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Technical Workshops | Thursday 14th July, 2011

ArcGIS for Land Records - Improving Data Quality

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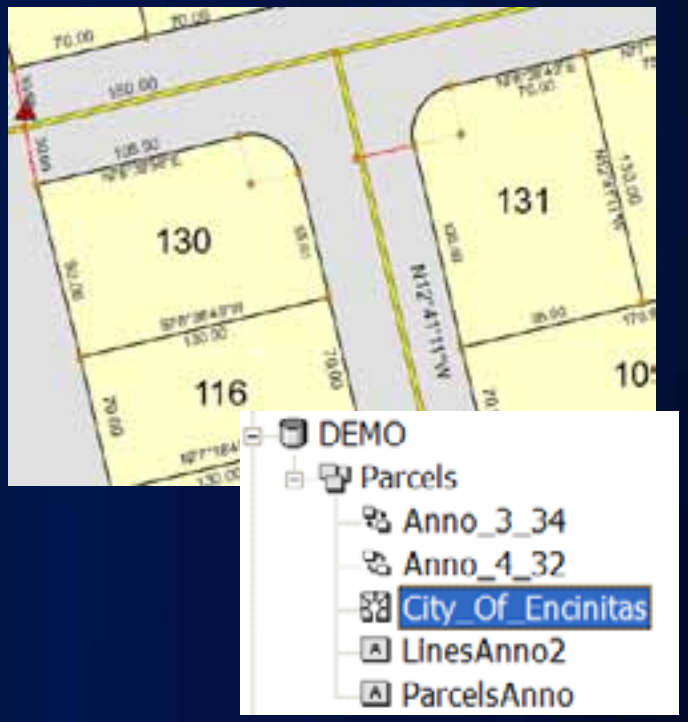
Managing parcels in ArcGIS

- 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



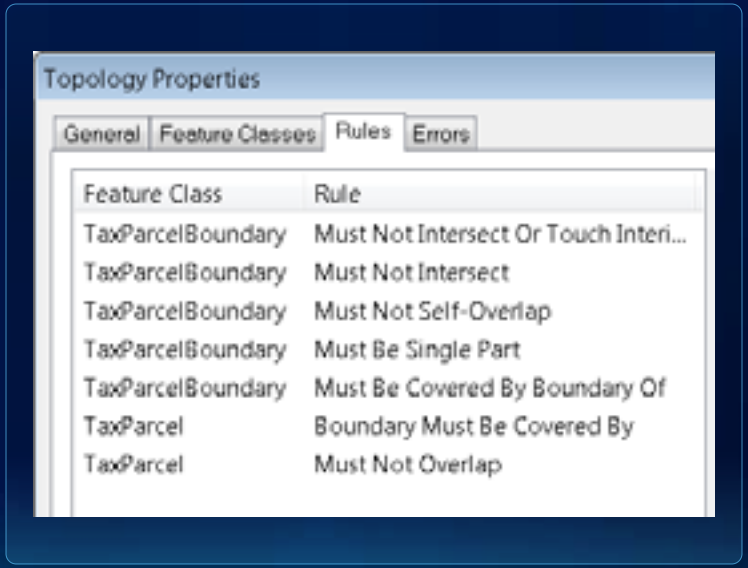
Parcel fabric data model

Improving data quality

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

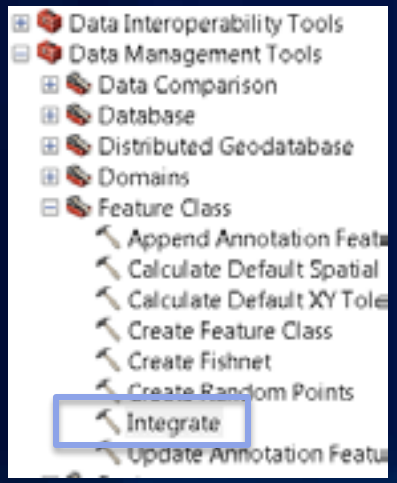
Topological integrity

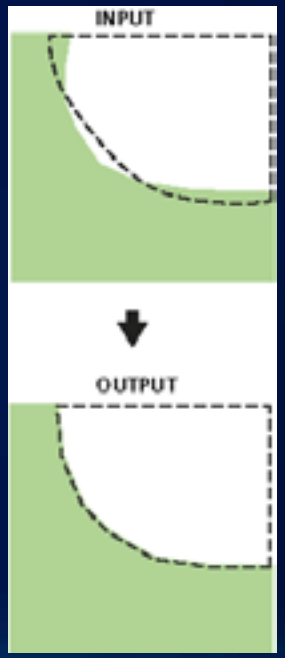
- **Ensure topological integrity before data migration**
- **Load Topology to Parcel Fabric tool**
  - **Loads a topology of polygons and lines**
  - **Topology needs to be clean and validated against required rules**



