
- Standard grid/cell based editing user experience
- Toggle selection, use the zoom control to increase size

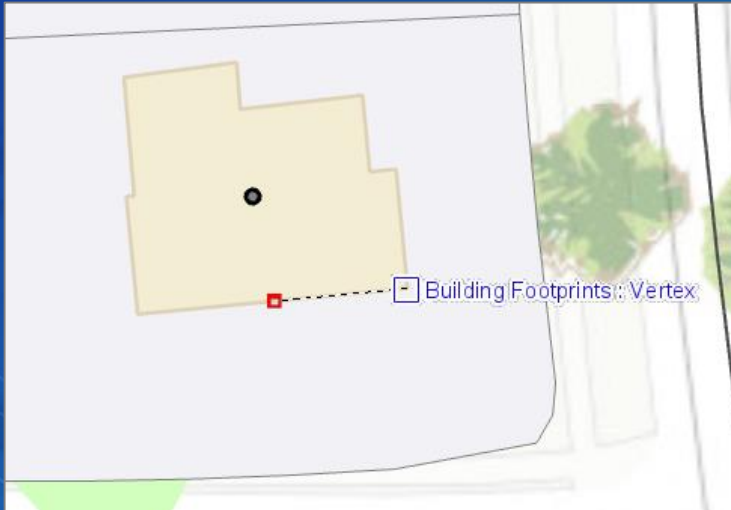# Demo - Creating and Maintaining Data

Supporting Text

Editing Guides
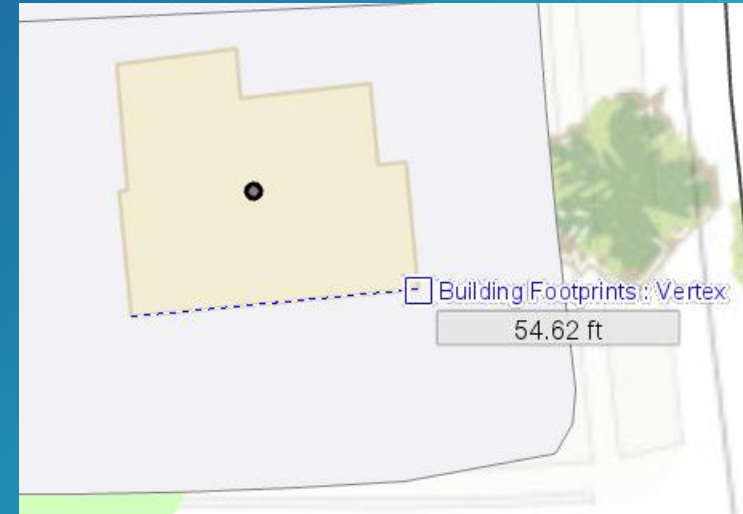
SUBHEAD INFORMATION

Snapping Overview

- Snapping allows you to connect geometric shapes
  - Ensures connectivity between features
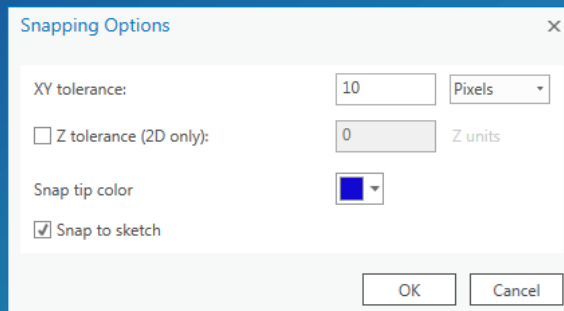
- Available for all create and modify tools
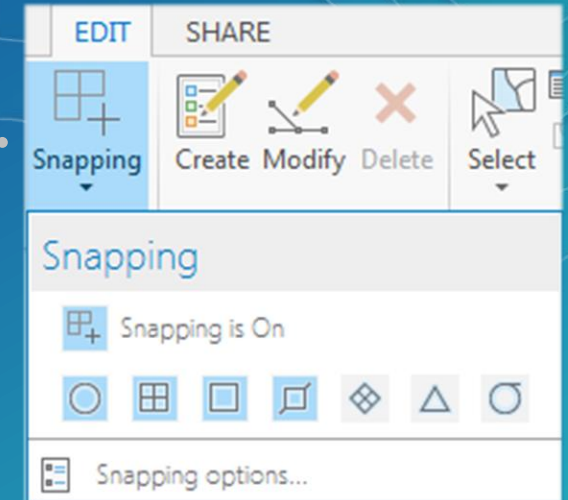

