

21st Annual GIS/CAMA Technologies Conference Chattanooga Convention Center

GIS/CAMA • Chattanooga, TN



March 6-9, 2017

Continuing Education (CE) Credit

Recertification Credit forms for CE credit can be collected from the Registration Desk on Thursday.

Housekeeping

The conference proceedings will be available approximately 8 weeks after the conference.



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Your Partners in GIS

The Benefits of the ESRI ArcGIS Parcel Editing Solution (the Parcel Fabric)

Presented by:

Frank Conkling

Panda Consulting



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Your Partners in GIS

Who is Panda Consulting?



- **Founded in 1998**
- **We are ESRI Business Partners since 1999**
- **We are Surveyors - Licensed Surveyors in Two States**
- **We are Teachers - Half of our Employees have taught Surveying and Mapping at State Colleges**
- **We are Beta Testers for ESRI software, especially the Parcel Fabric**
- **We have taught dozens of Workshops and performed dozens and dozens of Migrations**



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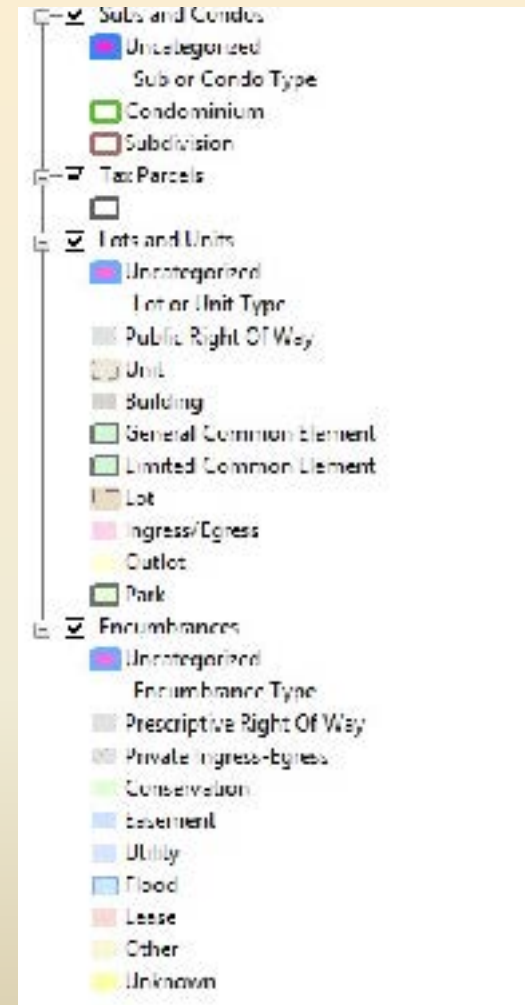
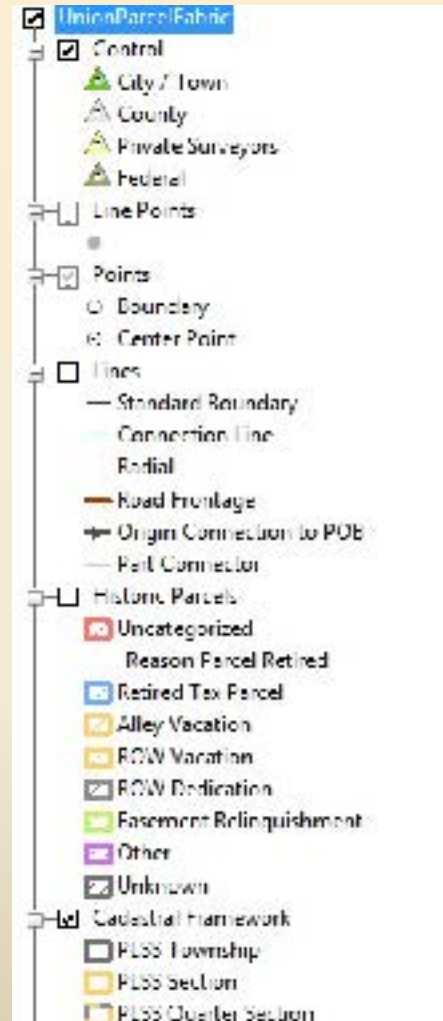
What is the ArcGIS Parcel Editing Solution (the Parcel Fabric)?

- A modern solution for maintaining and managing Land Records (including tax parcels)
- A complete solution that is optimized for editing and is integrated into the Local Government Information Model (LGIM)
- Provides all data required for many of the Land Record Maps and Apps.



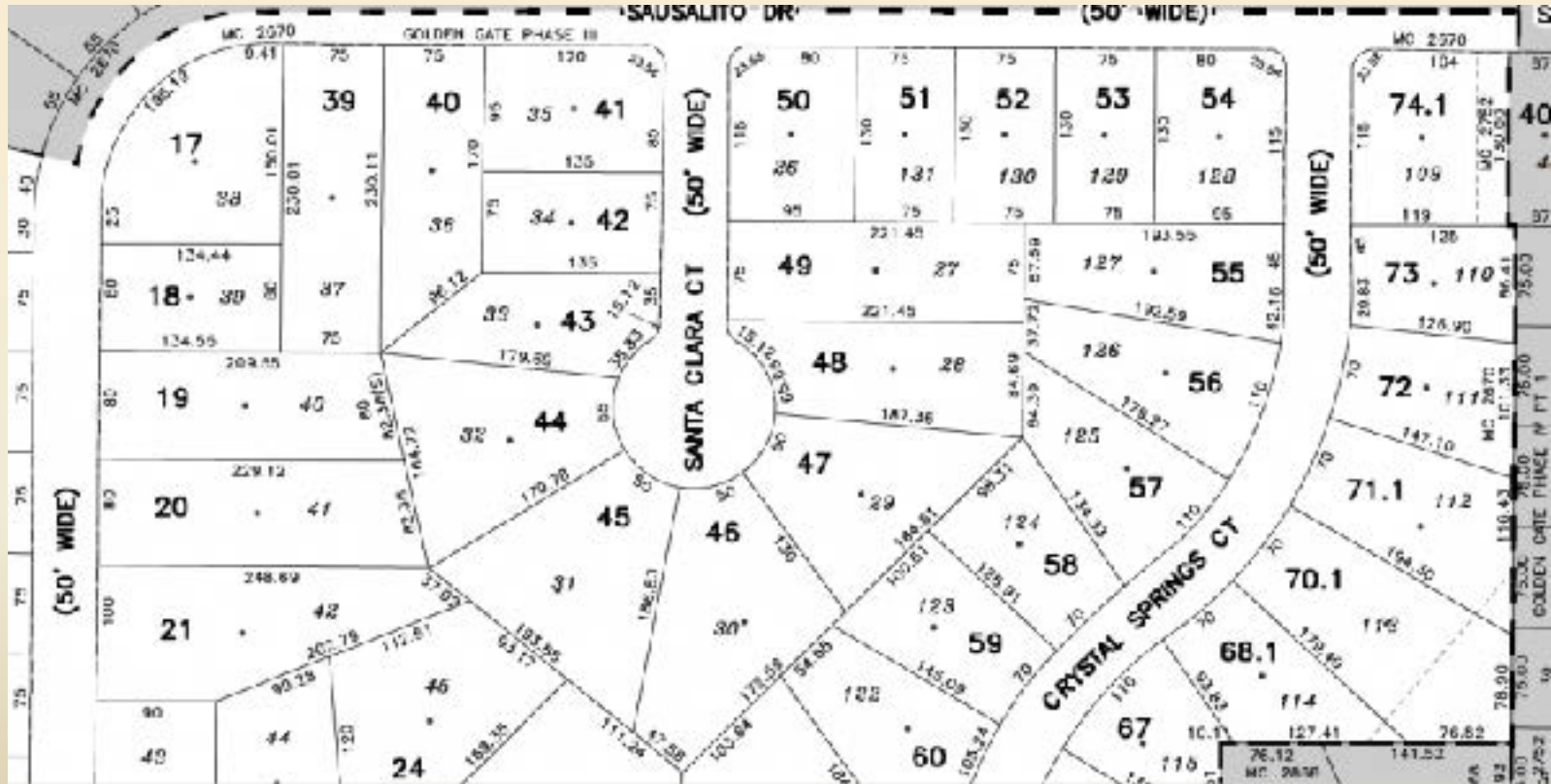
Comprehensive Data Model

A complete data model that maintains all information required to manage and maintain Land Records.



This is a Cartographic Data Model

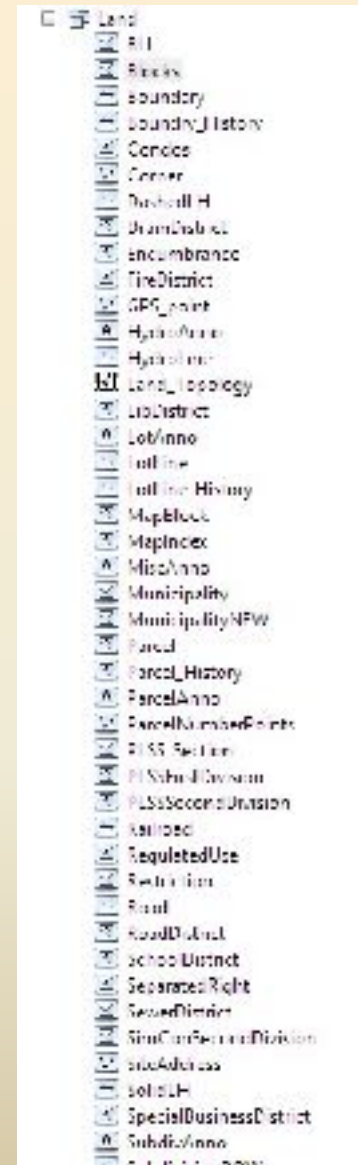
The Cartographic data model is structured to produce a Map.



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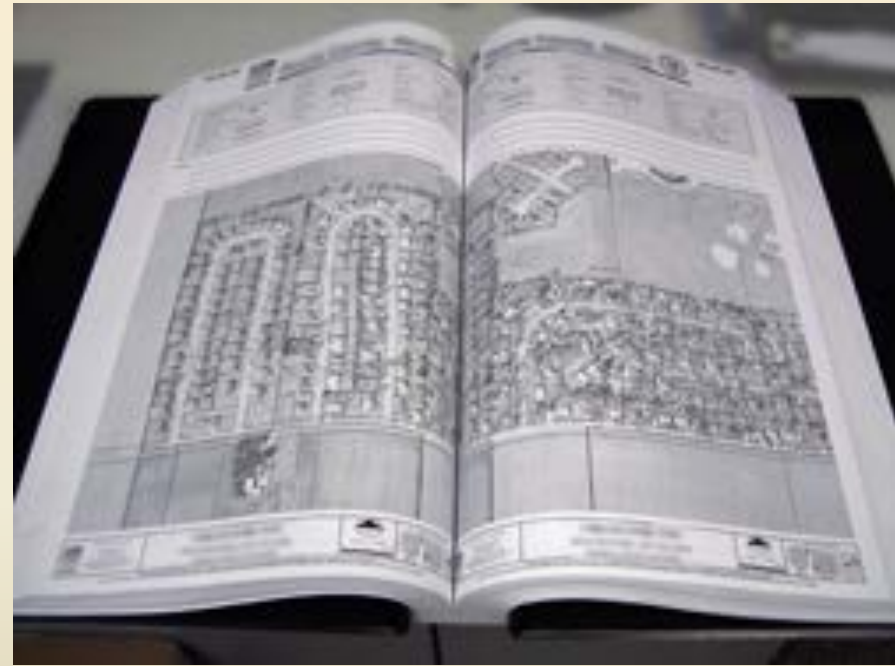
Cartographic Model Layers

