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Box Elder County, UT

Editing Parcel Fabric in ArcGIS Pro
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It's important to know

ArcGIS for Local Government Specialty

ArcGIS Online Specialty

Release Ready Specialty

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Contents

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Getting Familiar with the ArcGIS Pro Environment

The first step to learning about the Parcel Fabric in ArcGIS Pro is learn the software in which you'll be editing the data.

Let's start training with a couple exercises to get familiar with some basic concepts.

Project Start-Up

EXERCISE: Create a Project

- Open ArcGIS Pro
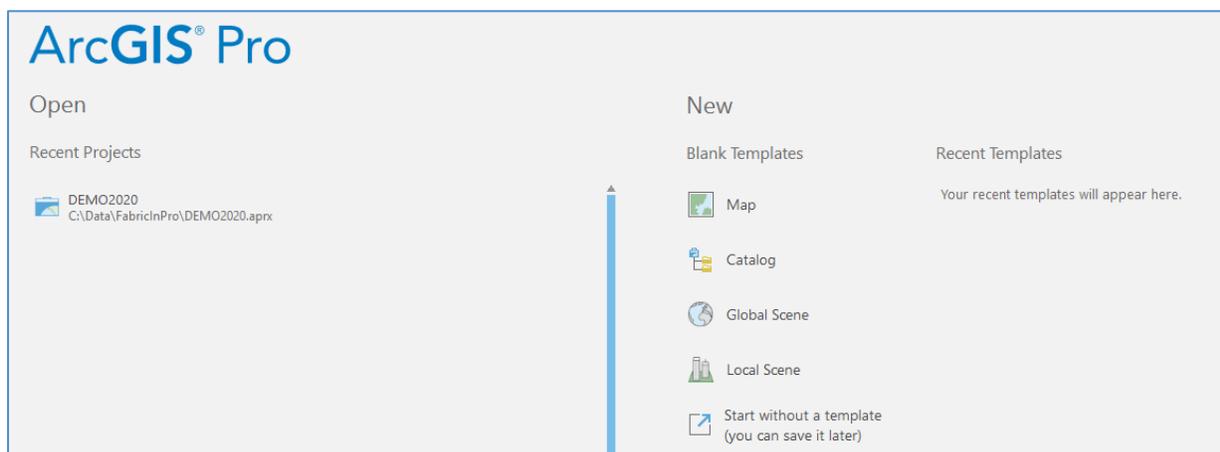
- Review Resources
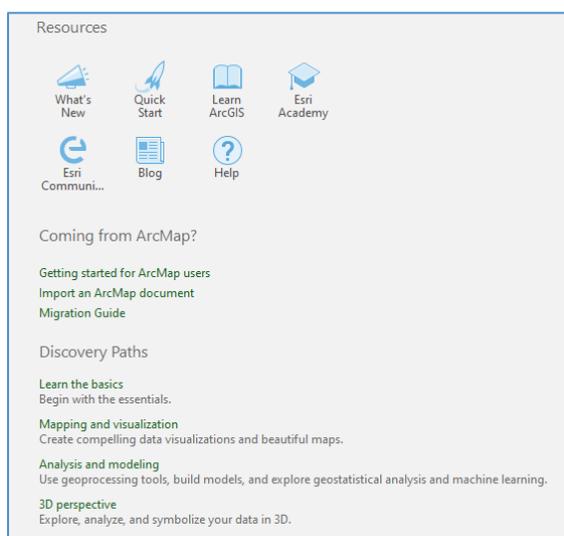
- Choose **Start without a template** option.

Connect to Geodatabase

Let's add the **file geodatabase** for practice work.

- Navigate to the location of the file geodatabase that contains your practice data.

NOTE:
Practice data will be a file geodatabase and will use the Add Database option.
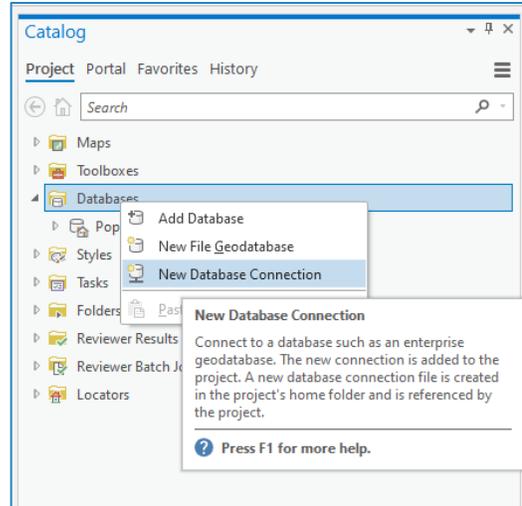
Add Fabric to Map

To add the **practice parcel fabric** and its associated layers to a map . . .

- right-click the parcel fabric in the **Catalog** pane (blue icon in the list)
- click **Add To New > Map**.

    TIP: You can also add the parcel fabric to a current map view or drag the parcel fabric into a map.

Note:

- You do NOT need to add all the parcel fabric associated layers to the map. When you add the parcel fabric to a map, associated layers are automatically added.

- Only one parcel fabric can be added to a map.

- Any non-fabric layers can be added after adding the fabric to the map.
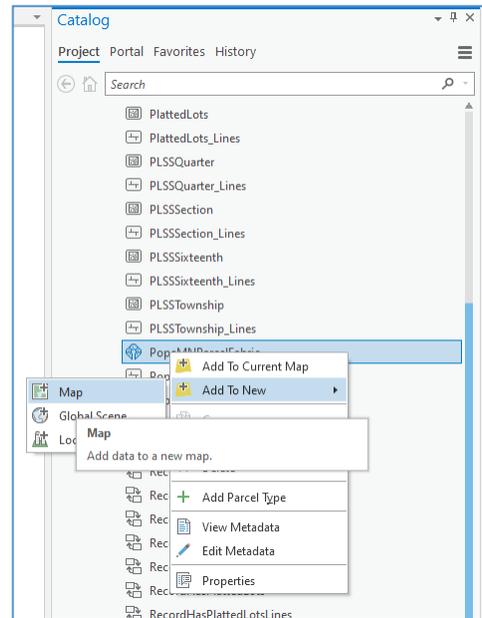
To add **your live data**, you will likely be using a feature service connection and will use your organization Portal to access it. The steps are the same . . .

- right-click the parcel fabric in the **Catalog** pane (blue icon in the list)
- click **Add To New > Map**.

TIP: You can also add the parcel fabric to a current map view or drag the parcel fabric into a map.
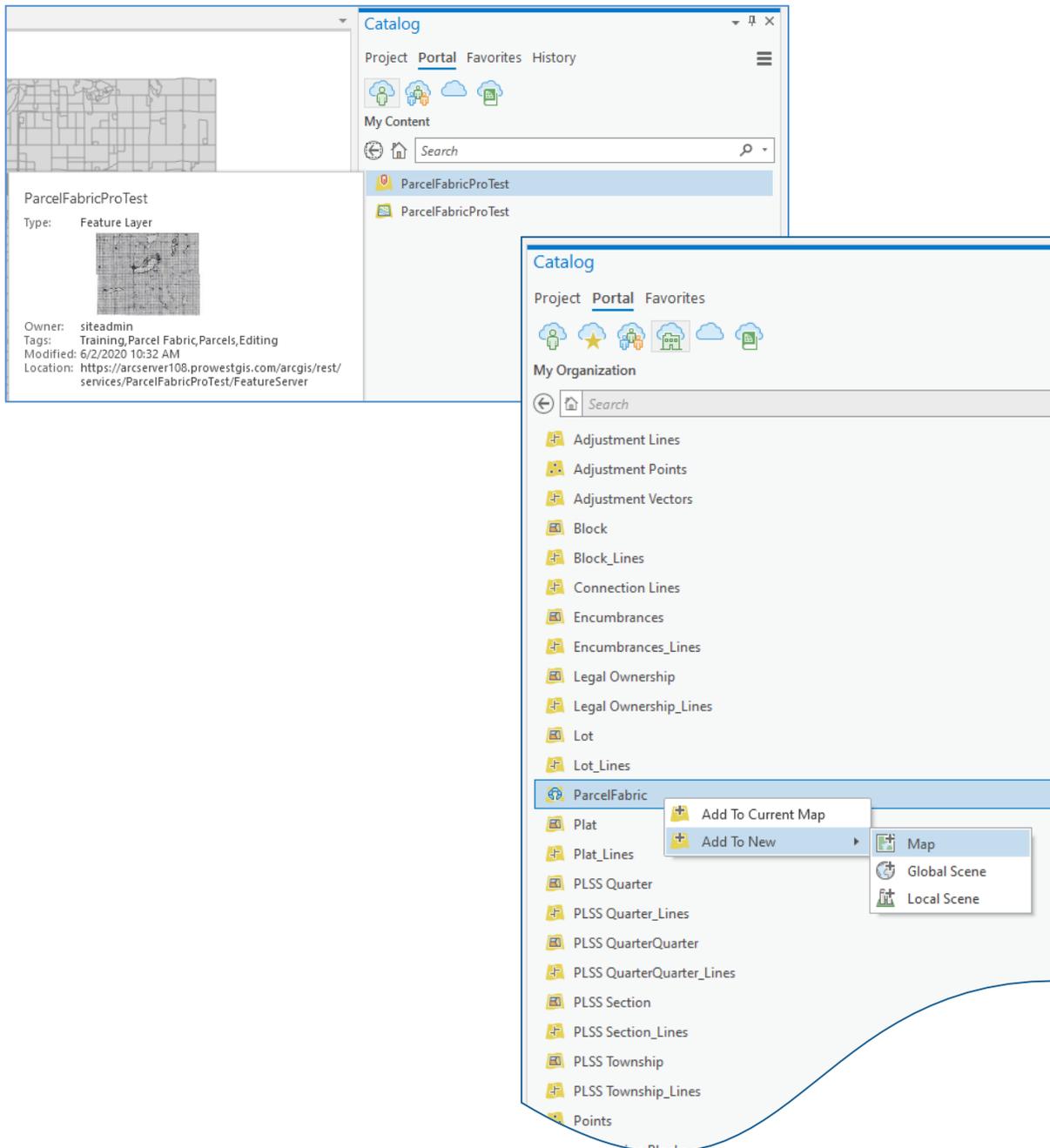
Map Overview

To reference the parts of the ribbon-based header, let's get familiar with the vocabulary.

Header Information
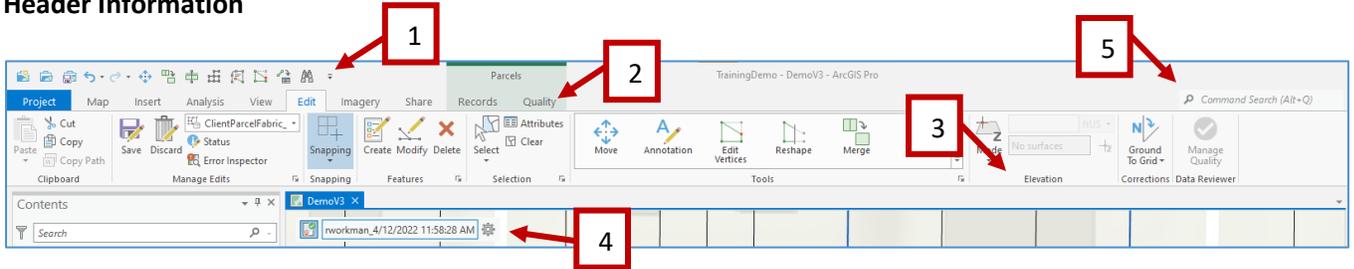
1. Quick Access toolbar
2. Ribbons/Tabs
3. Groups/Modules
4. HUD – Heads-Up Display
5. Command Search Bar

Table of Contents
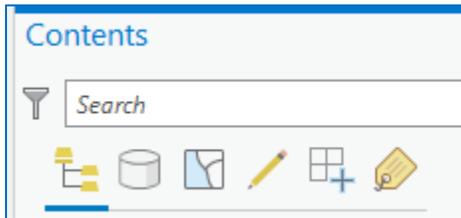
- List by Drawing Order
- List by Data Source
- List by Selection
- List by Editing
- List by Snapping
- List by Labeling

Setting Project Options

The following sections describe the editing environment in ArcGIS Pro and the various options you can set for displaying and editing parcels.

EXERCISE: Examine Options

1. Project options – Units, General, Map & Scene, Navigation, Editing, Customizing the Ribbon

Units

Let's review what is currently set and examine what our other options are in the event we need to change them at any point.

This is also where we can add / remove values we may need to use along the way for editing our data.

Example: Distance units
- Chains
- Rods
- Links
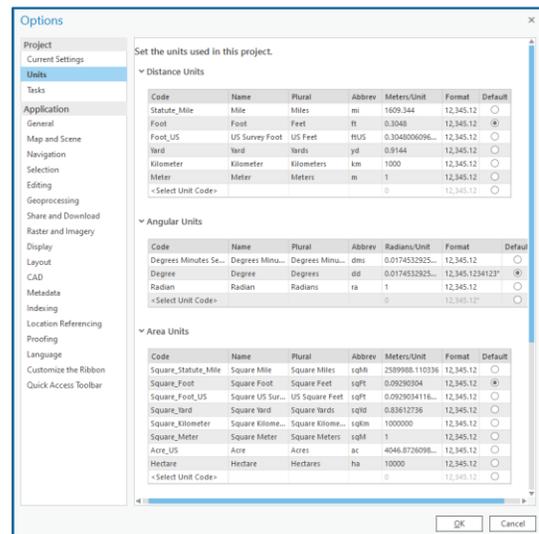
General

Here, you can change the theme of your Pro to be either the light or dark look, change the default settings for new projects, and determine how you want Pro to start each time you open it.

Project Recovery – autosave backup after x minutes
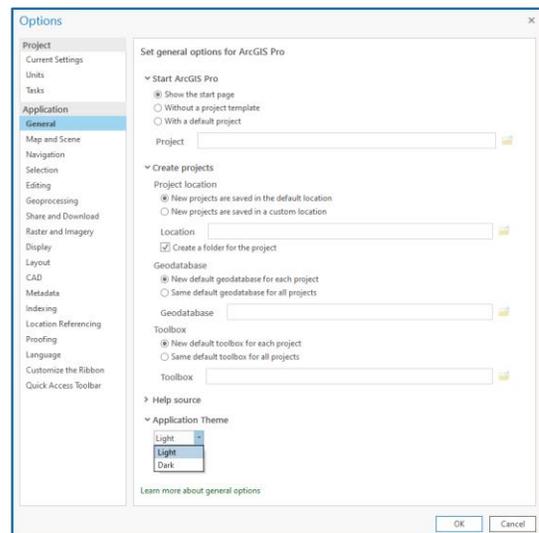
Map & Scene

The most noted highlight here is the option to make newly added layers either visible or not by default.

Basemap option
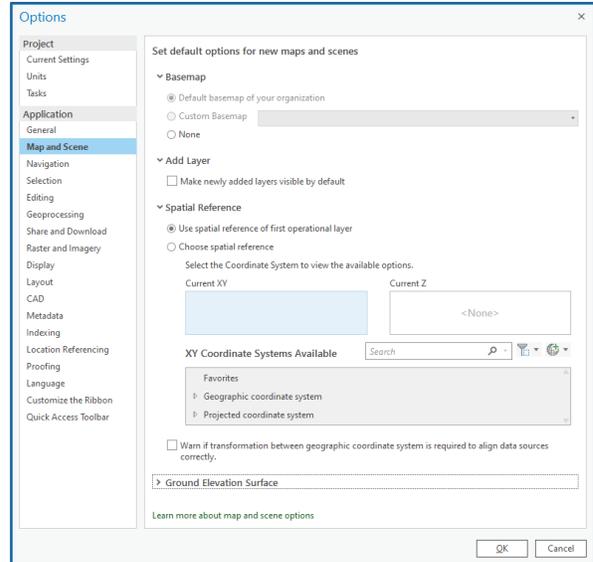
Navigation

Ah, the scrolly wheel conundrum! Which way do you like your mouse to work . . . if you roll forward, are you zooming in to the data or zooming out?
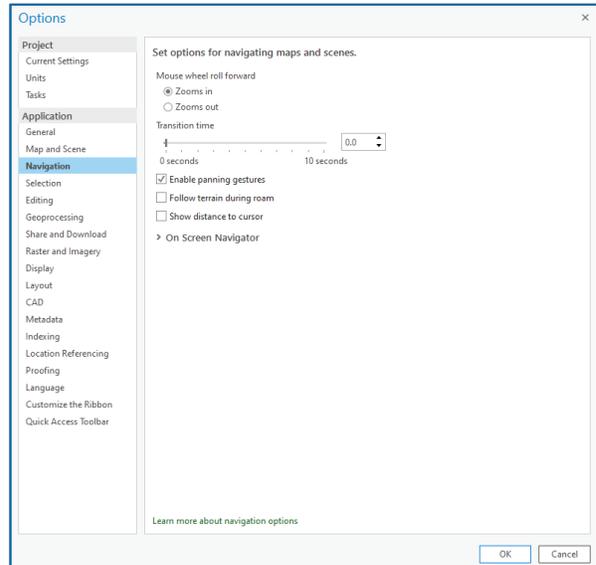
Editing

Several items require some deeper looks in the Editing options.

- Dynamic Constraints
- Double Click shortcut
- Editing toolbar placement
- Auto save
- Confirm save and discard edits
- Uncommitted edits behavior
- Dialog to confirm deleting data
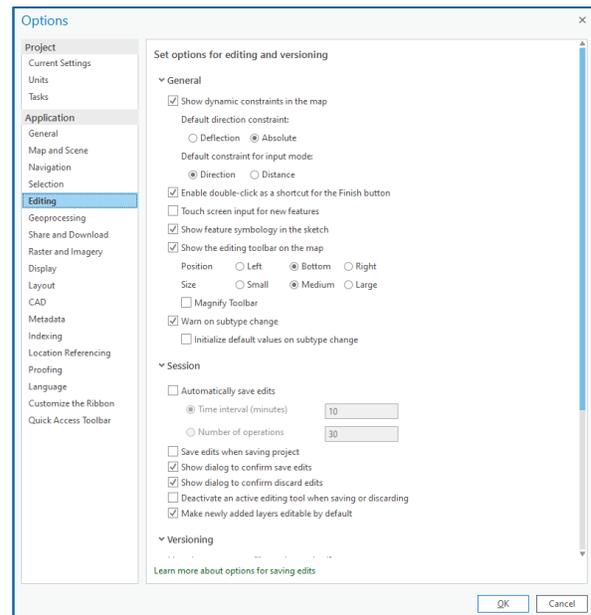
Customize the Ribbon

Everyone likes to make it their own, so here is the place you can do just that . . . what is available where. Take a look and explore a bit.
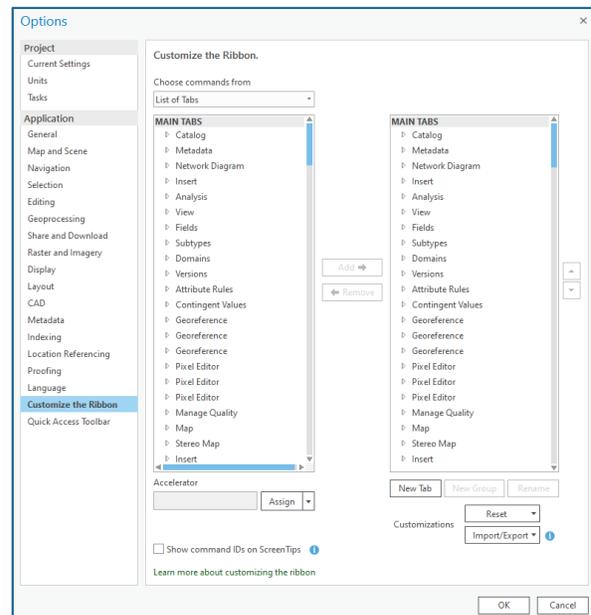
The Parcel Fabric

Parcel Fabric Concept

A parcel fabric is a 'continuous surface' of parcels – picture it as a geometric network of parcels. It is a seamless network of connected parcel boundaries because every parcel is either linked or connected to other parcels or control.

Parcel Fabric in ArcGIS Pro introduced the concept that the parcel fabric is the controller dataset that controls simple feature classes and a geodatabase topology.

The parcel fabric is created as a controller dataset that manages the following feature classes and topology:

- Records feature class
- Geodatabase topology
- Points feature class
- Connection lines feature class
- Parcel type feature classes
    - Polygon feature class
    - Line feature class
    - Historic group layer
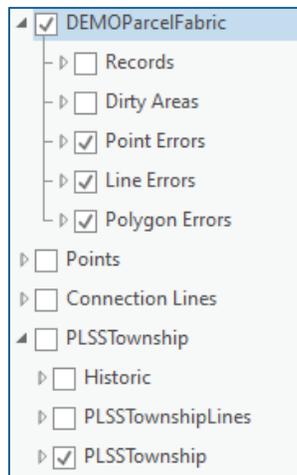
Parcel Editing Dataset

A Parcel Fabric MUST be located within a feature dataset.

