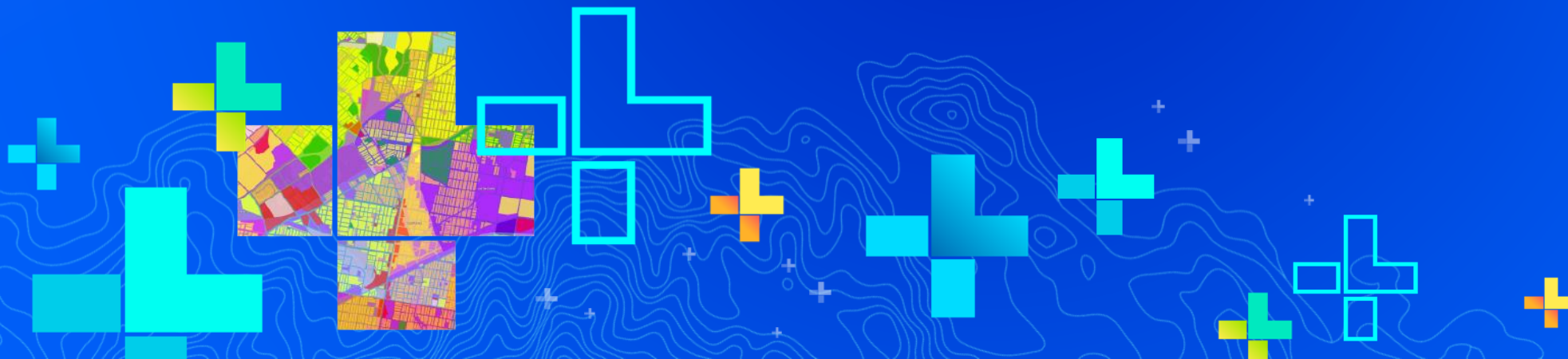




# ArcGIS Pro: Data Alignment and Management

Lisa Stanners and Sean Jones

SEE  
WHAT  
OTHERS  
CAN'T



# Agenda

- **Creating aligned data**
  - Templates, Snapping, Tracing, Auto complete
- **Align data**
  - Align features, Transform, Rubber sheet, Bulk snap
- **Maintaining data alignment**
  - Reshape, Rotate, Map topology – shared edge editing
- **Discover and fix alignment issues**
  - Geodatabase topology – rules, errors, fixes



# Creating Aligned Data

Lisa



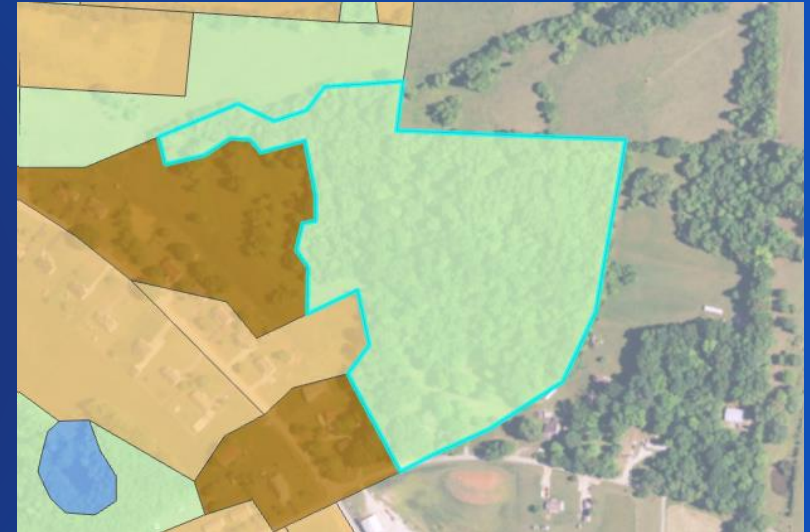
# Advanced Feature Templates

- **Group Templates**
  - Creates several features with one sketch
  - Primary template geometry determines builders
- **Preset Templates**
  - Generated from a selection of features
  - Placed with a point sketch