- Layers are created and managed according to the needs of the Map.
- Layers are grouped by Thematic Layering
- Lots of Text (Annotation)



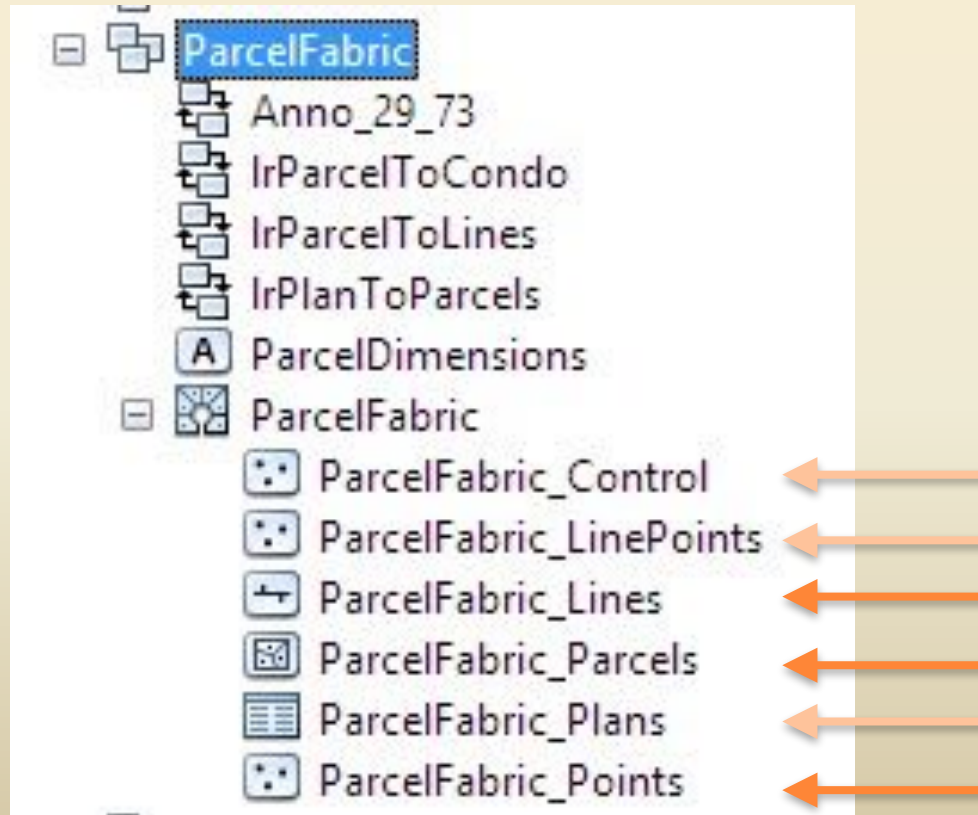
What is the Problem with This?

- The information on the Map must be interpreted to be useful.
- All “Image”
- Minimal “Data”
- Not Scalable
- No Analysis Possibilities



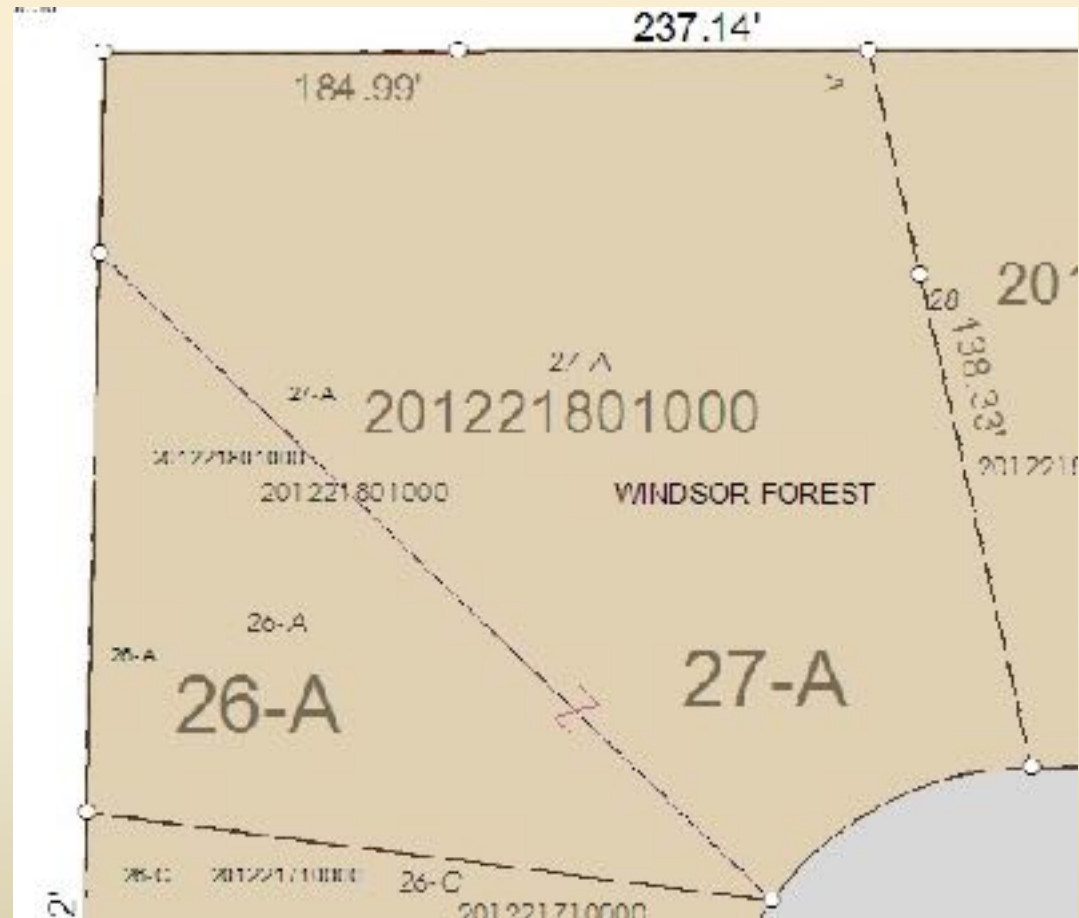
Comprehensive Land Records

- A Simpler, yet Comprehensive Structure.
- Aggregated by Geometry Type
- Layers are Linked together



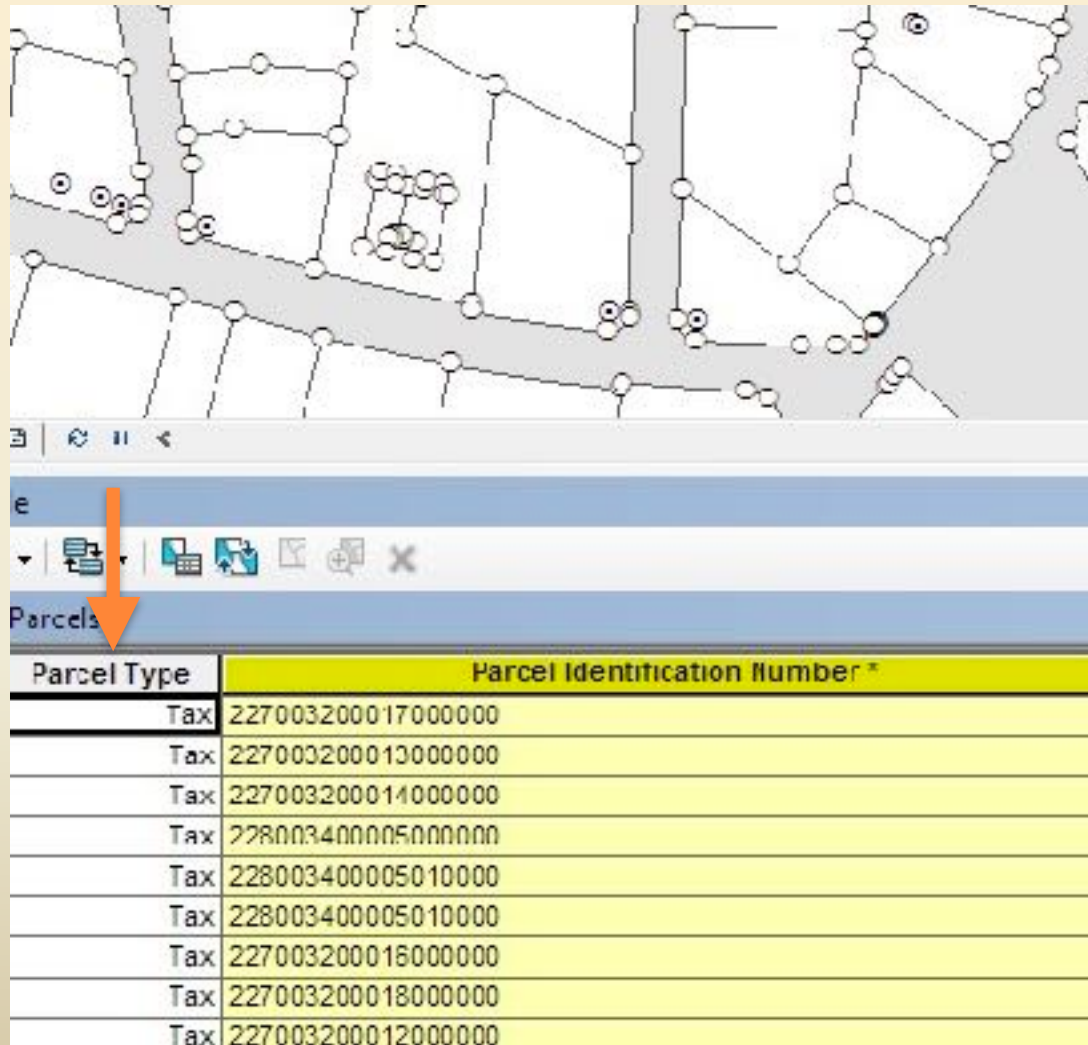
Ensures Vertical Alignment

- Corners define the locations
- Ensures all elements are kept in vertical alignment (think Topology).



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Polygon Layers are Defined by the “Type” Attribute field



The screenshot displays a GIS interface. The top portion shows a map of land parcels with various shapes and sizes, some containing small circular markers. Below the map is a toolbar with several icons. A table titled 'Parcels' is visible, with two columns: 'Parcel Type' and 'Parcel Identification Number *'. An orange arrow points from the 'Parcel Type' column to the map area.