Topological integrity

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



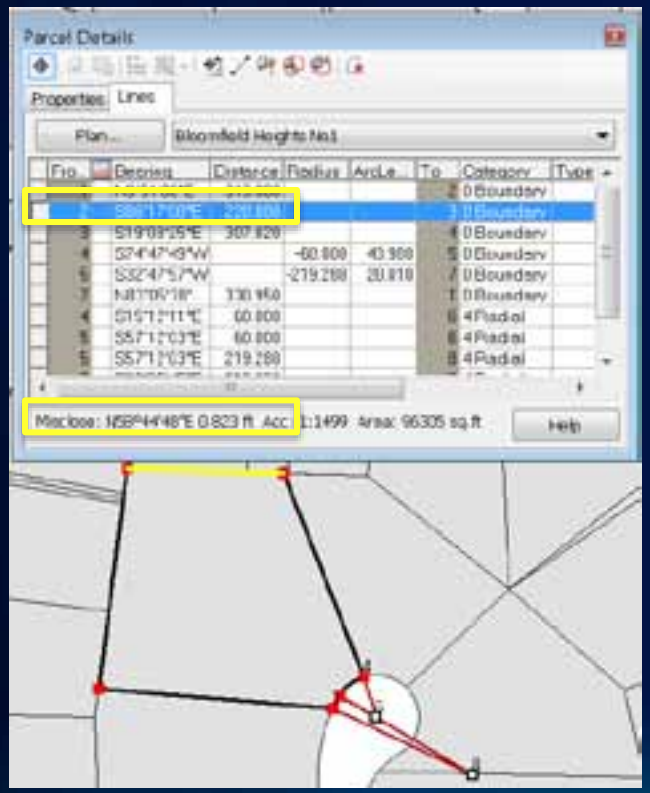


Topological integrity

- 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

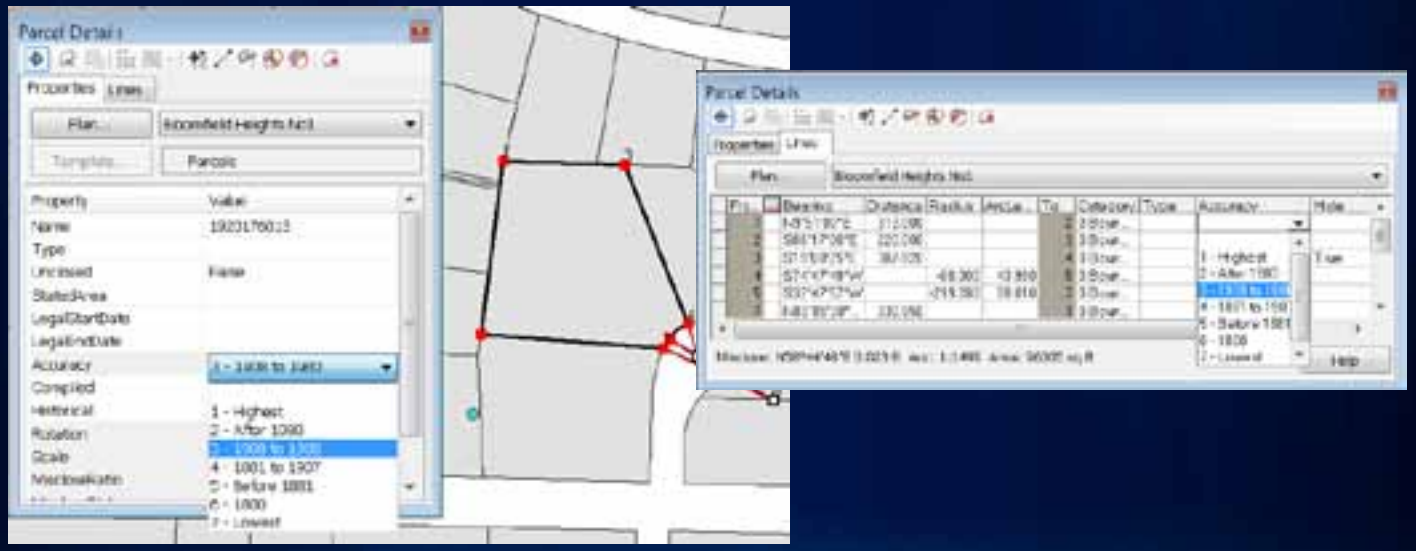
- **Fabric least-squares adjustment uses control points and COGO dimensions to recalculate/update parcel coordinates**

