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ArcGIS Pro Data Alignment and Management

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Agenda

- Review tools available for improving spatial accuracy of your data
 - Spatial adjustment
 - Snapping capabilities, tracing tools, auto-complete, etc.
 - Alignment tools
- Review tools available to maintaining accuracy & coincidence
 - Map Topologies & Geodatabase Topologies

Data Alignment

Common scenarios:

1. Editing without regards to spatial integrity.
2. Different data sources.
3. Features created or updated at different points in time.
4. Features created at different map scales.



Spatial Adjustment

Transformations

- Shift data in coordinate space
 - Digitize coordinates to real world
 - CAD coordinates to real world
 - Meters to Feet



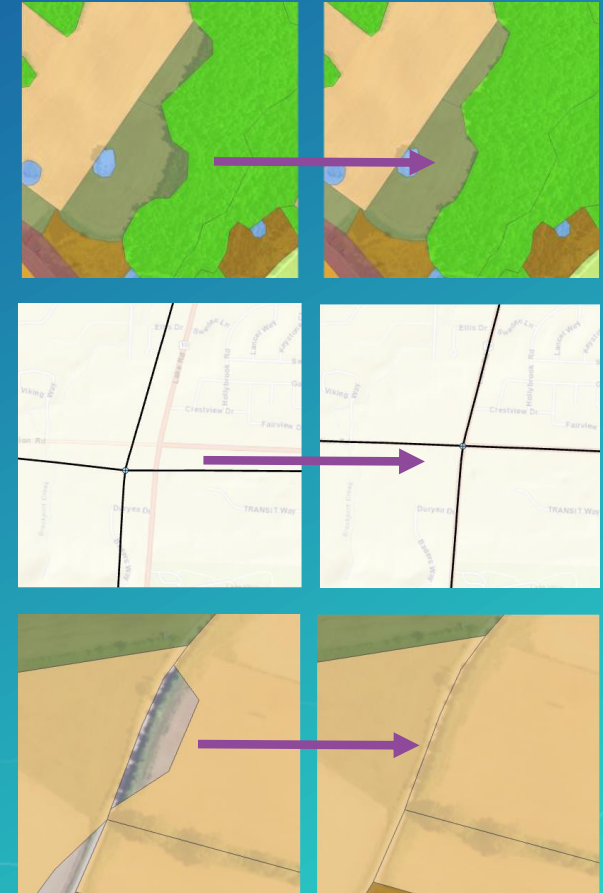
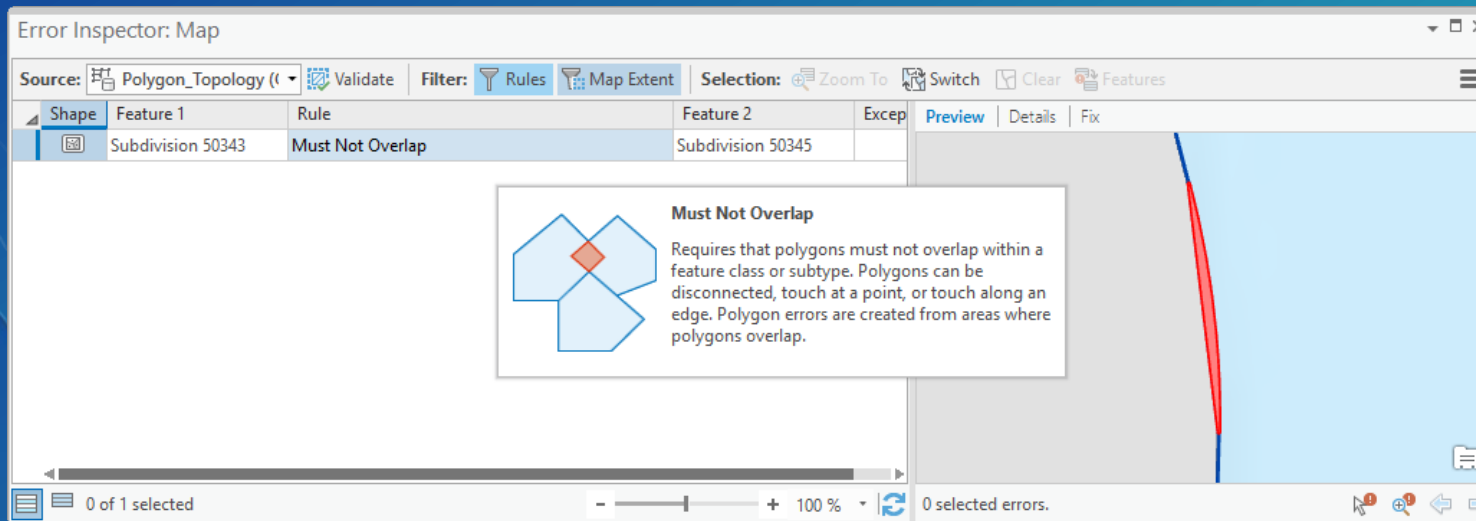


Spatial Adjustment Demo

Topologies – Why would you want to use one?