Parcel Type	Parcel Identification Number *
Tax	227003200017000000
Tax	227003200013000000
Tax	227003200014000000
Tax	228003400005000000
Tax	228003400005010000
Tax	228003400005010000
Tax	227003200016000000
Tax	227003200018000000
Tax	227003200012000000



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The Codes for the “Type” Field

- Type 01 - PLSS Townships
- Type 02 - PLSS Sections
- Type 03 - PLSS 1/4 Sections
- Type 04 - PLSS Special Surveys
- Type 05 - Subdivisions / Condos
- Type 06 - Lots and Tracts
- Type 07 - Tax Parcels
- Type 08 - Ownership
- Type 09 - Encumbrances



Polygon Types

- Type 01 - PLSS Townships
- Type 02 - PLSS Sections
- Type 03 - PLSS 1/4 Sections
- Type 04 - PLSS Special Surveys
- Type 05 - Subdivisions / Condos
- Type 06 - Lots and Tracts

Ways that Land is Divided

- Type 07 - Tax Parcels
- Type 08 - Ownership
- Type 09 - Encumbrances

Ways that Land is Owned



Lines, Corners and Polygons are Related

Fabric parcels table and lines table are related

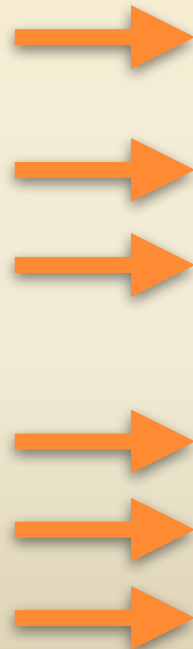
OBJECTID *	Shape *	Joined *	PlanID	Name
1	Polygon Z	1	2	Par 1

OBJECTID *	Shape *	Calculated	ParcelID *	Sequence	From *	To *
1	Polyline Z	<Null>	1	1	608	609
2	Polyline Z	<Null>	1	2	609	610
3	Polyline Z	<Null>	1	3	610	4
4	Polyline Z	<Null>	1	4	4	5
5	Polyline Z	<Null>	1	5	5	608
6	Polyline Z	<Null>	1	6	4	6
7	Polyline Z	<Null>	1	7	5	6
8	Polyline Z	<Null>	1	8	5	611
9	Polyline Z	<Null>	1	9	608	611
10	Polyline Z	<Null>	2	1	8	9
11	Polyline Z	<Null>	2	2	9	10



Record Level Metadata

- Tells you information about EVERY Parcel



Identify

Identify From: Tax Parcels

☐ Tax Parcels
① 26201668000100110

Location: 75,517.110 1,319,061.271 Feet

Field	Value
Parcel Type	7
Parcel Identification Number	20251670907470110
Floor Number	<null>
Station Area	0.24843
Legal Start Date	<null>
Legal End Date	<null>
Trained	1
Compiled From Records	0
Created By	FRANK
System Start Date	8/18/2015 1:19:59 PM
System End Date	<null>
Modified By	FRANK
Modification Date	8/21/2015 1:39:57 PM
Accuracy	<null>
Perimeter	350'
Scale	1
Misclose Ratio	100000
Misclose Distance	0.00005

Map showing a parcel highlighted in cyan. The parcel is labeled 111. Other parcels are labeled 102, 32, 31, 112, 117, and 116. A street labeled GARDENS PI is visible.



History Tracking

- As a Parcel is changed, a copy of the parcel data is marked Historic and Date Stamped.

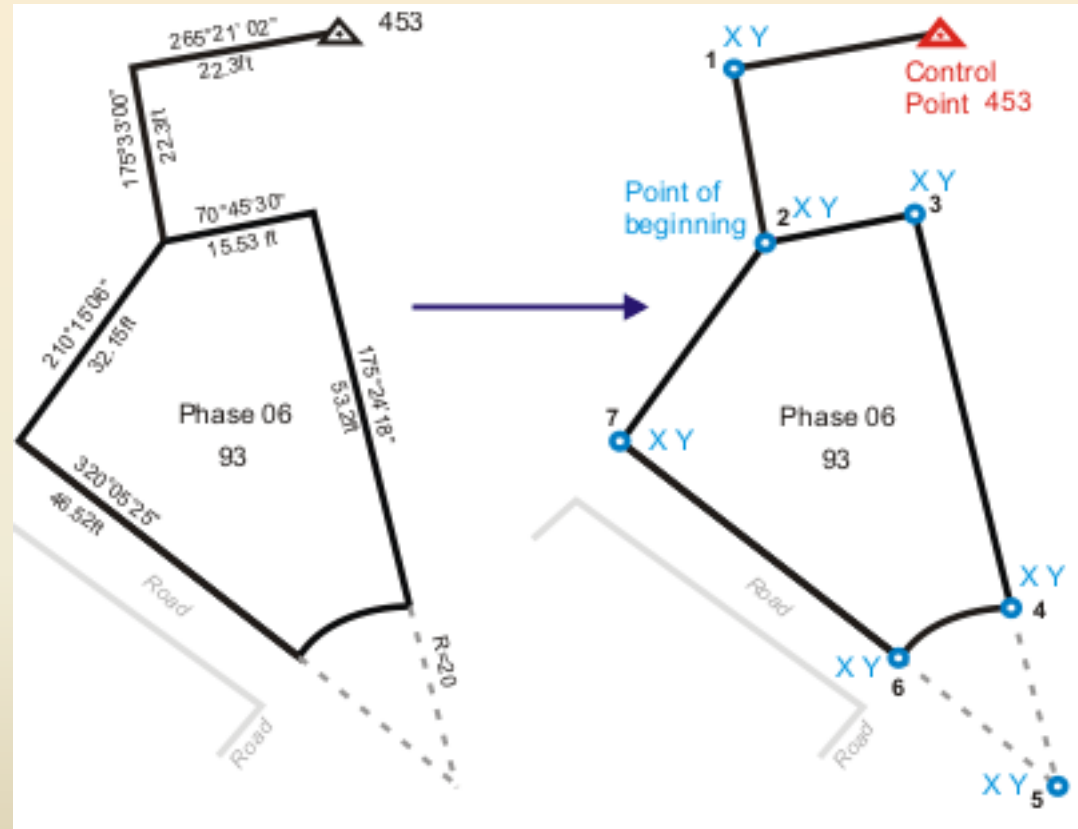
The screenshot displays a GIS interface with a legend on the left and a map on the right. The legend includes categories like 'Historic Parcels', 'Unincorporated', 'Reason Parcel Retired', 'Retired Tax Parcel', 'Alley Vacation', 'R/W Vacation', 'R/W Dedication', 'Easement Relinquishment', 'Other', and 'Unknown'. The map shows several units (UNIT 1-14) with various colors and patterns. Below the map is a table titled 'Historic Parcels' with columns for Parcel Type, Parcel Identification Number, and Reason Parcel Retired. An orange arrow points to the table.

Parcel Type	Parcel Identification Number	Reason Parcel Retired
Conveyance Division Road		Unknown
Conveyance Division Road		Unknown
Conveyance Division Road		Unknown
Conveyance Division Road		Unknown
Tax	THE MILLAGE AT BIRCHWOOD	Retired Tax Parcel
Tax	128101401000	Retired Tax Parcel
Tax	128101401000	Retired Tax Parcel
Tax	012400000000	Retired Tax Parcel



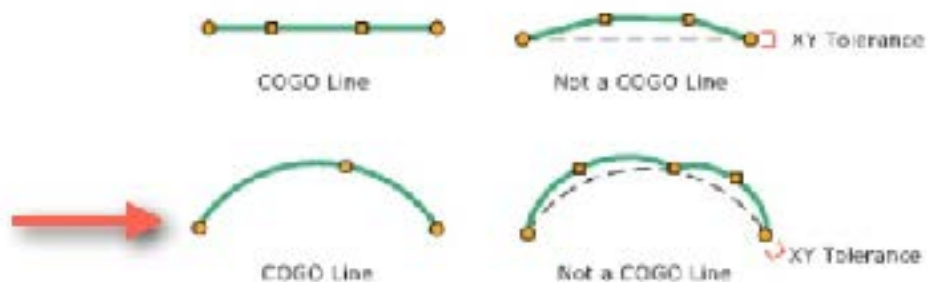
Record ALL parts of a Legal Description

- Every Parcel has its own set of Lines
- Lines can be more than Boundary Lines.
- POC - POB
- Meander Lines, etc.