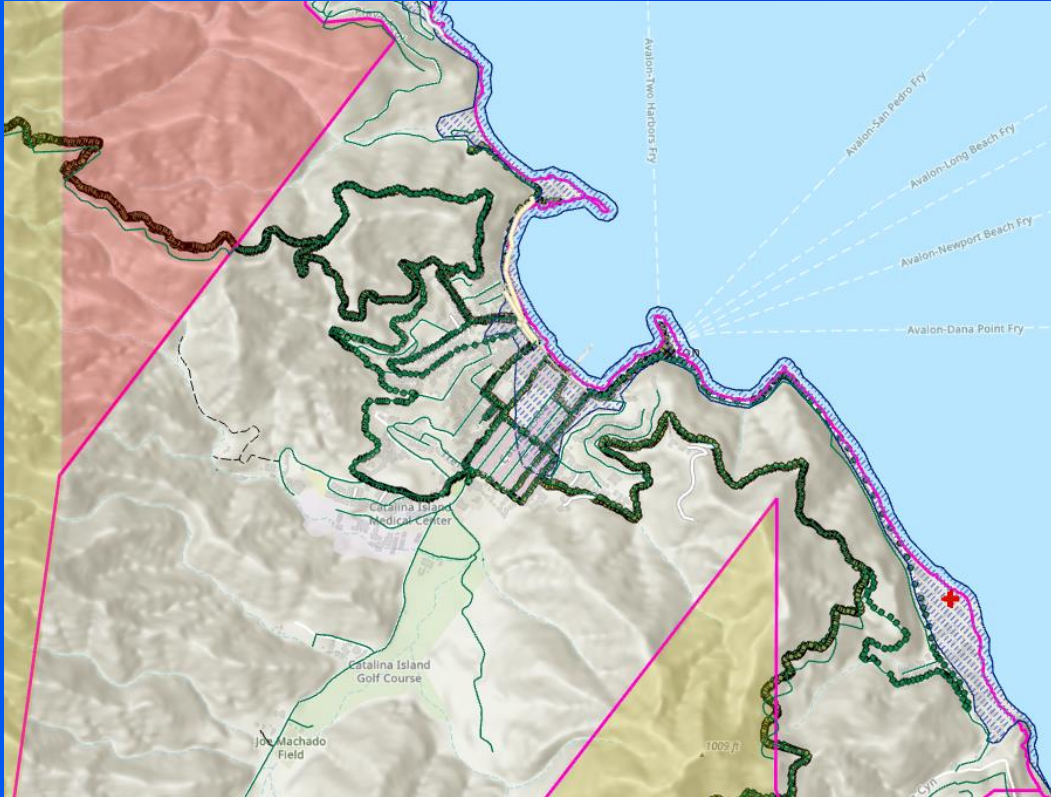


# Tools

- Auto-Complete (polygon and freehand)
- Trace
- Snapping environment







# Creating Aligned Features

Lisa

# Aligning data

Sean



# Transformations

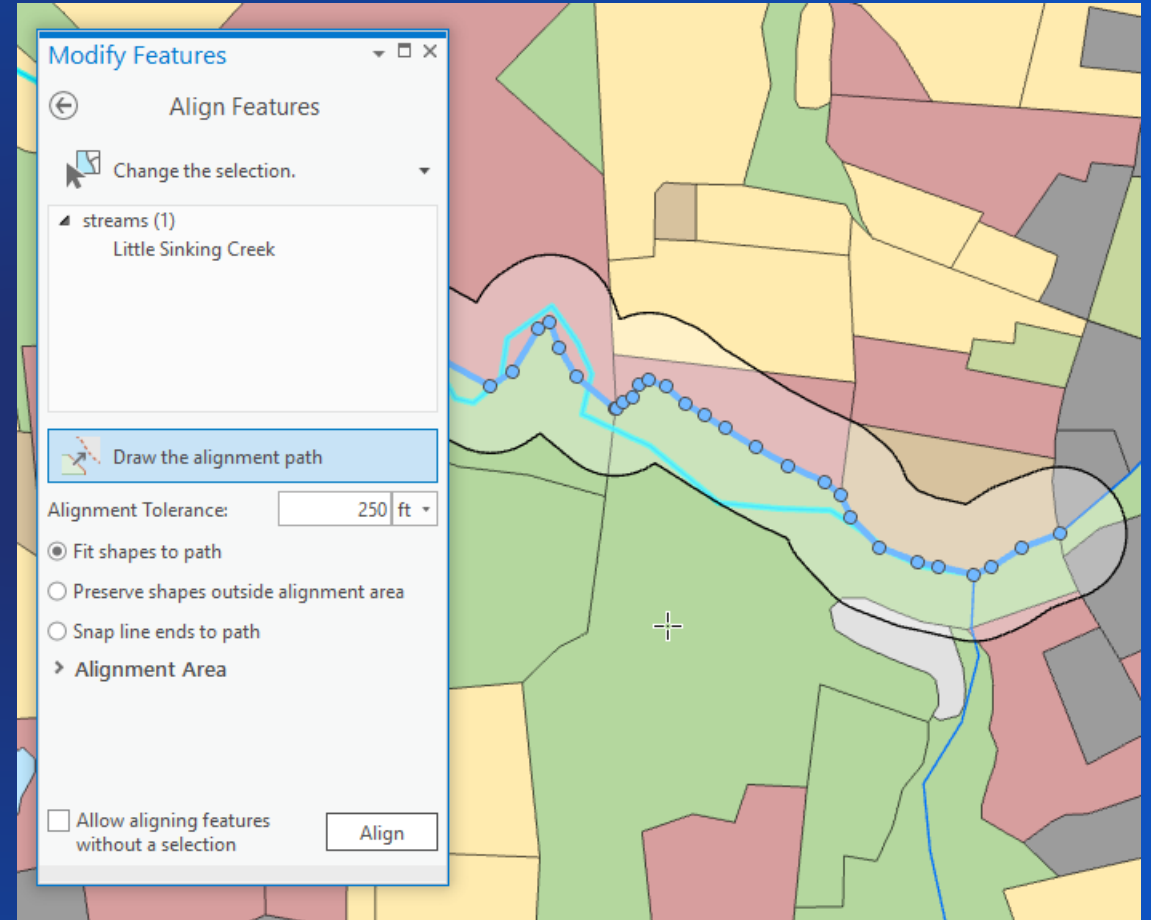
- Transform
  - Shift data in coordinate space
- Rubber sheet
  - Align data in close proximity
  - Massage data into alignment





# Align Features

- Align features to a traced line
  - Features aligned within tolerance
  - Respects topology



# Geoprocessing Alignment Tools

- Snap – bulk snapping based on user specified rules
  - Edit session

The screenshot displays the 'Geoprocessing' window with the 'Snap' tool selected. The 'Parameters' tab is active, showing 'Input Features' set to 'Zion park boundary'. The 'Snap Environment' is configured with 'Features' set to 'Streams', 'Type' set to 'Edge', and 'Distance' set to '100 Meters'. The 'Run' button is visible at the bottom right of the tool window.

To the right of the tool window, three case studies (CASE I, CASE II, and CASE III) illustrate different snapping scenarios. Each case shows the 'INPUT', the 'SNAP ENVIRONMENT' (a table of rules), and the resulting 'OUTPUT'.

**CASE I**

INPUT: RED

SNAP ENVIRONMENT

FEATURES	TYPE	DISTANCE
BLUE	EDGE	5 Meters

OUTPUT

**CASE II**

INPUT: RED

SNAP ENVIRONMENT

FEATURES	TYPE	DISTANCE
GREEN	VERTEX	5 Meters
BLUE	END	5 Meters
BLUE	EDGE	5 Meters

