

***Please!***  
*Turn OFF cell phones  
and paging devices*



## **Editing with ArcGIS - Tips and Tricks**

***Artie Robinson***

# Overview

- **Topics**
  - Productive editing techniques
  - Finding and fixing data errors
  - Editing coincident features and topology
- **Format**
  - Tips & tricks
  - Software demonstrations
  - Q & A session at end

# Help and helpful things

- **Context-sensitive help**

- On command on pulldown menu or button on toolbar, click

**What's This?** tool

- On command on context menu, highlight command, press

**Shift + F1**

- On control in dialog box, click

**What's This?** button

- **Desktop Help and ESRI Resource Centers**

- Help: Editing and data compilation section

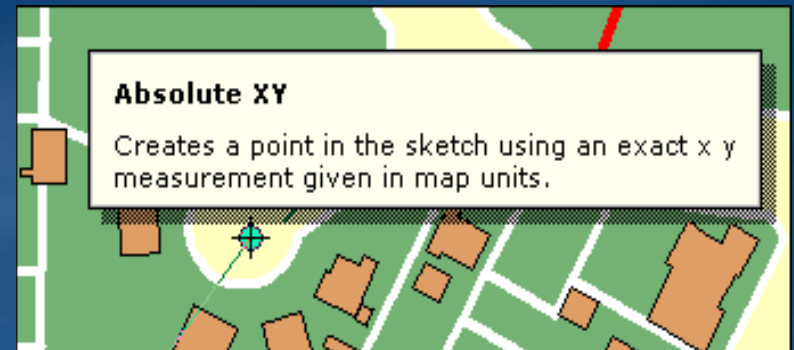
- Common editing tasks

- Tutorial videos

- <http://resources.esri.com> - one stop for ArcGIS information

- **Training Course**

- Data Production and Editing Techniques - DPET



# Switching among tools while sketching

How can you quickly switch from a sketch tool to another tool and back to a sketch tool again?

## Use shortcut keys: E, C, X, Z, and B

- **E** key to toggle between the Sketch tool and the Edit tool (and Edit Annotation tool, when working with annotation)
- **C** key to pan
- **X** key to zoom out
- **Z** key to zoom in
- **B** key to zoom and pan continuously

Shortcuts common to all editing tools

Shortcut key	Editing function
Z key	Zoom in
X key	Zoom out
C key	Pan
B key	Continuous Zoom/Pan
V key	Show vertices
Esc	Cancel
Ctrl + Z	Undo
Ctrl + Y	Redo
Spacebar	Suspend Snapping

These shortcuts are available with any tool in ArcMap (starting with ArcGIS 9.2)

To see a list of all the editing shortcut keys, in ArcGIS Desktop help, on the Index tab enter “*shortcuts, for editing in ArcMap*”

# Creating an edit sketch using other features

- Constraints - Sketch tool context menu
- Add sketch segments
  - Parallel
  - Perpendicular
- At
  - Absolute XY
  - Delta XY
- With specific
  - Length
  - Direction
  - Direction and Length
  - Distance
  - Deflection angle
  - Tangent curve

Absolute X, Y

6212175.192	2291415.967
-------------	-------------

Delta X, Y

182.634	230.979
---------	---------

Length

357.120
---------

Direction

333.4349
----------

Direction/Length

0.0000	220.235
--------	---------

Deflection Angle

45
----

Tangent Curve

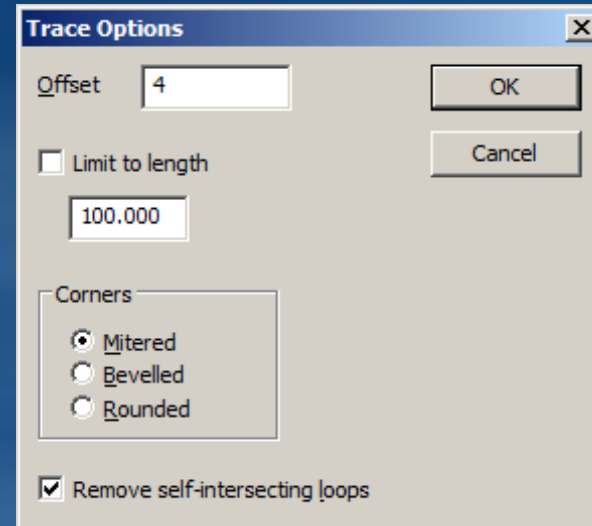
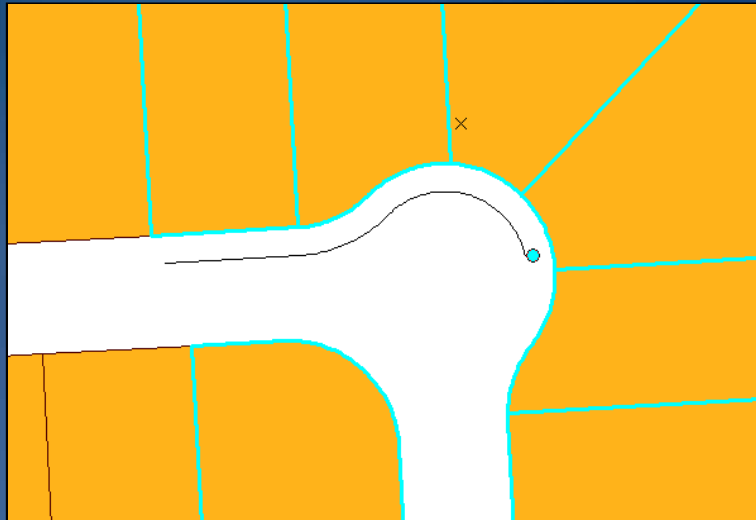
Delta Angle	35
Chord	
Chord	
Delta Angle	
Arc Length	
Radius	

Snap To Feature	
Direction...	Ctrl+A
Deflection...	Ctrl+F
Length...	Ctrl+L
Change Length	
Absolute X, Y...	F6
Delta X, Y...	Ctrl+D
Direction/Length...	Ctrl+G
Parallel	Ctrl+P
Perpendicular	Ctrl+E
Segment Deflection...	F7
Replace Sketch	
Tangent Curve...	Ctrl+T
Streaming	F8
Delete Sketch	Ctrl+Delete
Finish Sketch	F2
Square and Finish	
Finish Part	