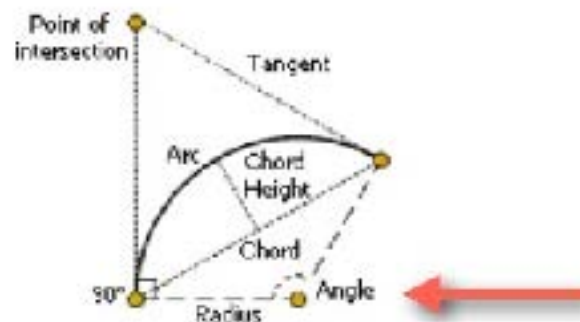


True Curves

A Curve in a Feature Class

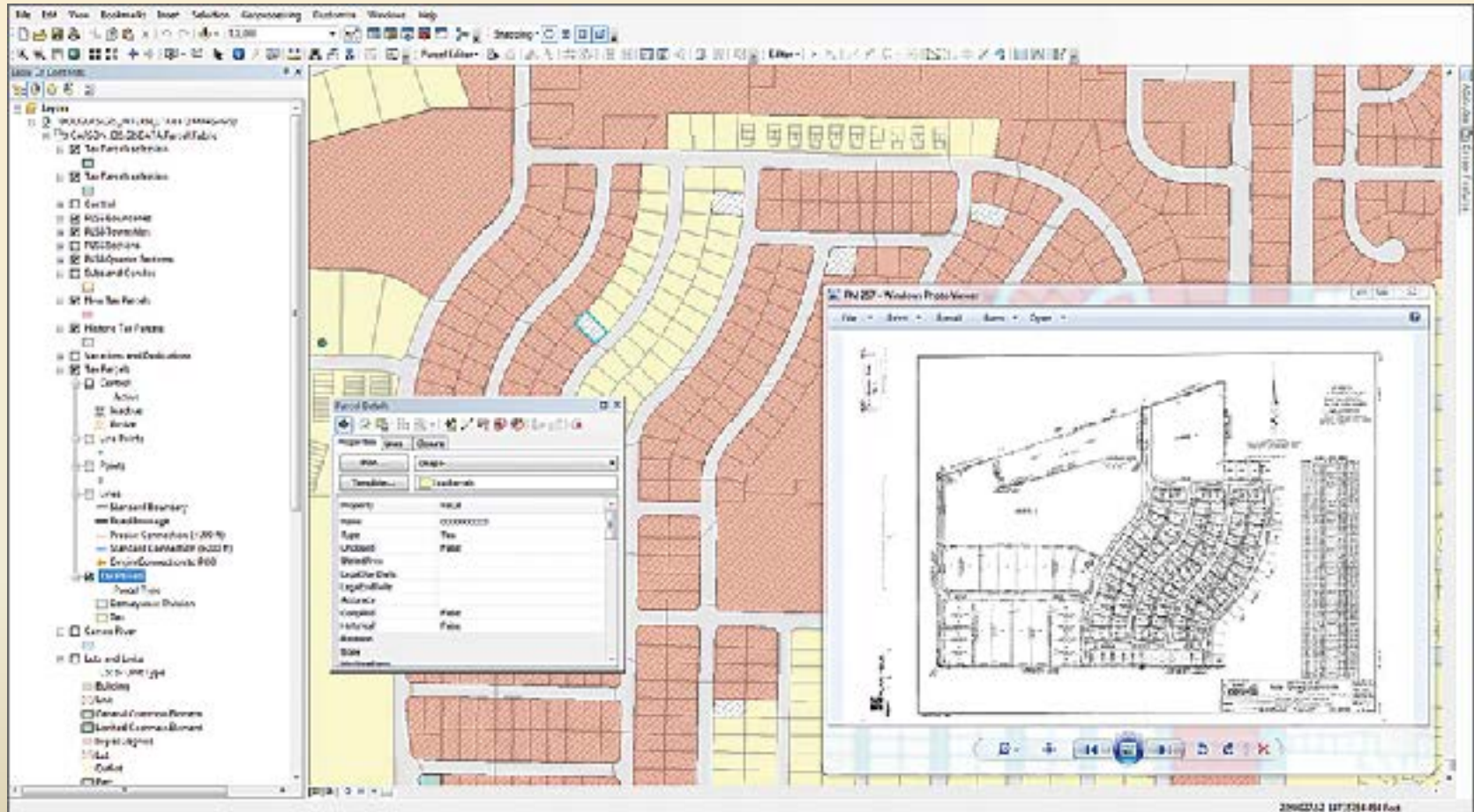


A Curve in the Parcel Fabric



Content Management System

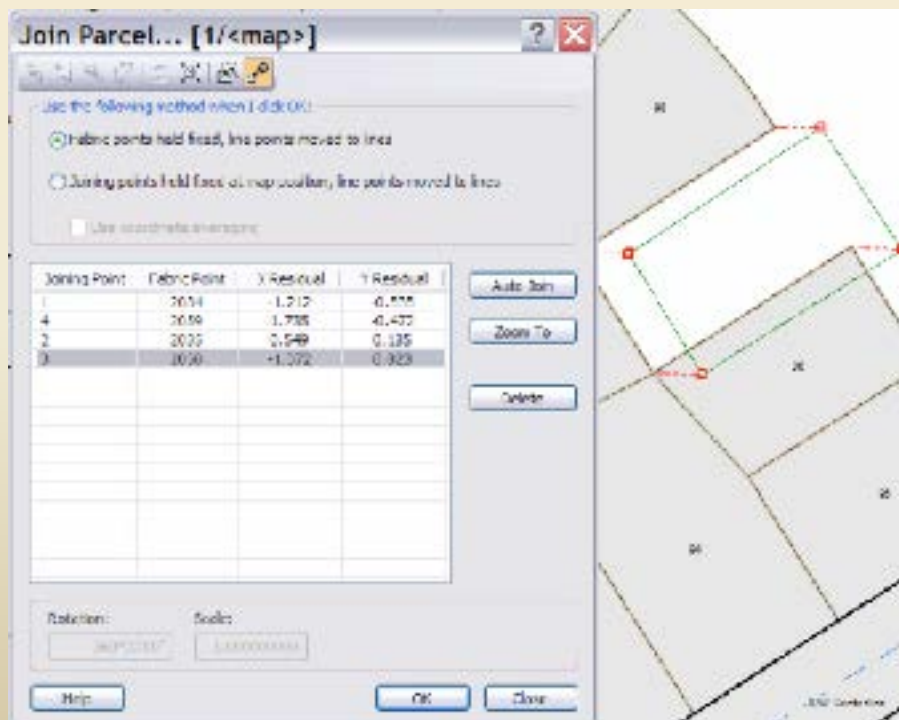
“Plans” provide information on Source Documents.



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Measurements versus Monuments

- The correct way to map land interests.
- Eliminates issues with Differing Precision.
- Record measurements are stored.
- Location is determined by Monuments and “Intent”.



What is Differing Precision?

- Just because two lines are described with Different precisions, does not mean they are different lines.



What are “Monuments”?

Section No. 76010
F.P. No. 2100285

State Road No. 15 (U.S. 17)

Putnam County

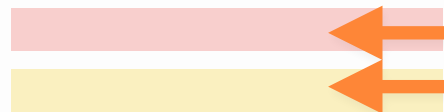
Parcel No. 113

Fee Simple

A Parcel Of Land, Being A Portion Of The Job Wiggins Grant, Section 48, Township 10 South, Range 27 East; Putnam County, Florida, Being More Particularly Described As Follows:

COMMENCE At A 1 Inch Iron Pipe (No Identification) At The Northwestern Corner Of The Job Wiggins Grant, Section 48, Township 10 South, Range 27 East, Putnam County, Florida; Thence Run South 40° 50' 29" East, Along The Southwesterly Line Of Said Section 48, A Distance Of 2,259.23 Feet To The Baseline Of Survey For State Road No. 15 (U.S. Highway No. 17, A Variable Width Right Of Way), As Depicted On Florida Department Of Transportation Right Of Way Map Section, 76010 F. P. Number 2100285; Thence North 49° 08' 54" East, Departing Said Southwesterly Line, And Along Said Baseline Of Survey A Distance Of 2,014.66 Feet, Thence South 51° 43' 34" East, Departing Said Baseline Of Survey, A Distance Of 33.60 Feet To The Southeasterly Existing Right Of Way Line Of Said State Road Number 15, And To The **POINT OF BEGINNING**; Thence North 49° 08' 54" East, Along Said Southeasterly Existing Right Of Way Line A Distance Of 485.18 Feet; Thence South 51° 56' 39" East, Departing Said Southeasterly Existing Right Of Way Line, A Distance Of 94.12; Thence South 49° 08' 54" West, A Distance Of 485.55 Feet; Thence North 51° 43' 34" West, A Distance Of 94.05 Feet To The **POINT OF BEGINNING**.

Containing 1.029 Acres, More Or Less



Measurements
Monuments

Being a Part of Tax Parcel No. 48-10-27-0000-0370-0020



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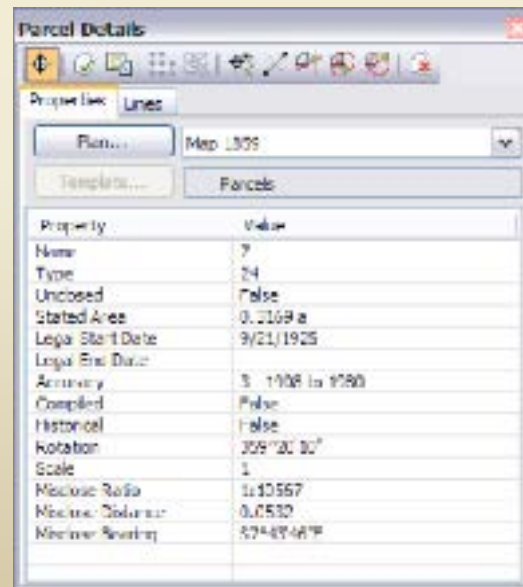
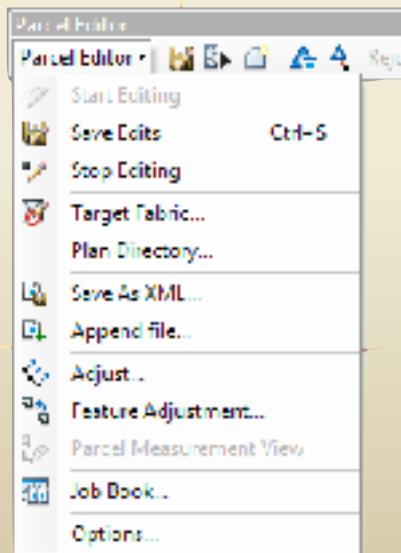
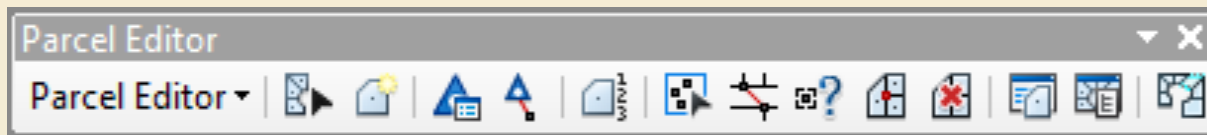
Legally, Monuments Rule

- If there is a conflict of measurements, Then Monuments control the location of Corners.
- The Question is what was the “intention” of the Deed?



Efficient Maintenance Tools

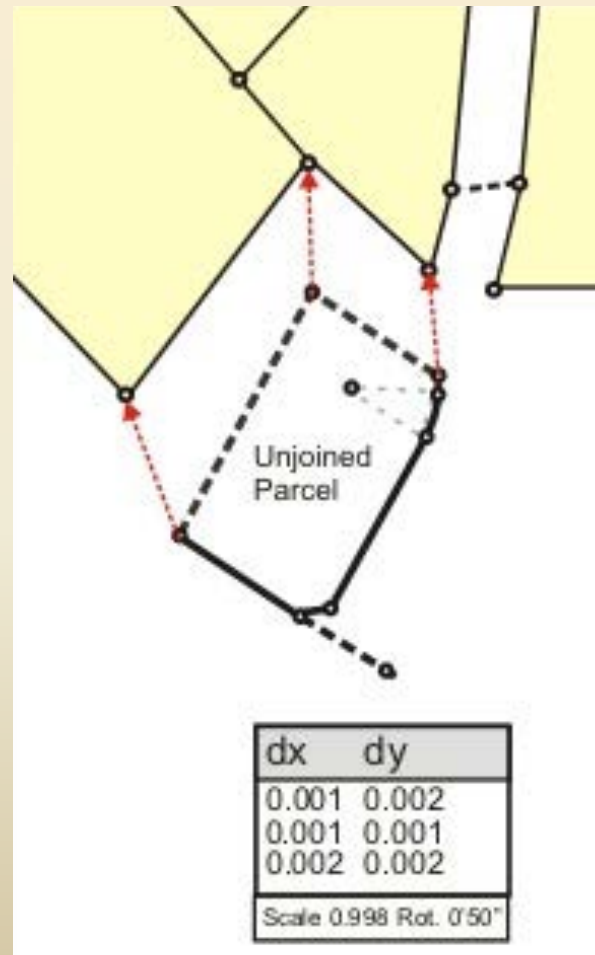
- Tools perform multiple processes at the same time.
- Tools work on multiple Layers
- Adjustments are managed by “Joins”



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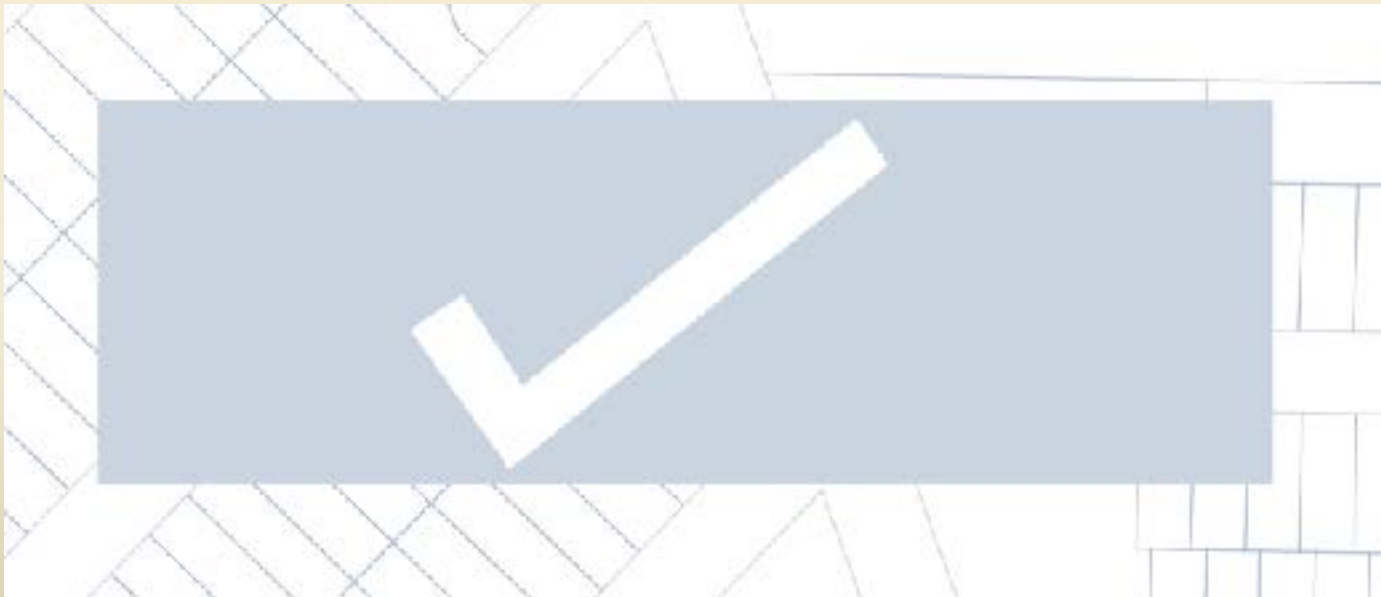
What is a Join?