OUTPUT

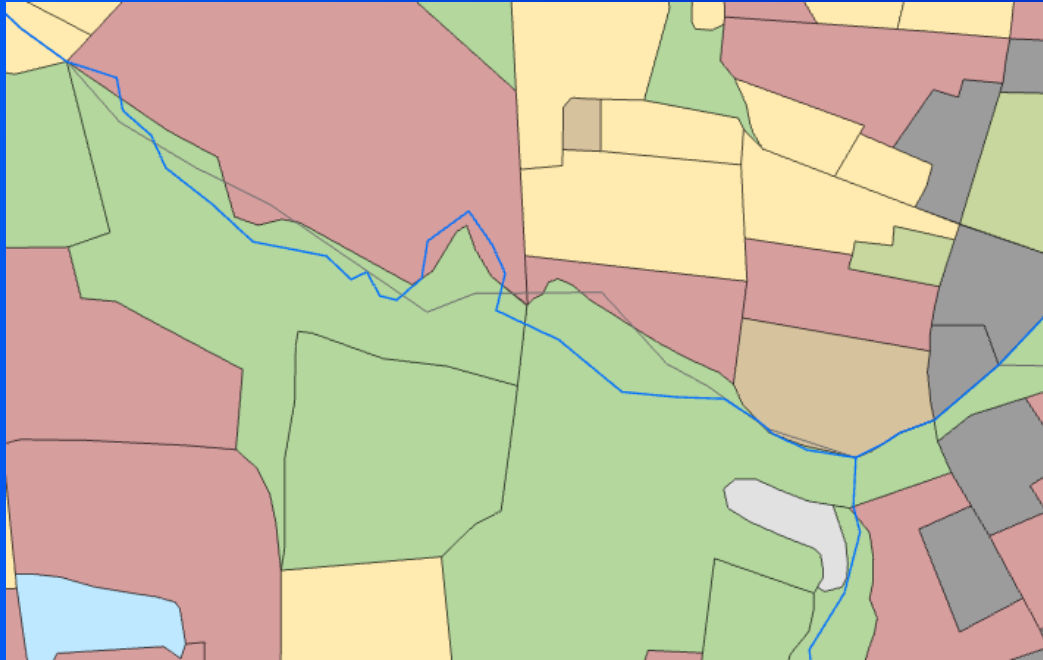
**CASE III**

INPUT: RIVER  
COUNTY

SNAP ENVIRONMENT

FEATURES	TYPE	DISTANCE
COUNTY	EDGE	5 Meters

OUTPUT



# Aligning data demo

Sean

# Modifying Aligned Data

Lisa





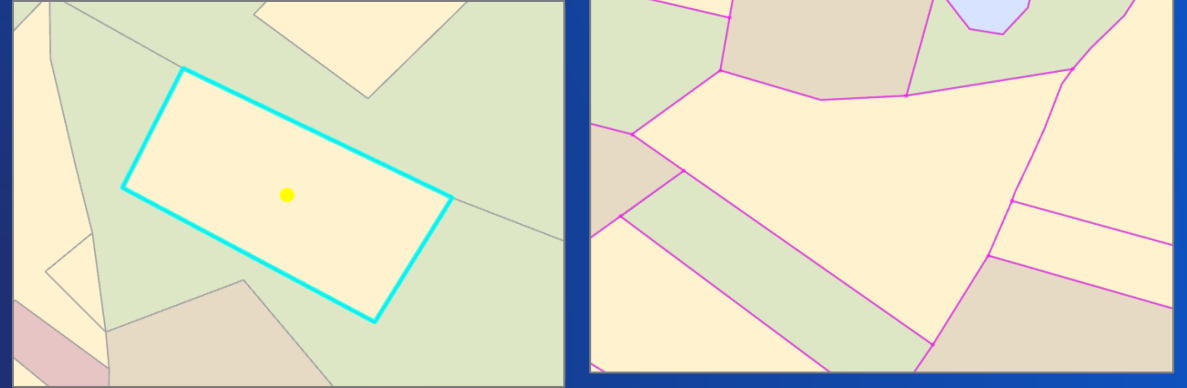
# Core Editing Tools

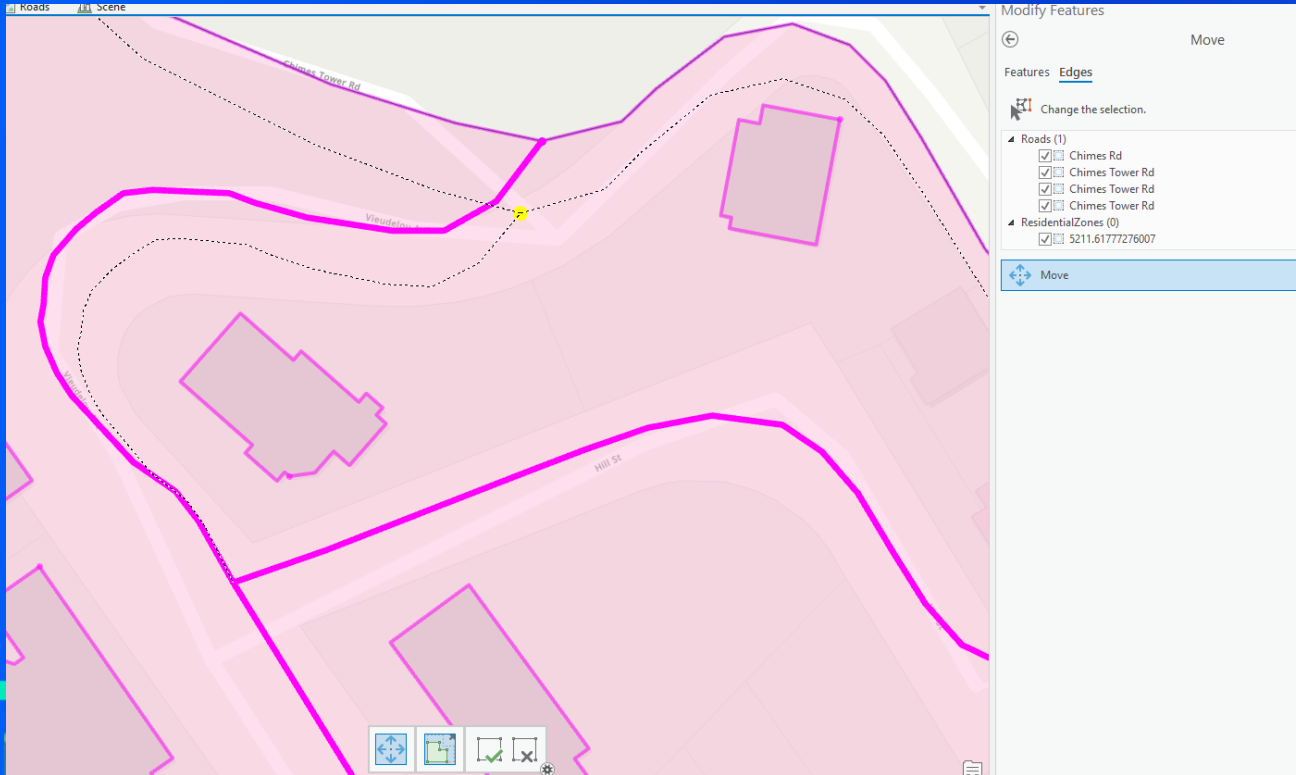
- Reshape Multiple Features
- Extend or Trim
- Replace Geometry
- Auxiliary anchor (Rotate and Scale tools)