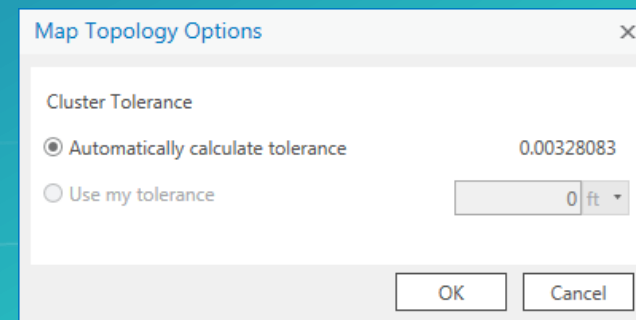
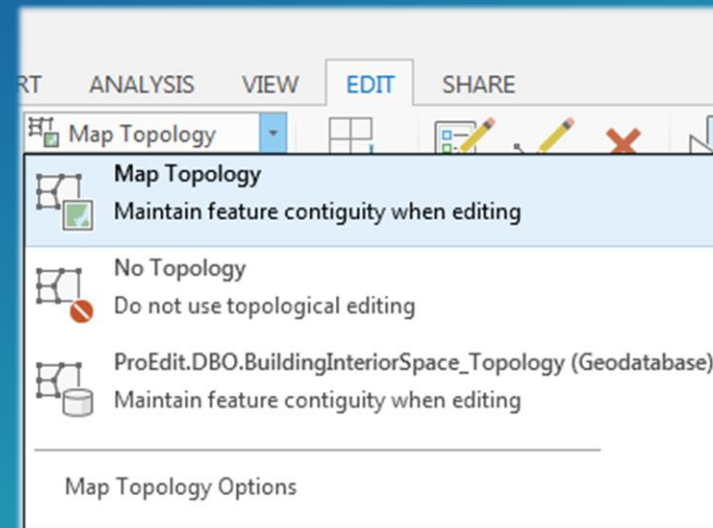
Topology assists with the maintenance, updating, and creation of contiguous features, ensuring data integrity

1. Tools for editing coincident geometries between feature classes
2. Tools for finding and fixing errors based on rules you define



Editing Behavior Settings

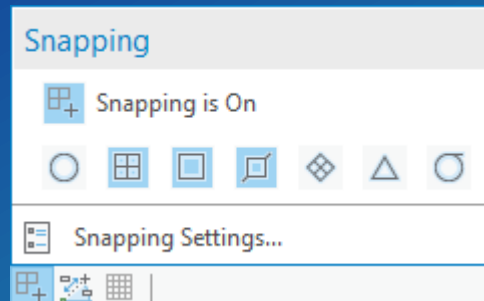
- **Map Topology**
 - Enables shared edge editing behavior for all editable and visible layers in the map
- **Geodatabase Topology**
 - Enables shared edge editing behavior for all feature classes that participate in the topology
 - Feature classes do not have to be in the map to be updated
- **No Topology (Default)**
 - Disables topological editing – features can be ‘disconnected’ from adjacent features



Keeping Your Data Aligned

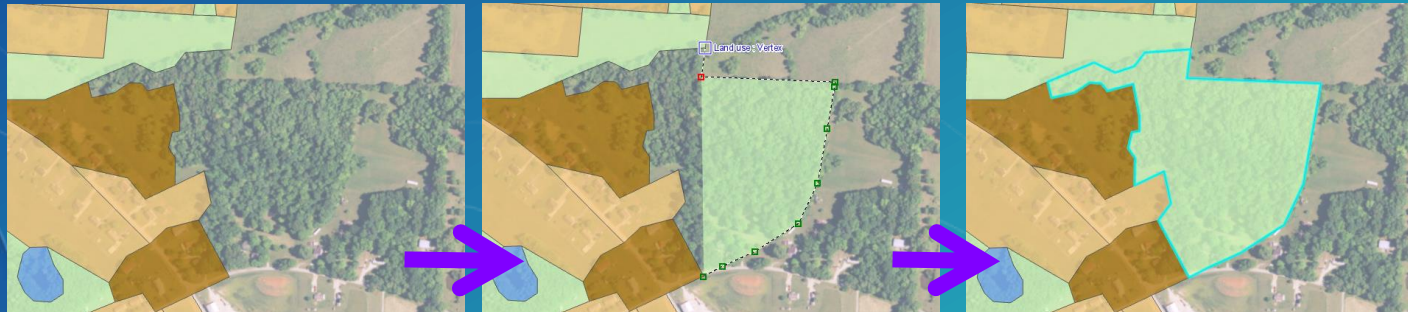
- **Functionality is available with No Topology, Map Topology, or Geodatabase Topology**