- Defines where parcels are located and how they relate to adjoiners.

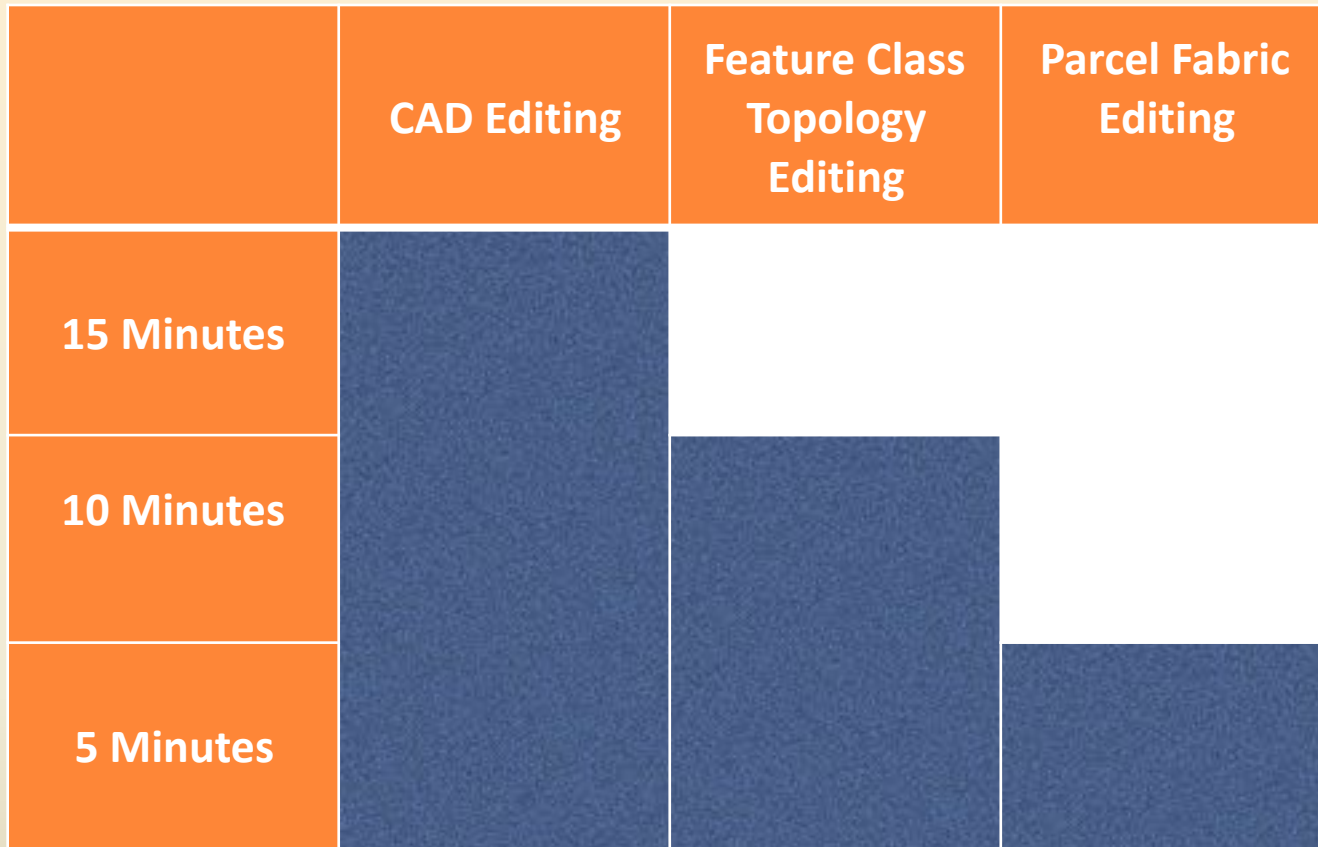


What does this mean?

- Because you are not constantly “tinkering” or “adjusting” parcels that are already mapped, you can map faster and more efficiently.



Typical Parcel Maintenance Times*

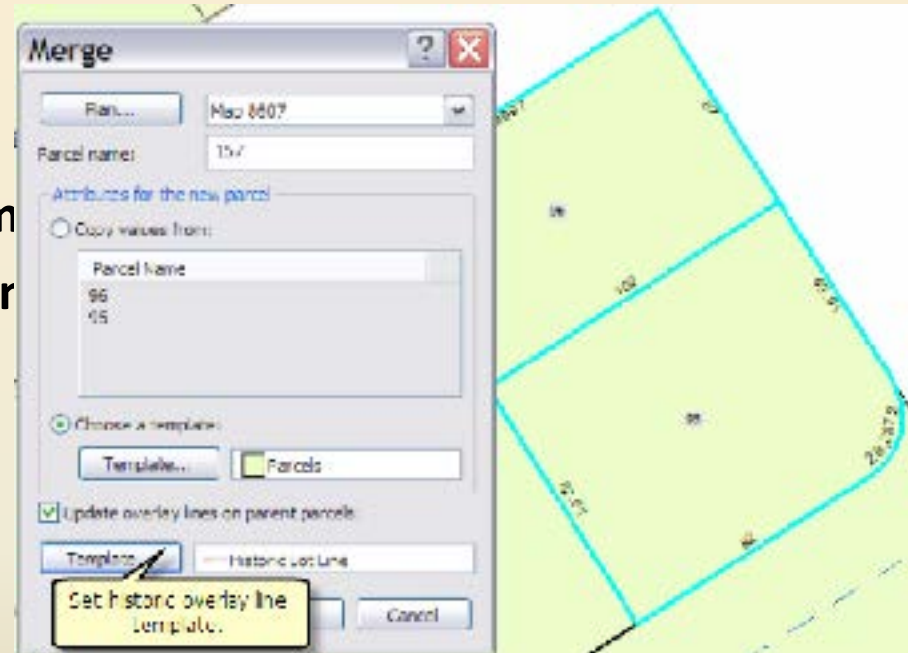


- * Your Mileage may Vary



Typical Tool - Merge

- One Step performs the following:
- Marks existing Parcel Historic.
- Marks Existing Lines Historic.
- Creates New Lines for combined geometry
- Creates New Parcel for combined geometry
- Creates Attribution for New Parcel, including:
 - New Parcel ID
 - Record level metadata
 - Calculated Area from New Lines



Typical Tool - New Parcel

- Allows you to create lines and Polygon at the same time.

The screenshot displays the 'New Parcel' tool interface. On the left, a table lists the boundary lines with their bearings, distances, radii, and arc lengths. On the right, a diagram shows a parcel with five vertices numbered 1 through 5, connected by lines. The diagram includes a small square symbol near vertex 3, possibly indicating a right angle or a specific boundary type.

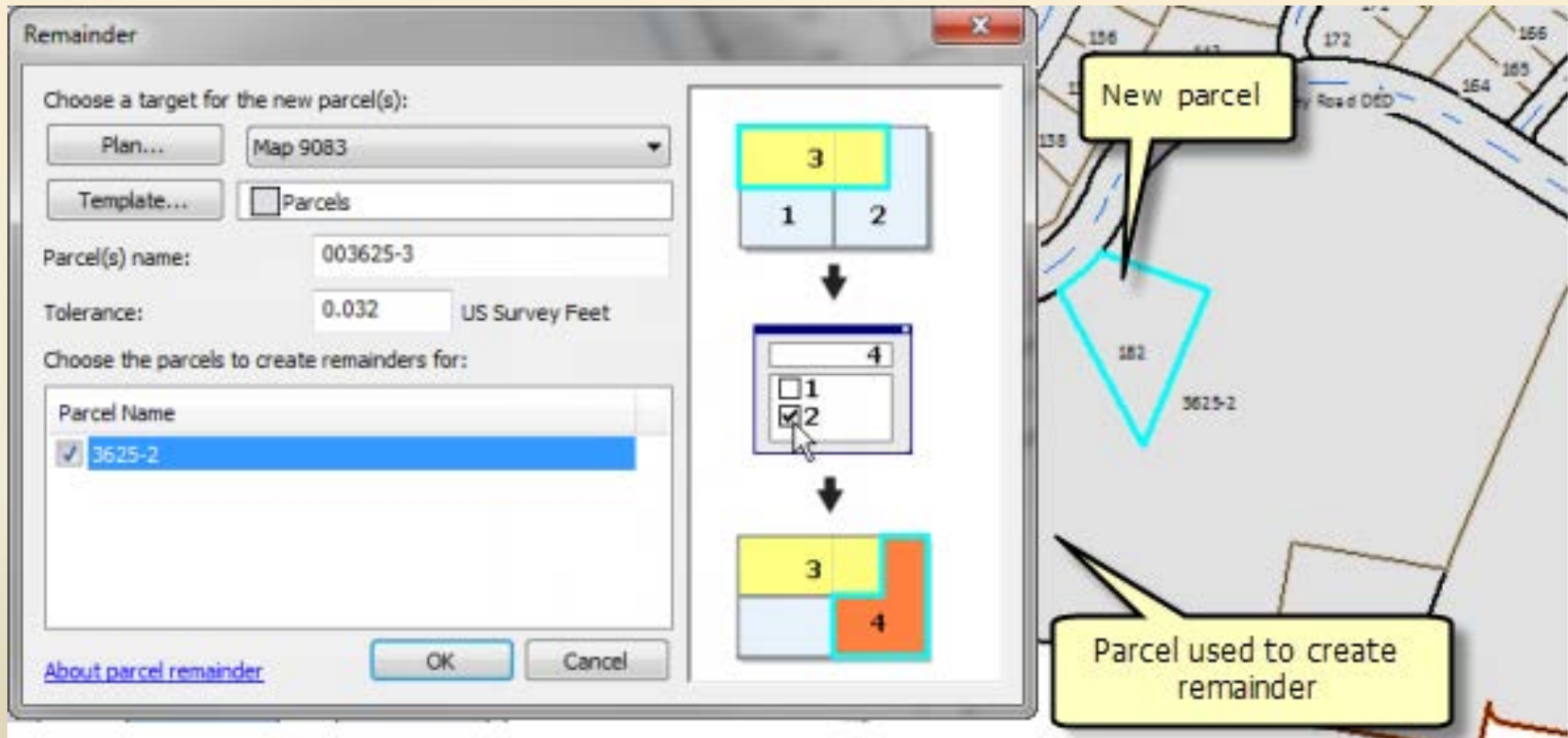
	From	Bearing	Distance	Radius	Arc Le ..	To	Category
	1	N0°13'00"E	82.260			2	D Boundary
	2	N0°13'00"E		25.000	34.300	3	D Boundary
	3	S89°49'35"E	72.250			4	D Boundary
	4	S0°13'00"W	105.900			5	D Boundary
	5	S00°30'41"W	92.350			1	D Boundary
							D Boundary