- Align Features— adjust layers to a sketched or traced shape



# Shared-Edge Editing

- **Topology – map or gdb**
  - ALL visible editable layers in the map
- **Edges tab**
  - Supports moving, reshaping, vertices and aligning edges
- **2D only**





# Modifying Aligned Data

Lisa

# Discover and fix alignment issues

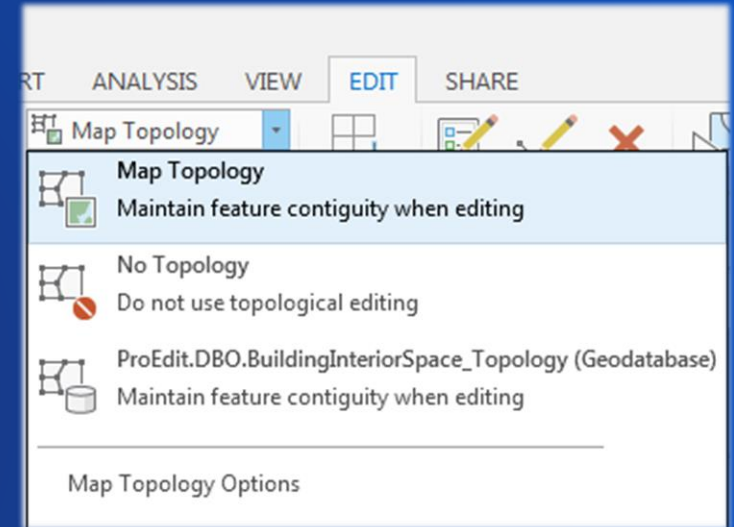
Sean





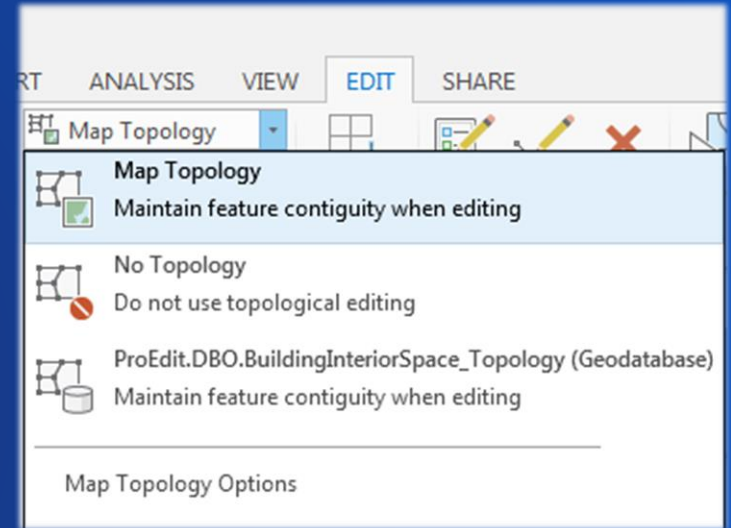
# Topologies – What kinds are there?