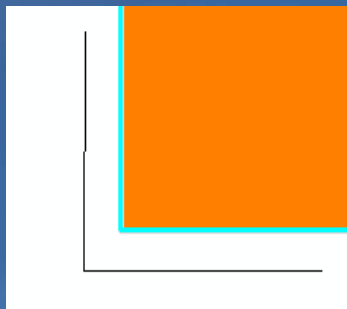
# Using the Trace tool for new features



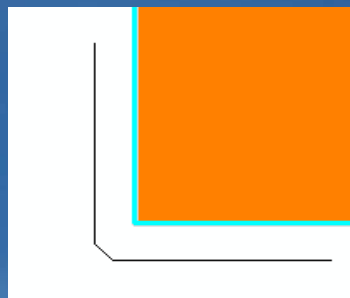
- Adds sketch segments by tracing along selected features



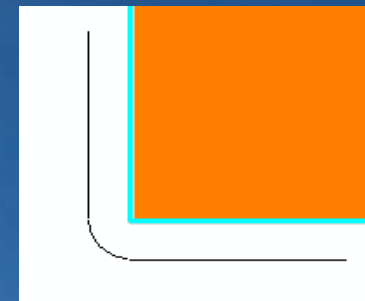
Mitered



Beveled



Rounded



# Overriding map units

- Use unit abbreviation after distance value
- Distance units interpreted from entered value

Distance - Meters

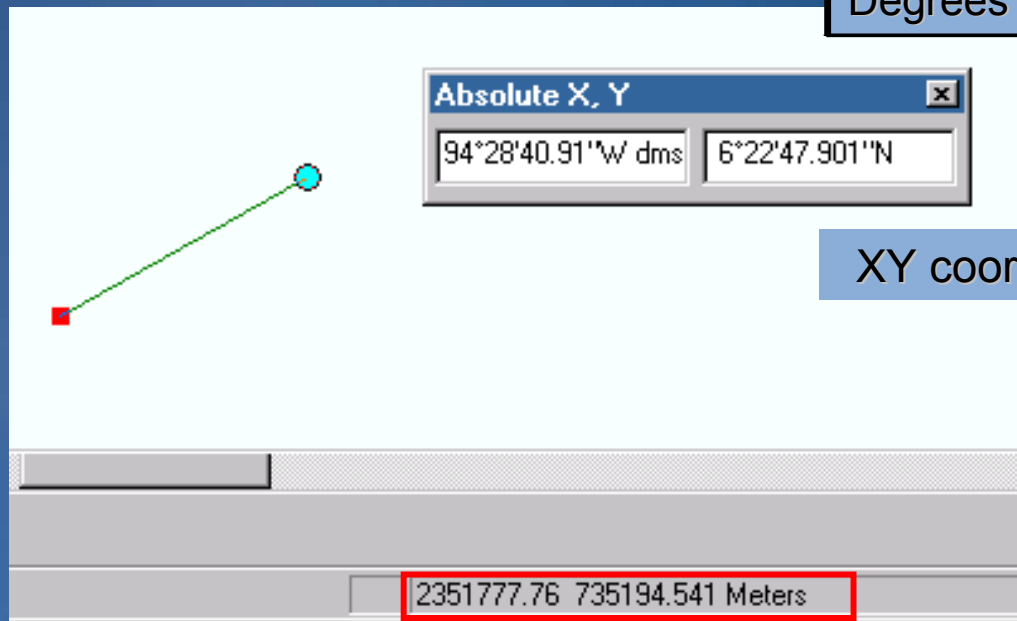
Map Units - Feet

<i>Unit</i>	<i>Abbrev.</i>
Meter	m
Kilometer	km
Millimeter	mm
Foot	ft '
Mile	mi
Nautical mile	nm
Chain	ch
Yard	yd
Inch	in
Survey Foot	ftUS
Survey Chain	chUS
Survey Mile	miUS
Survey Yard	ydUS

# Overriding map units

- Enter coordinates in DD, DMS, or DDM when map has a projected coordinate system
- Absolute XY and Delta XY
- New in ArcGIS 9.3

<i>Unit</i>	<i>Abbrev.</i>
Decimal degrees	dd
Degrees minutes seconds	dms
Degrees decimal minutes	ddm



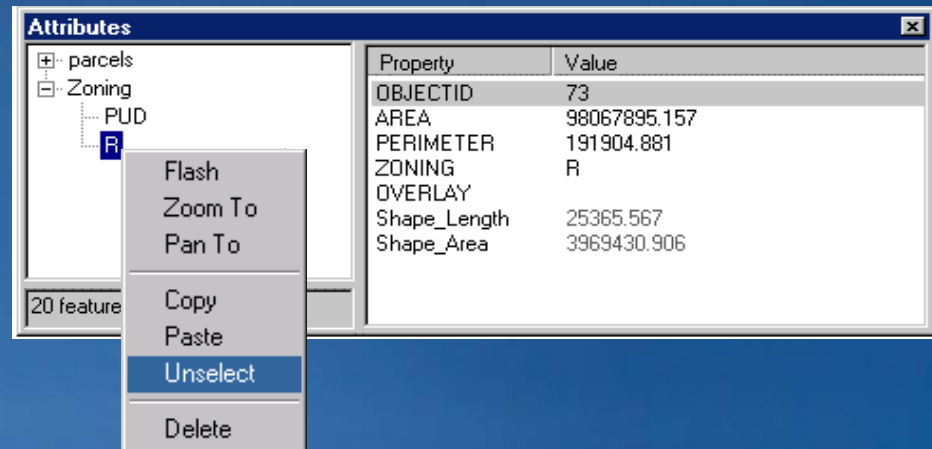
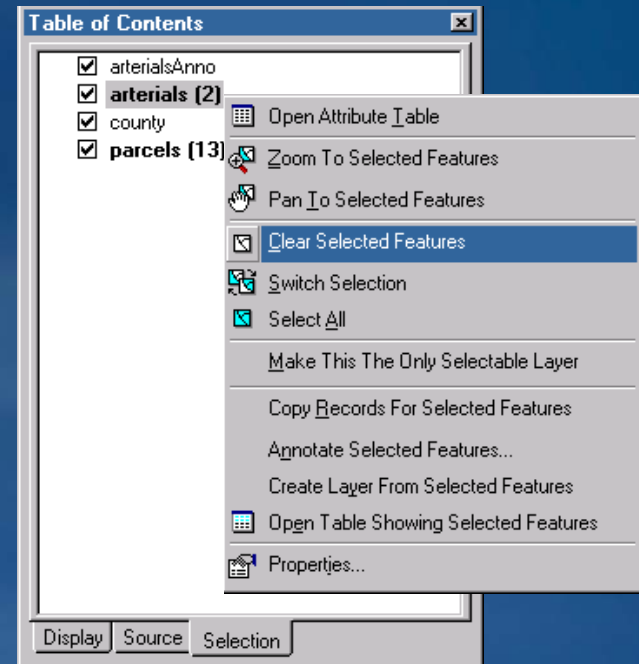
XY coordinates - DMS