For clarity, Pro-West often uses the LGIM dataset name of "ParcelEditing" to ensure everyone knows exactly for what purpose that dataset is used.

In ArcGIS Pro, when a parcel fabric is created or upgraded, several items are automatically created:

- The Parcel Fabric itself – the blue icon
- Connection lines
- Points
- Records
- Topology
- Relationship Classes (not visible in **Contents**)
- Validation feature classes/table in the root GDB
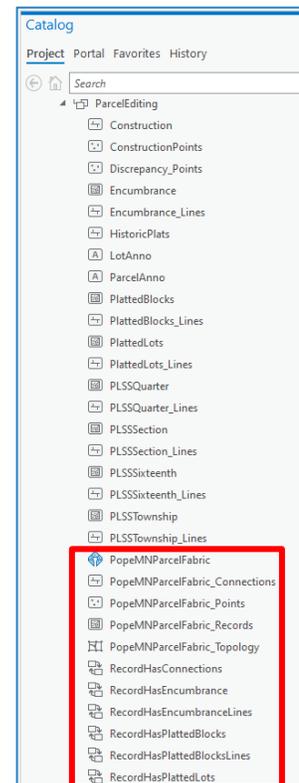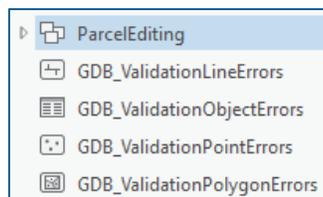
Let's dive in!

Fields

The attribute fields are configurable based on the needs of the client, the attributes in the current client data, and any recommendations made by Pro-West.

- Fields in the data can be added, removed, or edited within the Catalog pane as desired.
- Fields from one feature class can also be copied and pasted into another feature class.
- It is NOT recommended to edit or remove default Parcel Fabric fields as those are set up for a variety of purposes.
  - If you wish not to see all the fields when working in ArcGIS Pro, you have the ability to hide them in the Design > Fields view using the "Visible" column of checkboxes.

EXERCISE: Explore Fields

- Add a new field manually and test Copy/Paste from another feature class
  - Set Visibility
  - Set Highlighting
- Examples:
  - Doc # field,
  - Doc Type field,
  - Comments,
  - alt PIN field,

Domains

When a parcel fabric is created in ArcGIS Pro, the following domains are added to the geodatabase:

Parcel fabric domain	Name	Description
PF_AdjustmentConstraint	Parcel Fabric Adjustment Point Constraint	Whether points should move in an LSA (are the control points or not?) • XY free, Z constrained (regular parcel point) • XYZ constrained (control point that won't move in an LSA)
PF_AreaUnits	Parcel Fabric Area Units	The units used for stated area. Examples include: • Acre • Square Foot
PF_COGOType	Parcel Fabric COGO Type	The COGO dimensions type. • **From Measurements / Entered** if the dimensions match the measurements on the record. • **From Geometry** if the dimensions are generated from the line geometry. • **Computed** if the dimensions are derived from other dimensions, for example, parcel merge.
PF_LabelPosition	Parcel Fabric Label Position	Indicates if the label position is to the left or right of the parcel line or is centered over the parcel line
PF_YesNo	Parcel Fabric Yes No	True or false. 0=No, 1=Yes

Client domains can be added and configured as well to accommodate their needs. The final list of domains can be found in the Data Dictionary.

UPGRADE TIP:
If the data is upgraded from an existing ArcMap parcel fabric, any domains in use will be transferred to the ArcGIS Pro parcel fabric and applied.

Domains in the geodatabase can be added, removed, or edited to work with your data as desired. It is NOT recommended to remove default Parcel Fabric domains as those are used for a variety of purposes. It is also NOT recommended to remove any domain values from a default domain. If you wish, you may add values to an existing domain to fit your specific needs.

EXERCISE: Explore Domains

- Create a domain – apply to a field (ex: Doc Type)
- Copy/Paste a domain
- Add/delete values from a domain (example: CSM)

Layer Properties

Double click any of the items in the Table of Contents and the Layer Properties for that item will be shown. There are many tabs that have options to alter the behavior and appearance of the item.

General Tab: Name & Scale

The first tab, General, is where you can change the name of the item as it will appear in the TOC.

Additionally, the General tab is where the control is set for the scale at which the layer is visible. This is very helpful when dealing with datasets with varying sizes and properties.
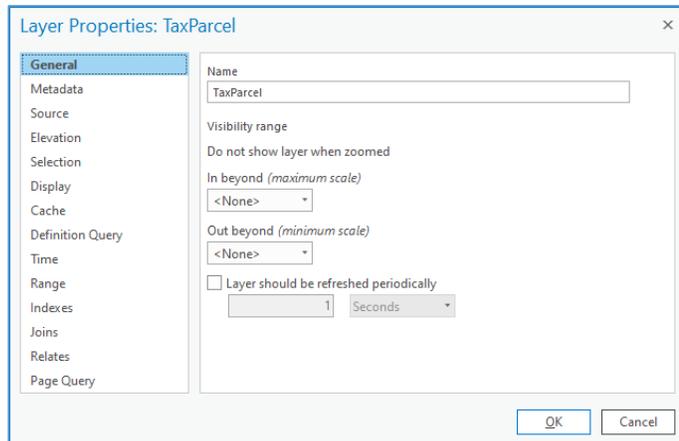
Definition Query Tab

The Definition Query tab allows for only very specific data to be visible from the overall source layer. The query can be created with the 'New definition query…' button or by editing the existing query.
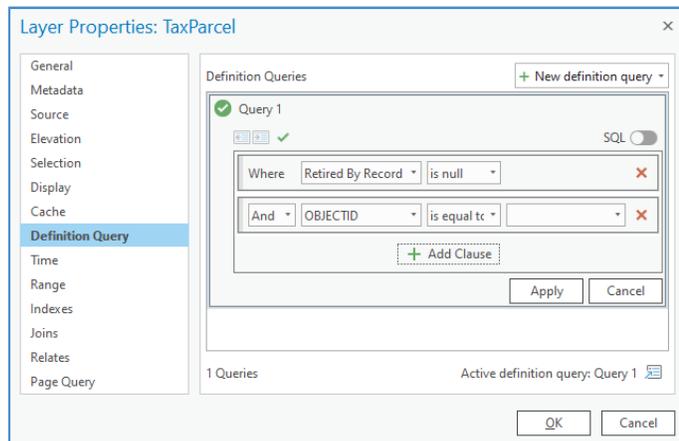
Joins & Relates Tabs

Note the relationships in which each feature class participates.
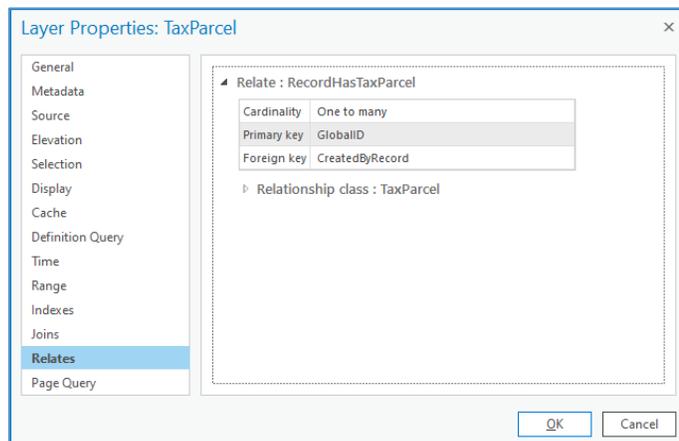
What is the Points feature class?

Points represent parcel corners, end points of connection lines, and stand-alone cadastral reference features such as control points.

UPGRADE TIP:
Upon an upgrade from an existing ArcMap parcel fabric, any Control Points are migrated to the Points feature class and are attributed in the **Is Fixed** field as "Yes". All other fabric points are migrated to the Points feature class with **Is Fixed** as "No".
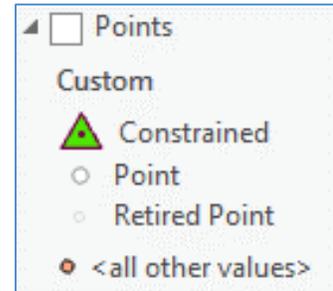
The Points class is enabled with editor tracking and has the following system-added attribute fields:

Attribute field alias	Data type	Description
Name	Text	Name of the point or control point.
Created By Record	Guid	Global ID of the record that created this point.
Retired By Record	Guid	Global ID of the record that retired this point. The point becomes historic if all adjacent parcels are historic.
Is Fixed	Long	Indicates whether the point is a parcel point or a control point. Fixed points have coordinates that cannot be changed. The field uses the system-added PF_YesNo domain.
Adjustment Constraint	Long	Used in LSA to determine the amount of influence the point can have. A system-added domain indicates if XYZ are fully constrained or if XY are free.
Preserve	Long	Used in LSA to determine whether the point can move (not control) or stay where it is at (control).
Ellipse Major	Double	Feedback mechanism
Ellipse Minor	Double	Feedback mechanism
Ellipse Direction	Double	Feedback mechanism
X	Double	X-coordinate of the point.
Y	Double	Y-coordinate of the point.
Z	Double	Z-coordinate of the point.
XY Accuracy	Double	Horizontal positional accuracy.
Z Accuracy	Double	Vertical accuracy.
XY Uncertainty	Double	
GlobalID	Global ID	Global ID of the point. Global IDs uniquely identify features in a geodatabase.

EXERCISE: Explore Control

- Create a new control point

What are Connection Lines?

Connection lines are used to define measurements between points that are not parcel boundaries.

For example, connection lines are lines that connect parcel points across roads or lines that connect parcel points to control points.

Connection lines can be used for a variety of reasons:

- To label ROW width (as shown)
- To see Origin to POB traverse
- To represent centerline or other line features that will not have a polygon in the parcel fabric

The Connection Lines feature class is a COGO-enabled lines feature class and is enabled with editor tracking.
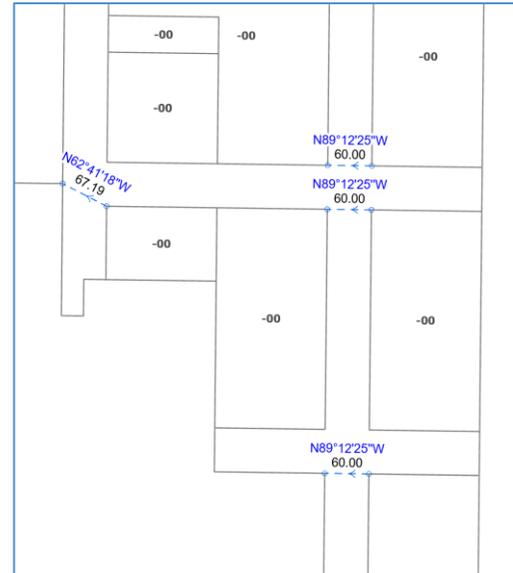
UPGRADE TIP:
If the ArcGIS Pro parcel fabric data was upgraded from an existing ArcMap parcel fabric, certain features were added to the Connection Lines feature class.

- Connection lines
- Precise Connection lines
- Origin to POB lines
- Unclosed parcels

Since lines in an ArcMap parcel fabric are associated with Plans, when upgraded to ArcGIS Pro, the **Created By Record** field of the Connection Lines feature class is populated with the Global ID of the transferred associated Record.

Consider adding a new field and creating a new domain – both 'ConnectionType' – if knowing which lines are which type of connection is important.

EXERCISE: Explore Connection Lines

- Create a connection line to generate a label.
- What other scenarios could you use this?

What are Parcel Type feature classes?

Parcels are added to the parcel fabric as parcel types.

A parcel type is defined by a polygon and a line feature class. Both the parcel polygons and the lines are associated with the legal record that created them.

Parcel types can have different schemas (attribute fields and related tables) and can participate in different geodatabase topology rules and attribute rules.

Examples of parcel types are Tax parcels and Subdivision parcels.

<u>UPGRADE TIP:</u> When an existing fabric is upgraded, the lrParcelType domain is used to generate the Parcel Types in ArcGIS Pro.

- If there are features for a value, then a Parcel Type is created.
- If there are no features for a value, then it is not created.
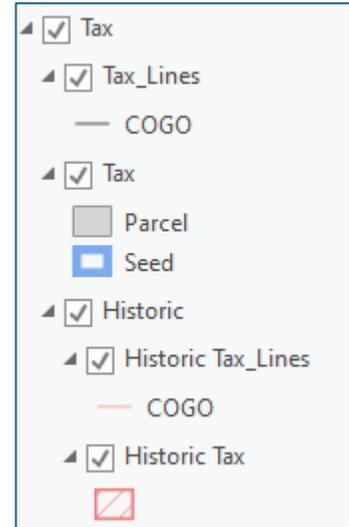
Parcel polygon feature class

The parcel polygon feature class is enabled with editor tracking and has the following system-added attribute fields:

Attribute field alias	Data type	Description
Name	Text	Parcel name or identification number (PIN).
Parcel Subtype	Long	Used for adding subtypes. Use the Add Subtype geoprocessing tool to add a subtype.
Created By Record	Guid	Global ID of the record that created this parcel.
Retired By Record	Guid	Global ID of the record that retired this parcel. The parcel is historic.
Stated Area	Double	Area stated on the legal record.
Stated Area Unit	Long	Units of the area stated on the legal record. The field uses the system-added PF_AreaIUnits domain.
Calculated Area	Double	Area of the polygon shape.
Misclose Ratio	Double	Ratio of the parcel's misclose distance to the parcel perimeter.
Misclose Distance	Double	Distance between the start point and end point of the parcel traverse.
Global ID	Global ID	Global ID of the parcel polygon. Global IDs uniquely identify features in a geodatabase.
Is Seed	Long	Indicates whether the parcel is a seed parcel. The field uses the system-added PF_YesNo domain.
Validation Status	Short	Reports whether the feature has been validated or not and if there are errors associated with previous validations

Parcel line feature class

The parcel line feature class is a COGO-enabled feature class, is enabled with editor tracking, and has the following system-added attribute fields:

Attribute field alias	Data type	Description
Created By Record	Guid	Global ID of the record that created this parcel line.
Retired By Record	Guid	Global ID of the record that retired this parcel line. The line is historic.
Direction (COGO-enabled field)	Double	The direction (bearing) of the line from its start point to its endpoint.
Distance (COGO-enabled field)	Double	The distance between the start and endpoint of the line.
Radius (COGO-enabled field)	Double	The distance between the curved line and the curve center point.
Arc Length (COGO-enabled field)	Double	The arc distance between the start and endpoint of the curved line.
Radius2 (COGO-enabled field)	Double	Stores a curve parameter for spiral curves.
COGO Type	Long	The COGO dimensions type. Dimensions can be derived from geometry, computed, or entered from measurements on the record. The field uses the system-added PF_COGOTYPE domain.
Is COGO Ground	Long	Indicates whether the COGO dimensions are on the ground or on the grid. The field uses the system-added PF_YesNo domain.
COGO Accuracy	Long	Indicates the accuracy of the dimensions of the line. The field uses the system-added PF_COGOAccuracy domain.
Rotation	Double	Angle the line is rotated to fit to the parcel fabric.
Scale	Double	Amount the line is scaled to fit to the parcel fabric.
Parent Line ID	Guid	Global ID of the parent line that was split to create this line.
Direction Accuracy	Double	Based on the survey, the direction accuracy of the value in the COGO direction field. The default value is 30 seconds indicating that the direction is accurate up to 30 seconds.
Distance Accuracy	Double	Based on the survey, the distance accuracy of the value in the COGO distance field. The default value is 0.5 ft indicating that the distance is accurate up to half a foot.
Label Position	Long	Position of the line that the label will appear. This field uses the PF_LabelPosition system-added domain.
Validation Status	Short	Reports whether the feature has been validated or not and if there are errors associated with previous validations
GlobalID	Global ID	Global ID of the parcel line. Global IDs uniquely identify features in a geodatabase.

Historic Group Layer

For many organizations, the ability to automatically maintain and archive parcel history is a primary reason for the migration to the parcel fabric. The history of the parcel is as much a part of the legal record as new survey information.

Historic parcels

The parcel fabric tracks parcel history with both Record date (date on record of survey) and system date (date parcel changes were entered into the database).

When an existing parcel is replaced by parcels created in a new Record, the existing parcel and its lines become historic and the active Record is coded into the RetiredByRecord field.

In showing the historic features in a map, the feature is controlled by the definition query:
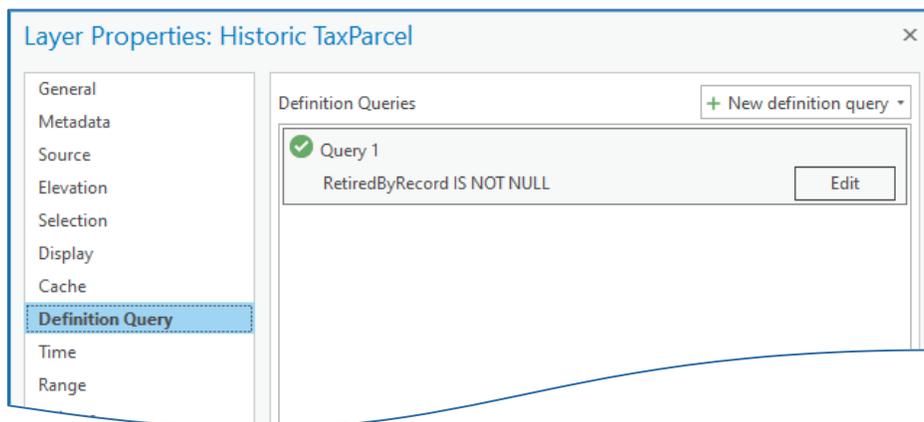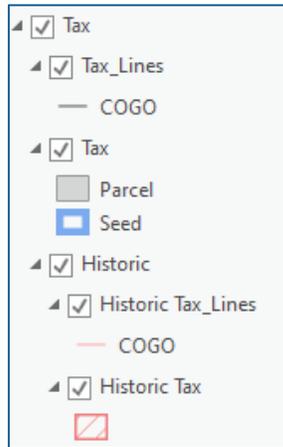
EXERCISE: Explore your parcel types

What are Records?

The parcel fabric organizes parcel data based on the original recorded data, typically plans, plats, or records of survey. Plans, plats, or records of survey are **legal documents** used by surveyors and engineers to describe and map the findings of their fieldwork.

Parcels are created and edited in response to changes in the legal record. Changes in the legal record are typically reflected in the submission of a new record of survey.
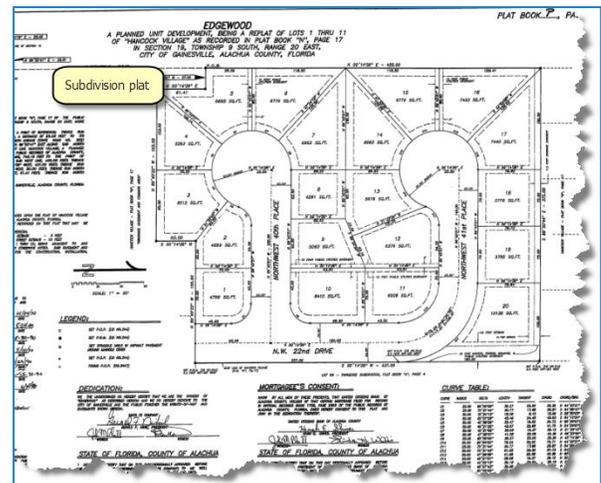
The **Records** feature class stores manually entered information about the legal parcel record such as the record date and record type.

A single polygon feature with a unique record name is stored for every legal record added to the parcel fabric. The record spatial feature is a polygon feature that automatically matches the cumulative geometry of all the parcels associated with it.
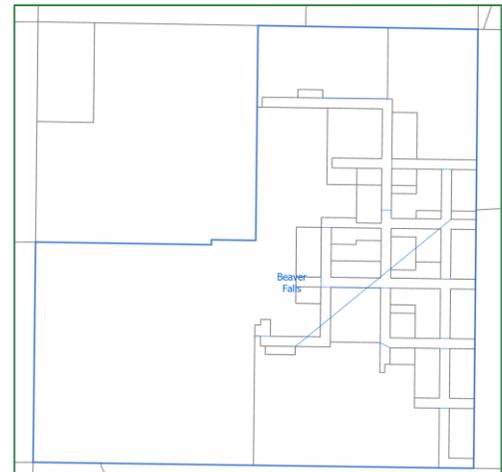
The **Records** feature class is a polygon feature class that stores the following information:

- A single record feature for every legal record added to the parcel fabric.
- A GlobalID for every record, which is referenced by all the parcel features associated with the record. The Created By Record field of the parcel features stores the GlobalID of the associated parcel record.
- The geometry of the record, which is the record footprint. The record footprint or polygon matches the cumulative geometry of all the parcels associated with it.
- Unique record names that allow for integration and association with external recording systems.