Snapping with feature construction tool
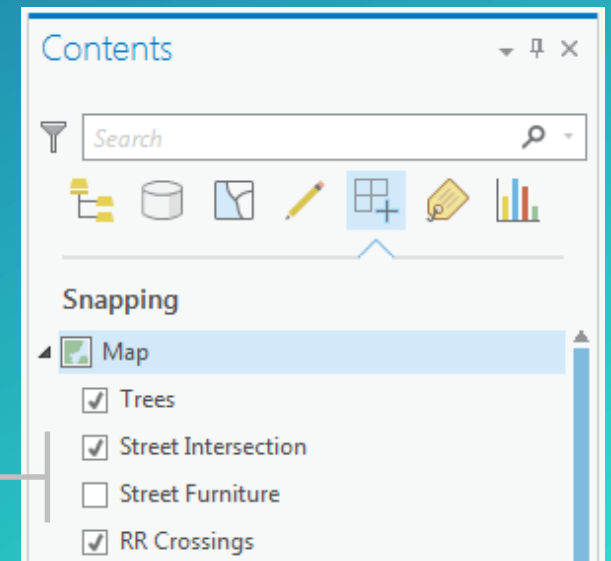

Snapping with Measure tool

Configuring Snapping

- **Toggle snapping on and off from the ribbon**

- **Control snapping by layer in Contents pane**

- **Snapping Options**
  - **Set tolerance by pixels or map unit**
  - **Must enable Z tolerance for snapping in maps**
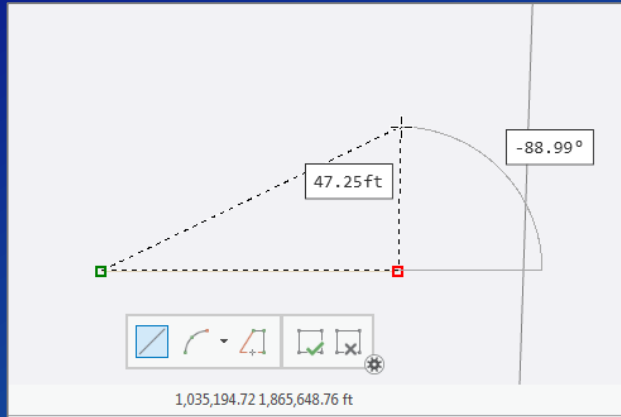 - **Snap to sketch**
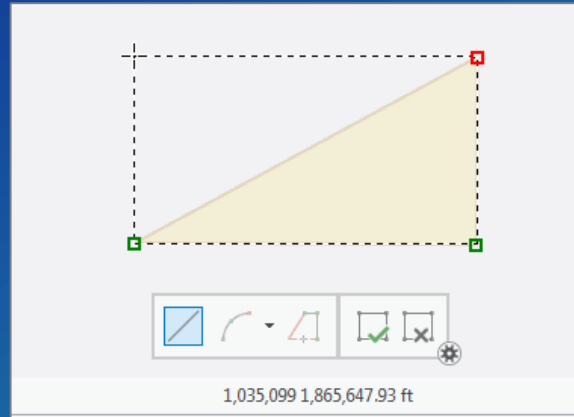
Snapping On/Off Toggle
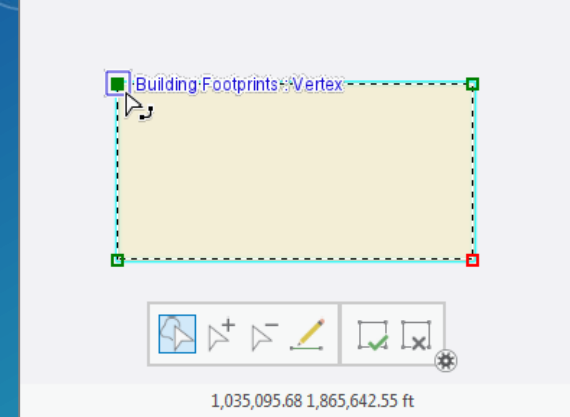
Layer Snapping Enable/Disable
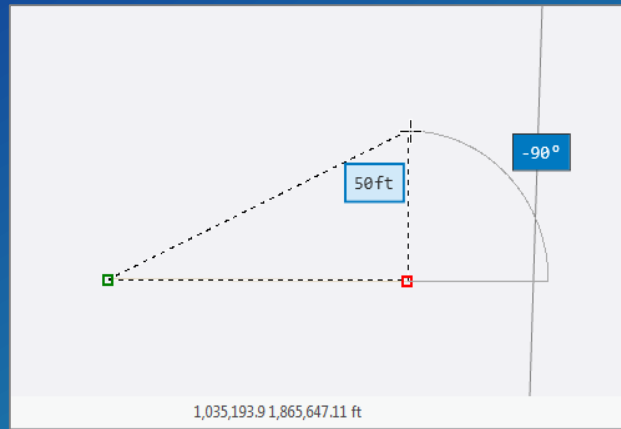
On Screen Controls
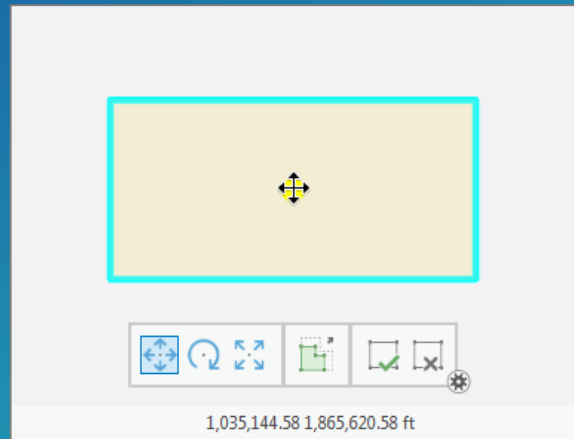

Dynamic Constraints - Display
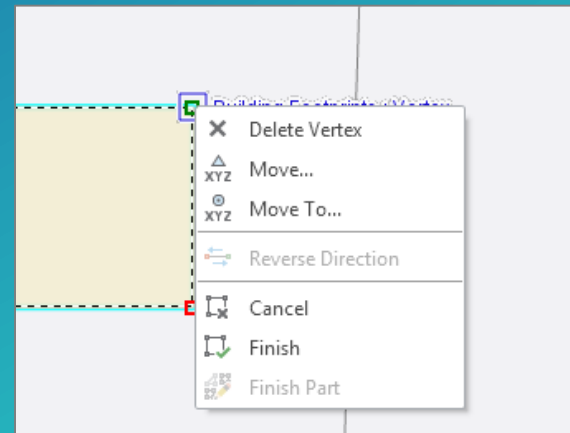

Editing Toolbar – Construct Features

Editing Toolbar – Edit Vertices

Dynamic Constraints – Editing Values

Editing Toolbar – Modify Features

Edit Vertices – Context Menu

Demo – Using Editing Guides

Supporting Text

# Topological Editing

SUBHEAD INFORMATION

Topological Editing Overview

- Topology assists with the maintenance, updating, and creation of contiguous features, ensuring data integrity