Misclose: N89°38'41"E 0.007 feet Acc: 1:52354 Area: 0.2



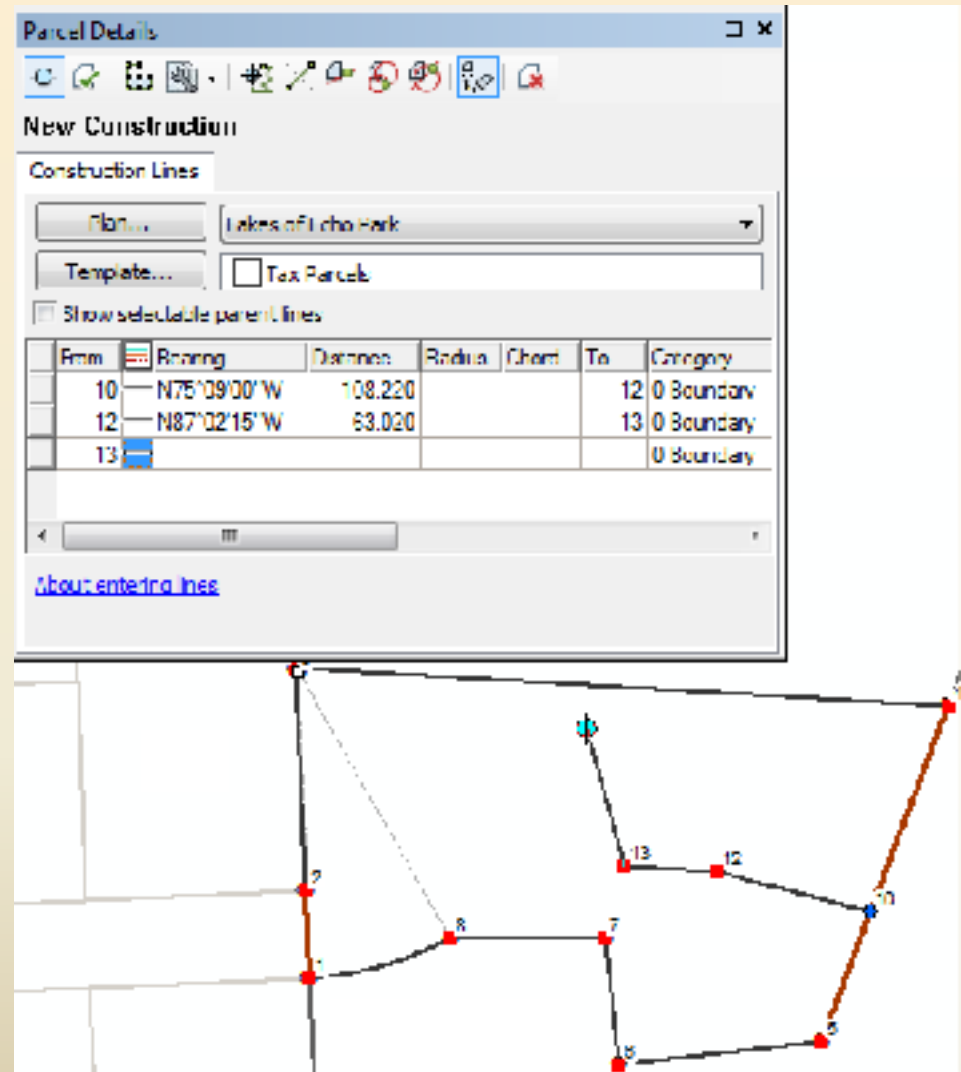
Typical Tool - Parcel Remainder

- “Clips out” the new parcel from the parcels it overlaps.



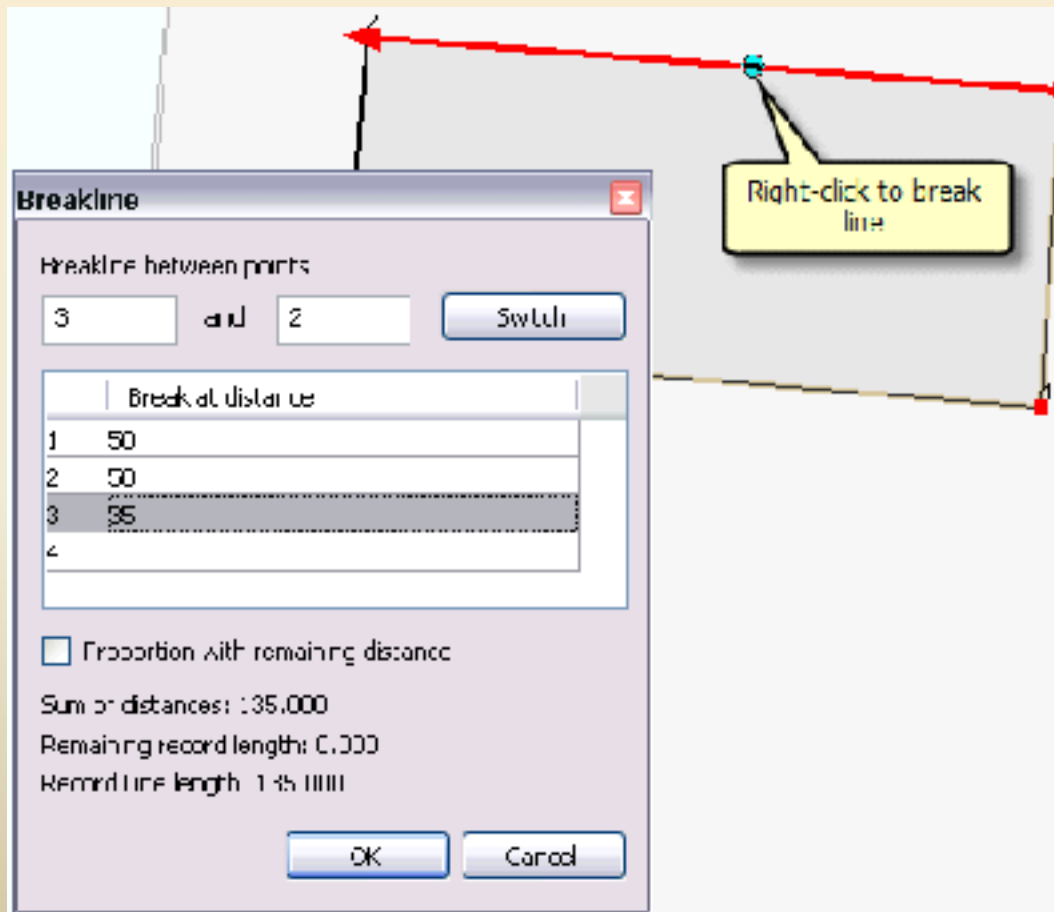
Typical Tool - Construct from Parent

- Allow you to “split” a parcel into multiple parts.
- Creates lines and polygons at the same time.



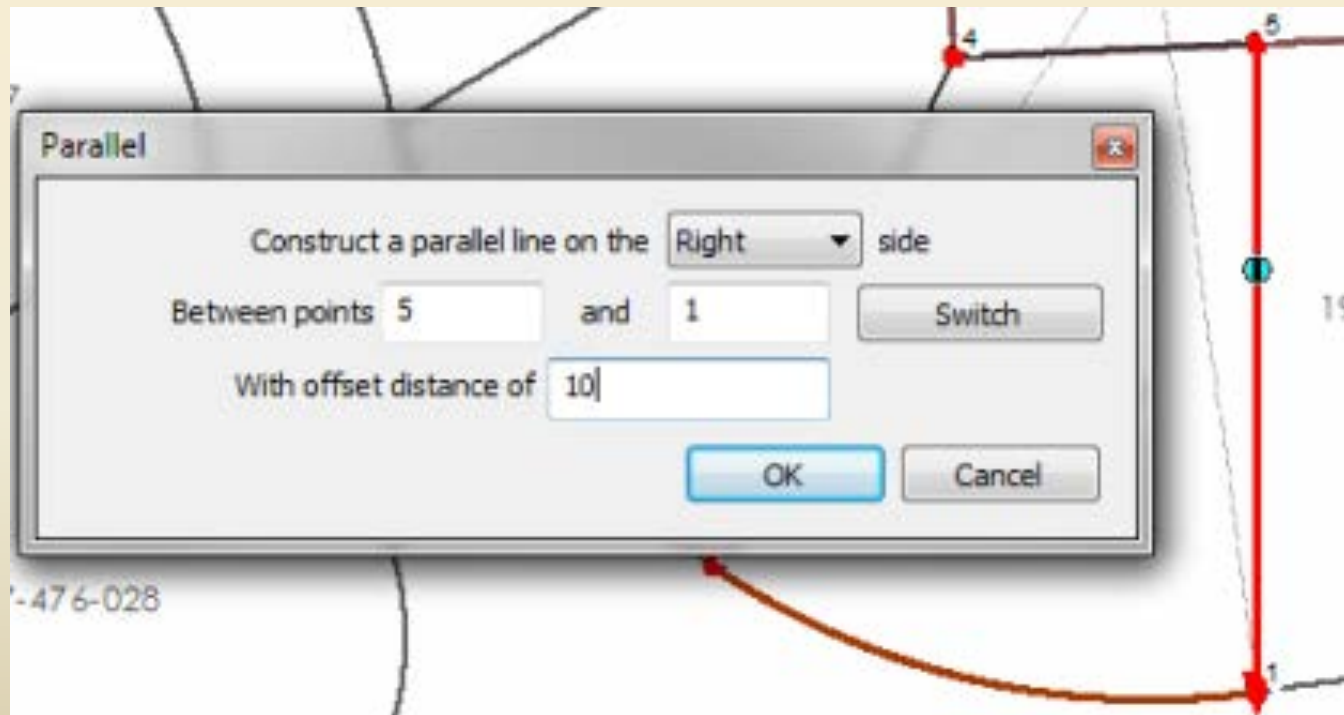
Typical Tool - Breakline

- Allows you to insert “break points” or proportion a boundary.



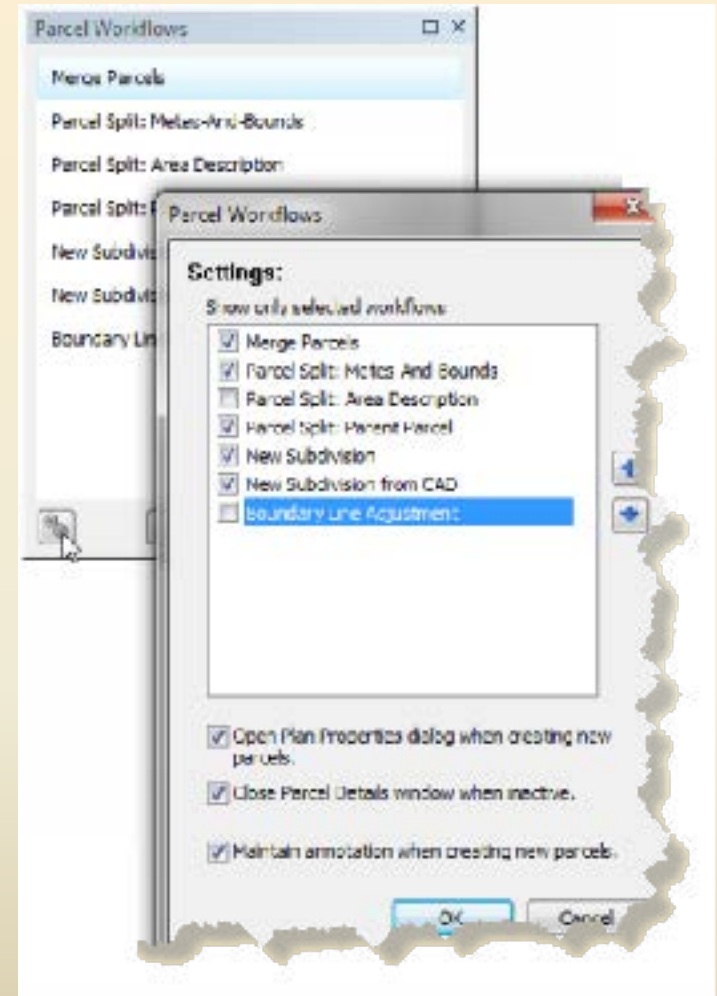
Typical Tools - Parallel Offset

- Allows you to build boundary parallel to other boundary lines.
- Great for Aliquot splits or Easements.