Map Units - Meters



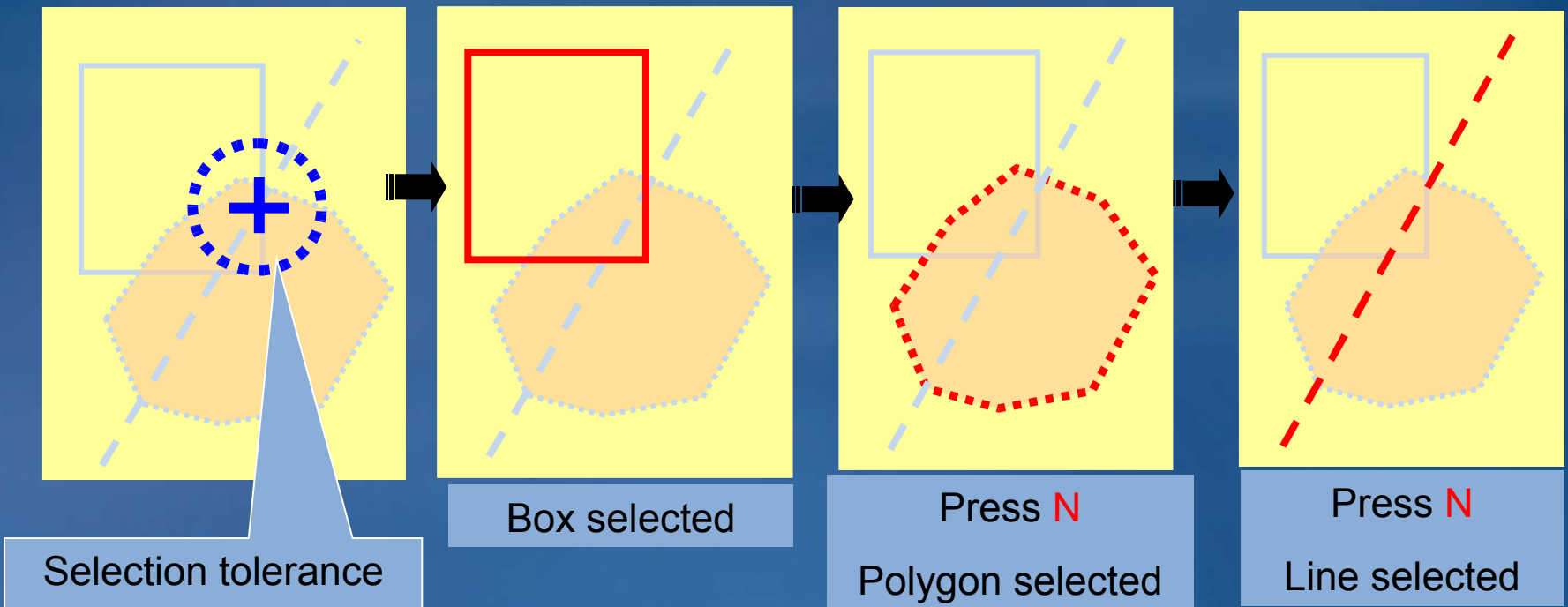
# Modifying the feature selection

- **Selection tab:** right-click on layer to
  - Zoom/pan to selected features
  - Clear selected features
  - Switch selection
  - Select all
  - Make only that layer selectable
  - Also has keyboard shortcuts
- **Attributes dialog box:** right-click on feature
  - Unselect features in a layer one at a time
  - Can work with multiple selectable layers



# Selecting from overlapping selectable features

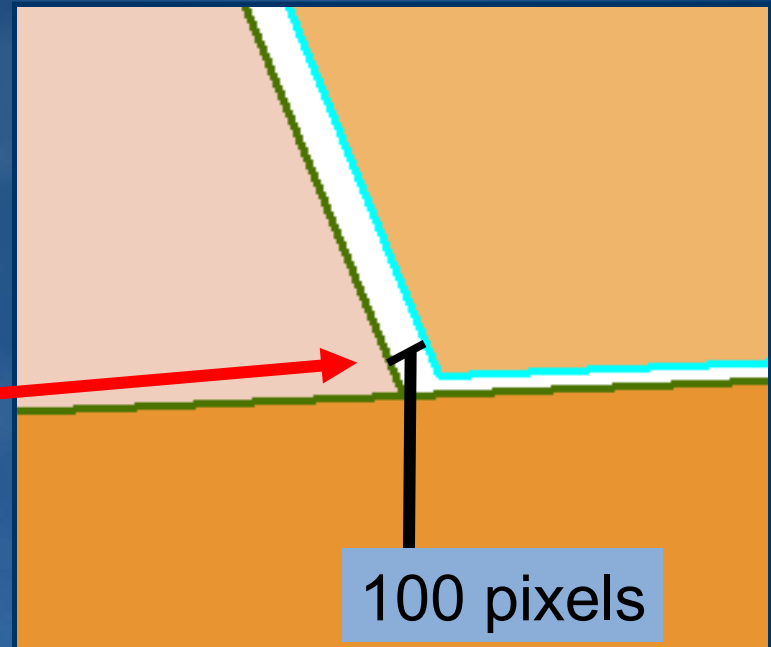
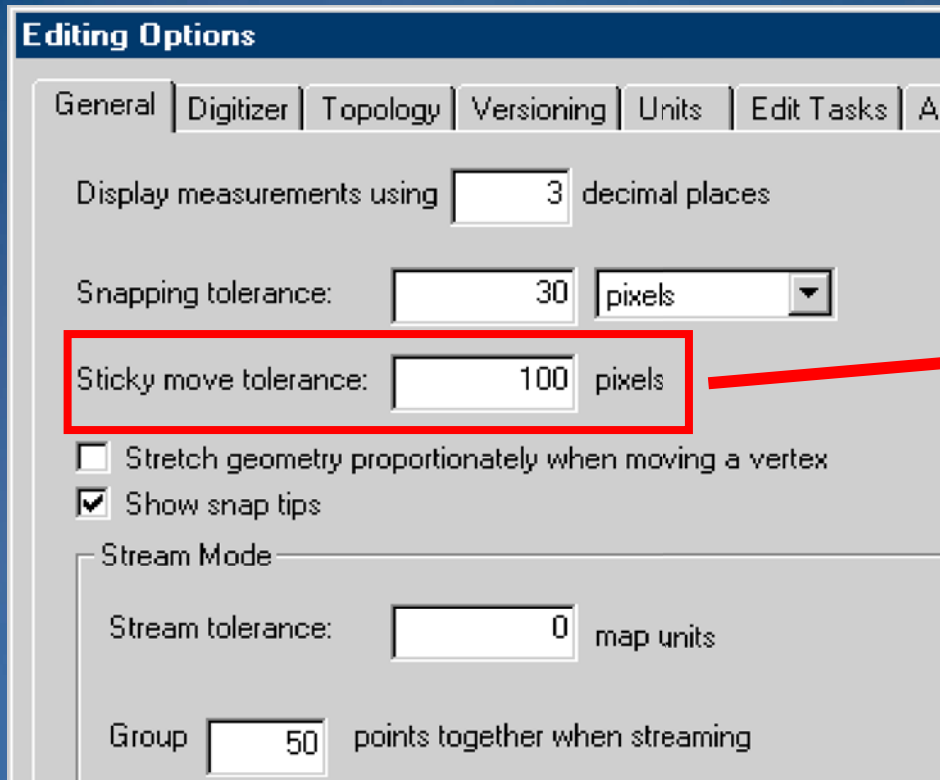
- Use the select “next” function
- Click with Edit tool to select feature, then press the **N** key
- Must point to first feature within the selection tolerance