- There are two types of topologies in ArcGIS:

    - Map Topology – allows you to edit shared edges and nodes while maintaining feature contiguity

    - Geodatabase Topology - rules-based methodology that involves validating spatial relationships and correcting feature geometry
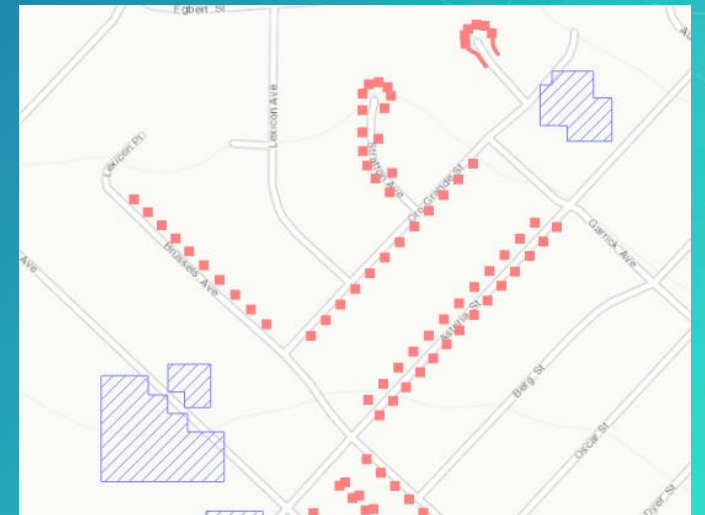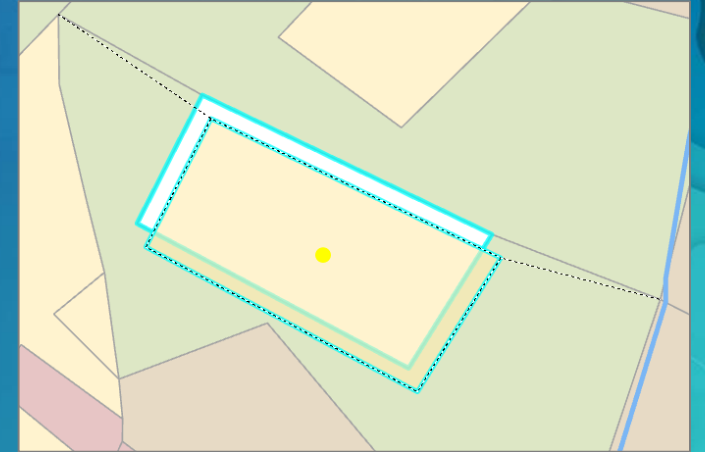
Editing Behavior Settings

- Map Topology
  - Enables shared edge editing behavior for all editable and visible layers in the map

- Geodatabase Topology
  - Enables shared edge editing behavior for all feature classes that participate in the topology
  - Feature classes do not have to be in the map to be updated

- No Topology
  - Disables topological editing – features can be 'disconnected' from adjacent features
 -
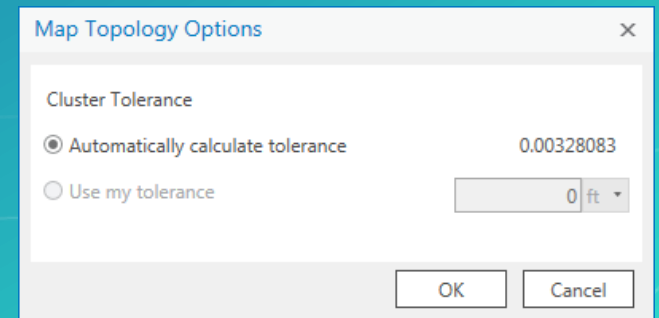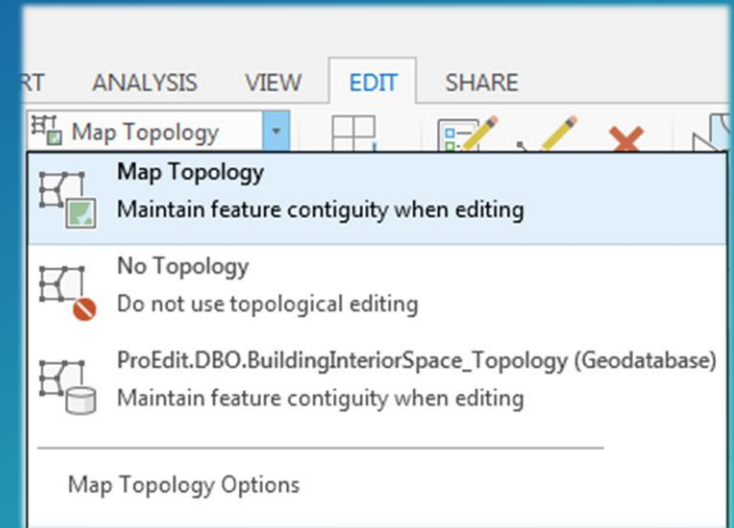
Map Topology - Shared Edge Editing

- No Topology setting is default in Pro

- Edge editing is integrated in several tools
  - Supports moving, reshaping, and aligning edges

