ArcGIS for Land Records - Improving Data Quality

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Managing parcels in ArcGIS

- Parcel editor toolbar
- Based on an optimized model for parcel storage
  - Parcel fabric
- Tools for streamlined parcel editing workflows
  - Splits, merges, resurveys, etc
  - Data migration
  - Metadata for edits – job tracking
- Tools to improve data quality
  - Topological integrity
  - Positional accuracy
What is a parcel fabric?

- Set of related tables and feature classes stored in a geodatabase
- Connected parcel groups
  - Forms a parcel boundary network
- Explicit topology
  - defined by common parcel corners, no overlaps and gaps between neighboring parcels
Parcel fabric data model

Parcels

Lines

Points

Lines

Points

Control

Line Points

Plans
Improving data quality

• Data quality in parcel data:
  - Topological integrity
  - Correct attributes
  - Spatial accuracy/positional accuracy
  - Relative accuracy
Topological integrity

- Ensure topological integrity before data migration
- Load Topology to Parcel Fabric tool
  - Loads a topology of polygons and lines
  - Topology needs to be clean and validated against required rules
Topological integrity

- Ensure topological integrity before data migration
  - Use Integrate geoprocessing tool to make shared boundaries coincident
  - Eliminate gaps and overlaps
Topological integrity

- Data migration of a clean topology
- In the parcel fabric parcel joining enforces connectivity during incorporation
Correct dimensions

- Correct attribute data
  - Parcel dimensions are correct – data entry
Spatial accuracy

- Fabric least-squares adjustment uses control points and COGO dimensions to recalculate/update parcel coordinates
Fabric least-squares adjustment

• Parcel network is adjusted to control network
• COGO dimensions used to recalculate coordinates
• Parcel point coordinates are updated, dimensions are not changed
• Finds mistakes/blunders in parcel data
• Parcel data should be correct
  - Topologically clean
  - Correct dimensions
Fabric least-squares adjustment

- Accuracy categories on parcels and lines affect the outcome of the adjustment
  - Parcels/lines with high accuracy category adjust less than parcels/lines with low accuracy category
  - Accuracy categories act as weights in adjustment
Fabric least-squares adjustment

- Least-squares adjustment will be successful if:
  - Parcel network fits/transforms well to control network
  - Good connectivity in parcel network
  - No blunders in COGO dimensions
Fabric least-squares adjustment

- Parcel network fits/transforms well to control network
• **Good connectivity in parcel network**
  - Connection lines connecting parcel blocks, or
  - ROW polygons
Fabric least-squares adjustment

- No blunders in COGO dimensions
  - Blunder results in the adjustment of geometry that is outside reasonable tolerances
  - Least-squares adjustment is useful for identifying blunders or incorrect COGO dimensions
• When starting out with poor quality data:
  1. Enter new subdivisions
  2. Apply appropriate accuracy category to new data
  3. Apply low accuracy category to surrounding data
  4. Run adjustment on new data and surrounding data
    - Accuracy categories give adjustment a benchmark work with - which data is good, which data is bad
Improving data quality – relative accuracy

- Fabric feature adjustment aligns other layers to adjusted parcel boundaries
Fabric feature adjustment

• Coordinates changes from fabric adjustment are stored as vectors
• Vectors are used in a feature adjustment to adjust and align overlaying layers