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**

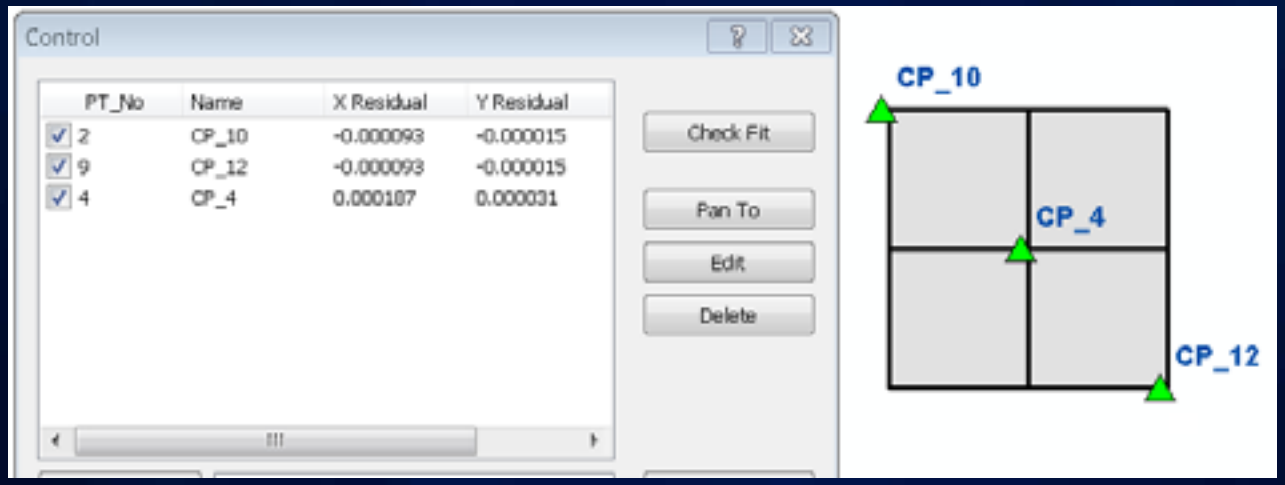


Fabric least-squares adjustment

- **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

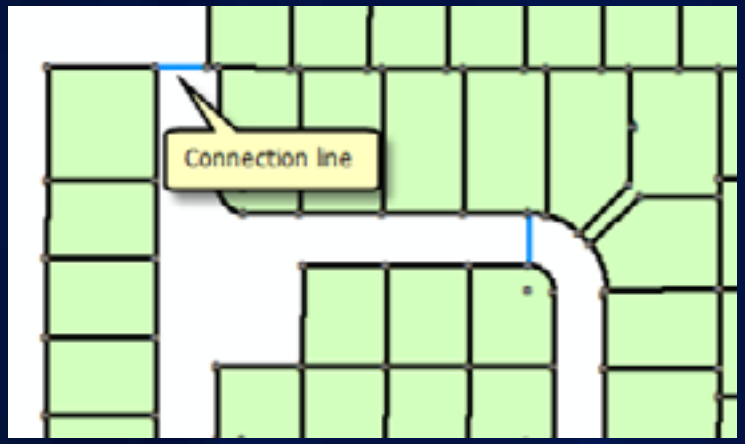
Fabric least-squares adjustment

- **Parcel network fits/transforms well to control network**



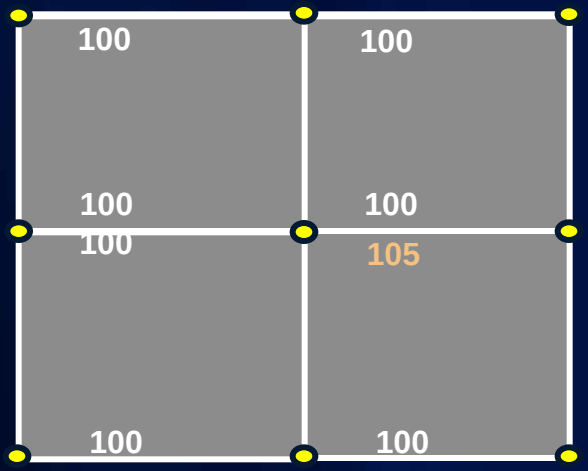
Fabric least-squares adjustment

- **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

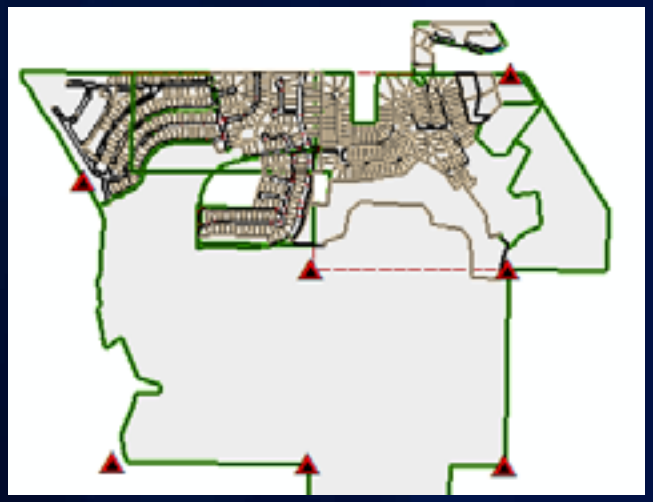


Fabric least-squares adjustment

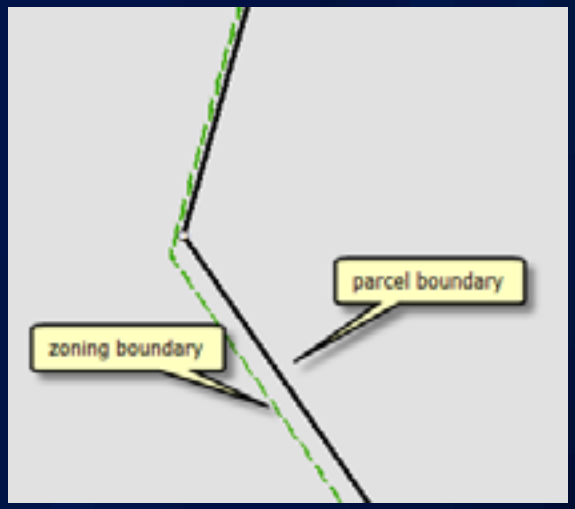
- **When starting out with poor quality data:**