- Shared edge editing is only available in 2D map views
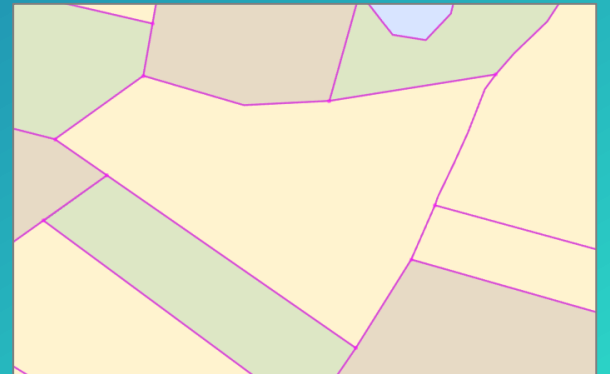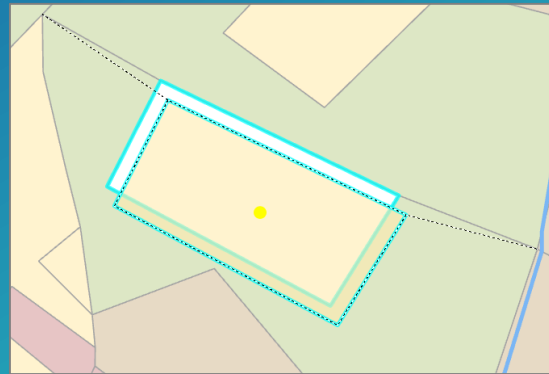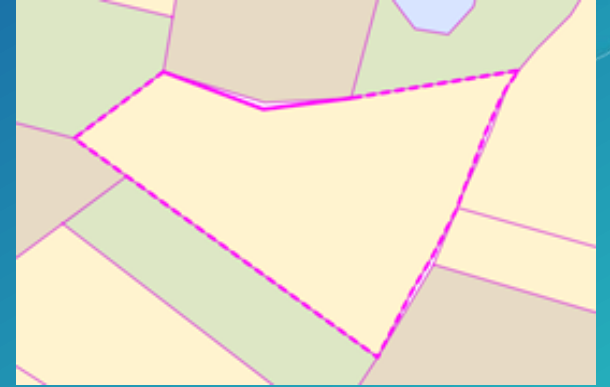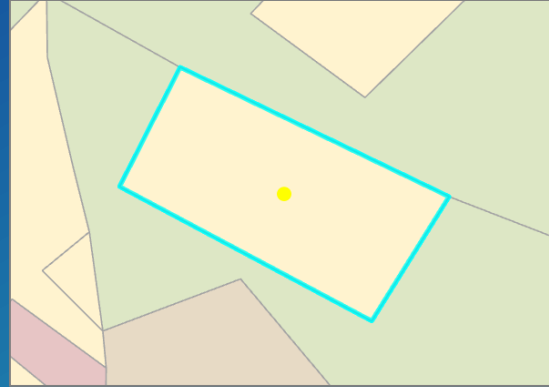
Edge Editing Mode

- When topological editing is enabled, these tools will display the 'Edge' tab

- The selected edge is displayed in the tree view
  - Connected features that will be impacted by the edge edit are also listed in the tree
 - You can omit edges from the edit by unchecking their box
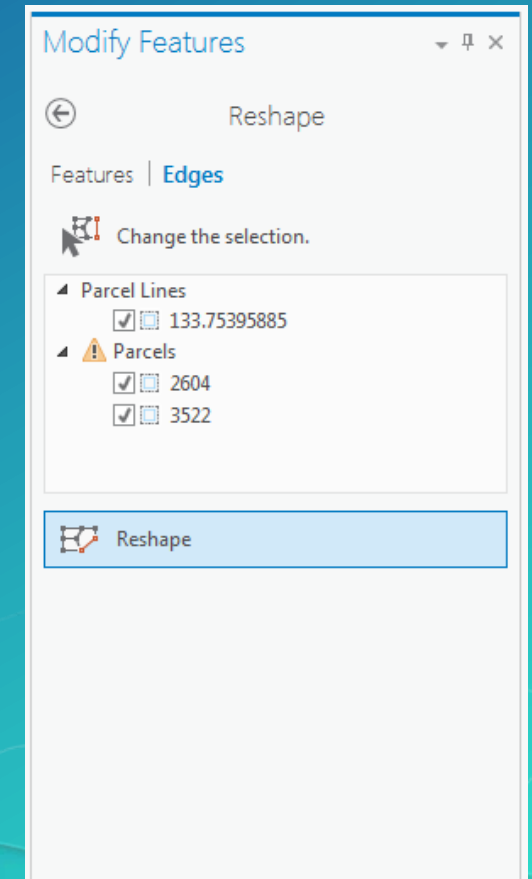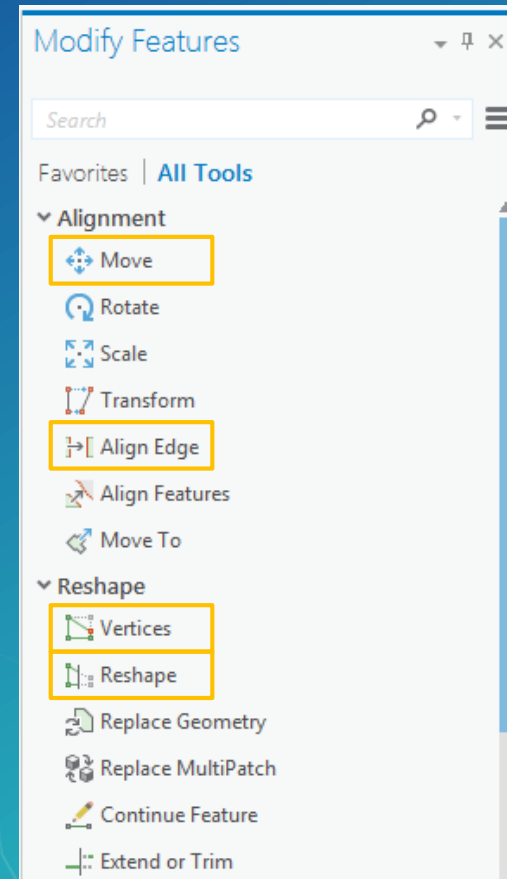
Geodatabase Topology

- **Geodatabase Topology layer is now a group layer in the map**
  - Allows you to work with errors as standard feature layers
  - Can now label errors in the map for visualization