In addition to a drawing of the survey measurements, Records contain other information that can be added as attribute fields withing the Records feature class such as the following:

- Legal description of the surveyed area
- Easement and right-of-way description

- Type of document
- Landownership information
- Approval statements
- Name of the surveyor
- Legal date the plan was recorded
- Survey date
- Plan units

UPGRADE TIP:
If the data was upgraded from an existing ArcMap parcel fabric, the Plans table is migrated into the Records feature class and is given the spatial area of the parcels associated with the original Plan. All Plans table attribute fields are migrated to the Records feature class as well.

The following are the system-added attribute fields by default:

Attribute field alias	Data type	Description
Name	Text	Name of record, plan, deed, or other legal document. **The name must be unique.**
Record Type	Long	Stores the user-defined type of the record, for example, a plan or deed. **Add your own record type domain to this field.**
Recorded Date	Date	The date the legal record was recorded. This is typically stated on the record document.
Parcel Count	Long	The number of parcels currently assigned to a record
Retired Parcel Count	Long	The number of parcels currently retired by a record
GlobalID	Global ID	GlobalID of the record. Global IDs uniquely identify features in a geodatabase. Parcel features are associated with records by referencing the record GlobalIDs in their attribute fields.

EXERCISE: Explore Records

- Can you add any other fields to the Records that you might want to reference?
    - Examples might be: Surveyor, Survey Company, Document number, etc.
- Do we need to add a Record Type domain?

Record-driven vs. Quality-driven Workflows

In addition to the structural parcel fabric features, the parcel fabric was designed with both **Record-driven** and **Quality-driven** workflows in mind. These two themes are the systems that dictate and manage the behavior of the Parcel Fabric.

Record-driven Workflows

What do we mean when we say the Parcel Fabric is a **Record-driven** system?

The Parcel Fabric demands the inclusion of Records for many of the functions and tools. It was designed that way to mirror the legal record system. Records in the Parcel Fabric are representing your legal records within your parcel management system. History is also tracked within the Parcel Fabric through Records in the form of Historic Parcels.

Legal records should be a unique document such as:

- Deed
- Plat
- Plan
- Survey record

Legal documents are what drive changes in your parcels and in your Parcel Fabric. Some examples of those changes that translate into workflows withing the Parcel Fabric are:

- Splits
- Merges
- New Subdivisions

Quality-driven Workflows

What do we mean when we say the Parcel Fabric is a **Quality-driven** system?

Quality-driven workflows do not require a Record to be executed. Within the Parcel Fabric, quality is managed through several components. Some of those components are:

- Topology
- Attribute Rules
- Consistency Checks
- Weighted Least Squares Adjustments (LSAs)
- Versioning

The Editing Environment

Editing Ribbon

Manage Edits Group

Save / Discard:

An edit session is automatically started when you modify or create data. The edit session stops when you save or discard your edits.

- To save your edits, click **Save** 💾 on the **Edit** or **Records** ribbon.
- The edit session resumes when you make subsequent edits until you save or discard those edits.

Topology

Data editing can use any tool, but how those features **behave** is based on the type of topology set forth on the Edit ribbon. Topology is the concept of keeping features in alignment with the use of rules. ArcGIS Pro has 3 options:

No Topology

When this option is selected, there is nothing controlling the behavior of the data – no rubber-banding to hold things together. All features are free to move as you wish. This is an option to use **SPARINGLY** when there is something very specific that needs to be completed.
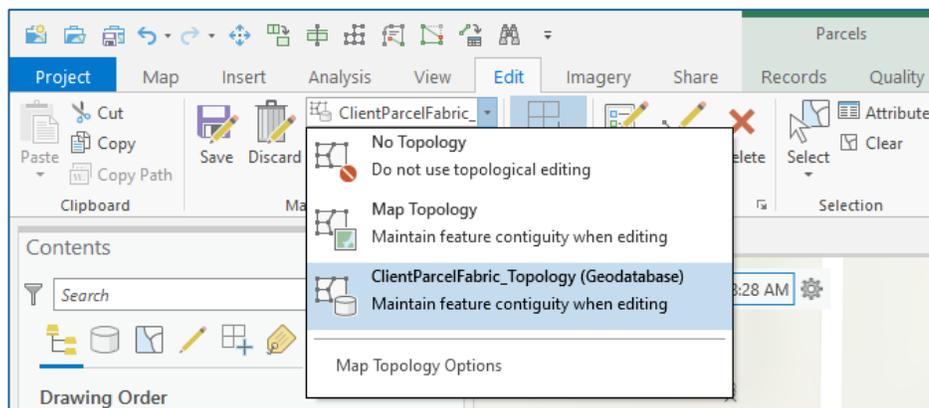
Map Topology

Map topology can be used to maintain coincidence with all <u>visible</u> adjacent features. Features that are not visible while edits are being made will not be automatically maintained. The Align Edge tool employs Map topology when completing that task.

Parcel Fabric Topology

Topological integrity between parcel features is maintained using parcel fabric topology, which is automatically turned on when a parcel fabric layer is added to the map. Parcel fabric topology automatically maintains coincidence with all adjacent features when individual parcel features are edited.

EXERCISE: Explore topology

- Try the various options with moving items around. Note the rubber-banding.

Review Editing Status

Parcel fabric layers have different **editable states** depending on the database in which they reside and the database connection. With your parcel fabric layers added to the map, click **List By Editing** 🖊 in the **Contents** pane to view the layer editing states.

Parcel fabric layers can have the following editable states:
- Editable
- Editable with warnings ⚠
    - when the map is in a different projection from that of the parcel fabric layers
    - when the parcel fabric layer is being edited on the default version (edits cannot be undone).
- Not editable 🔴
    - they were added directly to the map from an enterprise geodatabase connection
    - if they're connected to a traditional-versioned geodatabase and published as a feature service.

Hover over the edit state icons next to the layers to see a description of the error or warning.

You can also click **Status** 🔵 in the **Manage Edits** group on the **Edit** ribbon to view the editing states of layers in different maps in the project.

Snapping

Enable snapping
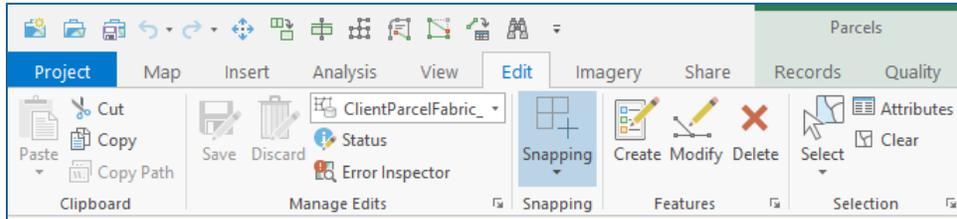
To enable snapping, do the following:

1. Click **Snapping** ⊞₊ in the **Snapping** group on the **Edit** ribbon.

2. Click the **Snapping** drop-down arrow to enable or disable snap agents such as **Point** ◯, **Endpoint** ⊞, and **Edge** ▱.

Tip:
Snapping ⊞₊ is also available on the status bar located at the bottom of an active map.

EXERCISE: Explore the snapping options and practice a snap or two

Create Features

Creating new features can happen in a number of ways – Tasks, new parcel tool, join from CAD, etc. In addition, feature templates are utilized in the parcel fabric just as they would be in typical geodatabases.

What are Feature Templates?

Feature templates can help maximize editing efficiency and minimize attribution error. For example, when creating parcels, you might use templates on your lines sublayer that set different accuracy and category values for different line types that you have defined. Any additional attributes that you add to fabric tables can also be automatically populated with specific values through a feature template.

Features are created via feature templates which define all the information required to create a feature:

- the layer where a feature will be stored,
- the attributes a feature is created with, and
- the default tool used to create that feature.

Templates are automatically created for each layer in the current editing workspace.

To Access the Feature Template:

- Navigate to the Create Features pane to see the list of visible feature types.

- Click on one of the layers listed to see the current template features – tools associated to the template are shown.

- Click the blue arrow on the right side to see more information regarding the active feature template.
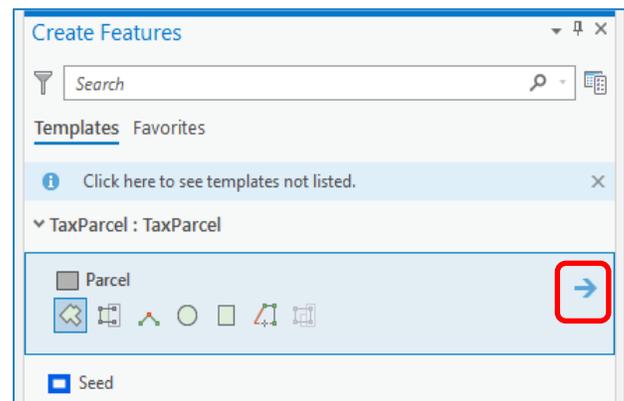
Here, you can enter attribute values for the current feature to be created.

- To modify the template, click the stack tool (Active Template Options) in the upper right corner, and choose Properties.

  Here, you can change the name of the template, add a description, Select the tools to be associated with template, and set which attribute fields will prompt for an attribute value.
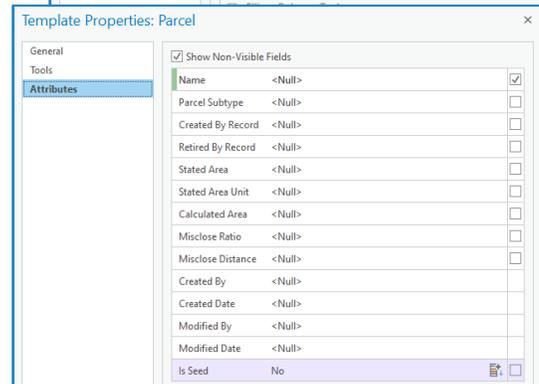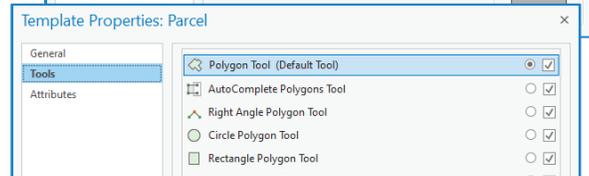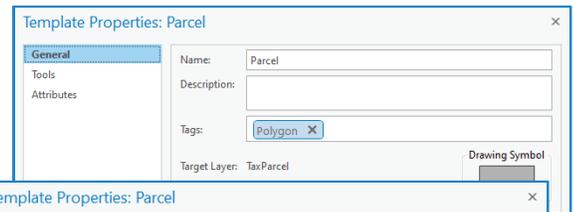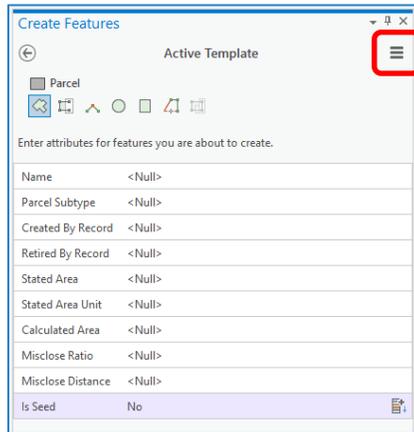
EXERCISE: Explore & Edit feature templates

Ground to Grid

The Ground to Grid tool corrects for distance and direction measurement differences between ground/field measurements and the grid measurements in your map defined by a coordinate system. The tool does this by interactively applying an offset angle for the direction and a multiplication factor for the distance.

To set the distance and direction factors, choose one of three options:

1. Type in both the ground direction and distance corrections if you know them.
2. Type in the ground direction and distance and draw the grid line in the map.
3. **Draw both the ground line and the grid line.**

EXERCISE: Set Ground to Grid Corrections
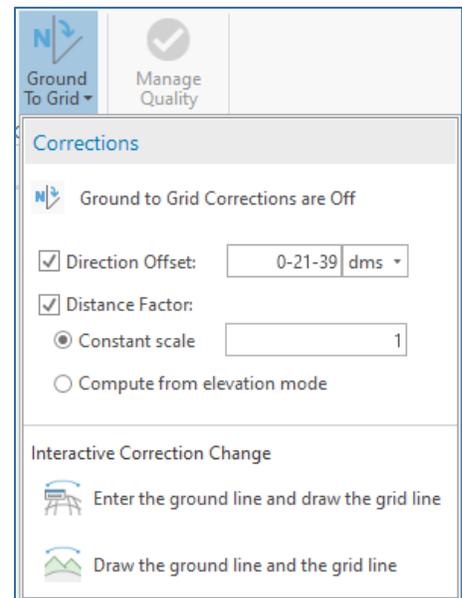
Records Ribbon
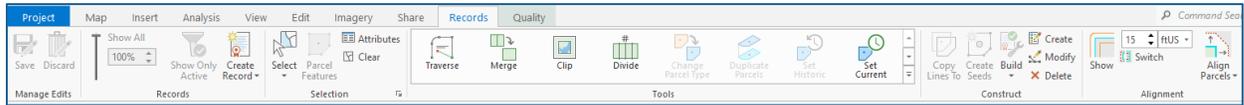
Work with the Manage Records pane

Parcel fabric records are created and managed using the **Manage Records** pane. To open the **Manage Records** pane, do one of the following:

- click the **New** drop-down arrow in the **Records** group on the **Parcels** ribbon and click **Manage**.

- Click the settings icon in the heads-up display and click Manage Records
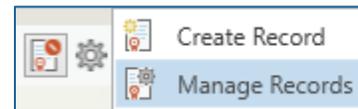
When the **Manage Records** pane is first opened, search query options are displayed for searching for parcel records. If there is an active record in the map, it is displayed in bold in the upper portion of the pane.

You can do the following in the **Manage Records** pane:

- Create a parcel record.
- Search for parcel records.
- View and edit parcel record properties.
- Set a parcel record as active.
- Assign a parcel record to a selection of parcel features.
- Open the Records attribute table.
- Delete records.
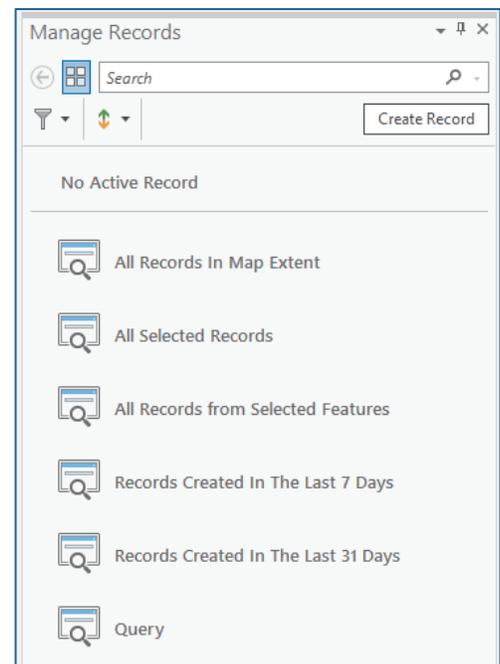
Record polygons

Each parcel record has a Record polygon. The Record polygon is the footprint of the legal record and should match the cumulative geometry of all the parcels associated with it.

When a parcel record is first created, it has no geometry. Record polygons are generated when parcels are created and associated with the active record or when existing parcel features are manually assigned to a parcel record. The Record polygon is updated whenever parcels are added to or removed from the record.

Let's work through some scenarios and see the results . . .

EXERCISE: Creating a new Record

Parcel records are created and managed in the **Manage Records** pane. To open the **Manage Records** pane, click the **Create Record** drop-down arrow in the **Records** group on the **Parcels** ribbon and click **Manage**.
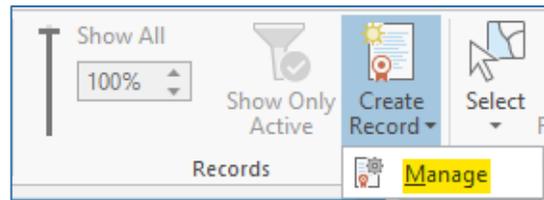
When you create a record, you can populate fields in the Records feature class with information about the legal document. The following table lists the system fields in the Records feature class:

1. Click **Create Record** in the **Records** group on the **Parcels** ribbon.

    Alternatively open the **Manage Records** pane and click **Create Record**.

2. In the **Manage Records** pane, type a name for the record or accept the default name.

    The name should represent the legal record name, for example, Heritage Estates Subdivision.

3. Choose a record type for the **Record Type** field.

    If you want to store and assign record types, create your own record type domain for your parcel fabric. Examples of record types are merge or split. Once the domain is created, open the Records attribute table and assign the domain to the **Record Type** field.

Tip:
You can open the Records attribute table from the Records sublayer under the parcel fabric layer in the **Contents** pane. Right-click the Records sublayer and click **Attribute Table**. You can also add new attribute fields to the Records attribute table, and they will appear under **New Record** in the **Manage Records** pane.

4. Populate the remaining fields with information about your record and click **Create** to create the record.

The newly created record is automatically set as the active record in the map.

The record's heads-up-display (HUD) box in the upper left corner of the map view displays the active record.
New parcel features will automatically be associated with the active record in the map.

Question: Does your new Record have a Record Polygon? Why or why not?

EXERCISE: Search for parcel fabric records

Search for parcel records by clicking one of the following automatic queries:

- All Records In Map Extent
- All Selected Records
- All Records from Selected Features
- Records Created In The Last 7 Days
- Records Created In The Last 31 Days

To create a custom search query, click the **Query** search option and click **Add Clause** on the **Query** dialog box.

To clear the results of a search query, click **Delete** ✕ next to the search text in the records text box. Click the back button ⮐ to return to the list of search options.
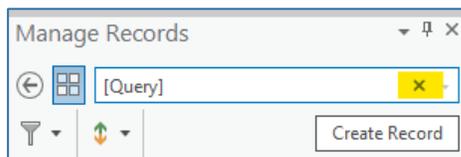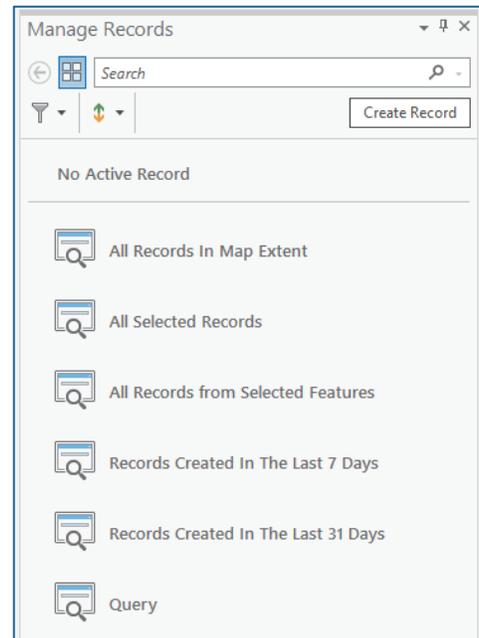
Question: What information do you see about a record?

EXERCISE: View & Edit record properties

Use one of the searches to find a preexisting record. Select the record to view the properties of that record.
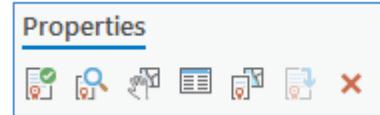
Review the tools in the Properties of the selected record.

Determine what attributes you can or cannot edit.

Questions:

- What can't you edit?
- Do you feel you would benefit by adding attributes to the Records?

EXERCISE: Set the active parcel record

When a parcel record is created, it is automatically set as the active record in the map. A different record can be set as active in the **Manage Records** pane.

1. Click the **New** drop-down arrow in the **Records** group on the **Parcels** ribbon and click **Manage**.
2. In the **Manage Records** pane, use a search query to search for the record you want to set as active. Select the record from the results list and click **Set Active Record** next to the record name.

The active record is displayed in bold in the top portion of the **Manage Records** pane and is also displayed in the record's heads-up-display (HUD) box in the map view.

A parcel record can be active or inactive when editing parcel data. If no record is active in the map, any parcel features that are created will not be associated with any parcel record.

No active record is recommended for fixing data and other quality-driven edits.

3. To exit an active record, click the active record toggle button on the record's HUD box. Use this toggle button to move in and out of the active record.

Display parcels in the active record only

To display parcel features in the active record only, click **Show Only Active** in the **Records** group on the **Parcels** ribbon. The command can be turned on or off.

If **Show Only Active** is turned off, you can set the transparency of parcels that are not part of the active record by dragging the transparency slider under **Show All**. Parcels that are not part of the active record can be made less transparent, while parcels that are part of the active record will display as normal.

Questions:

- When would you use an active record?
- When wouldn't you use an active record?
- Why?

EXERCISE: Assigning a RECORD to a group of parcels

You can assign a parcel record to a selection of parcel features. The following parcel features have a Created By Record attribute field and can be assigned to a parcel record:

- Parcel type polygons
- Parcel type lines

- Points
- Connection lines

To assign a parcel record to a selection of parcel features, complete the following steps:

1. Click the **New** drop-down arrow 🖼 in the **Records** group on the **Parcels** ribbon and click **Manage** to open the **Manage Records** pane.
2. Use a search query to search for the parcel record.
3. In the list of search results, select and right-click the parcel record and click **Assign Selection To Record** 🖼.