Use this technique with overlapping features

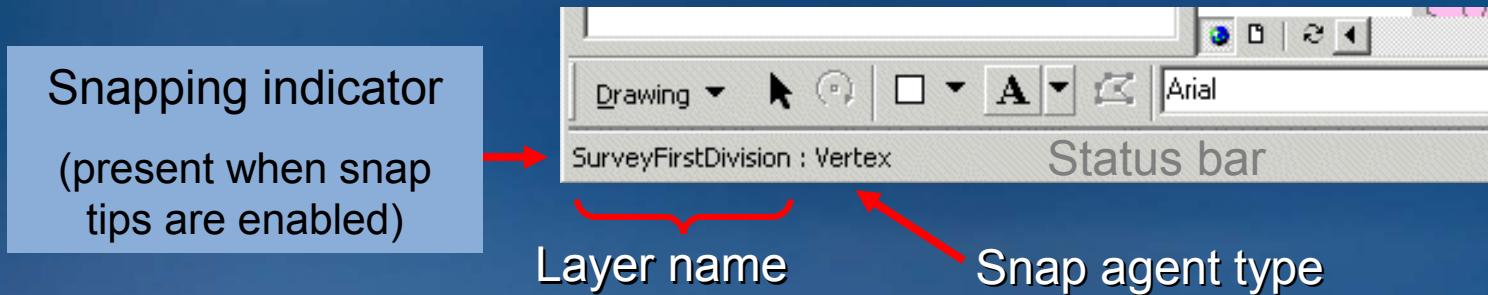
# Preventing accidental movement of features

- Set the sticky move tolerance
- Helps avoid accidental movement
- Prevents feature movement within tolerance

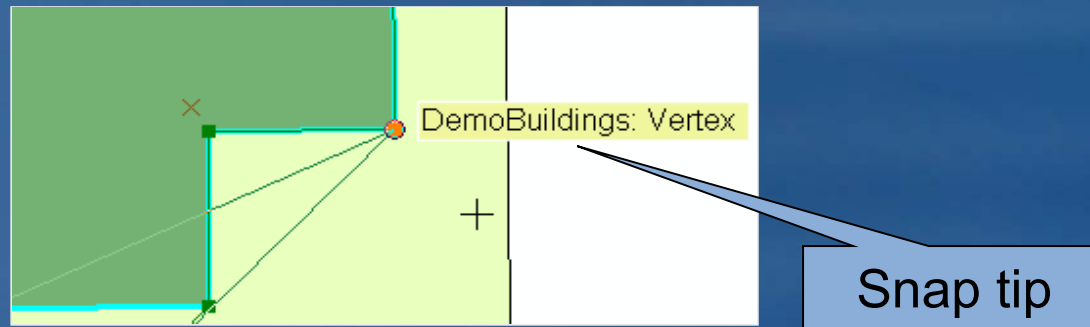


# Visualizing snapping environment while editing

- Snapping indicator in status bar

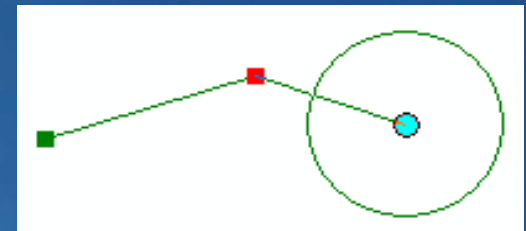
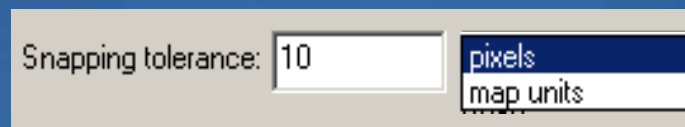


- Snap tips



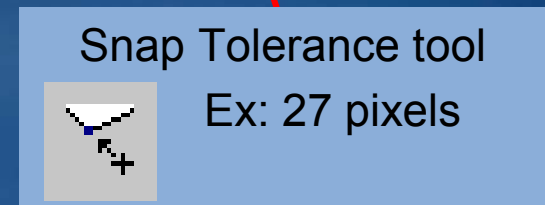
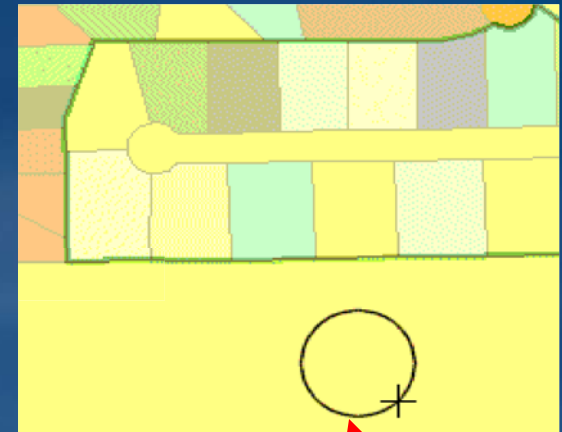
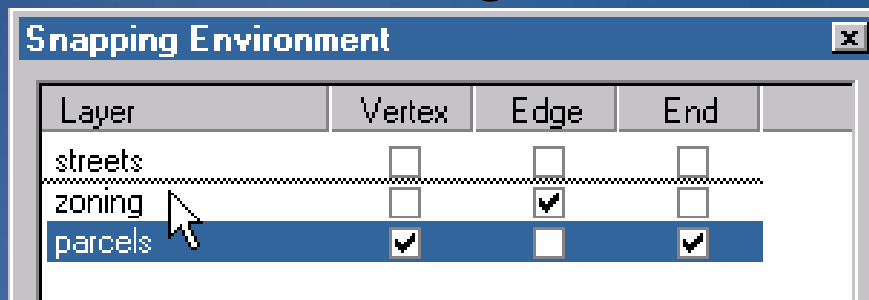
- Snapping distance (tolerance)