- **Map Topologies (Basic license)**
  - Allows you to edit shared edges and nodes while maintaining feature contiguity
  - Can be used with feature classes or shapefiles across workspaces. Uses any editable, visible layers in the map's contents pane
  - Saved in map document



# Topologies – What kinds are there?

- **Geodatabase Topologies (requires Standard license)**
  - Allows you to edit shared edges and nodes while maintaining feature contiguity
  - Rules-based methodology that involves validating spatial relationships
  - Topology errors
  - Persisted in the database
- Must be used with feature classes in same feature dataset

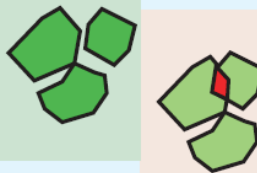


# Geodatabase Topologies – Topology Rules

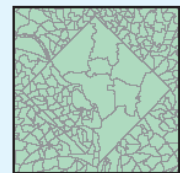
- 32 topology rules (no custom rules)
- Single or multiple feature classes
- Apply to feature class or subtype level
- Categorized by geometry type (polygon, line, point)
- Can export topology errors

### Must not overlap

Polygons must not overlap within a feature class or subtype. Polygons can be disconnected or touch at a point or touch along an edge.



Polygon errors are created from areas where polygons overlap.




A voting district map cannot have any overlaps in its coverage.

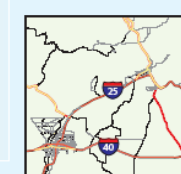
*Use this rule to make sure that no polygon overlaps another polygon in the same feature class or subtype.*

### Must not have dangles

The end of a line must touch any part of one other line or any part of itself within a feature class or subtype.



Point errors are created at the end of a line that does not touch at least one other line or itself.

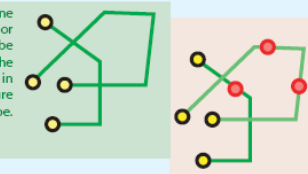


*Use this rule when you want lines in a feature class or subtype to connect to one another.*

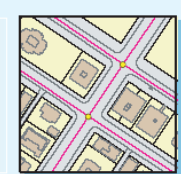
A street network has line segments that connect. If segments end for dead-end roads or cul-de-sacs, you could choose to set as exceptions during an edit session.

### Must be covered by endpoint of

Points in one feature class or subtype must be covered by the ends of lines in another feature class or subtype.



Point errors are created on the points that are not covered by the ends of lines.

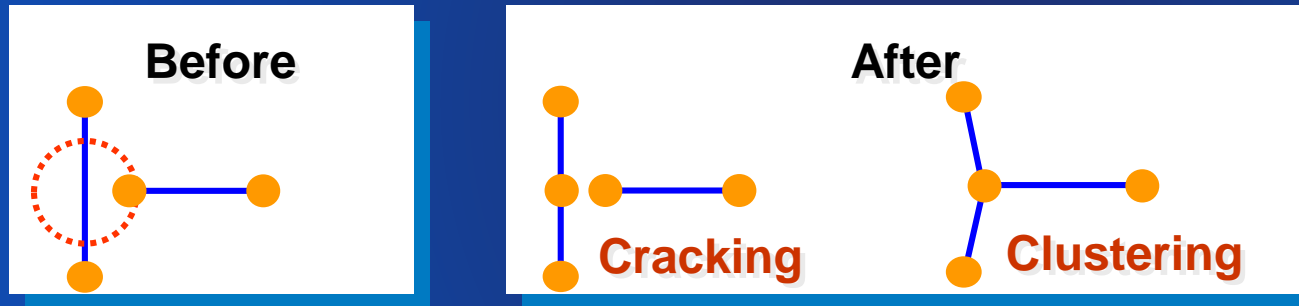


Street intersections must be covered by the endpoints of street centerlines.