The Created By Record attribute field of the selected parcel features will be populated with the GlobalID of the associated record, and a record polygon will be created to match the geometry of the added parcel features.

If the parcel features are already associated with a parcel record, they will be reassigned to the chosen record. The Created By Record field will be updated with the GlobalID of the reassigned parcel record, and the record polygon will be regenerated to match the geometry of the parcel features.

Tip:
Turn on the Records sublayer under the parcel fabric layer in the **Contents** pane to display the record polygons.

Question:

- When would you need to apply this exercise?

Parcel Edit Tools

Parcel Tools	
Tool	**Description**
Change Parcel Type	Move the selected parcels to the parcel type chosen on the Change Parcel Type dialog box.
Duplicate Parcels	Duplicate the selected parcels to the parcel type chosen on the Duplicate Parcels dialog box.
Set Historic	Sets all selected parcels as historic. All selected parcels will be retired by current active record.
Set Current	Sets all selected parcels as current. All selected parcels will have the retired by record ID cleared.
Copy Lines To	Copy selected parcels or lines to the parcel type chosen on the Copy Lines to dialog box. Use lines to create new features.
Create Seeds	Create parcel seeds from lines forming enclosed loops in the map extent.
Shrink To Seeds	Create parcel seeds from selected parcels.
Build Extent	Build Parcels in the map extent.
Build Active	Build parcels in the active record.
Delete Parcels	Delete the selected Parcels.
Align Parcels	Show the Align Parcels Pane. This allows you to make adjacent parcels coincident using an alignment tolerance and links.
Merge Points	Merge two or more selected fabric points.
Merge Boundaries	Merge collinear parcel lines into a single line.
Simplify By Straight Li...	Simplify polygons and lines by replacing multiple consecutive segments with single or fewer segments.

Alignment Tools	
Tool	**Description**
Move	Move the selected feature(s).
Rotate	Rotate the selected feature(s).
Scale	Scale the selected feature(s).
Annotation	Edit Annotation features(s).
Align Edge	Align a topological edge to its nearest face by clicking.
Align Features	Close gaps between adjacent polyline or polygon features using a traced line and a buffer tolerance.

Reshape Tools	
Tool	**Description**
Edit Vertices	Add, move, or delete vertices and segments for the selected feature.
Reshape	Reshape an existing line or polygon features by drawing the new shape and crossing the existing feature in at least 2 places.
Continue Feature	Continue sketching the selected feature.
Extend or Trim	Extend or trim polyline features and terminate them where they touch another feature.
Fillet	Create a tangent curve connecting 2 segments.
Line Intersection	Split lines where they intersect.

Divide Tools	
Tool	**Description**
Planarize	Split selected line features where they intersect and remove any coincident line segments.
Clip	Clip all editable and visible features that touch or are within a buffered distance from selected feature(s).
Explode	Separate selected multipart features into individual features. These parts become independent features and are assigned identical attributes.
Split	Divide a polygon or polyline into 2 features along a splitting line you create across the feature. Click a polyline segment to divide the feature without using a splitting line.
Divide	Divide line(s) or a polygon feature.

Construct Tools	
Tool	**Description**
Merge	Merge 2 or more features into an existing feature or union 2 or more features into a new feature.
Copy Parallel	Create parallel offset copies of selected line features.
Mirror	Reflect selected features around a line.

Attribute Tools	
Tool	**Description**
Sequential Numbering	Sequentially number polygons or lines along a sketch.
Transfer Attributes	Copy attribute values from one feature to another.

COGO Tools	
Tool	**Description**
Traverse	Create features by entering a traverse.
Update COGO	Update COGO attributes for selected lines to populate Direction and Distance values.
Cul-de-sac	Create a cul-de-sac for a selected street centerline. The last segment of the line can be used to create an offset cul-de-sac.
Split Into COGO Lines	Split selected line features at each vertex, creating a new feature for every segment. COGO-enabled lines will have their COGO attributes calculated.

Validate Tools	
Tool	**Description**
Validate All	Identify topology errors and symbolize them on layers in the current map.
Validate Extent	Identify topology errors and symbolize them on layers in the current map extent.
Validate Specified E...	Identify topology errors and symbolize them on layers in a specified map extent.
Error Inspector	Show the Error inspector. This enables you to find, sort and fix errors.
Fix Error	Topology fix operations for a selected error.

Alignments

Align parcels in a workflow

You can use the following tools to align parcel features:

- **Align Parcels** —Transform parcels using links. The Align Parcels tool uses the Rubbersheet (Linear) transformation method.

- **Align Features** —Align and reposition individual parcel lines. This tool allows you more control over the placement of boundaries when aligning parcels.

Note:
This tool does not merge coincident points when aligning parcel boundaries.

Parcels can be aligned using the following workflows:

- Align selected parcels to surrounding parcel boundaries . This workflow is commonly used when aligning new parcels to existing parcels. New parcels are transformed and aligned to existing, surrounding parcels in the parcel fabric.

- Align individual parcel lines. Individual parcel lines can be repositioned to match a created alignment path. You can use this workflow in addition to the aligning parcels workflow.

- Align existing parcels to selected parcels. This workflow is commonly used when aligning existing parcels to the positions of new parcels. The position of the new parcels is held fixed, and surrounding boundaries are transformed to the fixed parcels location.

Align Parcels: Align selected parcels to surrounding boundaries

To align parcels to surrounding boundaries, parcel boundaries must lie within the specified alignment buffer. If necessary, select and move or rotate the parcel features you want to align so that they lie within a close proximity to their surrounding boundaries. Click the **Select** tool in the **Selection** group on the **Parcels** ribbon to select parcel features.

Tip:

If you created parcels in a new active record, click **Menu** on the records HUD (Heads-Up-Display) and click **Select Features In Active Record** to select all the parcel features created in the active record.

1. Select the parcels you want to align and click **Align Parcels** in the **Alignment** group on the **Parcels** ribbon to open the **Align Parcels** pane.

   The alignment buffer is displayed as an orange transparent buffer drawn around the new parcel boundaries. If the surrounding parcel boundaries and points do not lie within the alignment buffer, enter a larger tolerance in the **Alignment Buffer Value** text box in the **Alignment** group on the **Parcels** ribbon.

Tip:

Click **Show** in the **Alignment** group on the **Parcels** ribbon to turn the display of the alignment buffer on or off.

2. 1Click **Generate links within tolerance** in the **Align Parcels** pane to detect and create links between selected parcel points and their matching points in the surrounding parcels.

3. Optionally click **Add new links** to manually add links between points and their matching points on the surrounding parcels.

   In some cases, generating links may not detect matching points. You must manually create a link for these points.

   Links are symbolized differently to distinguish manually created links from generated links. Manually created link lines are displayed with a green circle on the line. Parcel points that have no generated links are symbolized with a transparent pink square overlapping the point.
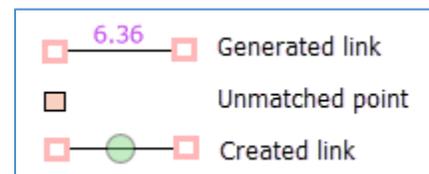
Note:

At least two links are needed to align parcels. The best alignment results are achieved when as many points as possible are matched with existing points.

4. Optionally click **Add anchor points** to add an anchor point to a parcel point.

If an anchor point is added to a parcel point, it will be held as fixed in the alignment and will not move. Additionally, fixed parcel fabric points behave in the same way as anchor points and do not need the addition of an anchor point. Fixed parcel fabric points such as control points do not move in a parcel alignment.

5. Under **Alignment** in the **Align Parcels** pane, type a snap tolerance.

   The snap tolerance is used to resolve gaps and overlaps that result from unmatched points. The snap tolerance is applied after the alignment process. Examples of unmatched points are those points that should snap to adjacent parcel lines.

Tip:
You can set the snap tolerance to 0 and refine individual boundary alignment using the Align lines to a created path workflow below.

6. Click **Align** to align the parcels.

   If you need to perform further alignment of individual lines, proceed to the Align lines to a created path workflow below.

Align Features: Align lines to a created path

You can use this workflow to align all the boundaries of a selected parcel or only align individual parcel boundaries. For example, after aligning a parcel using the Align Parcels tool, you can use this workflow to align an individual curve on the parcel that did not exactly match the curve on the surrounding boundaries.

Note:
The Align Features tool does not merge coincident points when aligning parcel boundaries.

To align parcel lines using a created path, follow these steps:

1. Select the parcel that has the lines you want to align and click the **Align Parcels** drop-down arrow in the **Alignment** group on the **Parcels** ribbon and click **Align Features** ⬈.

2. In the **Align Features** pane, choose **Draw the alignment path** ⬈ or **Create alignment path from selected parcels** ⬆.

   To align all parcel boundaries, choose **Create alignment path from selected parcels**. An alignment path is created on the adjacent boundaries that lie closest to the selected parcels.

   To align individual boundaries of the parcel, clear the parcel selection and choose **Draw the alignment path**.

3. If you choose to draw the alignment path, decide whether you want to trace a path along existing boundaries lines or use editing tools to draw a new location for all the boundaries. Boundaries will align to the traced path or the alignment path you draw.

Tip:
Trace an alignment path along existing boundaries when you want to hold those boundaries as fixed in the alignment. When drawing a new alignment path, all boundaries in the alignment tolerance move to the drawn path.

4. To trace the alignment path along existing boundaries, do the following:
   1. Click to snap to the line you want to align and drag the pointer along its boundary.
   2. Click an end point to finish the trace.
   3. If necessary, change the alignment tolerance in the **Alignment Tolerance** text box to ensure that the lines being aligned lie within the tolerance.
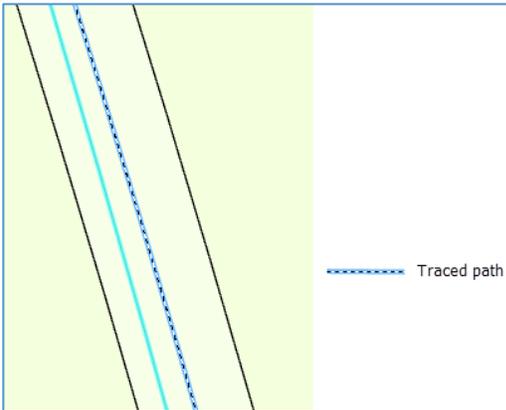
Align the boundary to the path traced on the adjacent boundary

5. To draw a new alignment path using editing tools, do the following:
    1. Choose a tool from the Construction toolbar at the bottom of the map view and draw an alignment path.

    For example, you can use the **Line** and **Arc Segment** tools to construct a new path. All boundaries in the adjustment tolerance will move to the drawn path.

    2. If necessary, change the alignment tolerance in the **Alignment Tolerance** text box to ensure that the lines being aligned lie within the tolerance.
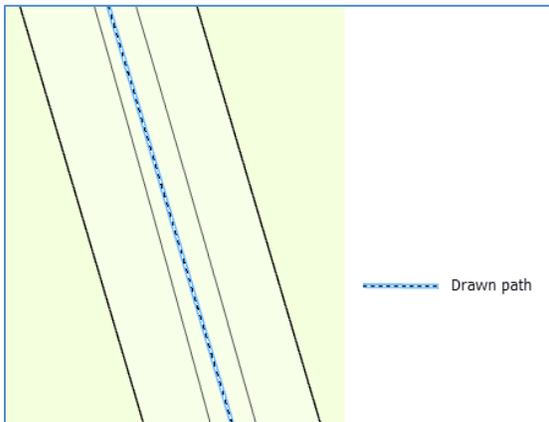
Align both adjacent boundaries to the drawn path.

6. If necessary, choose an alignment method.

Tip:
The **Snap line ends to path** method minimizes the creation of new vertices and is well suited for the alignment of most parcel boundaries.

7. Click **Align** to align the lines.

Align Features: Align existing parcels to new parcels

You can align existing parcels to the boundaries of newer, more recently created parcels. An example of this type of alignment is when new parcels have been created using monuments or control points as corner points or points of beginning. Existing parcels must be aligned to the location of these parcels.

To align surrounding parcels to the fixed location of selected parcels, click **Switch** ⬚ in the **Alignment** group on the **Parcels** ribbon to switch the selection to the surrounding parcels. Transform and align the surrounding parcels as described in the Align selected parcels to existing boundaries workflow above.

Alternatively create an alignment path to align boundaries. To hold a parcel as fixed and create an alignment path for surrounding parcels, do the following:

1. Select the parcels you want to hold as fixed. These are the newer, more recently created parcels.
2. Click **Switch** ⬚ in the **Alignment** group on the **Parcels** ribbon to switch the selection to the surrounding parcels.
3. Click the **Align Parcels** drop-down arrow in the **Alignment** group on the **Parcels** ribbon and click **Align Features** ⬚.
4. In the **Align Features** pane, click **Create alignment path from selected parcels**.

    An alignment path is created on the adjacent boundaries that lie closest to the selected parcels. In this case, an alignment path is created on the parcel that will be held as fixed.

5. Ensure that all boundaries being aligned lie within the adjustment tolerance. If necessary, change the adjustment tolerance.
6. If necessary, choose an [alignment method](#).

Tip:
The **Snap line ends to path** method minimizes the creation of new vertices and is well suited for the alignment of most parcel boundaries.

7. Click **Align** to align the lines.

Symbology and Labeling

Basic Symbology

To access the Symbology pane, right click the desired layer in the TOC and choose Symbology.

Basics: Changing Symbology Based on Unique Values

- Select Unique Values under **Primary Symbology**
- In the *Field 1 box* select an attribute field from the dropdown box
- Click *Add All Values* button if this is the first time creating the symbology, or select *Add Unlisted Values* to add additional values, but not all possible values.
- Change symbology for each value as preferred
- Click Apply > OK
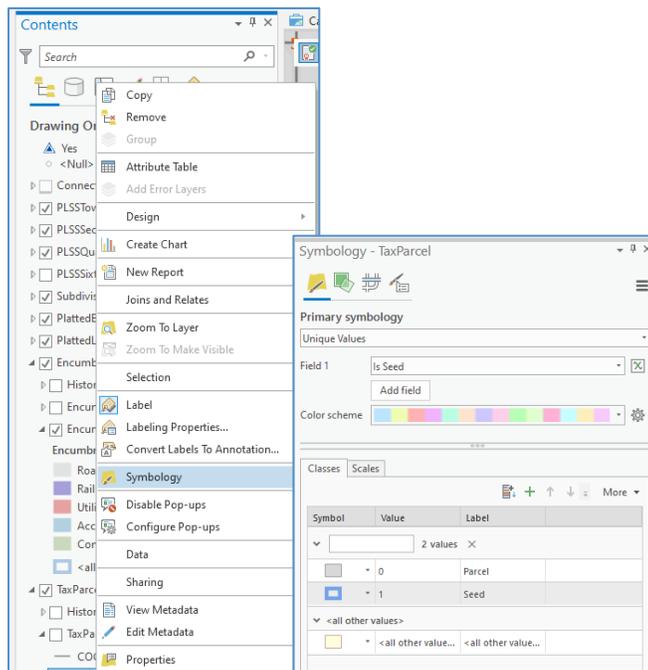
EXERCISE: Edit symbology

- Edit symbology for the Parcel Types in your map.

Basic Labeling

- Right-click a layer in the TOC and choose *Labeling Properties*

- In the Label Class pane, drop down the Class to choose the label class to be edited.

- The expression is written in Arcade language and can easily be edited to fit your needs.

- To turn a layer's labels on/off, right click the layer in the TOC & choose Label – it's a toggle so it will do the opposite of whatever is the current situation.
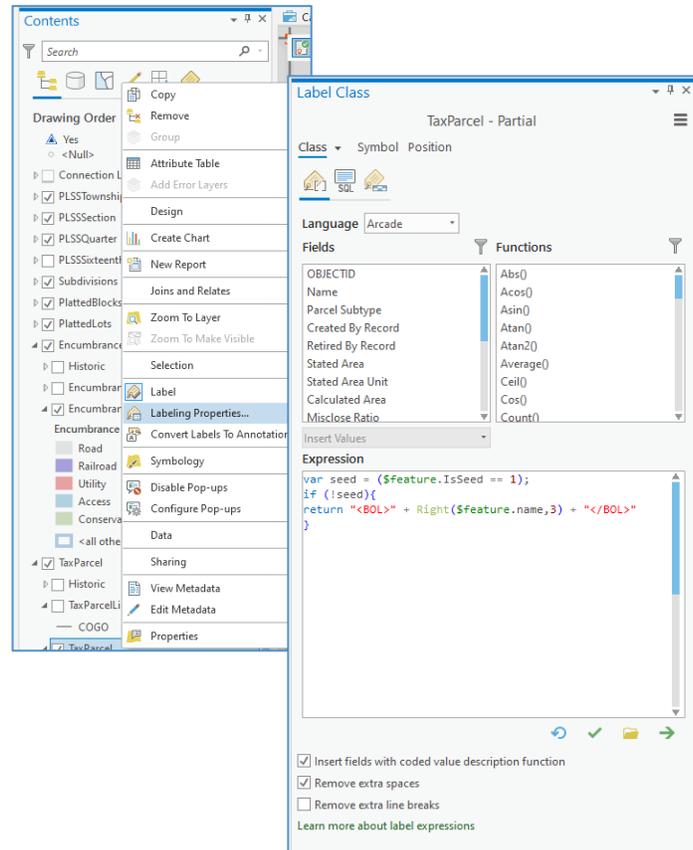
Parcel Fabric Line Class Labels

In Pro 2.9, the labeling classes have been edited to take advantage of the new field and domain to position the line labels to the Left, Right or Centered (Shared).
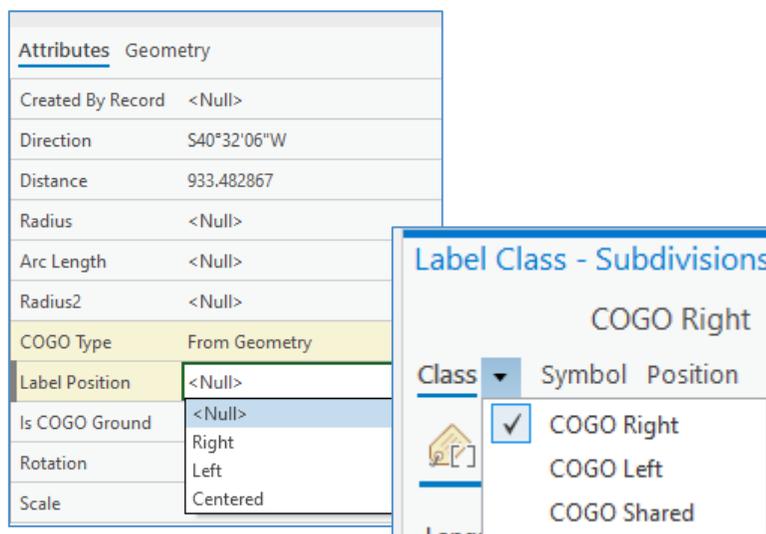
EXERCISE: Explore Labeling

Explore the tabs and buttons to change:
- visibility scale
- font colors
- font styles
- placement properties
- etc . . .

Saving and Loading Label Expressions

Advanced label expressions can be saved as label expression files (.lxp), which can be loaded into other layers or maps.

To save an Expression file:

1. Use the Green Arrow button below the Expression dialog to **Export** the expression to a saved location.
2. Name the file (.lxp – label expression)
3. Click Save

To load an Expression file:

1. Use the Folder button below the Expression dialog to **Import** an expression from a saved location.
2. Select the file (.lxp – label expression)
3. Click OK
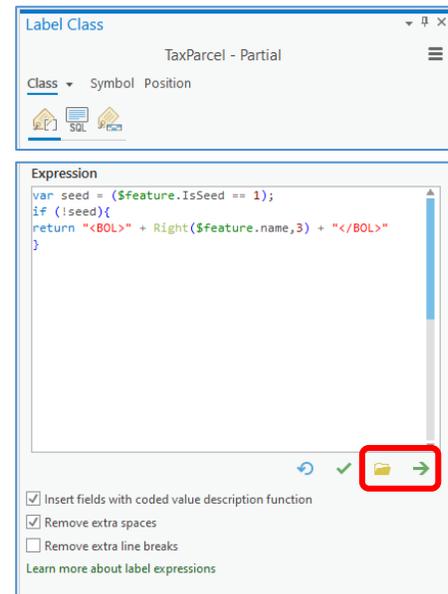
EXERCISE: Explore Expressions

- Export an existing expression to save it
- Create a new expression
- Import the original expression back in

Label Examples: Tax Parcel Defaults

Parcel Label Expressions

Partial PIN: to show only the last 3 digits:
```
var seed = ($feature.IsSeed == 1);
if (!seed){
return "<BOL>" + Right($feature.name,3) + "</BOL>"
}
```

Full PIN:
```
var label;
var seed = ($feature.IsSeed == 1);

If (IsEmpty($feature.Name)==true){
   return label;
}
Else if (!seed){
   label = "<BOL>" + $feature.Name + "</BOL>"
   if (IsEmpty($feature.StatedArea)==true){
     return label; //returns only the parcel name
   }
   Else {
     if (IsEmpty($feature.statedareaunit)==true) {
       label = label + "\n" + "<fnt size = '8'>" + Round($feature.statedarea, 2) + " Unknown" +
"</fnt>";
       return label;
     }
     label = label + "\n" + "<fnt size = '8'>" + Round($feature.statedarea, 2) + " " +
DomainName($feature, 'statedareaunit') + "</fnt>";
     return label;
   }
}
```

EXERCISE: Explore Parcel Type Labels

- Check and update the labels for Tax Parcels
- Partial PIN & Full PIN
- Display Tab expression
- Check the labels for Historic features
- Check the labels for each parcel type
- MORE

Dimension Label Expression

When viewing the line dimensions, the label expression is what is used to create that bearing/distance view.