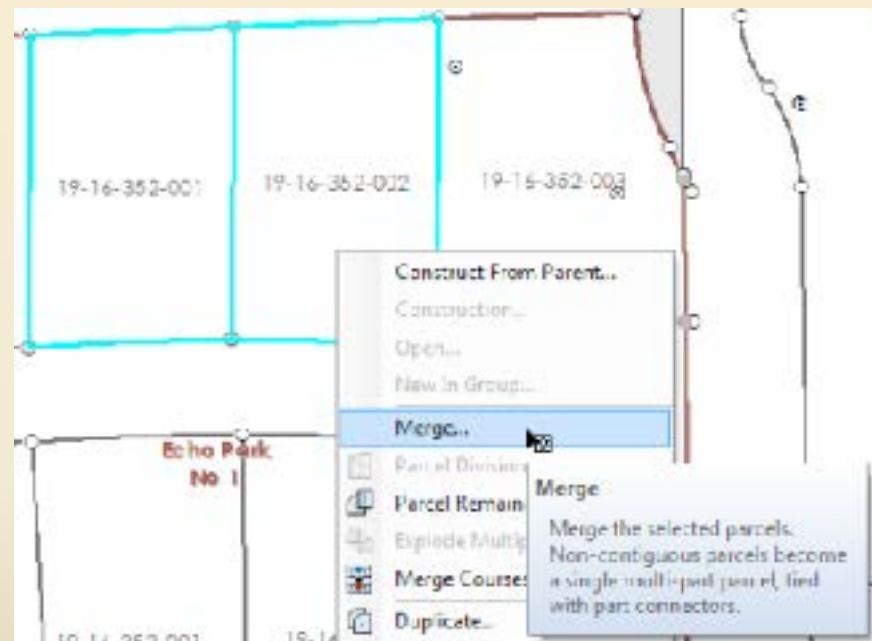
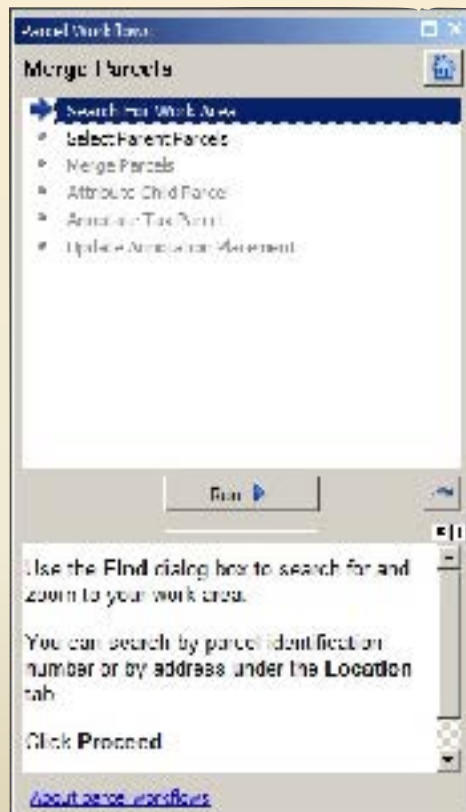
Integrated Workflow

- **Built-in Guides for the standardized procedures.**
- **Merge Parcels**
- **Split with Metes and Bounds**
- **Split with Area Description**
- **Split from Parent Parcel**
- **New Subdivision**
- **New Subdivision from CAD**
- **Boundary Adjustment**

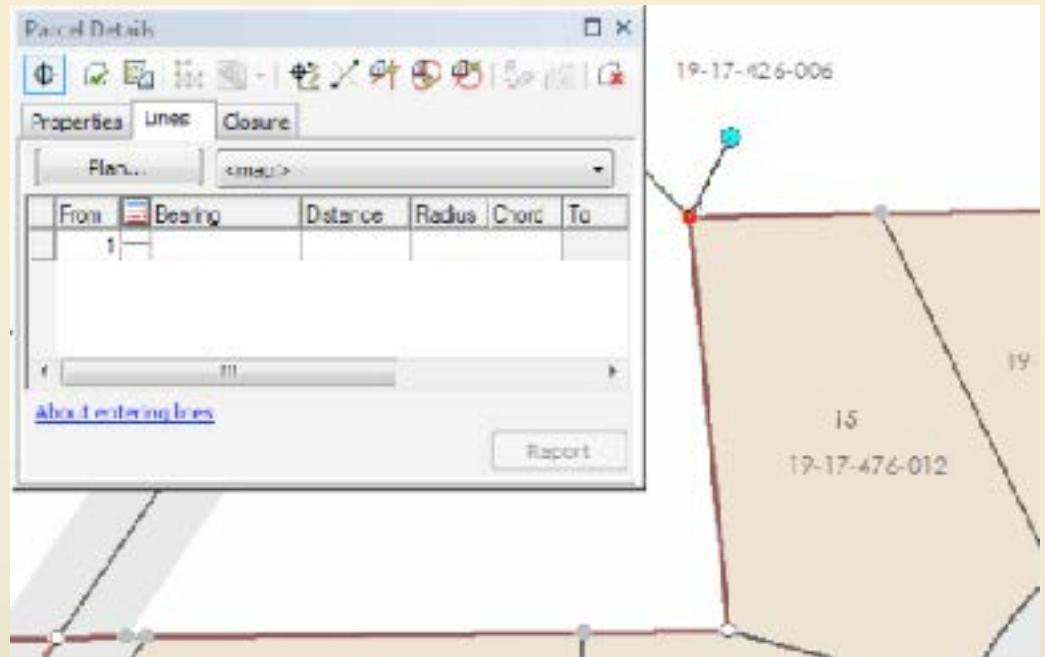
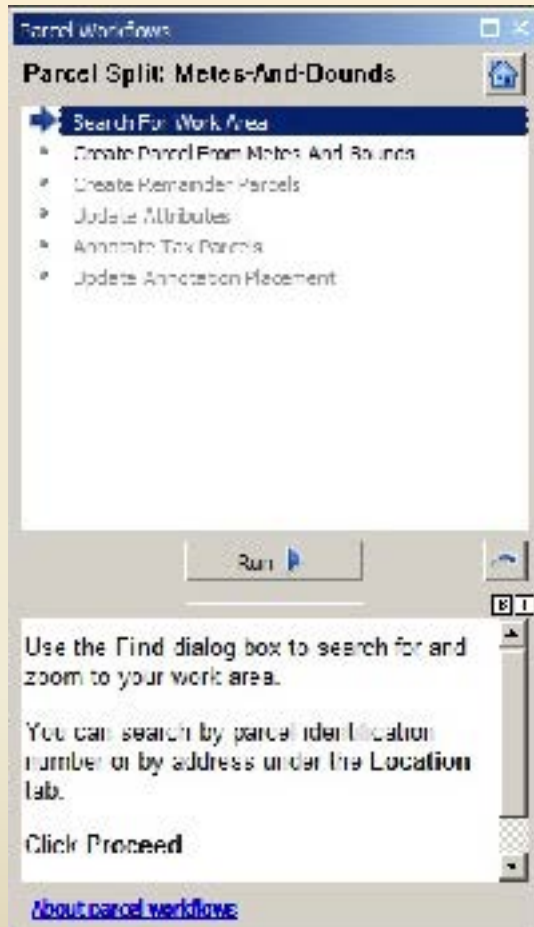


Merge Parcels

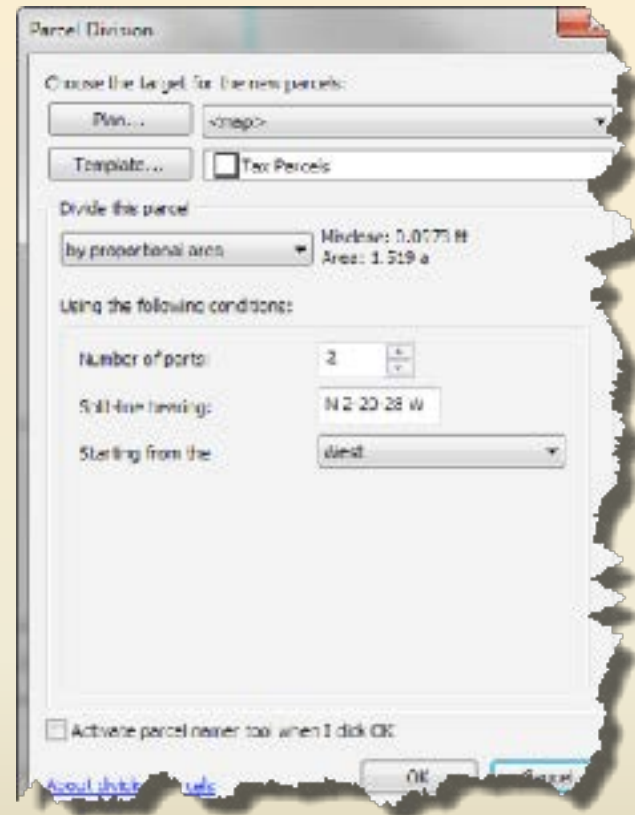
- Traditionally called “Combine” or Consolidation”



Split with Metes and Bounds



Split with Area Description



Split from Parent Parcel

Parcel Workflows

Parcel Split: Parent Parcel

- Search For Work Area
- Select Parent Parcels
- Construct From Parent
- Update Attributes
- Annuate Tax Parcels
- Update Annotation Placement

Run

Use the Find dialog box to search for and zoom to your work area.

You can search by parcel identification number or by address under the Location tab.

Click Proceed.

[About parcel workflows](#)

Parcel Details

Construction

Pier: rmao

Template: <Null>

Show selectable parent lines

From	Bearing	Distance	Radius	Chord	To	Category
10	N75°00'00"W	100.220			12	0 Box
12	N87°02'15"W	63.020			13	0 Box
13	N13°22'40"W	127.550			11	0 Box
					0	0 Box

[View entering lines](#)

Basis of bearing: 0-0-0



New Subdivision

Parcel Workflows

New Subdivision

- Search for Work Area
- Create New Subdivision
- Create Parcel Reminders
- Update Attributes
- Construct Lot Parcels
- Name Lot Parcels
- Update Attributes And Parcel Types
- Create Tax Parcels
- Name Tax Parcels
- Update Attributes
- Annotate Tax Parcels
- Update Annotation Placement

Run

Use the Find dialog box to search for and zoom to your work area.

You can search by parcel identification number or by address under the Location tab.