- Snapping environment



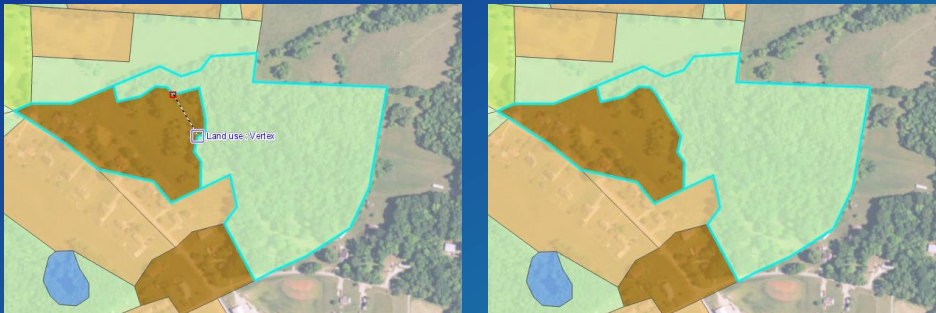
- Group Templates

- Construction tools: Auto-Complete (polygon and freehand); Trace

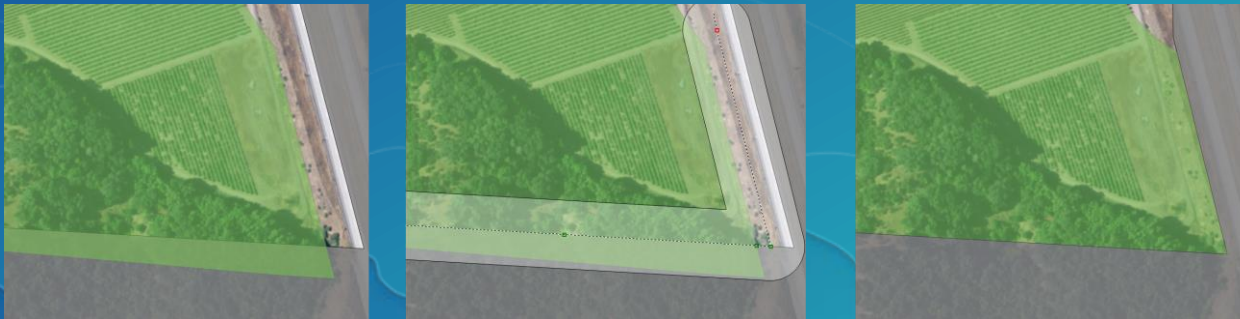


Keeping Your Data Aligned

- **Modify tools :**
 - **Reshape Multiple Features**

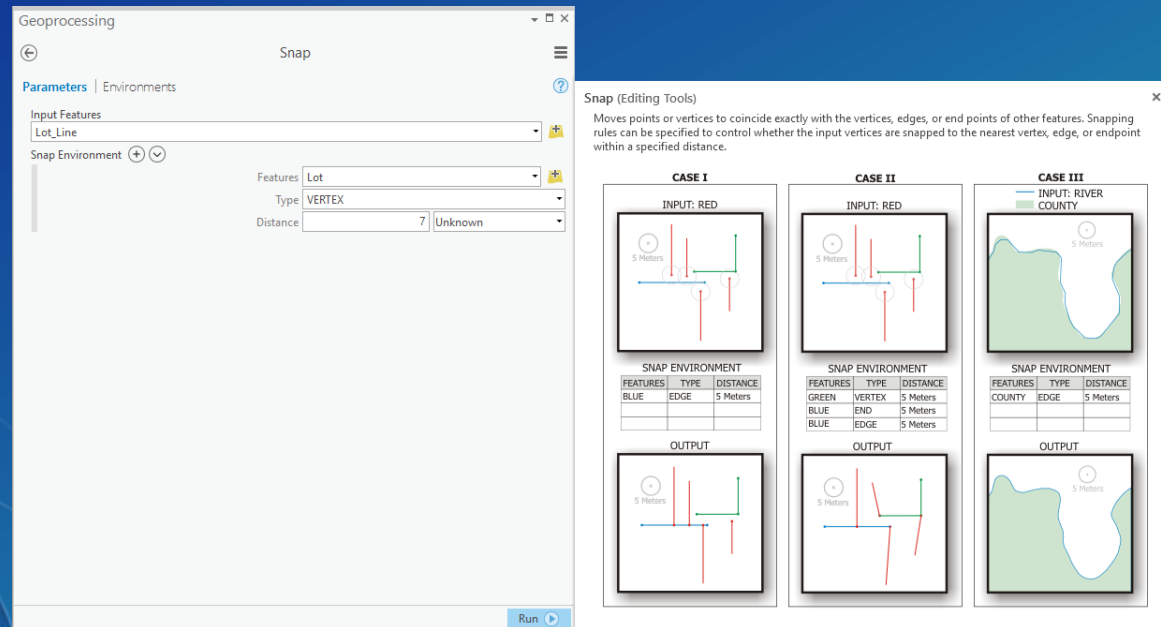


- **Extend or Trim; Replace Geometry; Auxiliary anchor (Rotate and Scale tools)**
- **Align To Shape – adjust layers to a sketched or traced shape**