*Use this rule when you want to model points that are coincident with the ends of lines.*

# Geodatabase Topologies – Validating a Topology

- Integrates geometries based on the cluster tolerance
  - **Cracking** – Vertices added at intersections of feature edges
  - **Clustering** – Snapping vertices that fall within cluster tolerance

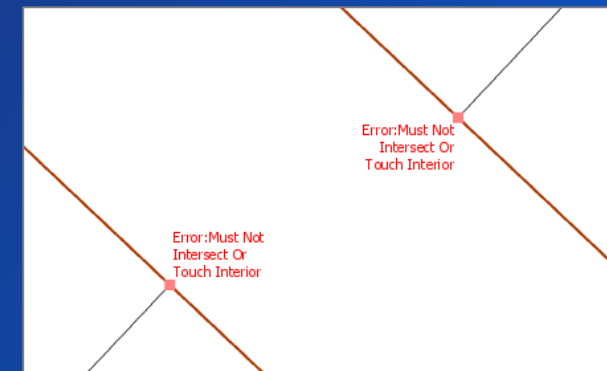
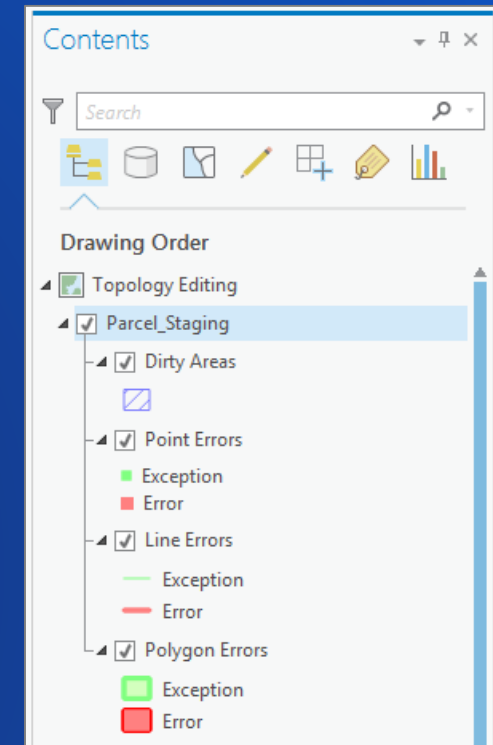


- Validates topology rules which may generate errors
  - **Deletes errors if the rules are no longer violated**
- No new features are created