  1. Enter new subdivisions
  2. Apply appropriate accuracy category to new data
  3. Apply low accuracy category to surrounding data
  4. Run adjustment on new data and surrounding data
     - Accuracy categories give adjustment a benchmark work with - which data is good, which data is bad

Improving data quality – relative accuracy

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



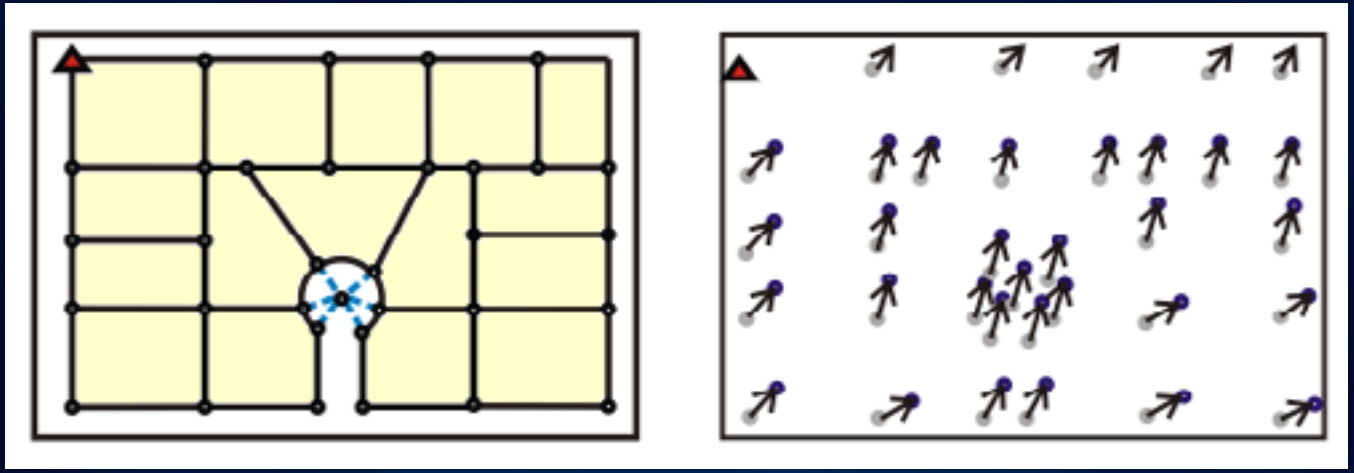
Least-squares adjustment



Feature adjustment

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

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