Geoprocessing Alignment Tools

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



- Integrate



Aligning Data Demo

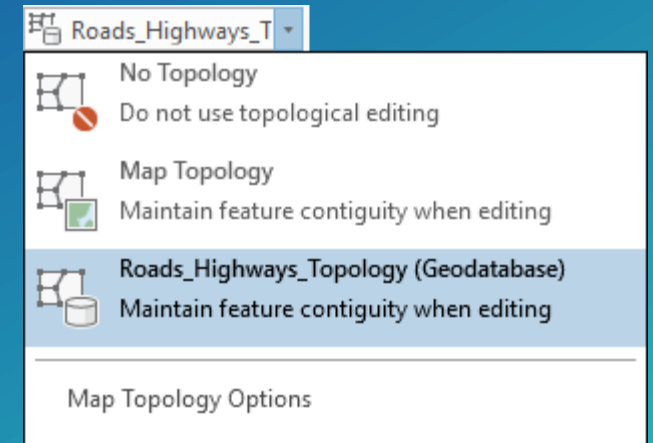
Topologies – What kinds are there?

1. 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, not in the geodatabase

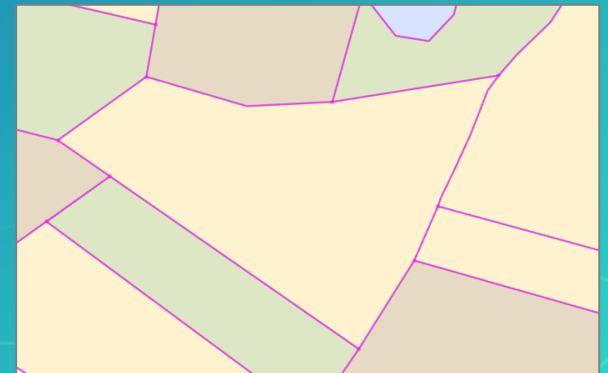
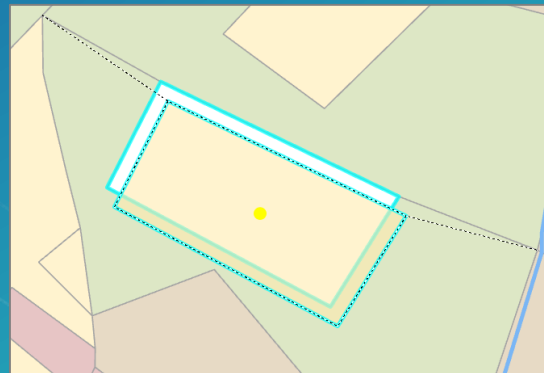
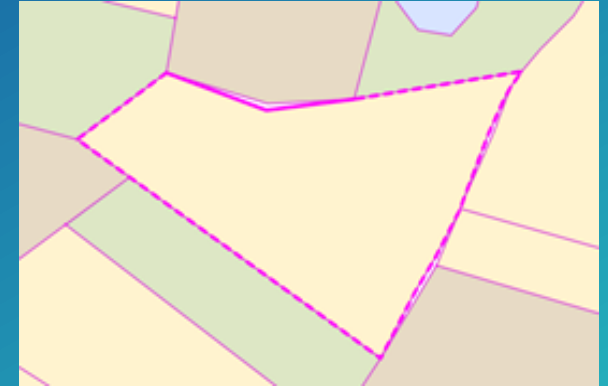
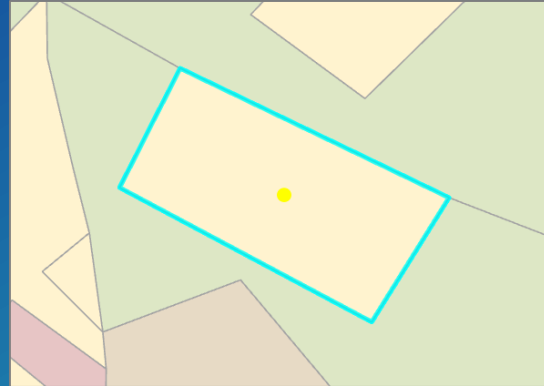
2. Geodatabase Topologies (requires Standard license)

- Rules-based methodology that involves validating spatial relationships and correcting feature geometry
- Allows rules to be defined and errors found
- Must be used with feature classes in same feature dataset
- Persisted in the database, dirty areas created when features edited