To view the expression,
1. Open the Layer Properties for the Tax Parcel Lines.
2. Navigate to the Direction and Distance view under Class.
3. The Expression is shown in the Expression dialog box. It should look something like this . . .

_____

```
// Change the settings portion to configure direction format, color, rounding and abbreviations
// This is an Arcade expression

// SETTINGS
var QuadrantBearingFormat = true; //set 'true' for quadrant bearing, 'false' for north azimuth
var ShowDistance = true;   //set as 'true' to show distance
var ShowDirection = true;  //set as 'true' to show direction
var ShowRadius = true;     //set as 'true' to show radius
var ShowCurveParemater = true;    //set as 'true' to show a curve parameter
var CurveParameter = "ArcLength"; //set as 'ArcLength' or 'Chord' or 'Angle' for central angle.
Case sensitive!
var ErrorString = "COGO ERROR";   //set to display invalid COGO combinations
var RadiusAbbr = 'R=';     //radius abbreviation
var ArclengthAbrr = 'L=';  //arclength abbreviation
var ChordAbbr = 'C=';      //chord abbreviation
var AngleAbbr = 'A=';      //central Angle abbreviation
var DistUnitRounding = 2;  //number of decimal places for distance units: distance, radius,
arclength & chord
var NumberFormat = "#,###.00" //number format. In this example: thousands separator with
padding of 2 zeros
var directionColor = "blue='255'"; //direction color: red, green, blue, cyan, magenta, yellow,
black. You can also use RGB or CYMK combinations.
var distanceColor = "black='255'"; //distance color: red, green, blue, cyan, magenta, yellow,
black. You can also use RGB or CYMK combinations.
var radiusColor = "blue='255'";   //radius color:  red, green, blue, cyan, magenta, yellow, black.
You can also use RGB or CYMK combinations.
var curveParamColor = "black='255'"; //curve parameter color:  red, green, blue, cyan, magenta,
yellow, black. You can also use RGB or CYMK combinations.
var partialCOGOColor = "magenta='255'"; //partial COGO color: red, green, blue, cyan, magenta,
yellow, black. You can also use RGB or CYMK combinations.
var invalidCOGOColor = "red='255'"; //invalid COGO color: red, green, blue, cyan, magenta,
yellow, black. You can also use RGB or CYMK combinations.
var fontNameSize = "<FNT name = 'Arial' size = '10'>"; //font type and size
```

```
// VARIABLES
var direction=$feature.Direction;
var distance=$feature.Distance;
var radius=$feature.Radius;
var arclength=$feature.Arclength;
var radius2=$feature.Radius2
var prefix;  // quadrant bearing prefix
var postfix; // quadrant bearing postfix
var bearing;
var quadbearing;
var binaryDictionary; //binary dictionary to check COGO combinations
var checksum=0; //initialize checksum
var validValuesArray; //array of valid values for COGO combinations
var partialValuesArray; //array of partial values for COGO
var degrees;
var minutes;
var seconds;
var DMS;
var directionStr = ""; //direction string using for label
var distanceStr = "";  //distance string using for label
var radiusStr = "";    //radius string using for label
var curveStr = "";     //curve parameter string using for label
var angleRad; //curve angle in radians
var COGOValidity; //COGO combinations validity. can be valid, partial or invalid.
```

There are many places in which the user can interact with the expression and make changes.

- All the "var" are places in which items can be updated –
  - True/False
  - Font color
  - Font name
  - Decimal rounding
  - abbreviations

EXERCISE: Explore Dimension Labels

- Explore variable changes
- Explore color changes, font changes, size changes, etc.

Miscellaneous Tips

For any further topics that you may have questions, please see the resource page at
https://pro.arcgis.com/en/pro-app/help/data/parcel-editing/whatisparcelfabric.htm.

This will get you started in the right direction and assist you with any parcel editing, manipulation, and/or adjustments you may need to make.

Record-driven Tasks

A task is a set of preconfigured steps that guide you through a workflow. A Task can be used to implement a best-practice workflow, improve editing efficiency, or create a series of tutorial steps.

Tasks are saved to task files and can be shared with other projects. To use the parcel fabric tasks, import the task file into your project – 5 are included with the parcel fabric initially.

To find these, they are loaded in this location: C:\Program Files\ArcGIS\Pro\Resources\Tasks\en-US\ParcelFabric\

The Record-driven Workflows task file contains the following tasks from ArcGIS 2.5 forward:
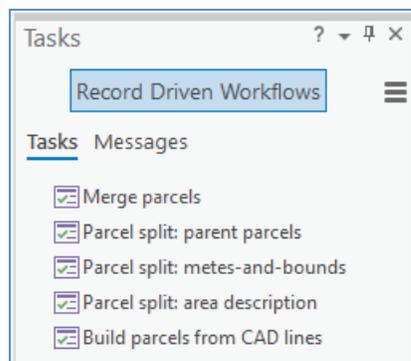
EXERCISE: Import and open a task

To import the task files into your project, follow these steps:

1. In the **Catalog** pane, right-click **Folders** and click **Add Folder Connection**.
2. On the **Add Folder Connection** dialog box, browse to the **Tasks** folder located in your ArcGIS Pro installation directory, for example, C:\ProgramFiles\ArcGIS\Pro\Resources\Tasks.
3. In the **Catalog** pane, under **Folders**, expand the **Tasks** folder, expand your language folder, and then expand the **ParcelFabric** folder to list the available task files.
4. Right-click a task file and click **Import and Open** ↓ to import the task file into your project as a task item.

The task file is added as a task item to the **Tasks** folder in the **Catalog** pane and is opened in the **Tasks** pane.

5. On the **Tasks** pane, select a task and click **Open Task** → to run it. You can also double-click a task to run it.

EXERCISE: Correct Task Error Messages

Existing Esri tasks were configured with Esri-defined workspaces, maps, and layer names. Thus, we need to ensure they will work with our maps and layers.

To make corrections…

1. Click on the **Messages** tab to view the error messages listed.
2. Select one of the messages, it doesn't matter which one at this point
3. Click the **Show Me** button at the bottom once it's active.
4. Follow the prompts to update broken resources in the Task Designer pane.
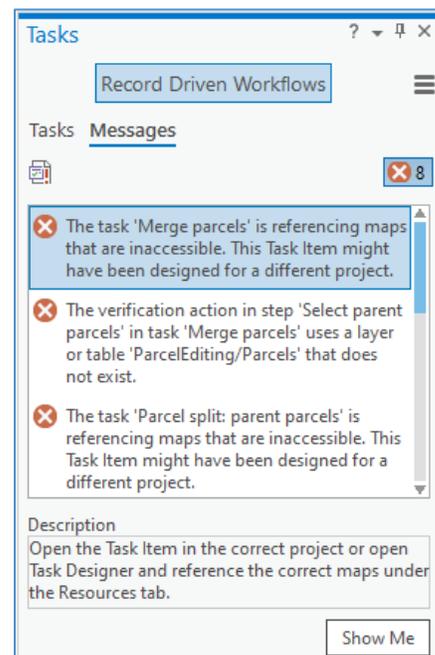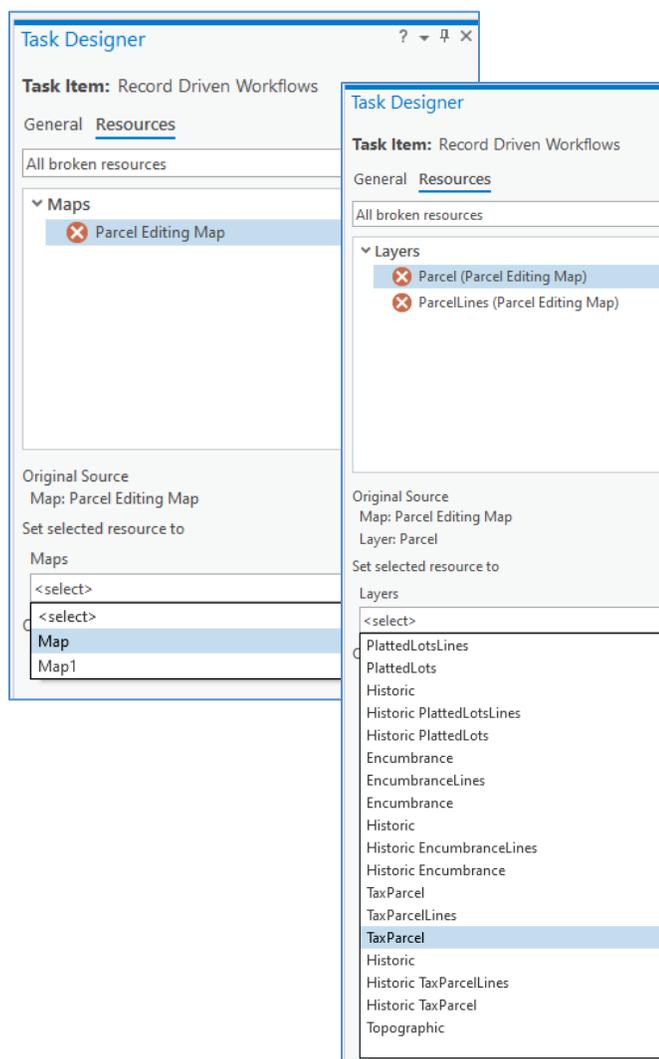
EXERCISE: Configure a task

The Tasks are general guides on how to perform parcel fabric editing workflows. You can configure and change the tasks, or you can create new tasks.

You can configure the parcel fabric tasks for your organization in the following ways:

- Change the task name.
- Add or remove steps.
- Change the step behavior.
- Change the action the step performs.
- Change the active map view for each step.
- Change how layers behave in the Contents pane.
- Track task usage history.

To configure an existing parcel fabric task:

1. Right-click the imported task file (task item) in the **Tasks** pane and click **Edit In Designer** . This will open the **Task Designer** pane where you can change the name and description of the task.

   - Alternatively, you can open the task, click **Options** ☰ on the **Tasks** pane and click **Edit In Designer**.

2. Click **Open Task** in the **Tasks** pane to see the step behavior in the **Task Designer** pane.
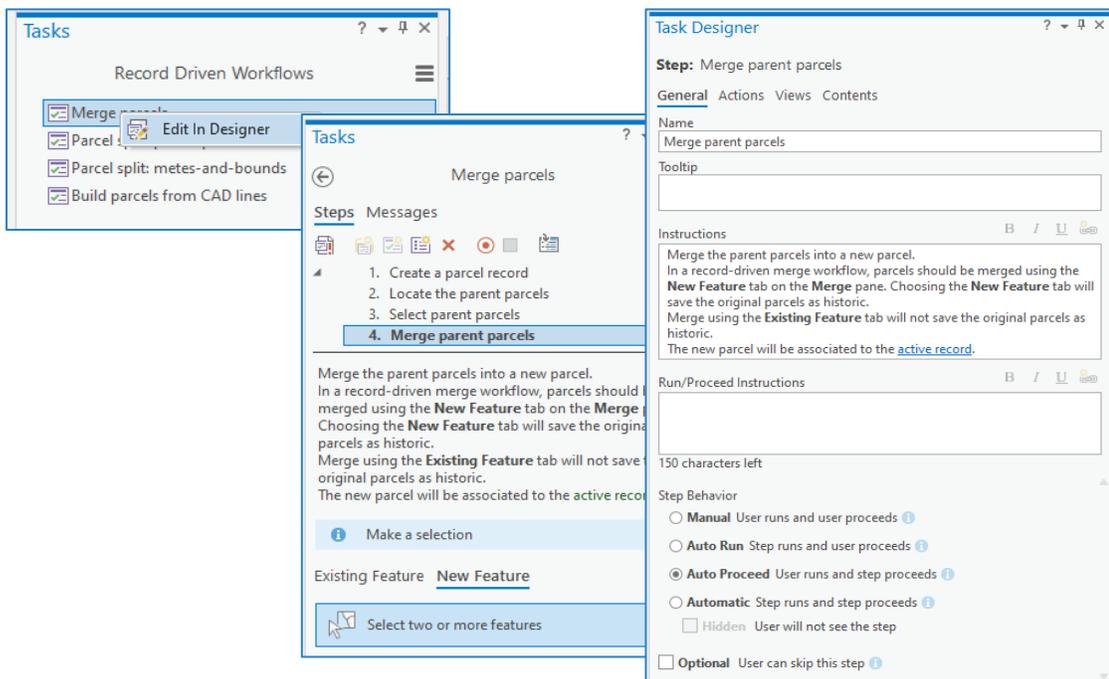
3. Select the step you wish to edit in the **Tasks** pane.

4. Use the **Task Designer** pane to make your edits
   a. General Tab
      i. Name
      ii. ToolTip
      iii. Instructions – make it your own language (merge v. combine for example)
      iv. Step Behavior
   b. Actions Tab
      i. Set the Command/Tool
      ii. When to start the tool
      iii. Prior/Post action
   c. Views Tab
      i. Set what map is active
   d. Contents Tab
      i. Set what layers are Visible, Selectable, Editable, and Snap-able.
         1. Can capture from your current settings in the map.
      ii. Set what snapping items are on – point, edge, vertex, etc.
5. Use the tools available on the **Tasks** pane to . . .
   a. Validate the Task
   b. Add a new Step to an existing Task
   c. Delete a Step from an existing Task
   d. Record steps to add to the Task

To create a new task

1. Click the **Task** 🔲 drop-down arrow on the **Insert** tab and click **New Task Item** 🔳.

OR

Use the **Tasks** pane and select the New Task tool

2. Use the tools available on the **Tasks** pane to . . .
    a. Add a new Step to the new Task
    b. Record steps to add to the new Task
    c. Validate the Task

3. Use the **Task Designer** to add detail to the steps
    a. General Tab
        i. Name
        ii. ToolTip
        iii. Instructions – in your own business language
        iv. Step Behavior

    b. Actions Tab
        i. Set the Command/Tool
        ii. When to start the tool
        iii. Prior/Post action

    c. Views Tab
        i. Set what map is active

    d. Contents Tab
        i. Set what layers are Visible, Selectable, Editable, and Snappable.
            1. Can capture from your current settings in the map.
            2. Set what snapping items are on – point, edge, vertex, etc.
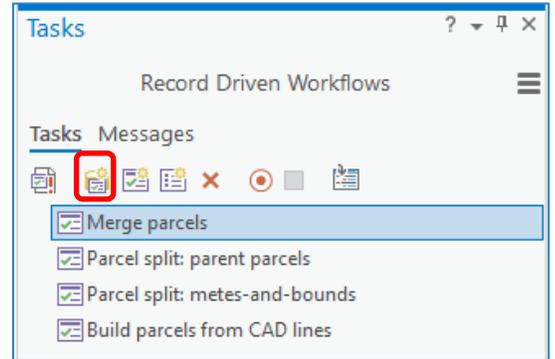
Tip:
Prep an actual edit that you want to use to create a task for and use the Record function while you do the edit. All of your steps and settings are captured by the Task configuration and then you can tweak the details.

Editing Exercises

Some exercises are arranged so that those with associated Tasks are paired with their non-task exercise for comparison's sake.

Assumptions for all exercises:

- Using the Parcel Fabric in Pro
- Are in an editing version (not Default) or a file .gdb
- Topology is set to GeodatabaseTopology

Assumptions for Record-driven exercises:

- Are using an Active Record

NOTES for all Tasks:

- Recognize that the Tasks bring the tool to you and enforce that all the steps are completed. Very consistent for multiple editors.
- These were all for 'ideal' situations. Often denoted as urban situations.

Record-driven Workflows

1: Create New Tax Parcel

The procedures below walk through a simple new parcel first with just a digitizing process. If you need the specificity of the traverse tool, see exercise 6 for more information.

1) New Tract: Create a new tax parcel **without COGO information**
   - Open the **Create Features** pane from the **Edit** ribbon

   - In the **Create Features** pane, select the tax parcel lines template

   - Draw shape with Construction Tool

   - When complete, use Create Seeds to verify the parcel is enclosed.

   - Then use Build Active to complete the parcel.

   This way of building a new parcel did NOT clip it out from any underlying features. The new feature may be overlapping a parent parcel.

   Be sure to SAVE your work.

Additional Practice:

Use an actual update to practice entering data.

   - Find a description to practice curve entry as well

Dynamic Constraint Option

Another option for entering data (as in steps 3 & 4 above) is to use the Constraint tools which are used as an on-screen heads-up style of traversing a parcel. The Constraint tool constrain the directions and distances of digitized lines to specific values entered the same way you would enter other COGO.

To turn dynamic constraints on or off, click **Dynamic Constraints** 🔲 on the status bar at the bottom of the active map.

1. Click on the map to start digitizing the line.
2. Press the Tab key to get editing focus on a displayed dimension.
3. Once the dimension has focus, modify its value.
4. Press Enter to constrain the line to the dimension.

N43-31-47E

57.31ft
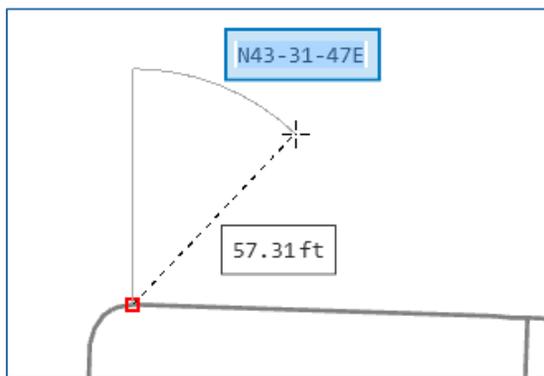
If you're digitizing a line using the **2 Point Line** tool ⌐, constrained dimensions will be stored in COGO fields if the line is COGO enabled. Line feature classes in the parcel fabric are COGO enabled.

You can set the default constraint behavior: hover the pointer over **Dynamic Constraints** 🔲 at the bottom of the map.

- Deflection angles can be used when digitizing polylines using the **Line** tool ╱ .
- Absolute angles can be used when using entering absolute bearings – QB or AZ.

NOTE: To save constraint dimensions in COGO fields, use the **2-Point Line** tool to create lines. With the **2 Point Line** tool, direction constraints can only be displayed as absolute angles.

Constraints

🔲 Dynamic constraints are On

Default direction constraint:
  ○ Deflection ◉ Absolute

Default constraint for input mode:
  ◉ Direction ○ Distance
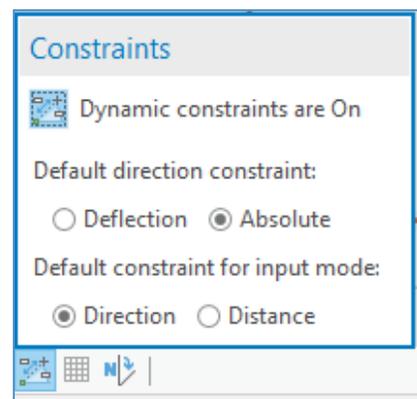
2: Merge Parcels (with Task)

The Merge parcels task is a record-driven workflow for merging two or more parent parcels into a new parcel. The original or parent parcels are saved as historic.

The description of the steps and actions used are in the Merge parcels task.
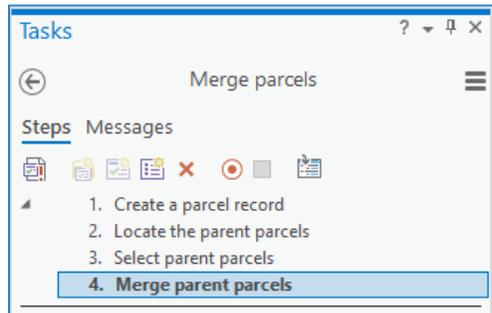
1. Create a parcel record

   - The **Manage Records** pane is embedded in the **Tasks** pane and is opened in the first step automatically.

2. Locate the parent parcels

   - Locate tool is prompted.
   - You can skip this **Locate** step.

3. Select parent parcels

   - Select by rectangle is prompted.