Click Proceed

[About parcel workflows](#)

Parcel Details

Properties 100% Closure

Plan... Bloomfield Heights

From	Bearing	Distance	Radius	Area Le...	To	C
1	N5°30'00"E	275.000			2	E
2	N83°54'00"W	275.000			3	E
3	N72°15'00"W	262.000			4	E
4	S47°14'00"W	165.960			5	E
5	N71°15'00"W		835.500	291.540	6	E
6	N10°55'00"W	85.000			7	E
7	N21°27'00"W		494.020	161.180	8	E
8	N34°30'00"E	488.840			9	E
9	S45°28'18"E	361.160			10	E
10	S73°58'00"E	148.820			11	E
11	S75°04'18"E	225.160			12	E
12	S5°58'00"W	168.250			13	E
13	S5°35'00"W	392.000			2	E

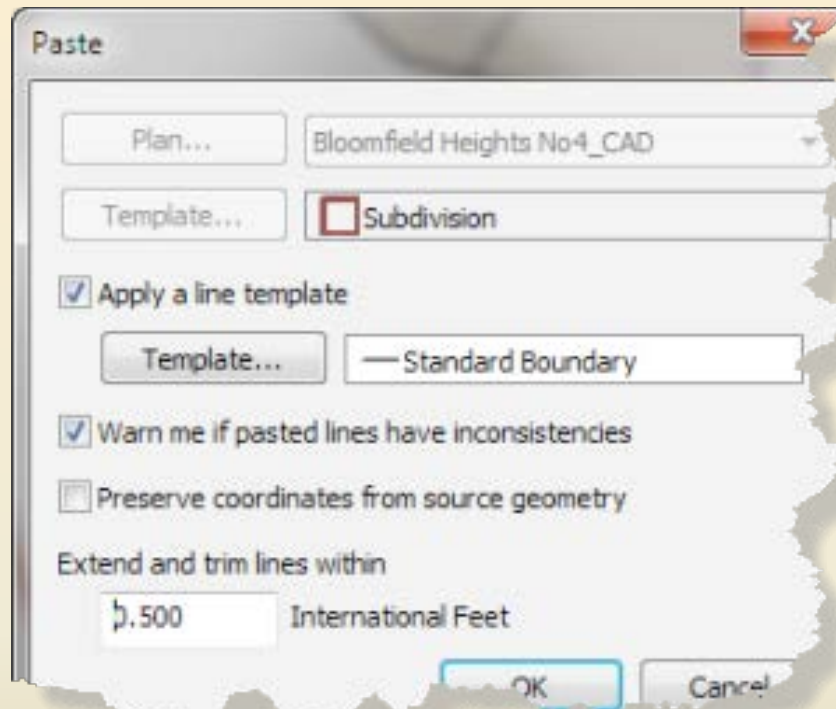
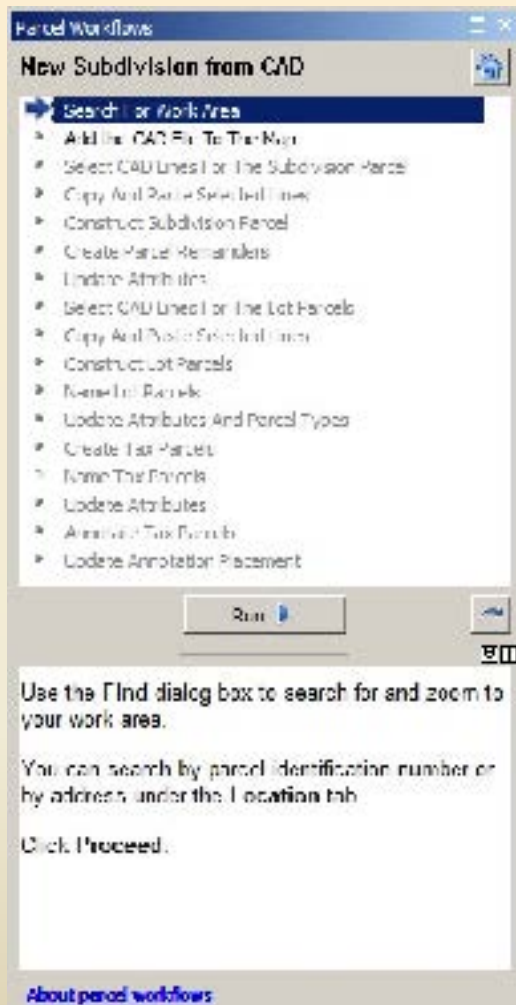
[About returned lots](#)

Midcourse: N29°31'24"W L:143 Fus. Acc: 1:2504 Area: Report

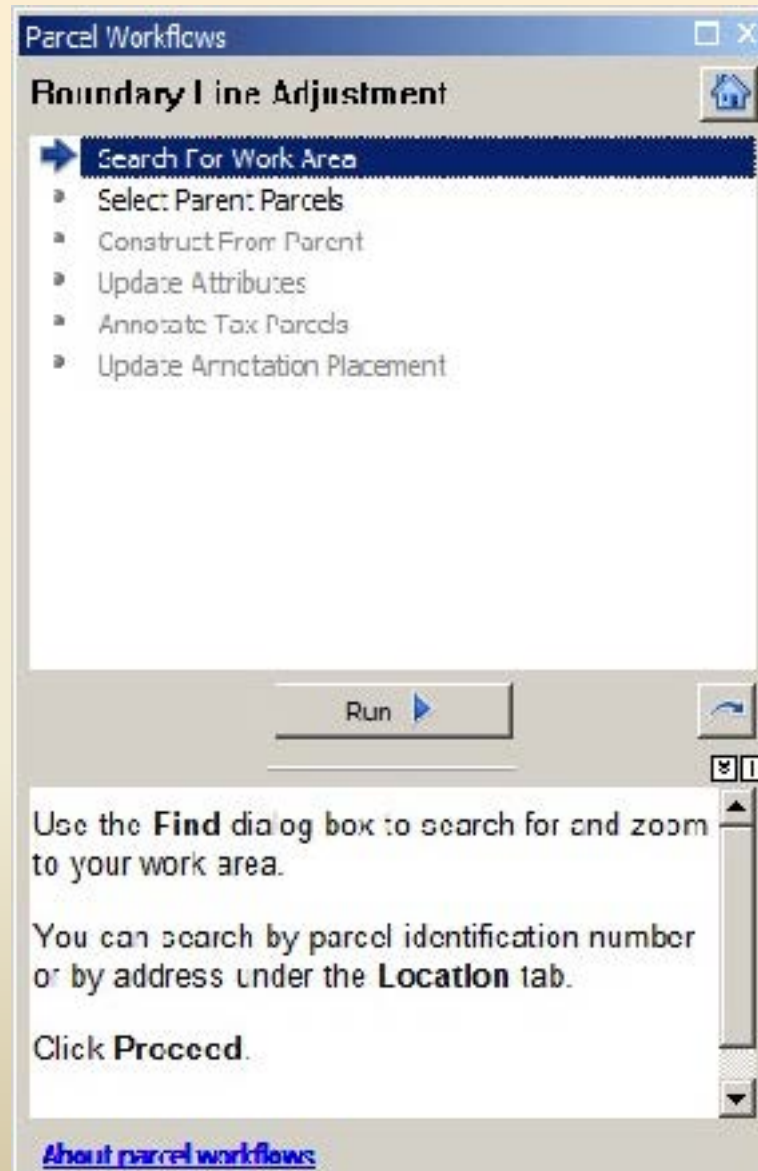


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New Subdivision from CAD



Boundary Line Adjustment

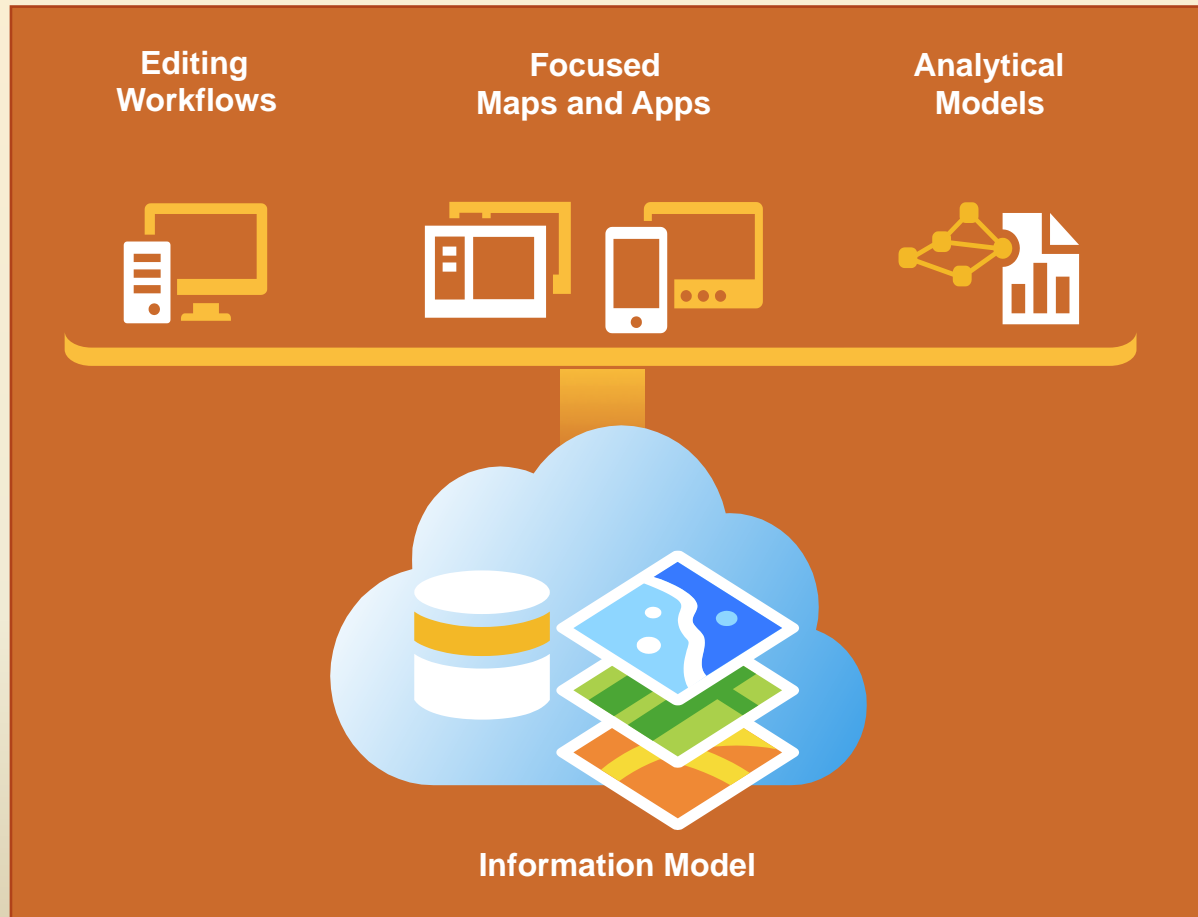


Complete Solution

- The Parcel Fabric structure is optimized for Editing.
- Publication structure is optimized for Publication.
- Perform Extract, Transform and Load for Publication.
- Think ArcGIS Online Maps and Apps.
- Structure contains key attributes



Parcel Fabric Feeds Data directly into the Local Government Solution



The ArcGIS Platform System of Engagement



Professional
GIS



21st Annual GIS/CAMA Technologies Conference • March 6–9, 2017 • Chattanooga, Tennessee

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Land Records Maps and Apps

Constituent Engagement	Value Analysis	Maintain Assessment Roll	Blight Remediation	Geo-Enable Assessment and Tax Office
Tax Parcel Viewer	Value Analysis Dashboard	Tax Parcel Editing	Citizen Problem Reporter	Model ArcGIS Online Organization
Land Sales	Residential Comp Finder	Parcel Drafter	Photo Survey	Community Parcels
Public Notifications	Tax Reverted Property	Tax Map Book	Blight Status Dashboard	Standard Integration patterns (CAMA, Tax Receivables, etc.)
Floodplain Inquiry		PLSS Editing	Code Violation	
Assessment Appeal		Community Addresses		



Questions?

Frank Conkling

frank@pandaconsulting.com

www.pandaconsulting.com

561-691-3277

See you at Booth #21

**Remember to sign up for the
Panda Parcel Fabric Forum**



A graphic for the GIS-Pro 2017 event. It features a stylized globe with a grid pattern, overlaid with a city skyline at dusk. The text 'GIS-Pro 2017' is prominently displayed in a bold, teal font. Below the title, the dates 'October 23-26, 2017' and the location 'Jacksonville, Florida' are written in a white, sans-serif font. The entire graphic is set against a background of a city skyline and a blue sky with clouds.

GIS-Pro 2017
October 23-26, 2017
Jacksonville, Florida





Assessment Leadership
Beyond All Limits

IAAO LAS VEGAS

**ANNUAL CONFERENCE
& Exhibition**

September 20-27
2017