- **Geodatabase Topology tools are only available in 2D map views**

- **Geodatabase Topology Administration**
  - Geodatabase administration tools in Pro will be available in the next release (1.4)
  - Continue to use ArcCatalog/ArcMap for these tasks
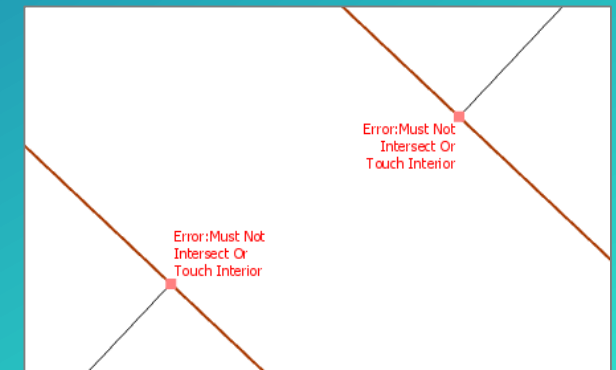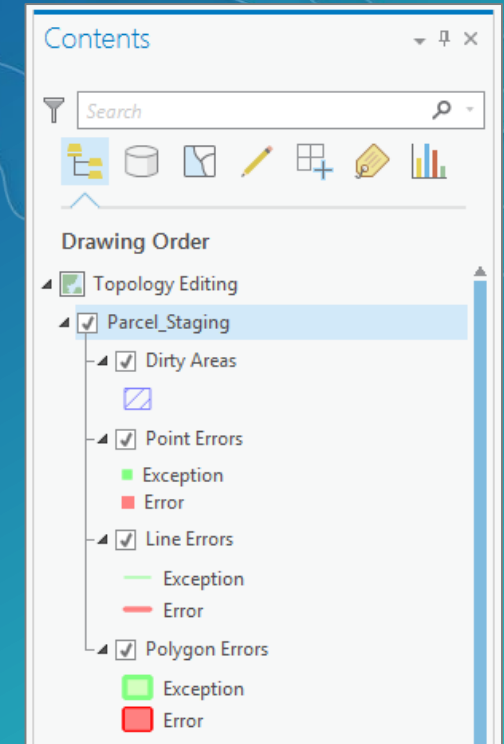
Fixing Errors

- Fix Error tool provides an quick and easy way to fix topological errors in the map

- Click an error and a context menu will appear with choices to:
  - Resolve error with a suggested fix
  - Mark as exception, clear exception

- Validate current map extent or entire topology
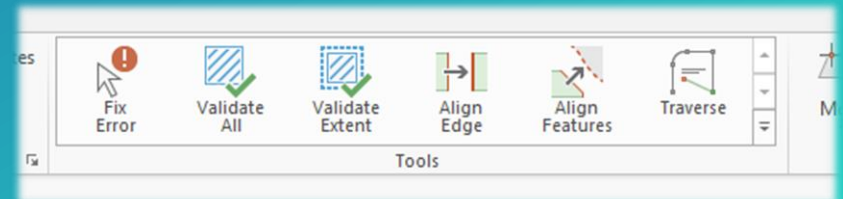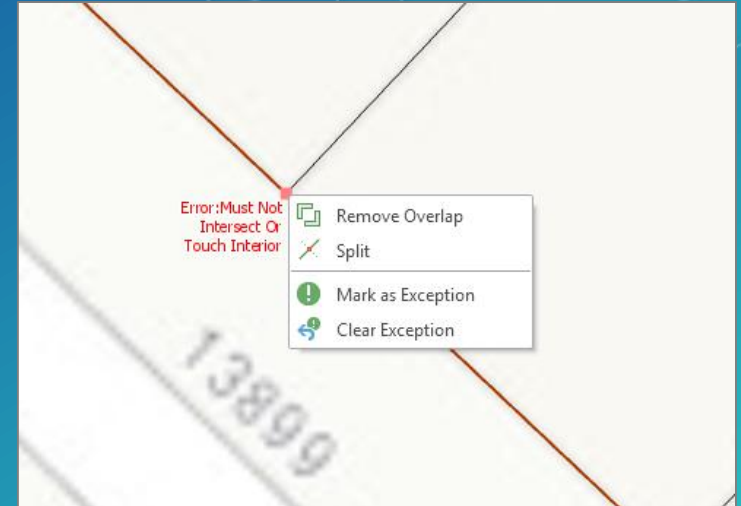
Error Inspector

- Error Inspector displays errors and associated information in a table format
- Ideal for fixing multiple errors at a time (i.e., batch mode)
- Can view all errors or filter by rule; map preview allows inspection of error