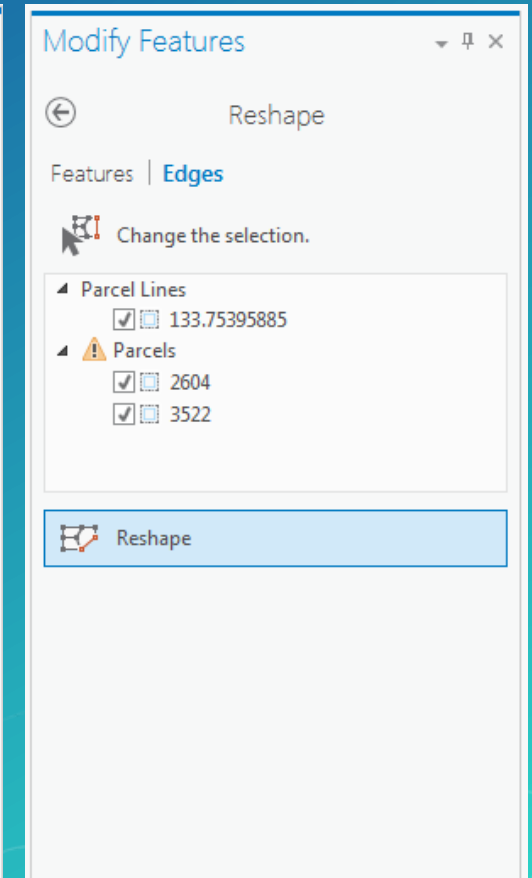
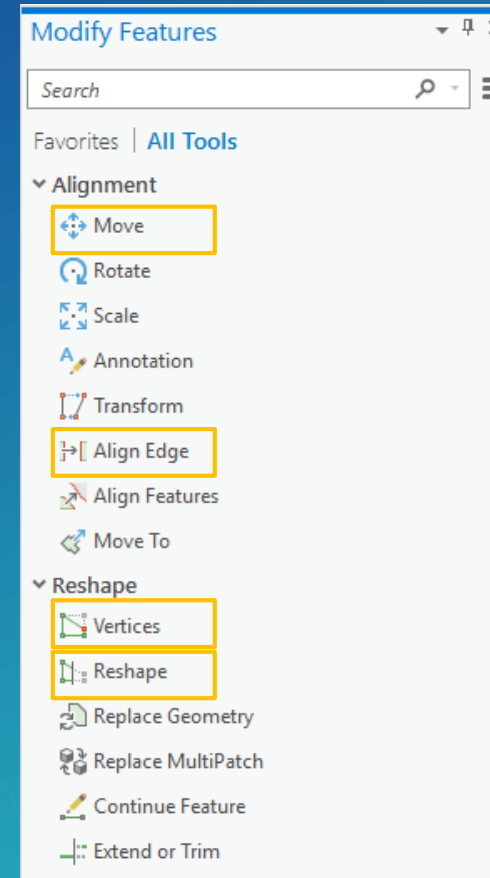
Map Topology—Shared Edge Editing

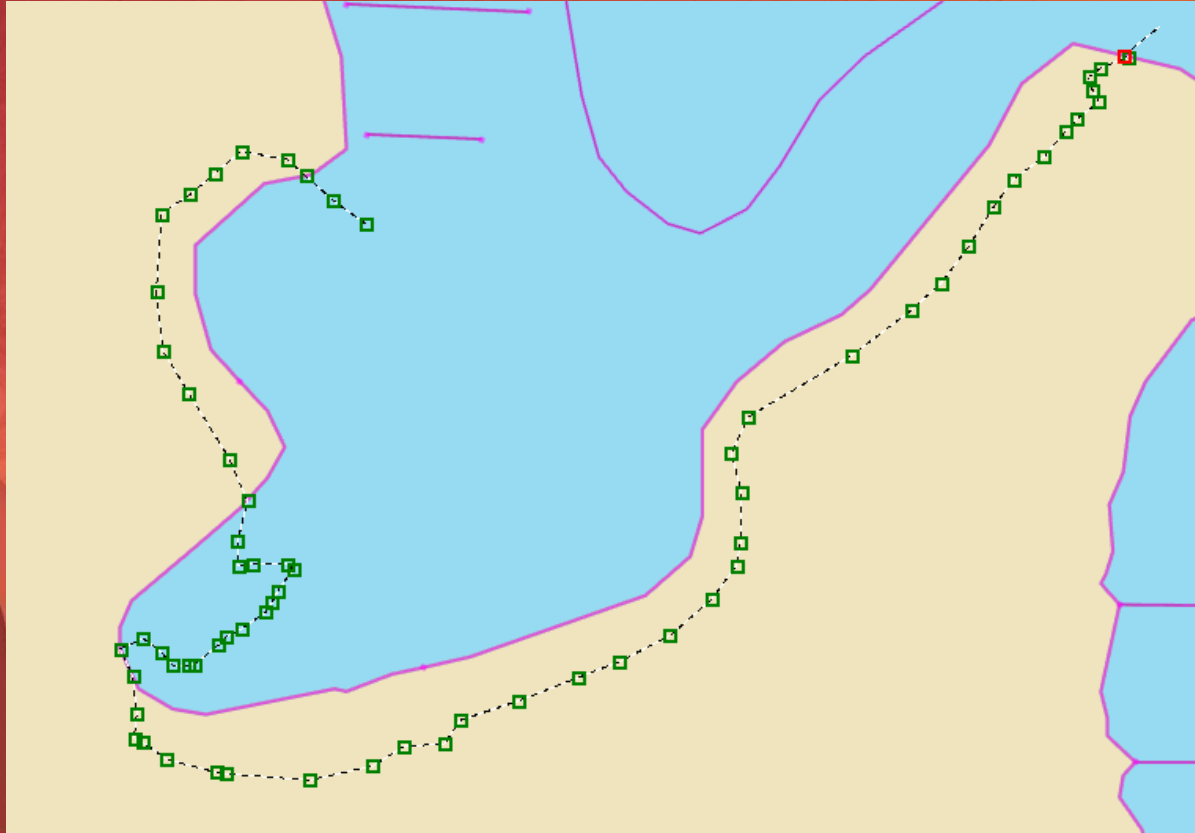
- Edge editing is integrated in several tools
 - Supports moving, reshaping, and aligning edges
- Shared edge editing is only available in 2D map views