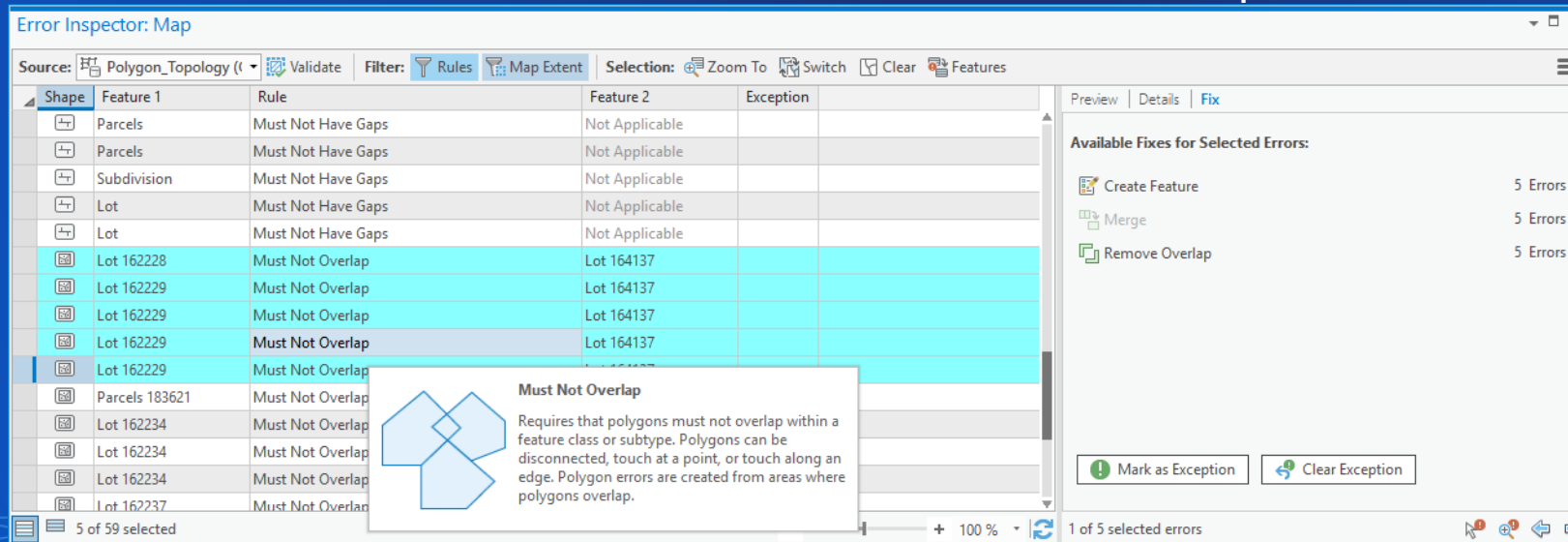
# Geodatabase Topology

- **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**



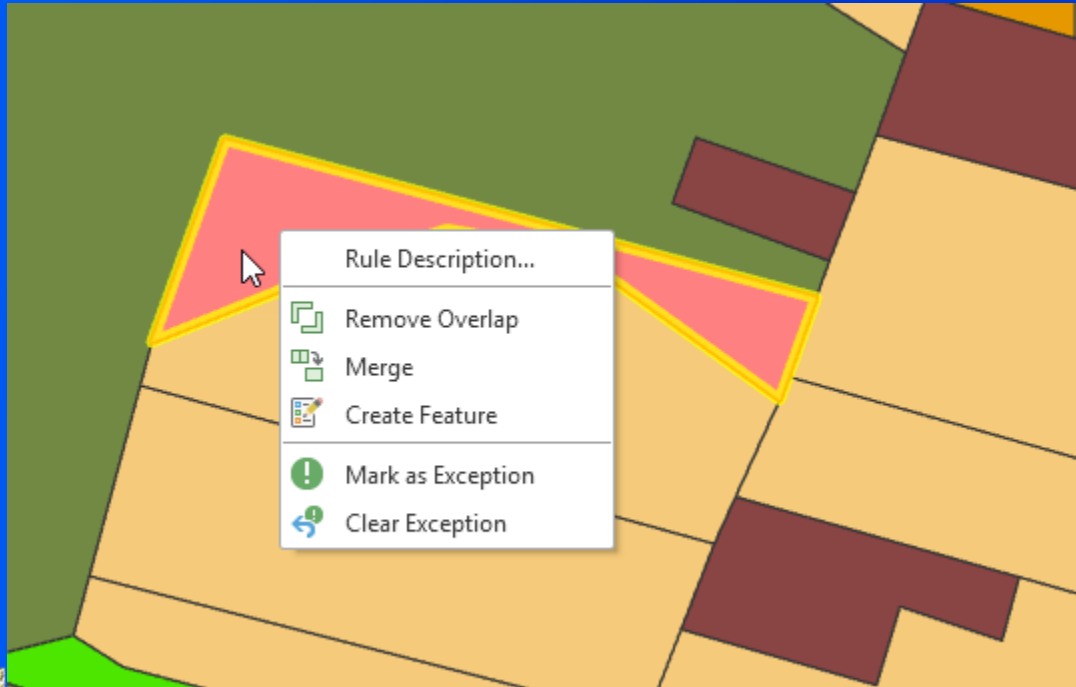
# Geodatabase Topologies – Error Inspector

- **Error Inspector lets you view and fix topology errors in a table.**
  - The rule violated
  - The feature class or classes involved in the error
  - The geometry of the error
  - The feature ID of the features involved in the error
  - Whether or not the error has been marked as an exception



# Geodatabase Topology

Sean



## See Us Here

WORKSHOP	LOCATION	TIME FRAME
• <b>ArcGIS Pro Editing: An Overview</b>	• SDCC - Ballroom 06 B	• Thursday 8:30 – 9:30
• <b>ArcGIS Pro Editing: 3D Editing</b>	• SDCC - Room 33 A/B • SDCC - Room 07 A/B	• Wednesday 2:30 – 3:30 • Thursday 1:00 – 2:00
• <b>ArcGIS Pro Editing: Data Alignment and Management</b>	• SDCC - Room 07 A/B	• Thursday 2:30 – 3:30
• <b>ArcGIS Pro Editing: Managing Feature Attributes and Related Data</b>	• SDCC - Room 07 A/B	• Thursday 10:00 – 11:00