4. Merge parent parcels

   - The **Merge** pane is embedded in the **Tasks** pane and is opened in the step automatically.
   - History is created and saved (assuming New Feature tab is chosen in Merge step).

3: Merge Parcels (No Task)

To merge parcels, you can use the Merge parcels task or follow these steps:

1. Create a parcel record for the parcel merge.

The parcel record will be set as active in the map. The Created By Record field of new parcel features will be populated with the GlobalID of the active record.

2. If necessary, use the **Locate** pane to search for and locate the parcels to merge.

3. Use the **Select** tool in the **Selection** group on the **Parcels** ribbon to select the parcels you want to merge.

Tip:
Select the parcel polygon to select the parcel. All parcel features are kept coincident with the parcel polygon using map topology.

4. Click **Merge** in the **Tools** gallery on the **Parcels** ribbon to open the **Merge** pane.

When merging parcels with an active record set in the map, the **Merge** pane opens with the **New Feature** tab open by default.

5. Enter the attributes of the newly merged parcel under **Merged Feature Attributes**.

6. Click **Merge** to merge the parcels.

The original parent parcels are saved as historic. The Retired By Record field of the historic parcel features is populated with the GlobalID of the active record.

4: Parcel Split Parent Parcel (with Task)

The Parcel split: parent parcels task is a record-driven workflow for splitting parent parcels into new parcels. Parcels are split by adding or modifying boundary lines and constructing new parcels. The original or parent parcels are saved as historic.

The split parent parcels workflow below describes the steps and actions used in the Parcel split: parent parcels task.
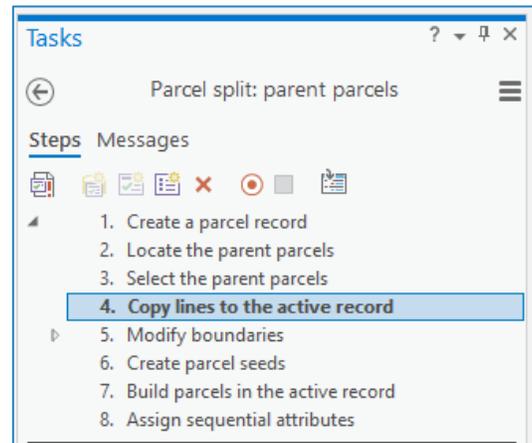
1. Create a parcel record
   - The **Manage Records** pane is embedded in the **Tasks** pane and automatically opens in the first step.

2. Locate the parent parcels
   - Locate tool is prompted.
   - In the task, you can skip this step.

3. Select the parent parcels.
   - The step loads the **Select** tool.

4. Copy lines to the active record
   - The **Copy Lines To** dialog box is embedded in the **Tasks** pane and automatically opens in the step.

5. Modify boundaries
   - The **Create Features** pane is embedded in the **Tasks** pane and automatically opens in the step. The **Select** and **Delete** tools are also available for use in the step.

6. Create parcel seeds

7. Build parcels in the active record

8. Assign sequential attributes

5: Parcel Split Parent Parcel (No Task)

To split parcels, follow these steps:

1. Create a parcel record for the parcel split.

The parcel record will be set as active in the map. The Created By Record field of new parcel features will be populated with the GlobalID of the active record.

2. If necessary, use the **Locate** pane to search for and locate the parcels to split.
3. Use the **Select** tool in the **Selection** group on the **Parcels** ribbon to select the parcels you want to split.

You can select more than one parcel to split. In this workflow, you will be using the boundary lines of parent parcels to construct new parcels.

Tip:
Select the parcel polygon to select the parcel. All parcel features are kept coincident with the parcel polygon using map topology.

4. Click **Copy Lines To** in the **Construct** group on the **Parcels** ribbon.
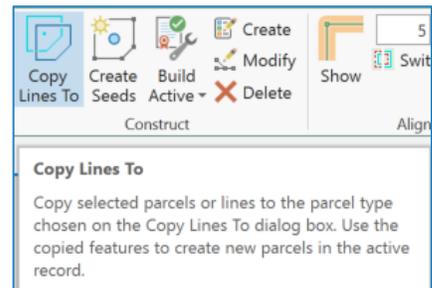
5. In the **Copy Lines To** dialog box, select the parcel type in which the new parcels will be constructed.
    a) Choose **Show only active record** to only show parcel features that are part of the active record.

    b) Choose whether you want to preserve the attributes of the parent parcels and transfer them to the new parcels.
        - If you choose to preserve attributes, they will be transferred to the seeds that are automatically created for the closed line loops.
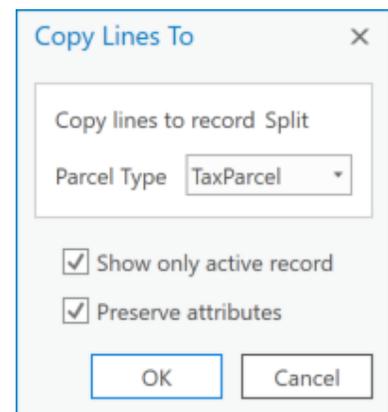
    c) Click **OK** to copy the lines of the selected parcels to the active record.

6. Add split lines or modify lines to construct new parcels. For example, add a split line between two new split points:

   a) Select a line to which you want to add a split point and click **Divide** ⊞ in the **Tools** gallery on the **Parcels** ribbon.

   b) On **Divide** pane, choose the divide method, the direction of the line to split and how to space the split points.

   c) Enter the distances of the split point or points and click **Divide**.

   d) If necessary, use the **Divide** tool to add a split point on a second parcel line.

   e) Use the necessary tool(s), such as the **Traverse** tool 🖼, the **Two-Point Line** tool ⌐, or any of the context menu options to add split lines between the split points.
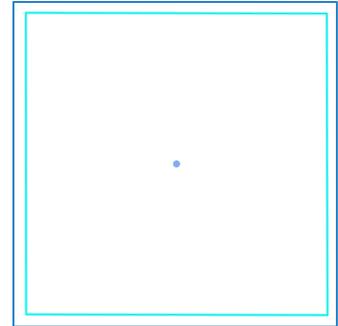
7. Click **Create Seeds** 🗗 in the **Construct** group on the **Parcels** ribbon to create additional parcel seeds for new, closed loops of lines.

   You can also move seeds or copy and paste parcel seeds.

   Create Parcel Seeds

   Create parcel seeds from lines forming enclosed loops in the map extent.
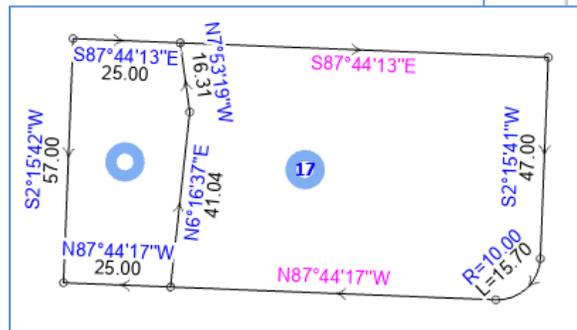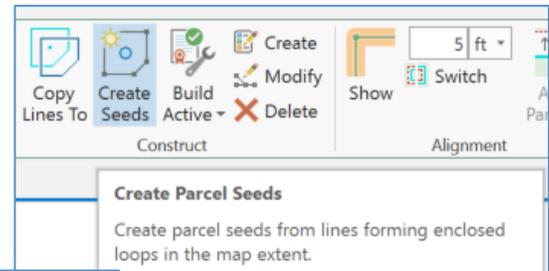
8. Select the parcel seeds and open the **Attributes** pane to add attributes for the parcel seeds. The seed attributes will be transferred to the parcels when they are built.

   Alternatively, you can choose to attribute the parcels when they are built.

9. Select parcel lines with partial dimensions and open the **Attributes** pane to update the line dimensions.

- Lines with partial dimensions are labeled with a dimension displayed in pink.
- The line is missing attributes in COGO fields.
- Use the **Update COGO** tool in the **Tools** gallery on the **Parcels** ribbon to generate and add missing COGO dimensions to parcel lines.

10. After attribute values have been updated, click **Build Active** in the **Construct** group on the **Parcels** ribbon to build parcels from lines and seeds in the active record.
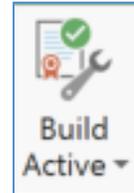
The original parent parcels will be saved as historic. Turn on the **Historic** sublayer under the parcel type group layer in the **Contents** pane to display historic parcel features.
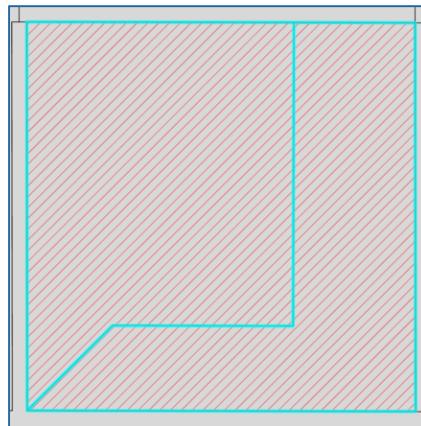
11. Optionally use the **Sequential Numbering** tool in the **Tools** gallery on the **Parcels** ribbon to add sequential attributes to the new parcels.

6: Split Parent Parcel – Metes & Bounds (No Task)

To split parcels using metes and bounds, you can follow these steps:

1. Create a parcel record for the parcel split.

The parcel record will be set as active in the map. The Created By Record field of new parcel features will be populated with the GlobalID of the active record.

2. If necessary, use the **Locate** pane to search for and locate the parcels to split.

3. Use the **Traverse** tool to create a parcel traverse.
   1. Click **Traverse** 📐 in the **Tools** gallery on the **Parcels** ribbon to open the **Traverse** pane.
   2. In the **Traverse** pane, choose the layer in which to create the traverse from the **Layer** drop-down menu.
   3. Snap to an existing point as the starting point of your traverse, or anywhere on the map.

   The new parcel will be aligned with existing parcels.

   4. Start entering your traverse dimensions.

Tip:

Click **Show Only Active** 🔻 in the **Records** group on the **Parcels** ribbon to only show parcel features in the active record. If there is a new record in the map, only the traverse lines should be visible. Turning off the display of surrounding parcel features by clicking **Show Only Active** makes it easier to view and enter traverse lines.

4. After entering your closed loop parcel traverse, click **Create Seeds** 🗂️ in the **Construct** group on the **Parcels** ribbon to create a seed for the parcel traverse.
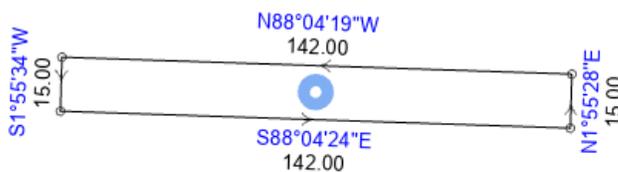
5. Click **Build Active** 🗂️ in the **Construct** group on the **Parcels** ribbon to build the parcel.

6. If necessary, select the newly built parcel, open the **Attributes** pane, and update its attributes.

7. If necessary, align the parcel so that it overlays existing parcels in the correct position.

8. Select the new parcel and click **Clip** 🔲 in the **Tools** gallery on the **Parcels** ribbon.

9. The **Input Features** tab should be your current selection. Verify it's correct.

10. In the **Clip** pane, make sure **Clip all editable layers** is not checked (at the very bottom), and click the **Target Features** tab.

11. Select the target parcels you want to clip and use to create remainder parcels. The view will change as you select your input and target features so you know what will be affected.

12. Choose the **Discard (Remainder)** option in the **Clip** pane
    1. NOTE: Be sure to explore the other Clip options.
13. Click **Clip** to clip and create remainder parcels.

Tip:
Turn on the **Historic** group layer for the parcel type in the **Contents** pane to display historic parcel features.

Select the remainder parcels, open the **Attributes** pane, and update their attributes. You can also use the **Sequential Numbering** tool 🔳 in the **Tools** gallery on the **Parcels** ribbon to assign sequential attributes.

7: Split Parent Parcel – Metes & Bounds (Ground To Grid)

To split parcels using metes and bounds and the Ground To Grid function, you can follow these steps:

1. Create a parcel record for the parcel split.

The parcel record will be set as active in the map.
The Created By Record field of new parcel features will be populated with the GlobalID of the active record.

2. If necessary, use the **Locate** pane to search for and locate the parcels to split.

3. Set your Ground To Grid offset factors
   1. Click the **Ground To Grid** dropdown under the **Corrections** group within the **Edit** tab on your ribbon.

   2. Choose the "Enter the ground line and draw the grid line" option under the **Interactive Correction Change** section.
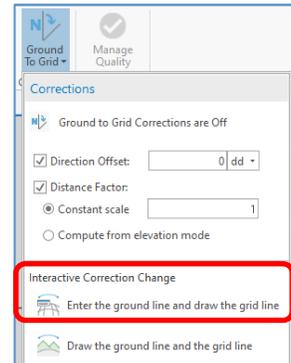
   3. A new window will prompt you to input the recorded Direction and Distance of a known, existing line in your fabric.
      1. You can use a section line or the line of a neighboring parcel.
      2. You can choose to only correct for direction by keeping the Distance at 0.
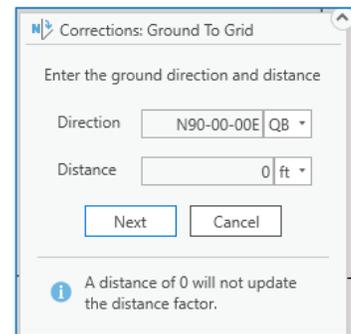
   4. After clicking **Next**, a new pop-up window will prompt you to click the start and end points of your known line in your map.

   5. Your Ground To Grid is now set. You know this because the Ground To Grid icon is now darker in color up on the ribbon and down at the bottom of your map next to the scale factor.
      1. Click either icon to toggle Ground To Grid on and off.

4. Use the **Traverse** tool to create a parcel traverse.

1. Click **Traverse** 📐 in the **Tools** gallery on the **Parcels** ribbon to open the **Traverse** pane.
2. In the **Traverse** pane, choose the layer in which to create the traverse from the **Layer** drop-down menu.
3. Snap to an existing point as the starting point of your traverse, or anywhere on the map.
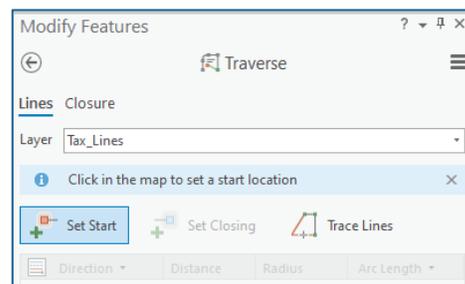
The new parcel will be aligned with existing parcels as the **Ground To Grid** adjustment will automatically work with the Traverse tool to adjust your input metes and bounds to any distortion or inconsistencies within your map. Ground To Grid will display the Direction and Distance values you input within the COGO attributes while changing the geometry of your line to fit your existing data.

4. Start entering your traverse dimensions.

Override Tip:

- Within the Traverse window, you can override project units by clicking the field drop-down arrow to choose a different unit for your dimensions.
- You can also type a shortcut override next to a dimension.
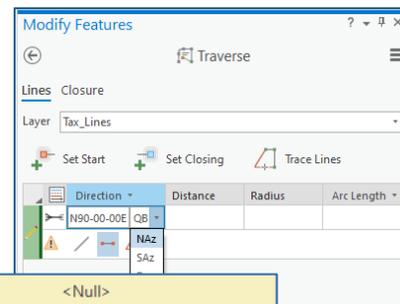
Override	Keystroke	Use in grid field
Meters	m or M	Distance, Radius, Arc Length
Kilometers	km or KM	Distance, Radius, Arc Length
Feet	ft or FT	Distance, Radius, Arc Length
Yards	yd or YD	Distance, Radius, Arc Length
Miles	mi or MI	Distance, Radius, Arc Length

- The parcel type polygon feature class has both **Stated Area** and **Stated Area Unit** attribute fields. You can override the project area unit and choose a different unit for your stated area by selecting the unit from the **Stated Area Unit** field drop-down box in the **Attributes** pane.

Tip:
Click **Show Only Active** 🔽 in the **Records** group on the **Parcels** ribbon to only show parcel features in the active record. If there is a new record in the map, only the traverse lines should be visible. Turning off the display of surrounding parcel features by clicking **Show Only Active** makes it easier to view and enter traverse lines.

5. After entering your closed loop parcel traverse, click **Create Seeds** in the **Construct** group on the **Parcels** ribbon to create a seed for the parcel traverse.

6. Click **Build Active** in the **Construct** group on the **Parcels** ribbon to build the parcel.

7. If necessary, select the newly built parcel, open the **Attributes** pane, and update its attributes.

8. Select the new parcel and click **Clip** in the **Tools** gallery on the **Parcels** ribbon.

9. The **Input Features** tab should be your current selection. Verify it's correct.

10. In the **Clip** pane, make sure **Clip all editable layers** is not checked (at the very bottom), and click the **Target Features** tab.

11. Select the target parcels you want to clip and use to create remainder parcels. The view will change as you select your input and target features so you know what will be affected.

12. Choose the **Discard (Remainder)** option in the **Clip** pane
    1. NOTE: Be sure to explore the other Clip options.

13. Click **Clip** to clip and create remainder parcels.

8: Build Parcels from CAD Lines (with Task)

The ***Build parcels from CAD lines*** task is a record-driven workflow for building parcels from CAD lines in the parcel fabric.
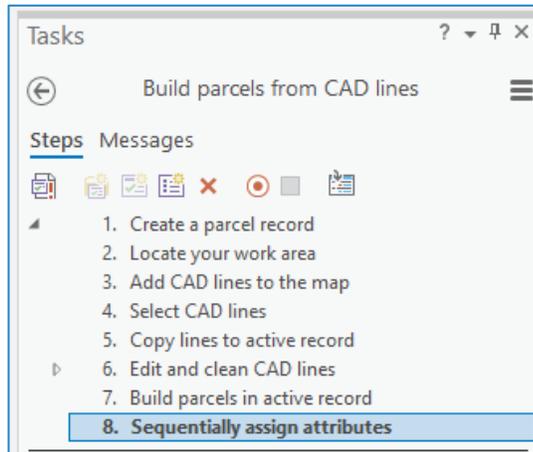
- In the Build parcels from CAD lines task, the **Manage Records** pane is embedded in the **Tasks** pane and automatically opens in the first step.

- In the Build parcels from CAD lines task, the **Catalog** pane is embedded in the **Tasks** pane and automatically opens in the step.

- In the Build parcels from CAD lines task, the step loads the **Select** tool.

- In the task, the **Copy Lines To** dialog box is embedded in the **Tasks** pane and automatically opens in the step.

- In the task, the Planarize tool, Extend Or Trim tool, Vertices tool, Create Seeds command, Validate Extent command, and Fix Error tool are automatically loaded in a pallette for the step.

- In the task, the step automatically runs the Build Active command and proceeds to the next step.

- In the task, the **Sequential Numbering** pane is embedded in the **Tasks** pane and automatically opens in the step.

9: Build Parcels from CAD Lines (No Task)

To build parcels from CAD lines, you can follow these steps:

1. Create a parcel record for the CAD file.

   The parcel record will be set as active in the map.
   The Created By Record field of new parcel features will
   be populated with the GlobalID of the active record.

Create Record	▾ ⊼ ✕
Name	Split
Record Type	<Null>
Recorded Date	4/12/2022 12:41:20 PM
Created By	<Null>
Created Date	<Null>
Modified By	<Null>
Modified Date	<Null>
Created Parcel Count	<Null>
Retired Parcel Count	<Null>

2. If necessary, use the **Locate** pane to search for and
   locate the parcels to split.

3. Click **Add Data** in the **Layer** group on the **Map** tab
   and browse to and add the CAD data to the map.

   To add external feature classes, you may need to add a geodatabase containing the data
   to the project or connect to a geodatabase.

4. Georeference the CAD lines if necessary.

   Georeferencing CAD lines moves the lines to the projection and spatial location of the
   parcel fabric. When georeferencing, you can move the CAD lines to an approximate
   position in the parcel fabric. After building the parcels, use alignment tools to align the
   parcels to the surrounding parcels in the parcel fabric.

5. Use the **Select** tool in the **Selection** group on the **Parcels** ribbon to select the CAD
   lines.

   Tip:
   To select all the lines in a layer, right-click the line layer in the **Contents** pane, point
   to **Selection**, and click **Select All**.

6. Click **Copy Lines To** in the **Construct** group on the **Parcels** ribbon to open the **Copy
   Lines To** dialog box.

7. Choose a parcel type to which to add the copied lines.

   The copied lines will be added as new lines to the parcel line feature class of the parcel
   type.

8. Choose **Show only active record** to show only parcel features that are part of the active
   parcel record.

Note:

Turning off the display of parcel features that are not part of the active record is useful when editing and modifying lines to construct new parcels.

If parcels are already part of the active record, they will be displayed in addition to the copied lines.