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

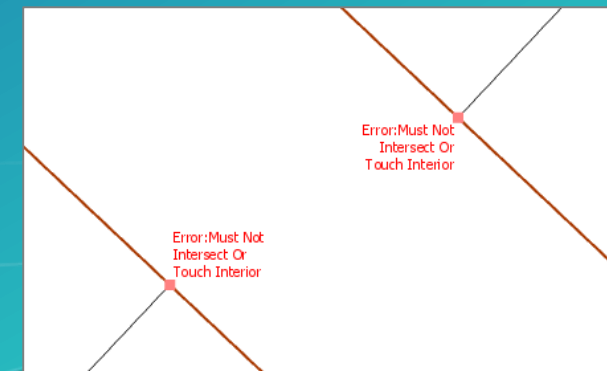
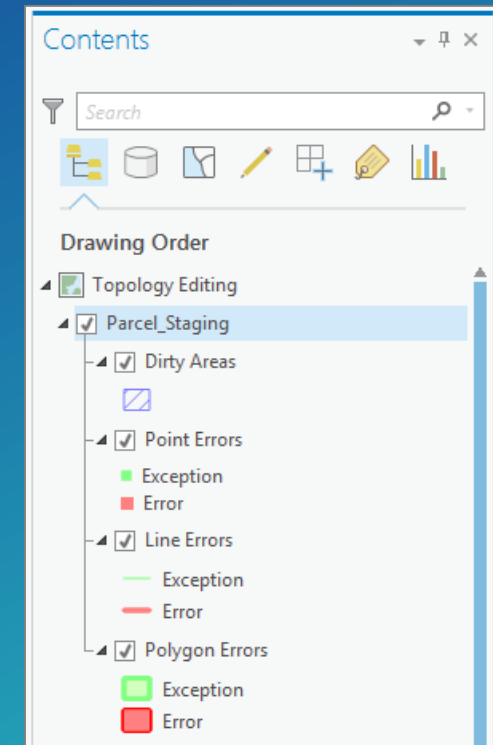




Map Topology Demo

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

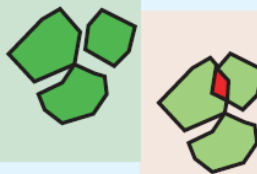


Geodatabase Topologies – Topology Rules

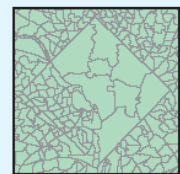
- 32 topology rules (no custom rules)
- Single or multiple feature classes
- Apply to feature class or subtype level
- Categorized by geometry type (polygon, line, point)
- Can also export topology errors with a Geoprocessing command
 - i.e Soil Polygons can't have gaps between them

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.




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


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

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.

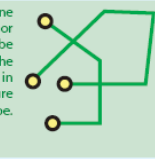


Use this rule when you want lines in a feature class or subtype to connect to one another.

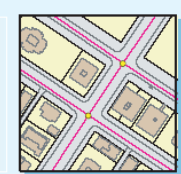
A street network has line segments that connect. If segments end for dead-end roads or cul-de-sacs, you could choose to set as exceptions during an edit session.

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.

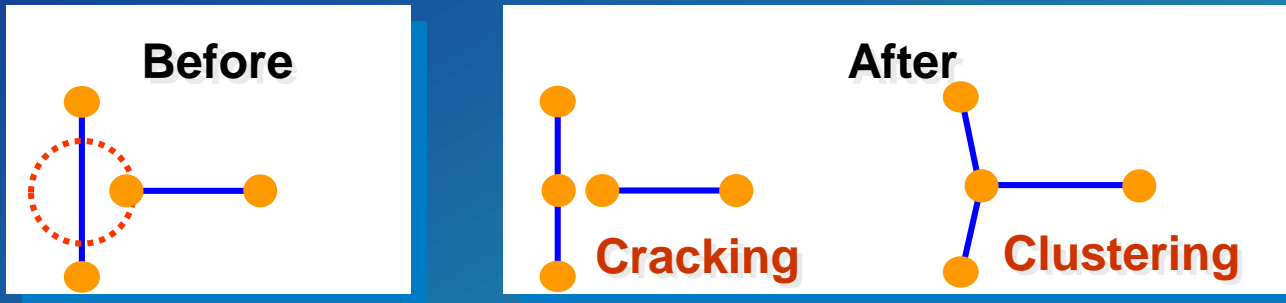


Use this rule when you want to model points that are coincident with the ends of lines.