Demo - Topological Editing

Supporting Text

Working with Elevation & 3D

SUBHEAD INFORMATION

3D Editing Overview
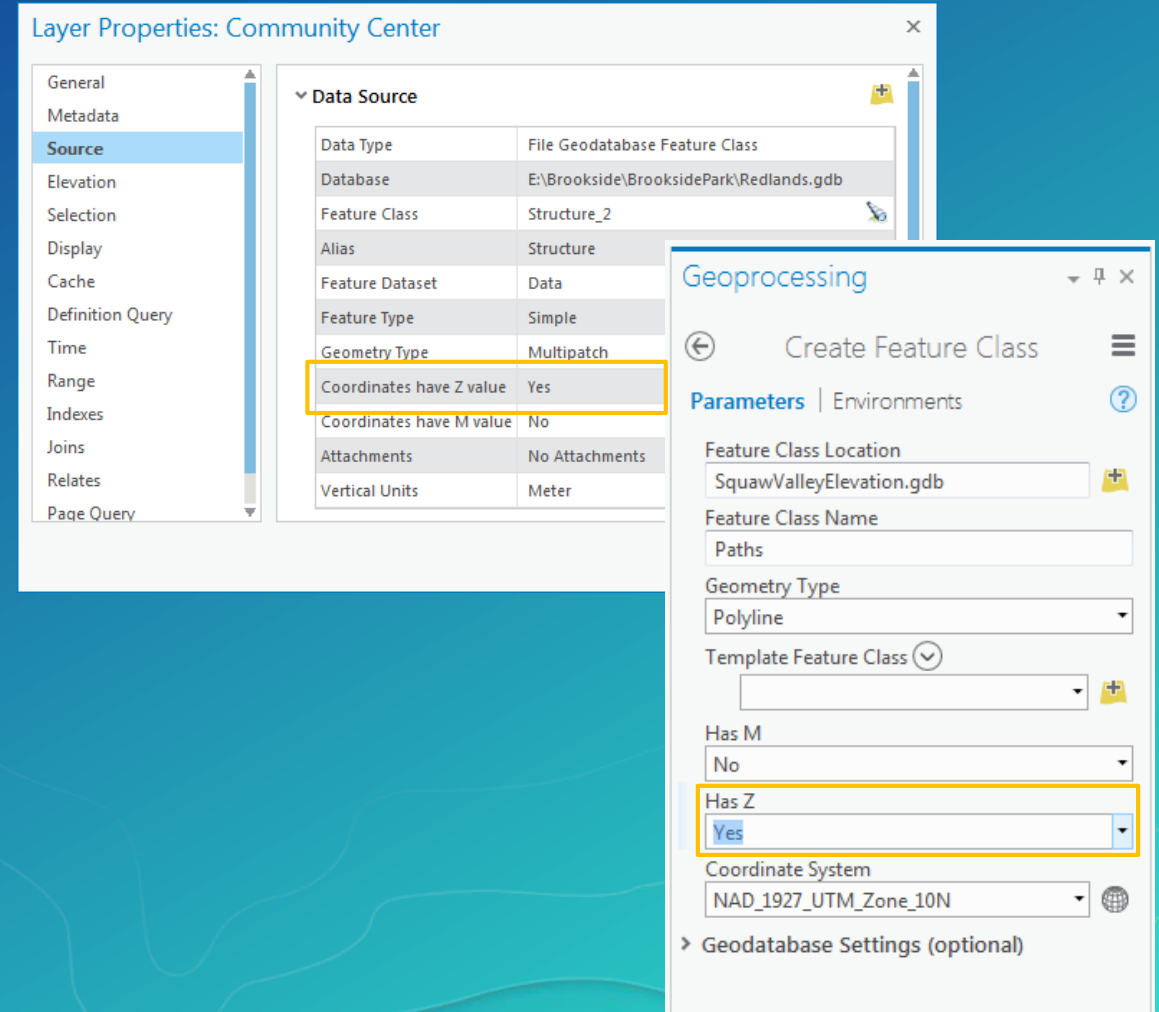
- Create new features in 3D
  - On the surface or at a constant elevation
  - Draw vertical lines or lines with pitch (at any angle)
  - Duplicate features vertically

- 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 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**

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
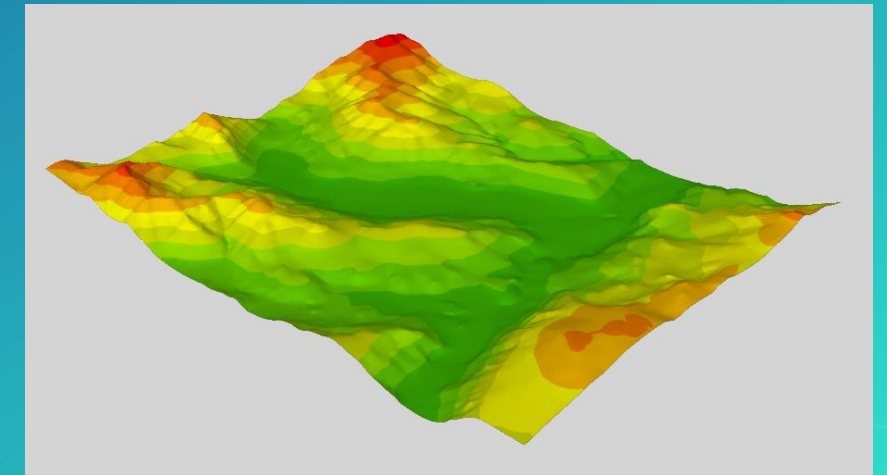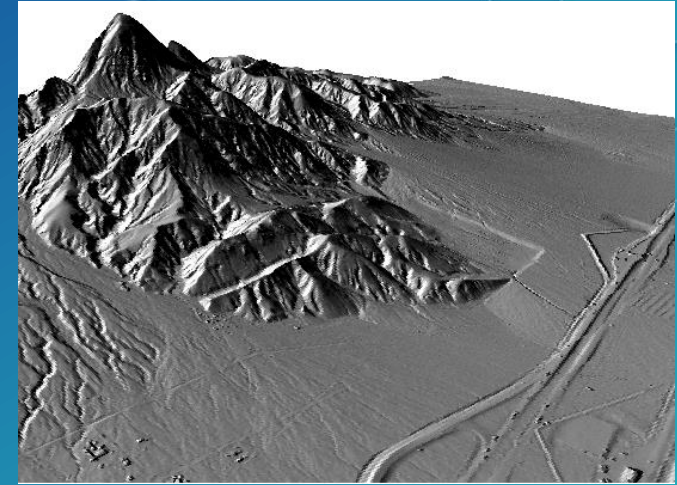
3D Data Creation Tools