9. Click **OK** to copy the lines to the active record.

    Seeds will be automatically generated for closed loops of lines.
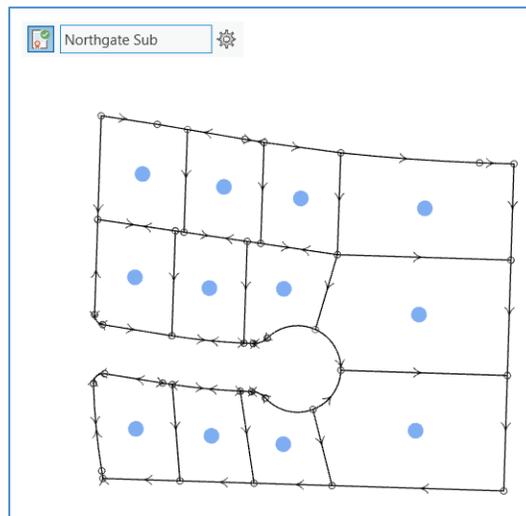
10. Clean the copied CAD lines. For example, you may need to do the following:
    - Extend or trim dangling lines, planarize lines, or delete lines that create gaps.
    - Click **Vertices** in the **Tools** gallery on the **Parcels** ribbon, and click on a line to display its vertices.
    - Delete parcel seeds. Erroneous parcel seeds can indicate erroneous line loops or gaps. Clean the gaps and delete the erroneous seeds.
    - Create additional parcel seeds. Click **Create Seeds** in the **Construct** group on the **Parcels** ribbon to generate parcel seeds.

11. Click **Validate Extent** in the **Tools** gallery on the **Parcels** ribbon to validate the map extent and detect any missed line errors.

    Topology errors are labeled in the map extent by their error name, for example, Missing Point. Open the **Error Inspector** pane to display the topology errors. Use the **Fix Error** tool to fix errors in the map with a predefined fix.

    Missing parcel and missing point errors will be fixed when parcels are built.

12. Optionally select and update the attributes of parcel seeds. The attributes will be transferred to the new parcels once they have been built.

Alternatively, you can update the attributes of the built parcels.

13. Click **Build Active** in the **Construct** group on the **Parcels** ribbon to build parcels from CAD lines in the active record.

14. If necessary, align the newly built parcels to surrounding parcel features.

15. If necessary, set parcels that were replaced by the CAD lines as historic.

If the parcel record of the CAD lines is the active record, the Retired By Record field of the parcel features being set historic will be populated with the GlobalID of the active record.

16. Use the **Sequential Numbering** tool in the **Tools** gallery on the **Parcels** ribbon to add sequential attributes to the new parcels.

You can also select parcels and open the **Attributes** pane to update attributes

17. Optionally use the **Update COGO** tool in the **Tools** gallery on the **Parcels** ribbon to add COGO dimensions to the newly built parcel lines.

Select the lines you want to update and click the **Update COGO** tool to open the **Update COGO** pane. COGO dimensions are generated from the line geometry. The COGO Type attribute of the line is set to **Computed**.

10: Union Parcels to Create a New Parcel

Unioning parcels will leave the original selected parcels as current/active and will create a new parcel as well – all current. **No History is created in this process** as long as there is no active record set and/or you are not merging within the same parcel type.

1) Select existing parcels to be unioned.

2) Navigate to and choose Merge tool

3) On the *Merge* pane. . .
   a. Use the New Feature tab for a Union

   b. Choose the button for "Keep original features"

   c. Choose the button for "Use template"

   d. Set the new template (must be visible in the TOC to be selectable with the template browser)

   o Examples:
      • Select existing Tax Parcels to begin a new Subdivision: The outer boundary of the tax parcels becomes the new Subdivision boundary
      • Select PLSS Sections to create the PLSS Township

   e. Fill in any other attributes needed

   f. Merge –
      The Merge tool will then merge the parcels together into a new parcel based on the Template setting and will NOT create any Historic features.

4) If not already done, update the attributes of the new parcel

SAVE EDITS!

Quality-driven Workflows

Quality Ribbon
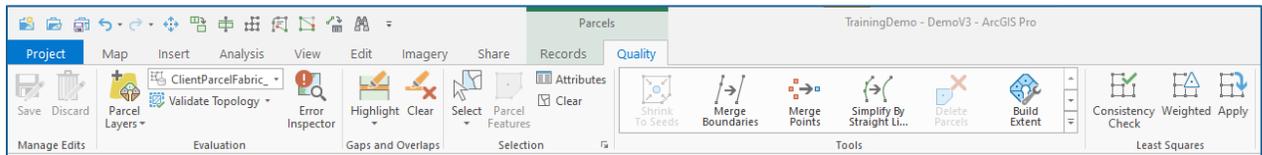
Evaluation Module
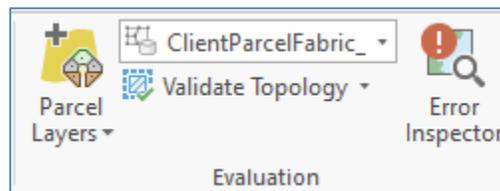
- Distance Mismatch
    - Evaluates the difference in the distance between the Shape Length and the COGO Distance.
    - Generates a new layer in the Table of Contents
    - By default, the difference criteria is set to 0.5' which means any line with a difference greater than 0.5' will be flagged.
    - You can change the difference in the Layer's Properties > Definition Query tab

- Too Short
    - Generates a new layer in the Table of Contents
    - By default, the evaluation is set to report any line that has a Shape Length less than 0.5'
    - You can change the difference in the Layer's Properties > Definition Query Tab

- Vertices
    - Generates a new layer in the Table of Contents
    - When used with a line class, it generates a new line class (dashed symbology)
    - When used with a polygon class, it generates a polygon class with a dashed boundary line and green nodes at the vertices – not necessarily the same as the Points layer.
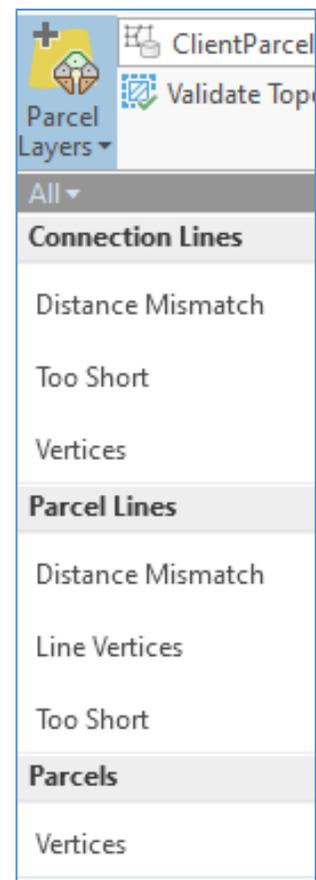
Gaps & Overlaps Module
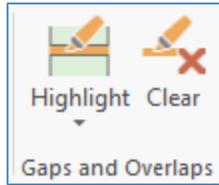
Gaps and Overlaps

This tool is used to find small gaps and overlaps in the data prior to running topology validation. It is also meant for small areas, such as just in your area of work on a split, combine or new subdivision.

<u>To use this tool:</u>

- Set the Highlight Settings – use the dropdown to get to the settings
    - o Enter the Width – something less than what would be an alley width.
    - o Layer – enter the layer to be evaluated
    - o Colors – set your Gap and Overlap colors

- Highlight the errors
    - o Click the tool to show any violators
    - o This tool only works in the current view – note the dashed line generated at the periphery.
    - o Use the Clear button to clear the currently highlighted features.
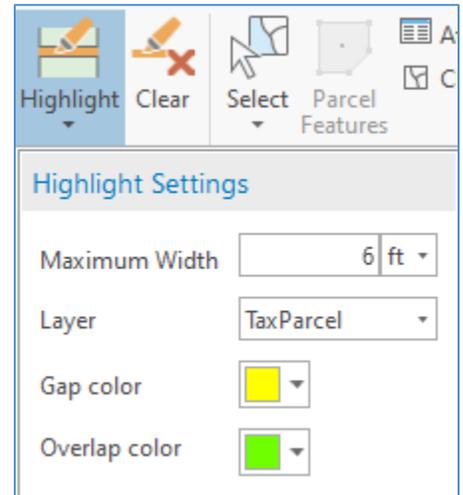
Do not highlight countywide – it will take a long time to evaluate if it finishes at all.

11: Topology Validation

Topology can be found in the Map's Table of Contents or in Catalog.

Via Table of Contents:

Dirty Areas:

- This is an indicator that shows areas that have not been validated yet.

Point, Line, Polygon Errors:

- These are visual representations of the errors that are found when topology is validated.
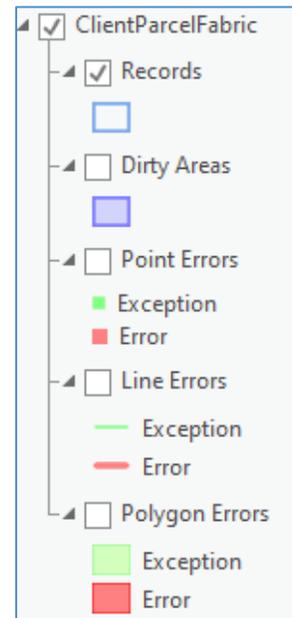
In Catalog:
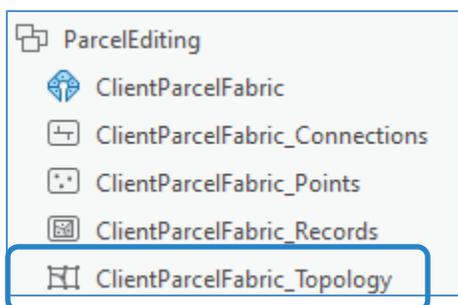
Many rules are created by the parcel fabric itself, but these are editable. The default rules pertain to each feature type by itself, meaning there are no rules to tie parcel types together.

To see the Topology properties, view the Properties of the Parcel Fabric Topology from Catalog.

General Tab:
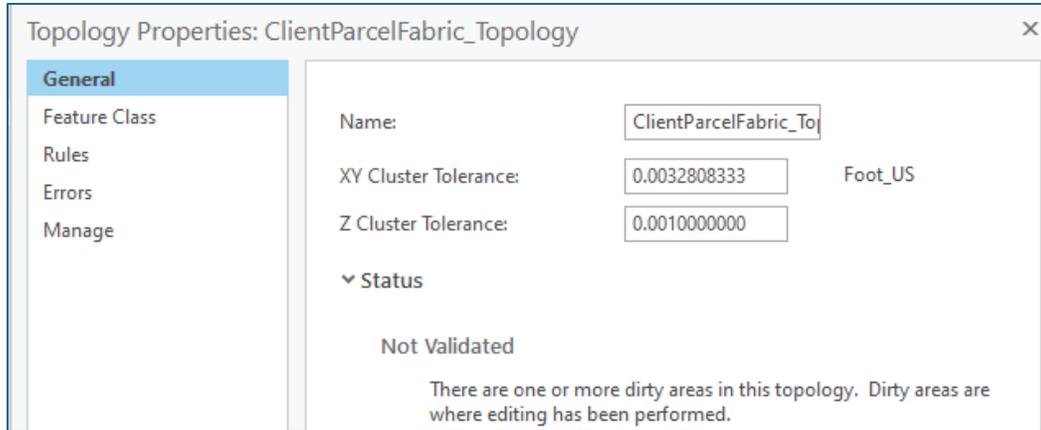
- Name: you can modify the name of the topology if you wish. A default name will be given if you do not specify.

- Tolerances: The XY and Z Cluster tolerances will be auto-populated with values based on the coordinate system of the data unless you specify otherwise.
  - Keep in mind that the tolerances indicate that any error smaller than that value will be auto-corrected and any error larger than that value will be flagged for you to review and correct. So, keeping the default values might be a good place to start and adjust once you start to review the errors.

Feature Class Tab:
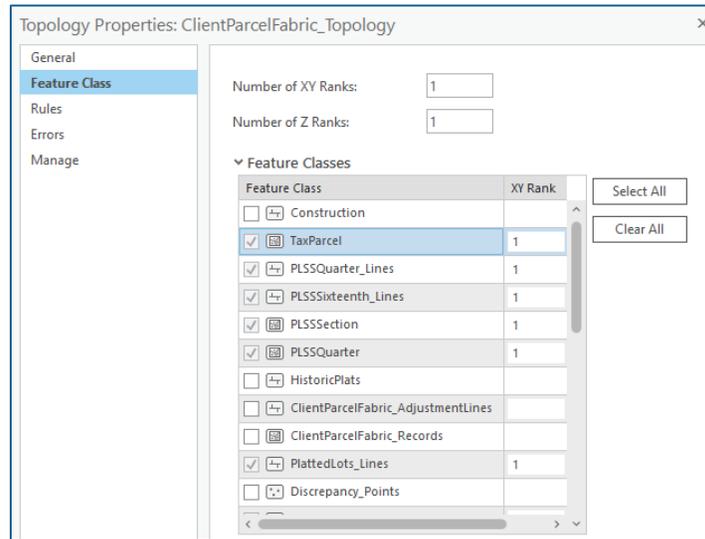
This tab allows you to choose which feature classes will participate in the topology and what rank each of those will receive.

# of Ranks: You can choose how many rankings you would like to participate in your topology.

- The lower the value, the better the rank – 1 is the highest rank meaning it's the best accuracy.
- Ranks indicate which features are considered more or less accurate than other features.
- If there is an error smaller than the tolerance specified in the General tab, it will be resolved based on the ranks listed here. Lower ranks will be adjusted to higher ranks. Equal ranks will split the difference/average the difference.

To select which features will participate, check the box to the left of the feature and then indicate the rank(s) you'd like to assign to it.

Rules Tab:

All the rules are shown in the Rules tab. There are some rules that cannot be modified as they are the basis of a fabric.

- These 6, per Parcel Type, are not editable:

To Add your own rules, either scroll to the bottom of the list to the prompt "Click here to add a new rule.", use the Add button at the top of the dialog box or use the Load Existing tool at the top of the dialog box.

Suggestions of what to add:

- Anything that will spatially relate multiple parcel fabric types
- Gap/Overlap rules where appropriate

You can modify or delete any rules that you create, but not what the fabric needs.

Errors Tab:

The Errors tab allows you to generate a summary of the errors and export that to a file as you need.

"Generate Summary" is only available when topology has been validated.

Manage Tab:

The Manage tab allows you to enable and disable editor tracking.

Topology Tools:

To validate and correct topology errors, use the tools in the pallet.

- **Validate All:** If there are more than 1000 features in your data, this tool will prompt you to open the geoprocessing tool to validate the entire dataset.
- **Validate Extent:** This will validate whatever is in your current data view. If there are more than 1000 features, it will again prompt you to run the geoprocessing tool.
- **Validate Specified Extent:** This tool will allow you to draw a box over the area you'd like to validate. If more than 1000 features, you will be prompted for the geoprocessing tool.

- **Error Inspector:** This will open the Error Inspector panel to examine individual errors and potentially make corrections or mark errors as exceptions.
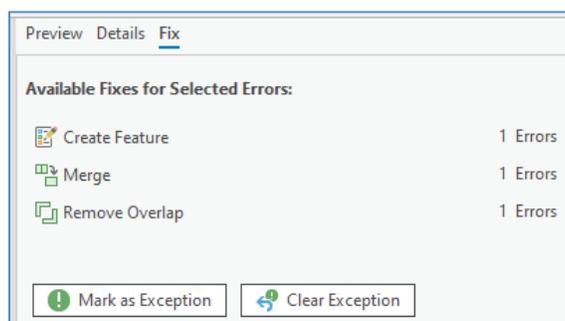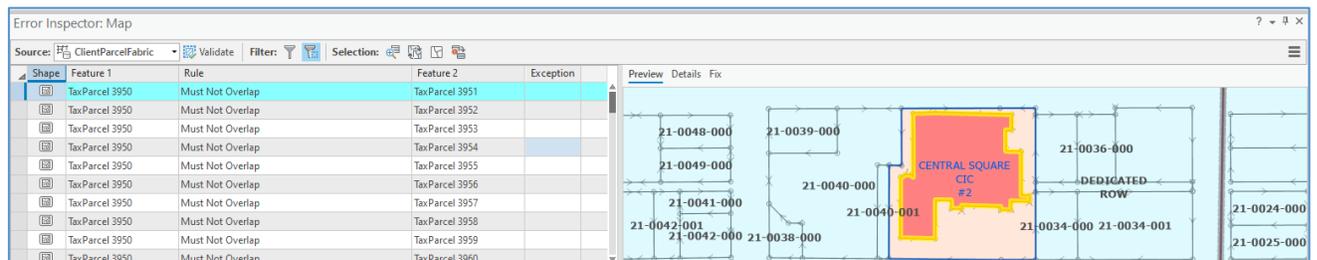
- **Fix Error:** This is an on-the-fly tool that will allow you to interact with individual errors to make corrections or flag as exceptions.
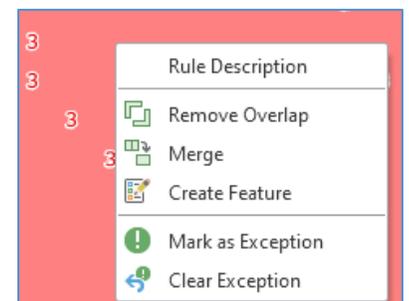
EXERCISE: Test Validate options and correct errors

1. Zoom to an area around a scale of 1:1000
2. Choose Validate Extent
3. Be sure your Point, Line and Polygon Errors are visible in your table of contents
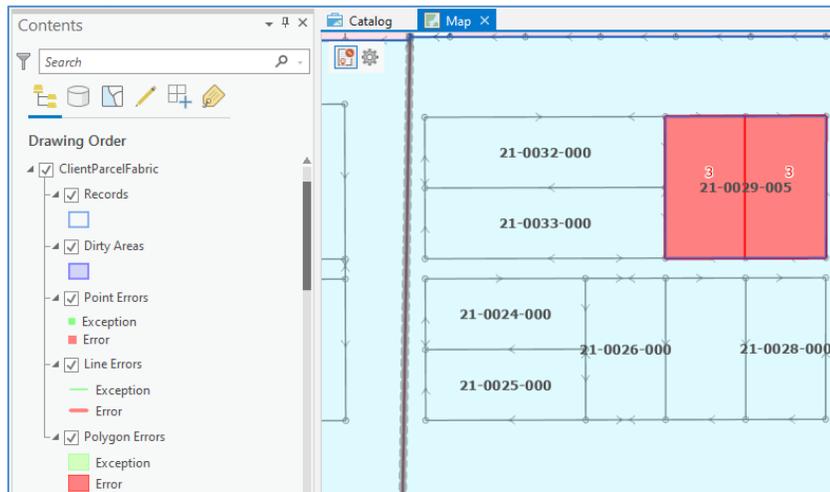
4. Open Error Inspector to review errors in current view

5. Assess & test various tools available
6. Test a mass exception
7. Open Fix Error tool
8. Assess and test various tools available

12: Attribute Rules

Attribute Rules provide efficiency by letting the computer do some automated calculations or queries to populate attributes that may otherwise be manually entered.
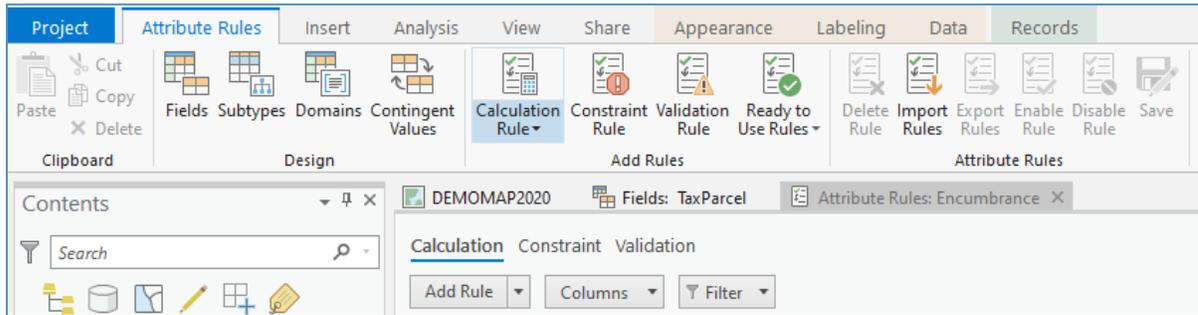
To access Attribute Rules, select a layer you wish to create a rule for and navigate to Design > Attribute Rules.

Three Attribute Rule Types:
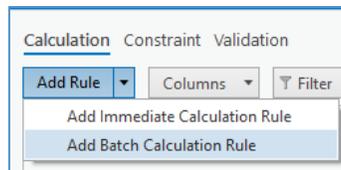
- Calculation

Examples:
- Calculate Acreage
- Calculate the Record Name

- Constraint

Examples:
- Control needs to be within 1000 feet of County boundary.