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

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



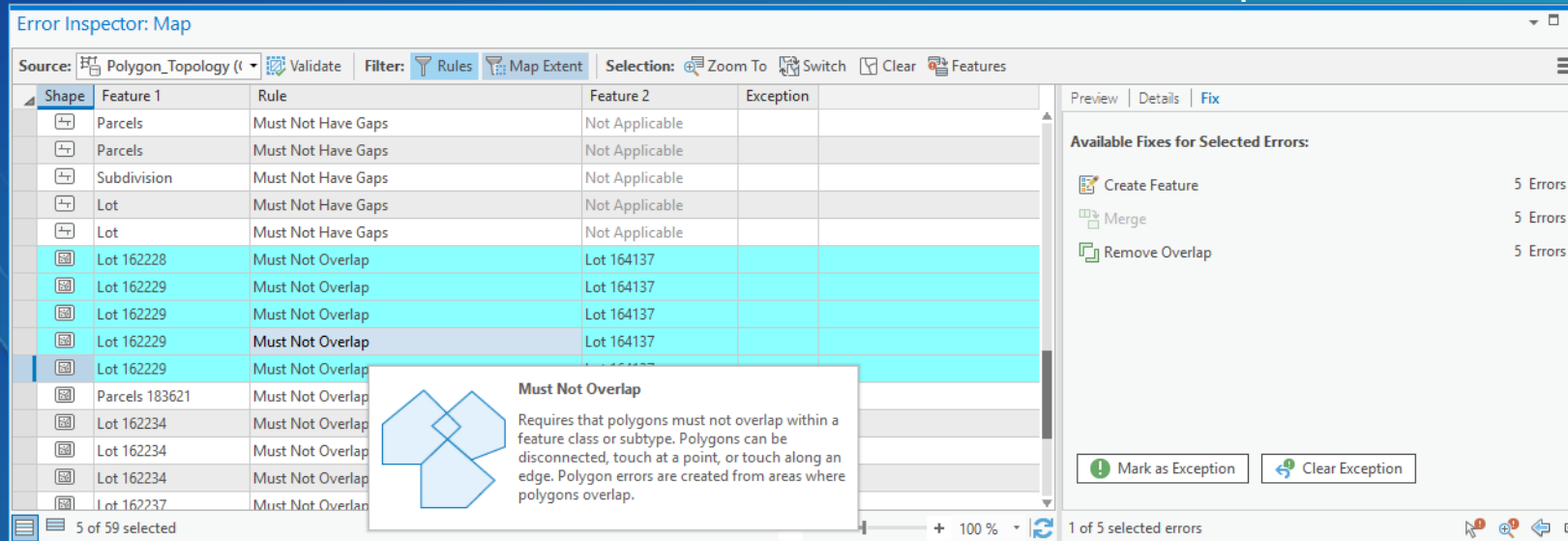
- Validates topology rules which may generate errors
 - **Deletes errors if the rules are no longer violated**
- No new features are created

Geodatabase Topologies – Editing Errors

- Errors cannot be deleted directly, the features must be edited and the topology re-validated
- Three options for correcting errors:
 1. Leave the error in the database
 2. Fix the error
 3. Elevate the error to exception status. This allows you to say this rule applies everywhere except 'here'

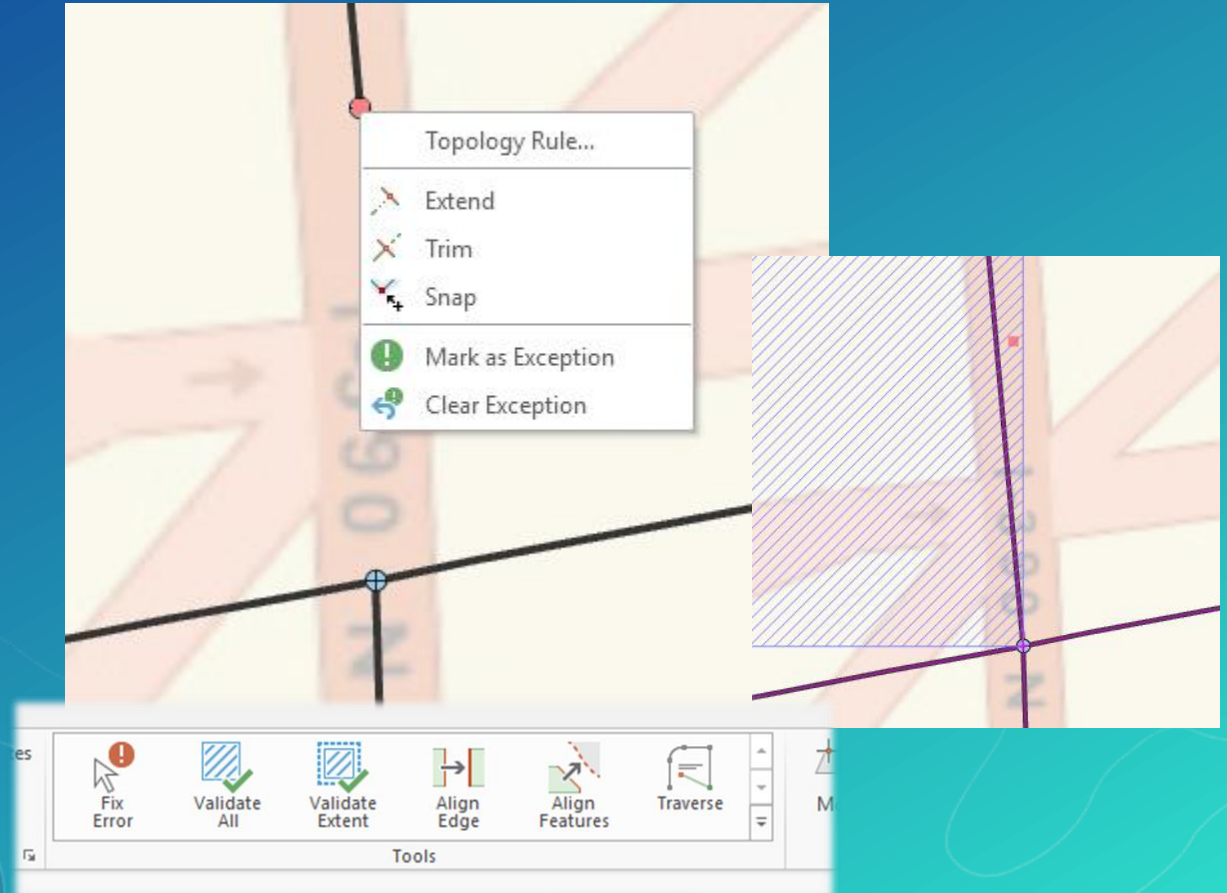
Geodatabase Topologies – Error Inspector