– View by pressing T shortcut key



# Controlling how features snap to one another

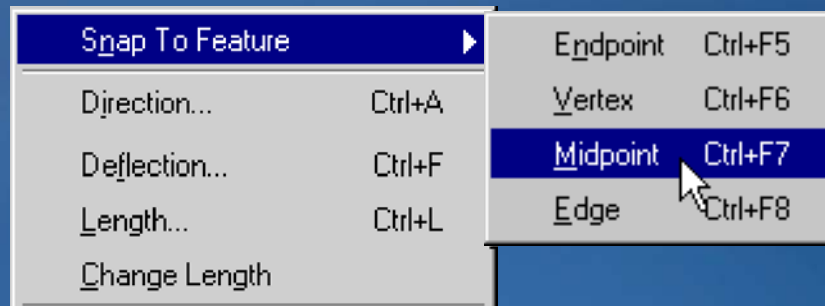
- Set snapping tolerance in the Editing Options dialog
  - Snap Tolerance tool (from Customize dialog box) to set interactively
- You can also:
  - Prioritize layers in the Snapping Environment dialog box



- Enable snapping to edit sketch elements (helps when creating rings or cutting polygons)
- Press the **Spacebar** to suspend snapping temporarily
- Use the **V** shortcut key to view vertex locations

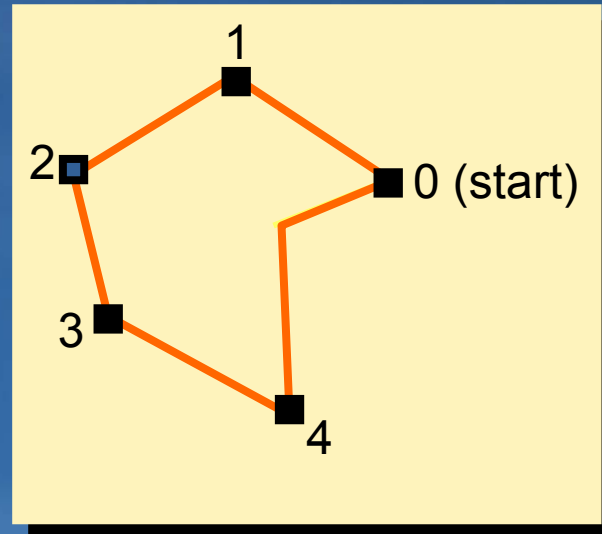
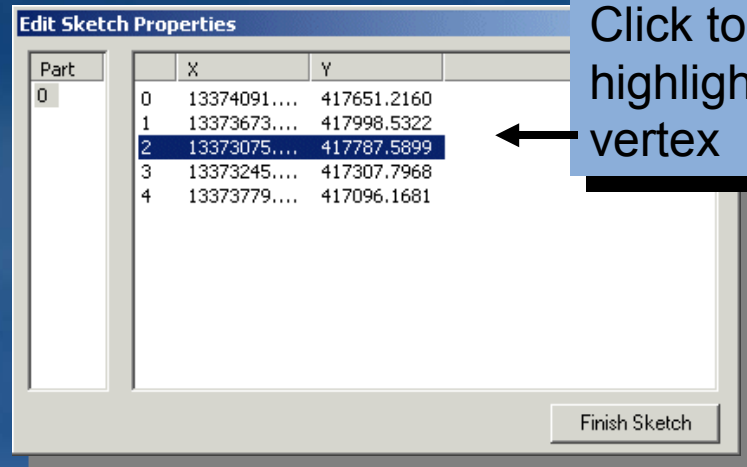
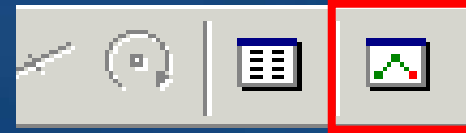
# Overriding the snapping environment

- **Snap To Feature command – right-click when sketching (9.2: Sketch tool only; 9.3: all sketch tools)**
- **Snapping on-the-fly**
- **Overrides snap environment settings**
- **Snap to feature geometry without setting individual snap agents**
- **Snap to midpoint of a line or polygon boundary**



# Changing the coordinates of a feature

- Edit Sketch Properties dialog box
- Highlight a vertex
- Works with “parts” of multipart features
- Context menu options
  - Insert vertices
  - Zoom to vertex
  - Delete
- Can edit X, Y, M, and Z values

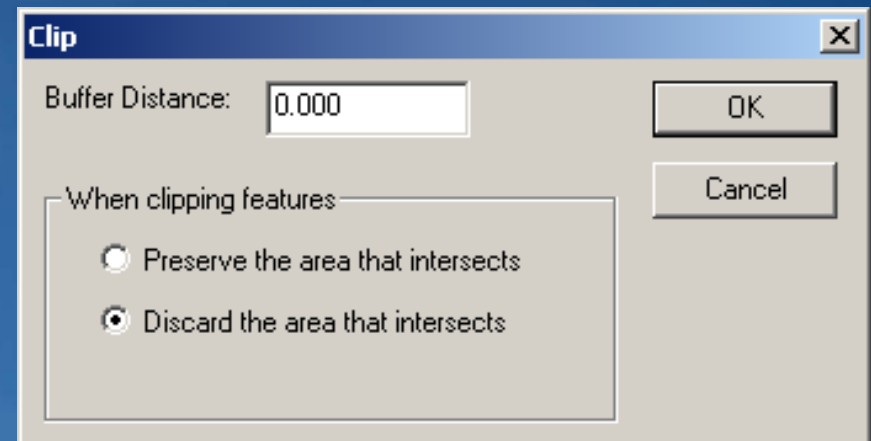
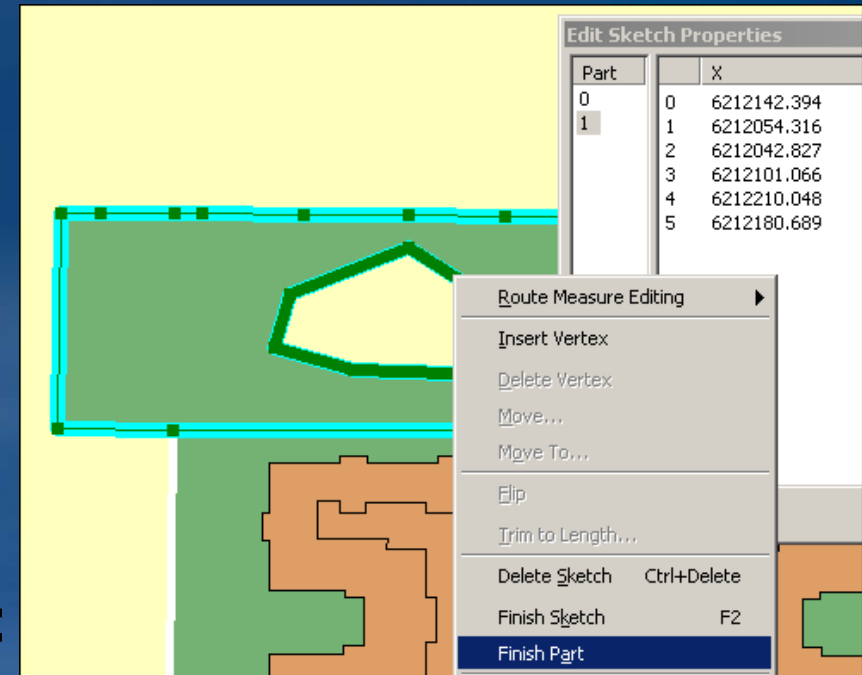