- Validation

Examples:
- Validate attributes

Pre-Configured Rules:

You can access the pre-configured rules by

- selecting and right-clicking a feature class in the Table of Contents
- Choose Data Design > Attribute Rules
- On the Attribute Rules ribbon, use the Import Rules dropdown and select Parcel Fabric
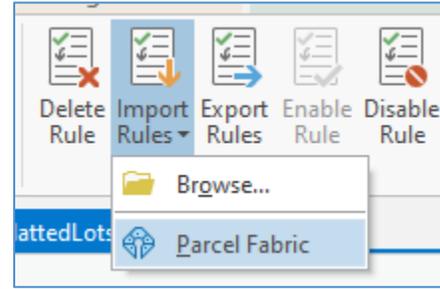
Rules such as Larger Than, Smaller Than, Longer Than, & Must Match Within can be modified in the Definition Query.

Polygon:

Rule Name	Description
MUST HAVE A RECORD	Parcel features must be associated to the record that created them
MUST BE LARGER THAN	Parcel shape area must be larger than the specified area
MUST BE SMALLER THAN	Parcel shape area must be smaller than the specified area
CURRENT MUST NOT OVERLAP	Current parcels must not overlap each other. Current parcels can overlap historic parcels and historic p
NAME MUST BE UNIQUE	Parcel names must be unique for current parcels in the same parcel type
NAME MUST NOT BE EMPTY	Parcel names must be populated and cannot be NULL
MISCLOSE RATIO MUST BE LESS THAN	Misclose ratio must be less than the specified tolerance
MICLOSE DISTANCE MUST BE LESS THAN	Misclose distance must be less than the specified tolerance
AREAS MUST MATCH WITHIN	Shape area and Stated Area must not differ by more than the specified tolerance

Line:

Rule Name	Description
MUST HAVE A RECORD	Parcel features must be associated to the record that created them
MUST BE LONGER THAN	Boundary line must be longer than the specified length
DISTANCE MUST MATCH WITHIN	Line shape length must match the COGO distance within the specified tolerance
DIRECTION MUST MATCH WITHIN	Line shape direction must match the COGO direction and rotation within the specified tolerance

Point:

Rule Name	Description
MUST BE IN XY EXTENT	Points must lie within the specified MBR (minimum bounding rectangle)
MUST BE IN XY EXTENT	Points must lie within the specified MBR (minimum bounding rectangle)
MUST BE IN Z EXTENT	Point's z attribute coordinate must lie within in the specified height range
XY MUST MATCH SHAPE WITHIN	Point's XY attribute coordinates must lie within the specified distance of the point's shape
Z MUST MATCH GEOMETRY WITHIN	Point's Z attribute coordinate must lie within the specified height of the point's shape

EXERCISE: Create Rules

A: Calculate Rule Type:
- o   Make sure to have fields for attribute to be calculated
- o   Create a new Attribute rule
- o   Edit a feature to test

B: Constraint Rule Type: Control must be within County.
- o   Test it by trying to add a corner at 1,1.

C: Validation Rule Type: via Pre-Configured Rules
- o   Modify Definition Query
- o   Test

13: Run a Consistency Check (Least Squares Analysis)

A consistency check will determine the location and number of measurement errors in your data. This is done through a Least Squares Analysis which checks the direction and distance accuracy of your lines.

1. Verify that your lines are populated with COGO attributes as these are the values that the process evaluates. **Distance**, **Direction**, **Radius, ArcLength** and **Radius 2** values.

   Note:

   If your lines are not attributed with COGO values, use the Update COGO tool to generate COGO values from the geometry (not from a deed).

2. Fill out the **Direction Accuracy** and **Distance Accuracy** fields for all lines you will be checking.
   - Default is 30 seconds for **Direction** and 0.49 ft for **Distance**.

   Note:
   - Higher values in the accuracy fields = Lower accuracy
   - Lower values in the accuracy fields = Higher accuracy
   - Example:
     - If I put a value of 120 in the **Direction Accuracy** field and a value of 3 in the **Distance Accuracy** field, that would mean that my **Direction** accuracy is plus or minus 2 minutes and my **Distance** accuracy is plus or minus 3 feet.

3. Use the **Analyze Parcels By Least Squares Adjustment** tool to run the consistency check.
   a. Select the lines that you want to analyze (could be connection lines as well)

   Tip:
   You can choose polygons as part of the analysis, but they will increase the processing time as the tool has to extract the lines from the polygons. Processing times will be faster by selecting only lines to be analyzed.
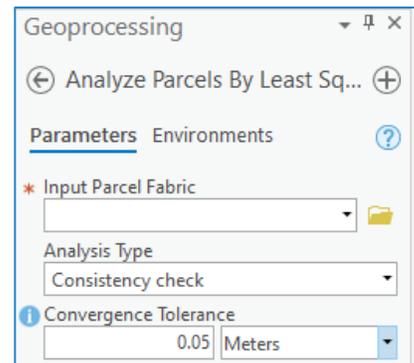
   b. Choose the Parcel Fabric to be analyzed.
   c. Under **Analysis Type**, choose "Consistency check".
   d. Choose the default **Convergence Tolerance** or type in your own.
   e. Run the tool.

4. View and analyze the results.

   a. **View Details** from the geoprocessing tool to check the Chi-Square test result. If the result is low or high, you will need to change the accuracy values assigned in Step 2.

Analyze Parcels By Least Squares Adjustment (Parcel Tools)   ×

⚠ Completed with warnings.

Started: Today at 3:01:42 PM

Completed: Today at 3:01:45 PM

Elapsed Time: 3 Seconds

⌄ Errors and warnings

⚠ Missing distance and/or direction accuracy values. Default accuracy values will be used. Distances: 0.492125 ftUS, Directions: 30 seconds

⚠ Chi square test: Low. To improve the chi square test decrease the values in the distance accuracy or direction accuracy fields. (Decreasing the accuracy value on a measurement increases its influence on coordinate positions in the network.)

   b. Explore the Adjustment Lines feature class added to the **Contents** pane.

      • The symbology will show you if there are any outliers in your data.

   c. Make corrections to any outliers you may have.

▲ ✓ Adjustment Lines
  ─▲ ✓ Distance
        ▬ Outlier
        — Standard
  ─▲ ✓ Direction Set
        ▬ Outlier
        — Standard
  ─▲ ✓ Geodetic Latitude
        ▬ Outlier
        ▬ Standard
  ─▲ ✓ Geodetic Longitude
        ▬ Outlier
        — Standard
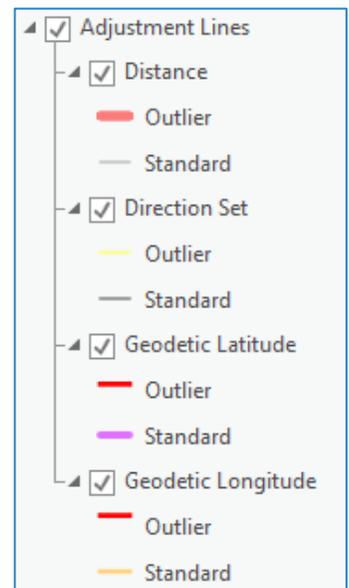
14: Run a Weighted Least Squares Adjustment

A weighted least squares adjustment will calculate more accurate coordinates for the points in your fabric using two or more control points. This is done through a Least Squares Analysis which checks the direction and distance accuracy of your lines, and then an application of the proposed adjustments.

1. Verify that your lines are populated with COGO attributes as these are the values that the process evaluates. **Distance**, **Direction**, **Radius**, **ArcLength** and **Radius 2** values.

   Note:

   If your lines are not attributed with COGO values, use the Update COGO tool to generate COGO values from the geometry (not from a deed).

Attributes	Geometry
Direction	N44°12'38"W
Distance	596.875854
Radius	<Null>
Arc Length	<Null>
Radius2	<Null>
COGO Type	From Geometry
Is COGO Ground	Yes
Rotation	0°00'00"
Scale	1
Direction Accuracy	30
Distance Accuracy	0.492125

1. Fill out the **Direction Accuracy** and **Distance Accuracy** fields for all lines you will be checking.
   - Default is 30 seconds for **Direction** and 0.49 ft for **Distance**.

   Note:
   - Higher values in the accuracy fields = Lower accuracy
   - Lower values in the accuracy fields = Higher accuracy
   - Example:
     - If I put a value of 120 in the **Direction Accuracy** field and a value of 3 in the **Distance Accuracy** field, that would mean that my **Direction** accuracy is plus or minus 2 minutes and my **Distance** accuracy is plus or minus 3 feet.

2. Use the **Analyze Parcels By Least Squares Adjustment** tool to run the least squares analysis.
   a. Select the lines that you want to analyze (could be connection lines as well)

   Tip:

   You can choose polygons as part of the analysis, but they will increase the processing time as the tool has to extract the lines from the polygons. Processing times will be faster by selecting only lines to be analyzed.
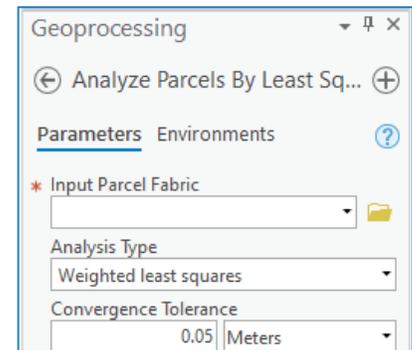
   b. Choose the Parcel Fabric to be analyzed.
   c. Under **Analysis Type**, choose "Weighted least squares".
   d. Choose the default **Convergence Tolerance** or type in your own.
   e. Run the tool.

Geoprocessing — ⊡ ×

← Analyze Parcels By Least Sq... ⊕

Parameters Environments   ⑦

* Input Parcel Fabric

Analysis Type
Weighted least squares ▾

Convergence Tolerance
0.05 Meters ▾

3. View and analyze the results.
   a. **View Details** from the geoprocessing tool to check the Chi-Square test result. If the result is low or high, you will need to change the accuracy values assigned in Step 2.

Analyze Parcels By Least Squares Adjustment (Parcel Tools)   ✕

⚠ Completed with warnings.

Started: Today at 3:01:42 PM
Completed: Today at 3:01:45 PM
Elapsed Time: 3 Seconds

⌄ Errors and warnings
  ⚠ Missing distance and/or direction accuracy values. Default accuracy values will be used. Distances: 0.492125 ftUS, Directions: 30 seconds
  ⚠ Chi square test: Low. To improve the chi square test decrease the values in the distance accuracy or direction accuracy fields. (Decreasing the accuracy value on a measurement increases its influence on coordinate positions in the network.)

   b. Explore the Analysis group layer with the Adjustment vector, point, and line feature classes added to the **Contents** pane.
      - The symbology of the points and lines will show you if there are any outliers in your data.
      - The vectors show the direction and length the adjustment will move each point.
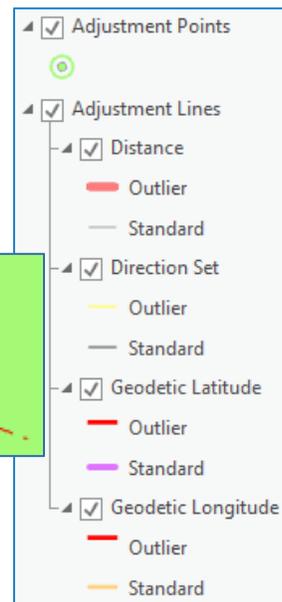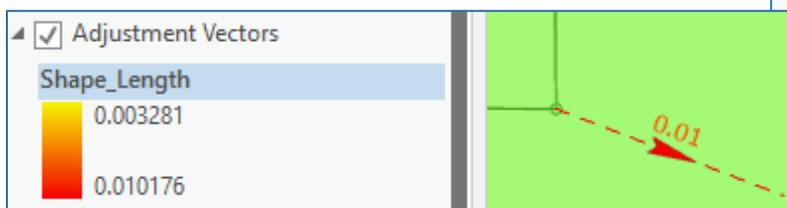
   c. Make corrections to any outliers you may have.

4. Rerun the **Analyze Parcels By Least Squares Adjustment** tool if you made corrections to any outliers.

5. If the adjustments look satisfactory, then run the **Apply Parcel Least Squares Adjustment** tool.

Note:
   a. This tool applies the results and proposed changes stored in the Adjustment feature classes. This makes it so there is no need to select the features during this step.
   b. Choose a **Movement Tolerance.**
      - Any adjustments that are smaller than this distance will not be applied.
   c. Choose if you want to **Update Attribute Fields** with statistical metadata.
   d. Run the tool
      - You may choose to "Enable Undo" for this tool before running it.
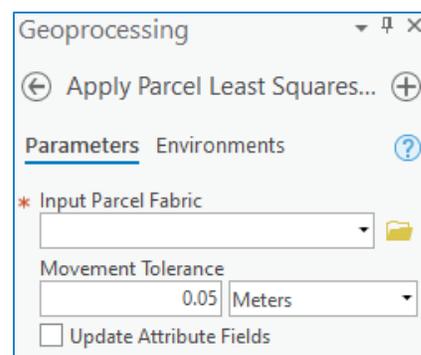
Enterprise Versioning

Many organizations have multiple editors and thus use an enterprise system to enable them to edit at the same time. When multiple editors are required to work with the Parcel Fabric, enterprise versioning is the method used so that each editor has a working copy of the data and can make edits without interference from other editors. When the editor wishes to then share and review edits, via the versioning tools, he/she can then review the edits in the context of the published edits from other editors and post edits to the default data.

The versioning process and tools enable multiple editors to stay connected to the main geodatabase while editing, review his/her edits against other editor's changes, and maintain the option to discard the entire version of edits in the case of major errors.

Versioning Process

A version represents a snapshot in time of the entire geodatabase. It contains all the datasets in the geodatabase. Versioning allows multiple users to edit the same data in an Enterprise geodatabase without applying locks or duplicating data.

Every Enterprise geodatabase has a parent version called DEFAULT; therefore, versioning is always enabled for the geodatabase. The DEFAULT version always exists and cannot be deleted. You maintain and update the DEFAULT version over time by posting changes to it from other versions. You can create any number of versions and have users edit them simultaneously.

Versioning with the Parcel Fabric only allows one step from the DEFAULT parent, but as many as is needed. In other words, the parent DEFAULT can have as many children as are needed, but no grandchildren. Without the Parcel Fabric, grandchildren are possible.

File geodatabases do NOT support versioning.

Access Versioning Commands

If you are editing a parcel fabric published as a feature service, you will be working with a branch-versioned geodatabase, and you will need to switch to and create versions. After you add the parcel fabric to a map, you can use the **Versioning** ribbon to create and manage versions.
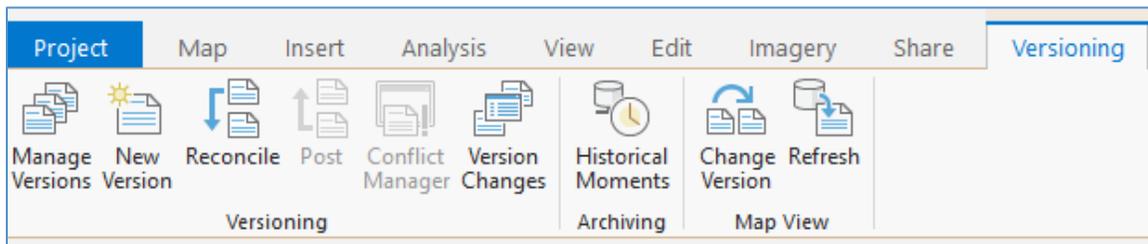
To access the **Versioning** ribbon,

1. Click **List By Data Source** 🛢 in the **Contents** pane

Then:

2. Select your database connection. The **Versioning** ribbon, containing commands to manage, create, and reconcile versions, becomes available.

OR

3. You can right-click the database connection in the **Contents** pane to switch between versions.
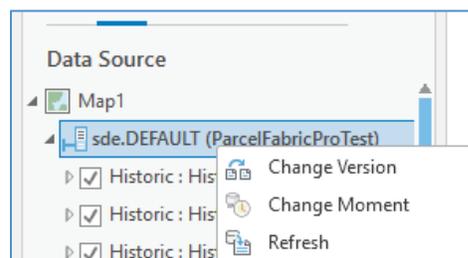
Create a new Version

1. Add all needed data to a **New Map**

2. Click on the **Default gdb** in the **List by Data Source** TOC pane
   a. This will make the Versioning Ribbon available

3. On the Versioning Ribbon, choose **New Version**
   a. Fill in the appropriate information
   b. Check the box to Switch to this new version

You can set one of three permissions on a version:
- **Private**— Only the owner or the ArcSDE administrator may view the version and modify versioned data.
- **Protected**— Any user may view the version, but only the owner or the ArcSDE administrator may edit datasets to which he or she has read/write permission.
- **Public**— Any user may view the version. Any user who has been granted read/write (UPDATE, INSERT, and DELETE or read/write) permissions on datasets can modify those datasets.

4. Verify the version changed in the **List by Data Source** TOC pane
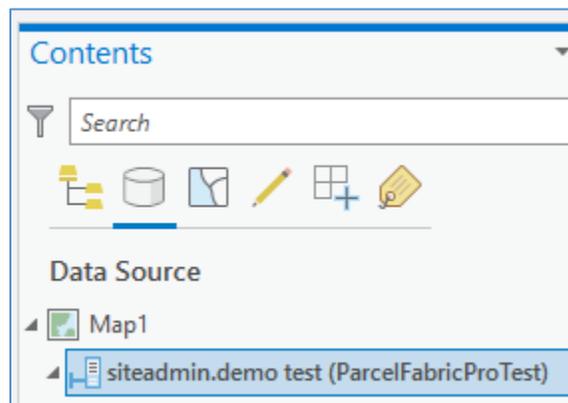
Reconciling & Posting Process

Reconciling: pulling all the changes from the target (parent/Default) version into your version and finding anything that doesn't match.
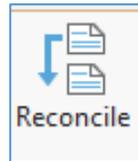
Reconcile merges all modifications between the current edit version and a target version. Any differences between the features in the target version and the features in the edit version are applied to the edit version. Reconciling happens **before Posting** a version to a target version. A target version is any version in the direct ancestry of the version, such as the default version.

* You cannot use the Undo operation to undo a Reconcile. To undo a Reconcile, you must exit your edit session without saving changes.

Posting: pushing your versioned edits to the default parent version.

* Posting cannot be undone since you are applying changes to a version you are not currently editing.

Reconciling & Posting a Version

1. Make sure you have the **Version to Reconcile** set in the Contents pane under the List by Data Source Tab
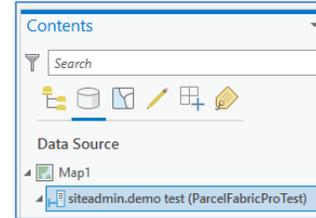
2. Click on the *Reconcile* button on the *Versioning Toolbar*
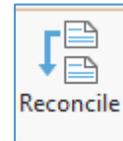
   If any conflicts arise, the Conflict Manager tool will be available on the Versioning toolbar. It can be used to resolve differences in the versions.

   If no conflicts arise, then you may continue to post the edits.

3. Click on the *Post* button on the Versioning Toolbar

4. Version maintenance:
   After posting data, you can either continue to edit with the same version or you can change version to Default and remove the current version.

   a. If you choose to continue editing with the same version, you may continue to edit and repeat the Reconcile and Post steps often.

   b. If you choose to remove the current version, use the *Change Version* option either from the Versioning toolbar or from a right-click menu of the data source to change back to the Default version.
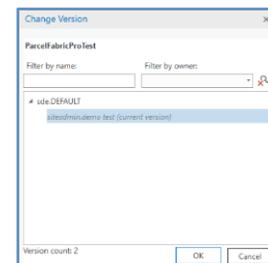
      i. Select the Default version and click OK

      ii. Then, use the *Manage Versions* tool on the Versioning toolbar to select, right click and choose delete to remove the version you no longer need. Be sure to Save the change.
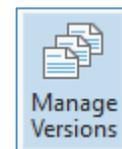
Appendix: Recommendations

Recommendations:

A. Change your symbology and labeling to fit your needs.

B. Become a member of the Esri GeoNet Community – Land Records and Local Government. https://geonet.esri.com/

C. Keep this website bookmarked:
   o https://pro.arcgis.com/en/pro-app/help/data/parcel-editing/whatisparcelfabric.htm

Data Cleanup Needs (aka Homework):

Every project leaves a little room for some homework – whether clean up needs, further decisions to be made, or tweaks to implement. Below are the items found, discovered, or recommended for the Client's homework.

1. Attributes:
   a. Ensure the attribute schema will match the Client's needs. Test what is there and what changes you may be thinking about.
2. Topology:
   a. There are several small gaps & overlaps that can be corrected with topology tools and other COTS ArcGIS Pro tools.

Things to think about . . .

A: Fabric Record usage
   Be clear about how the County will use Records moving forward

B: Review map Items:
- TOC items – add/remove features as needed, move items up/down or group
- Symbology changes including transparency, scale for visibility, and label options
- Field visibility and highlighting
- Set Labeling
- Prep Task settings – configuration of each task