- 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
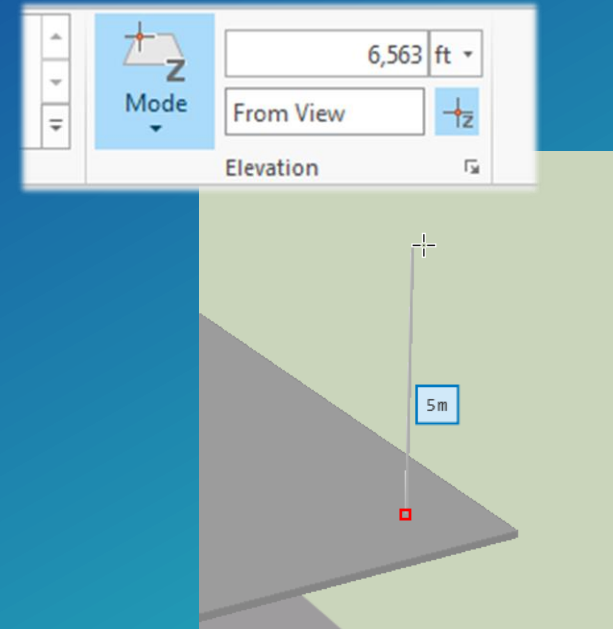
3D Feature Modification

- 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
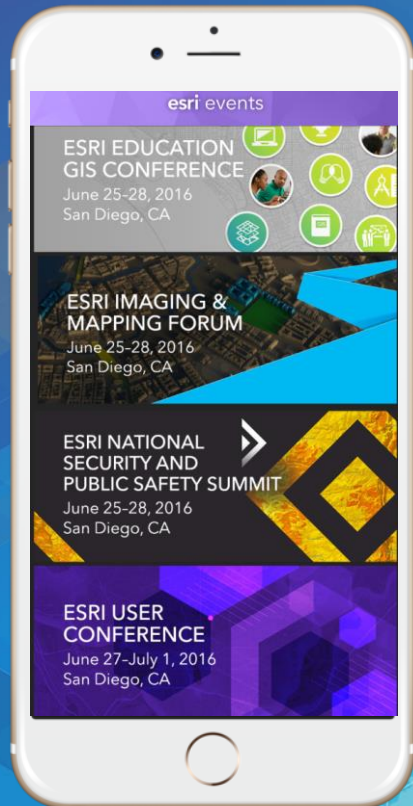 - Choose a different model from disk with the Replace Multipatch tool
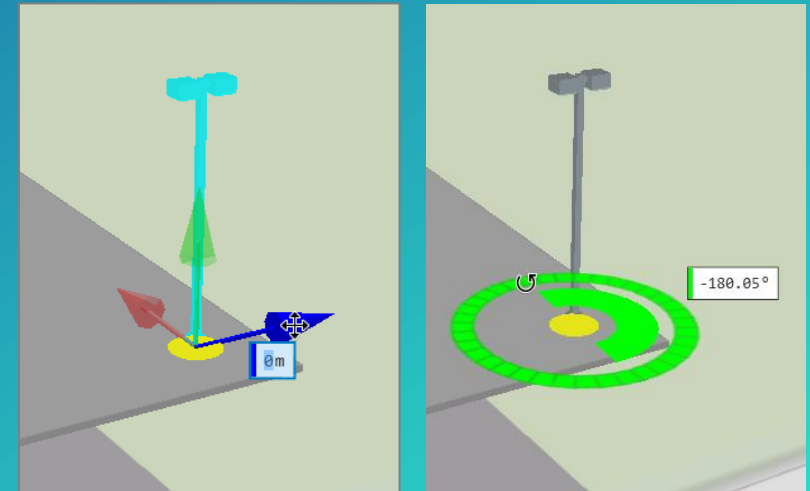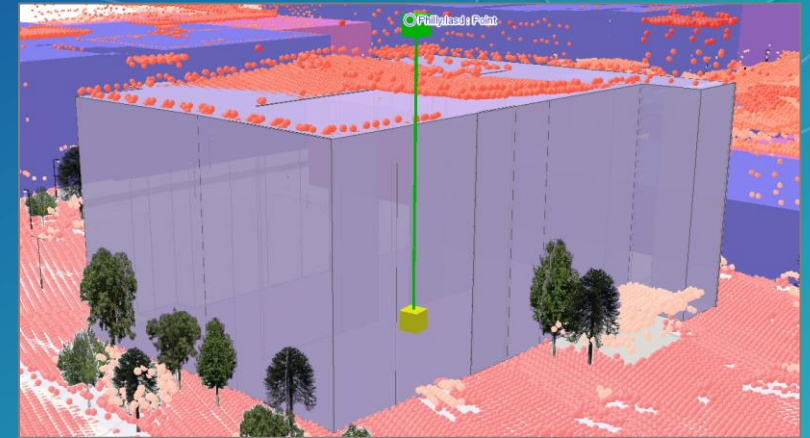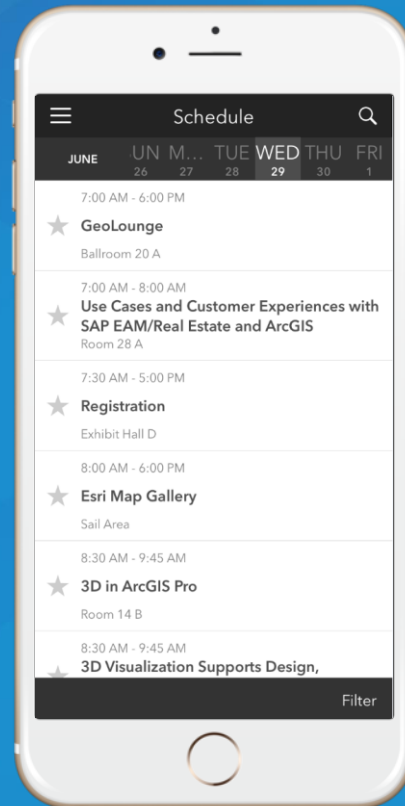
Demo – Working with Elevation & 3D