# Demonstration



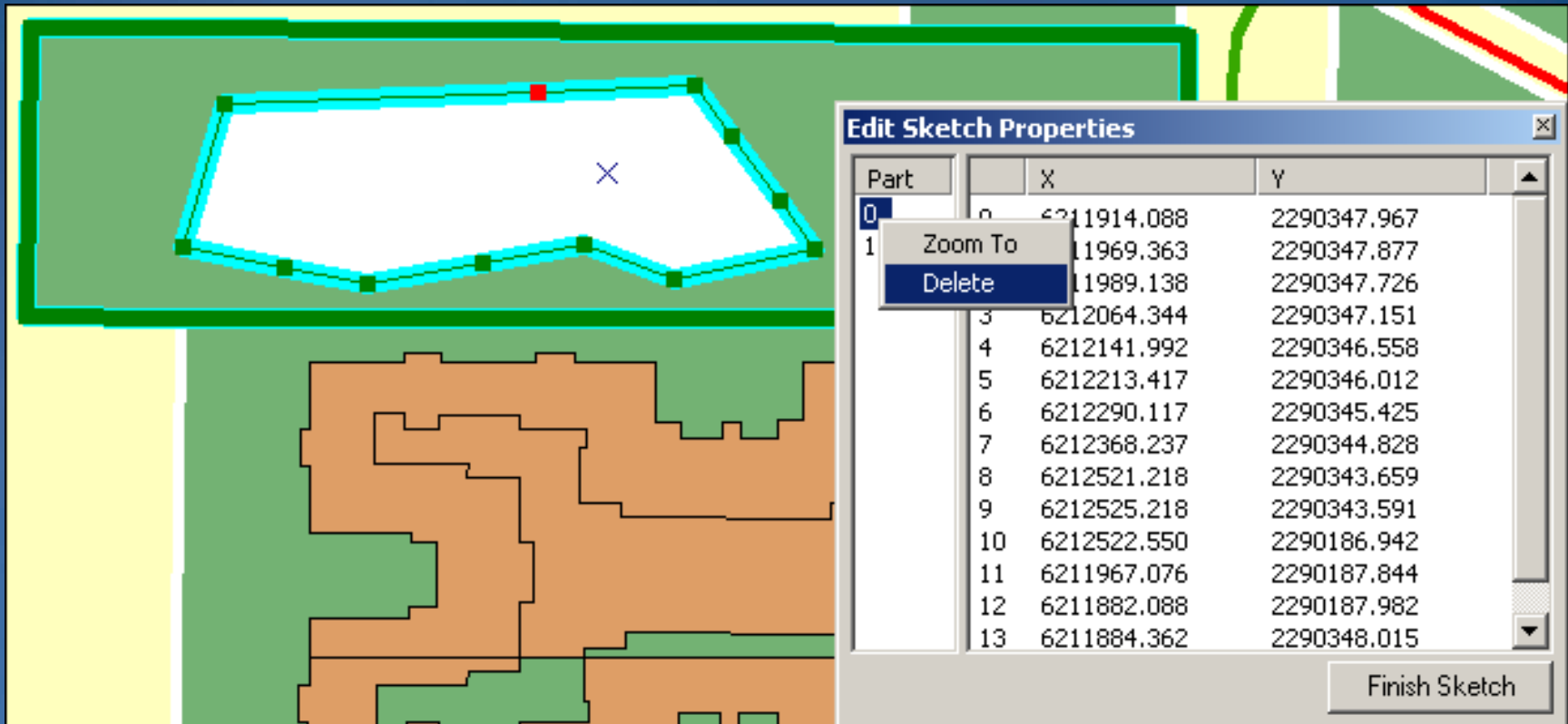
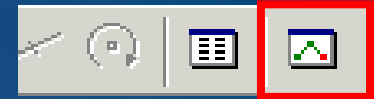
# Creating donut holes in polygons

- **By sketching the hole:**
  - Double-click feature to modify its shape
  - Click the Sketch tool
  - Right-click to 'Finish Part'
  - Sketch the hole feature
  - Finish the sketch
- **From another feature's shape:**
  - Create a feature where you want the hole
  - Select that "Holed" feature
  - Choose Editor menu > Clip
  - Choose 'Discard the area that intersects' option