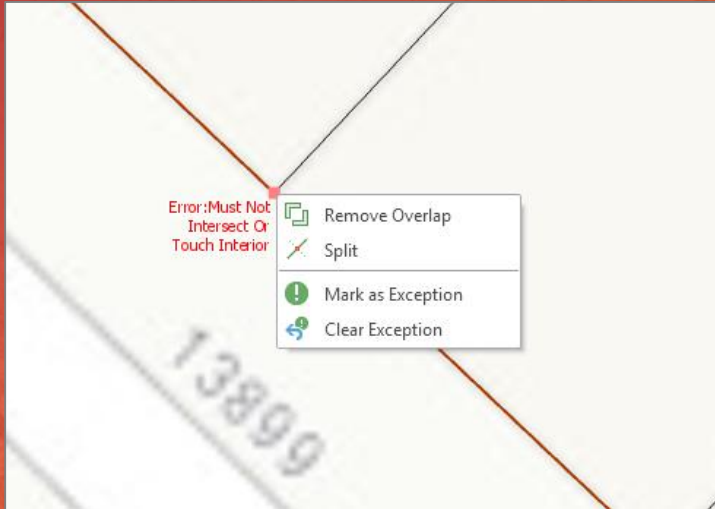
- **Error Inspector lets you view and fix topology errors in a table.**
 - The rule violated
 - The feature class or classes involved in the error
 - The geometry of the error
 - The feature ID of the features involved in the error
 - Whether or not the error has been marked as an exception



Geodatabase Topologies – Editing Errors

- **Fix Error tool provides an quick and easy way to fix topological errors in the map**
- **Select the topology errors on the map**
 - Creates an “Active Error Selection”
 - Context menu with fixes based on rule
- **Dirty areas are where edits were made**
- **Revalidate after edits**
 - Validate current map extent or entire topology





Geodatabase Topology Demo

Summary of Topologies

- If you just need to edit coincident boundaries – consider a map topology
- If you need to define and validate rules – use a geodatabase topology
- With geodatabase topologies:
 - Build and validate to improve spatial integrity between your data layers
 - Use the available editor tools to find and fix your errors
 - Use automated fixes as much as you can, but they aren't the answer for every error

ArcGIS Desktop Editing – Technical Workshop Schedule

- **ArcGIS Pro Editing: An Introduction**
 - Tuesday 7/11, 10:15 AM – 11:30 AM, SDCC - Ballroom 06 A
 - Wednesday 7/12, 10:15 AM – 11:30 AM, Hilton - Sapphire Ballroom E
- **ArcGIS Pro: 3D Editing**
 - Wednesday 7/12, 8:30 AM – 9:45 AM, SDCC - Ballroom 06 B
 - Thursday 7/13, 8:30 AM – 9:45 AM, SDCC - Ballroom 06 B
- **ArcMap Editing: Tips and Tricks**
 - Tuesday 7/11, 3:15 PM – 4:30 PM, SDCC - Ballroom 06 A
 - Wednesday 7/12, 10:15 AM – 11:30 AM, Hilton - Sapphire Ballroom I
- **ArcGIS Pro: Data Alignment and Management**
 - Wednesday 7/12, 3:15 PM – 4:30 PM, SDCC - Ballroom 06 C
 - Thursday 7/13, 10:15 AM – 11:30 AM, SDCC - Ballroom 06 B

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