Supporting Text

Please take our Survey

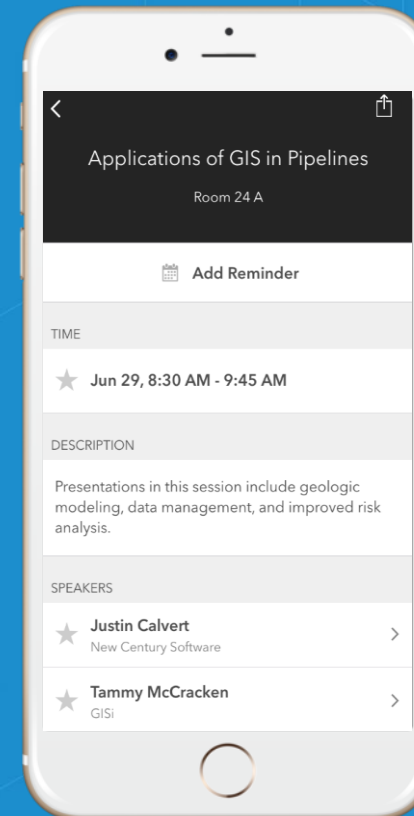**Your feedback allows us to help maintain high standards and to help presenters**

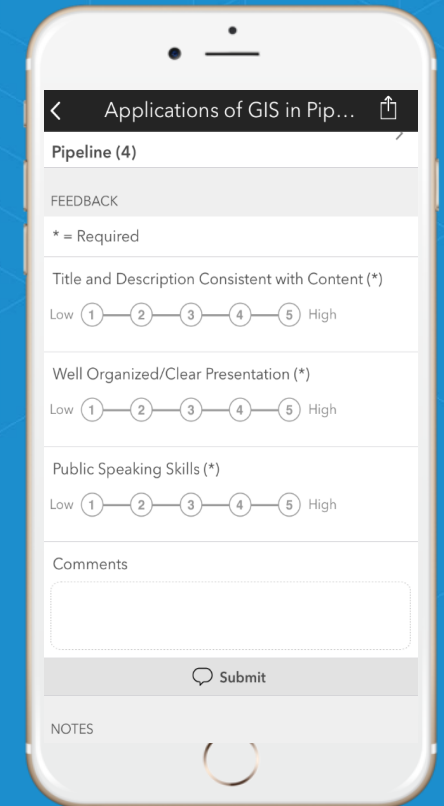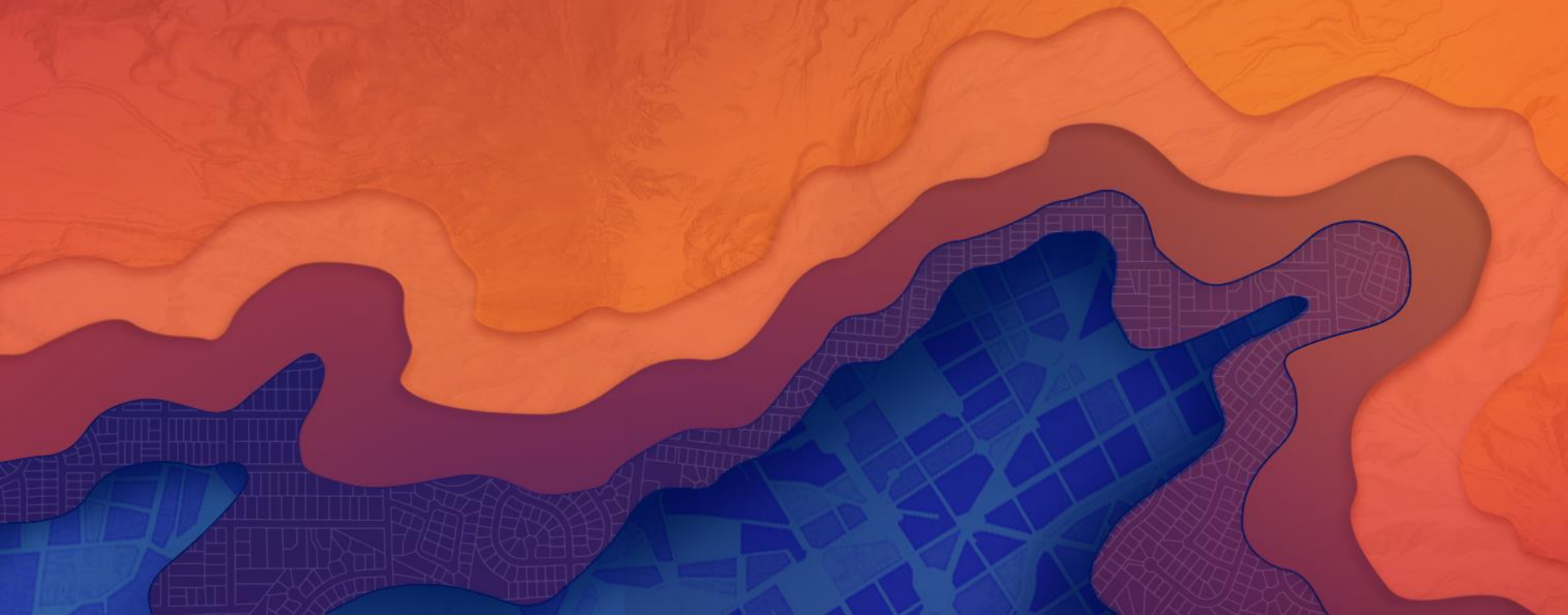| Find your event in the Esri Events App | Find the session you want to review | Scroll down to the bottom of the session | Answer survey questions and submit |

Questions

SUBHEAD INFORMATION

Thank you for attending!

SUBHEAD INFORMATION

esri | THE SCIENCE OF WHERE