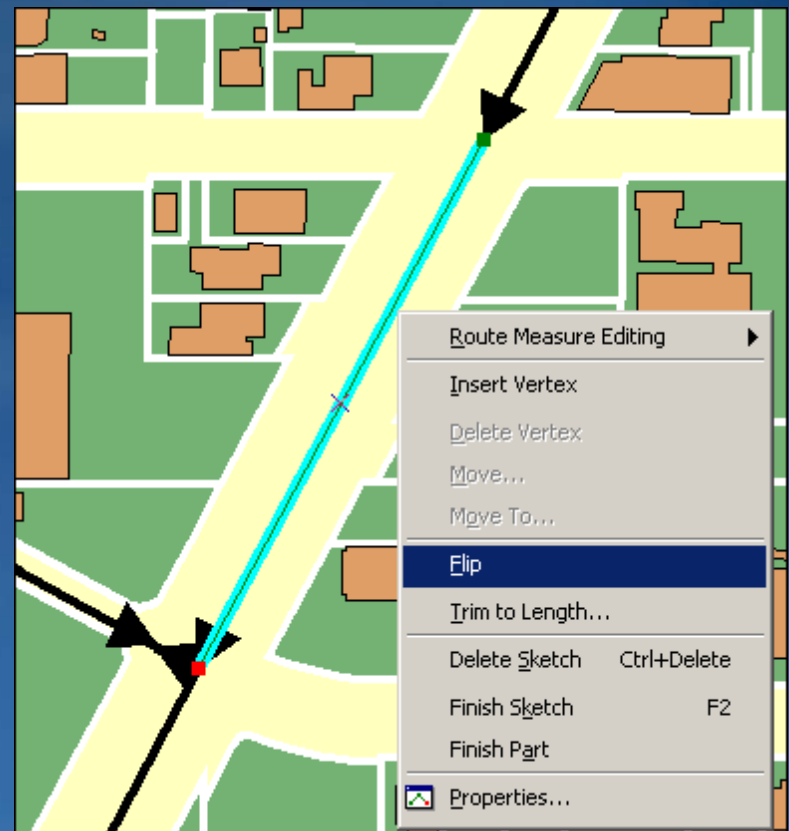
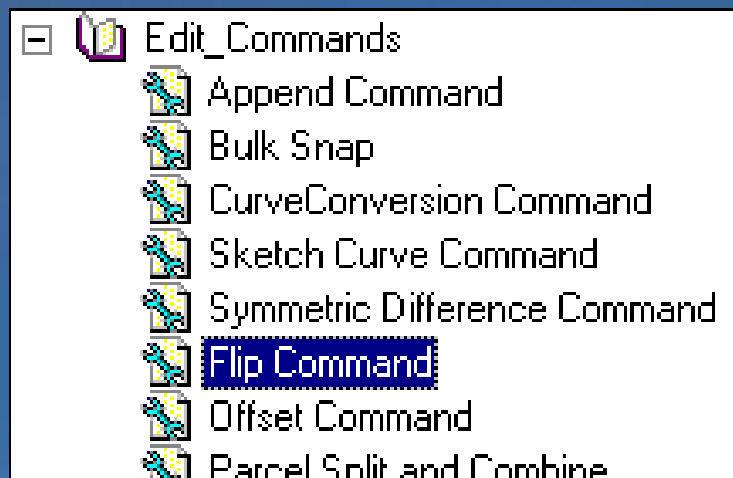
# Removing donut holes in polygons

- Double-click on the feature to modify its shape
- Open the Edit Sketch Properties dialog box
- Right-click on “Donut Hole” part and choose ‘Delete’



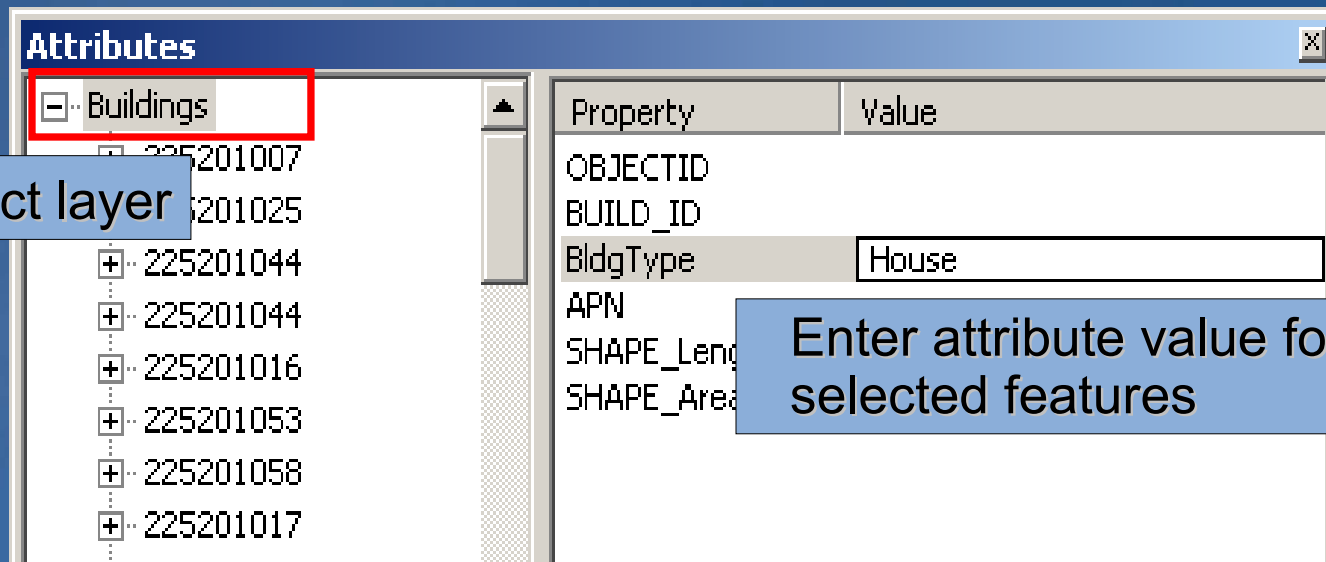
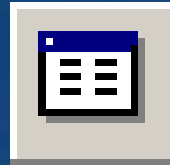
# Flipping the direction of a line

- **Flip command on the Edit Sketch context menu**
  - Double-click feature to modify its shape
  - Right-click shape to open the Sketch context menu
  - Click on the 'Flip' command
- **Flip developer sample**
  - VB6 SDK or Resource Center
  - Bulk flip selected lines



# Updating the attributes of multiple features

- Select target features
- Open Attributes window
- Choose layer
- Choose target field
- Type new attribute value

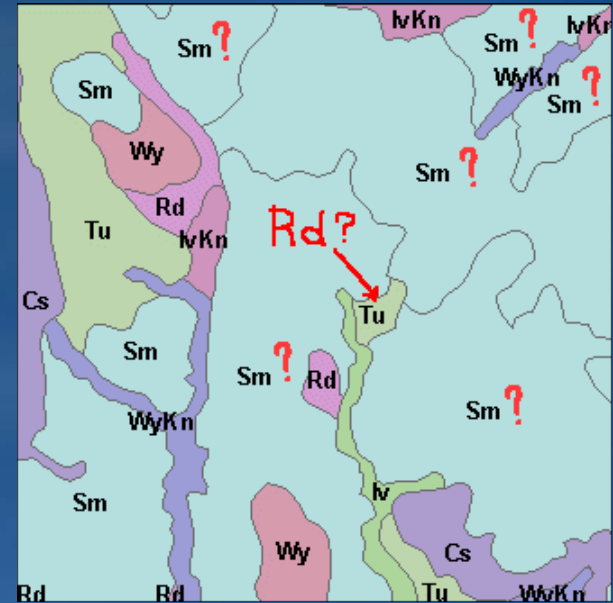


Property	Value
OBJECTID	
BUILD_ID	
BldgType	House
APN	
SHAPE_Length	
SHAPE_Area	

# Demonstration

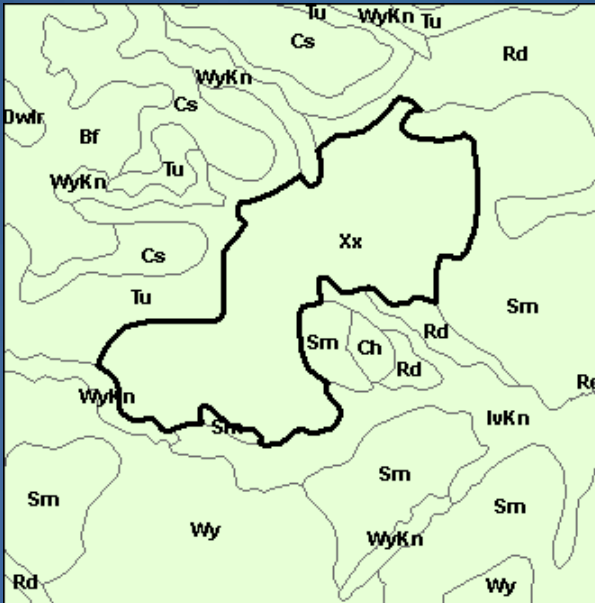
# Using visual inspection to find errors

- Automated methods cannot find all errors
  - Like legal codes incorrectly assigned
- Use cartography to support
  - Symbols and labels
- Look for unusual patterns
  - Compare map to itself
  - Compare to other sources (Aerial photos, other maps, etc.)
- Helps if you know your data!



# Validating features

- Editor > Validate Features command in ArcMap
- Applies geodatabase rules to selected features
  - Tests subtypes, domains, geometric networks, and relationship rules



Helps find illegal codes



Also tests custom rules (must program)

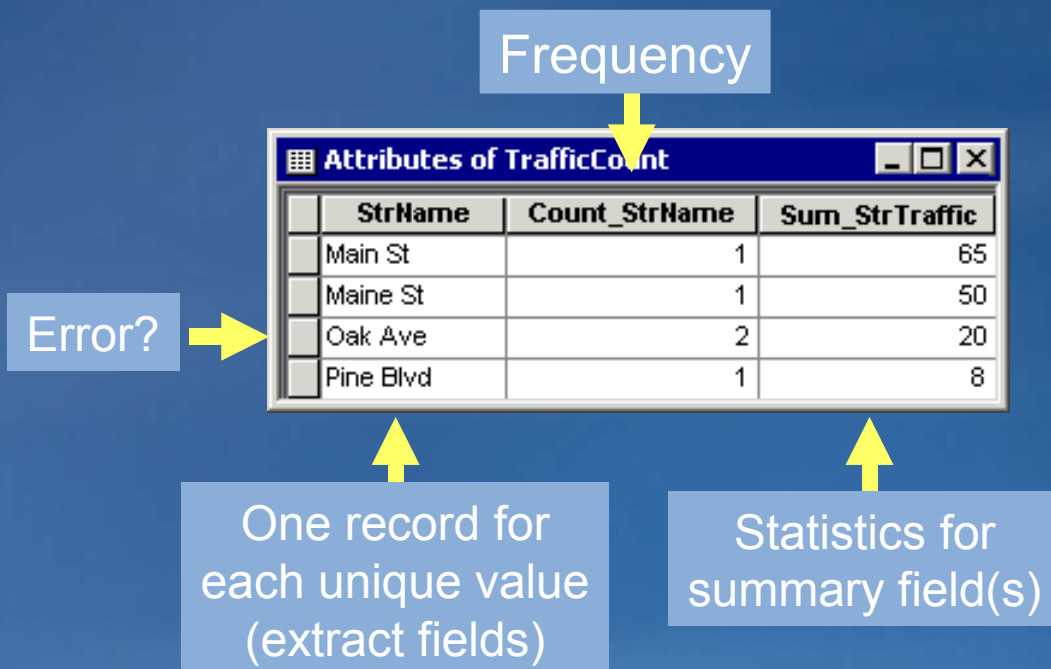
# Summarizing fields

- With the field Summarize command
- Find errors, generate statistics, find duplicates, extract fields
- You select fields and statistics
- Creates an output table

StrID	StrName	StrTraffic
1	Oak Ave	12
2	Main St	65
3	Pine Blvd	8
4	Maine St	50
5	Oak Ave	8

**Summarize**

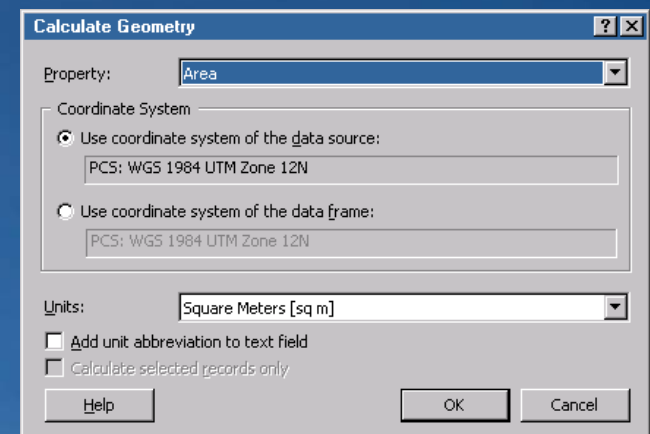
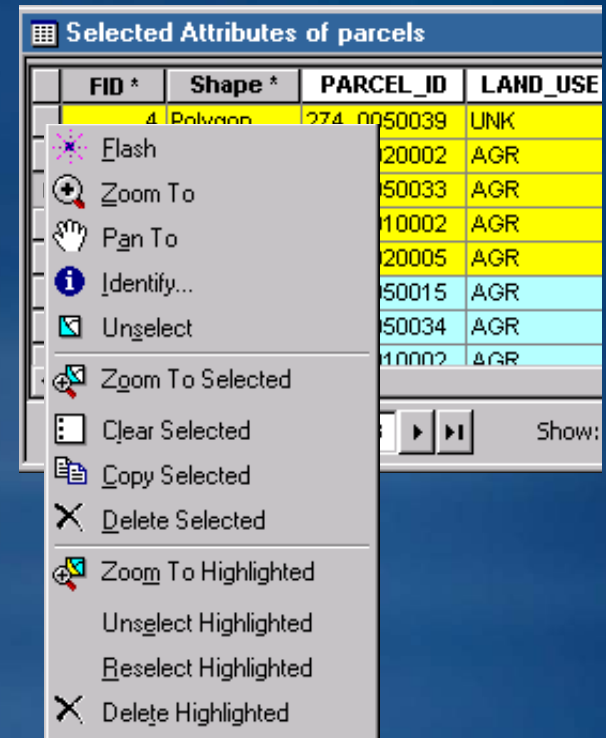
1. Select a field to summarize:  
StrName
2. Choose one or more summary  
+ OBJECTID  
+ StrID  
- StrTraffic  
 Minimum  
 Maximum  
 Sum
3. Specify output table:  
TrafficCount  
 Summarize on the selected





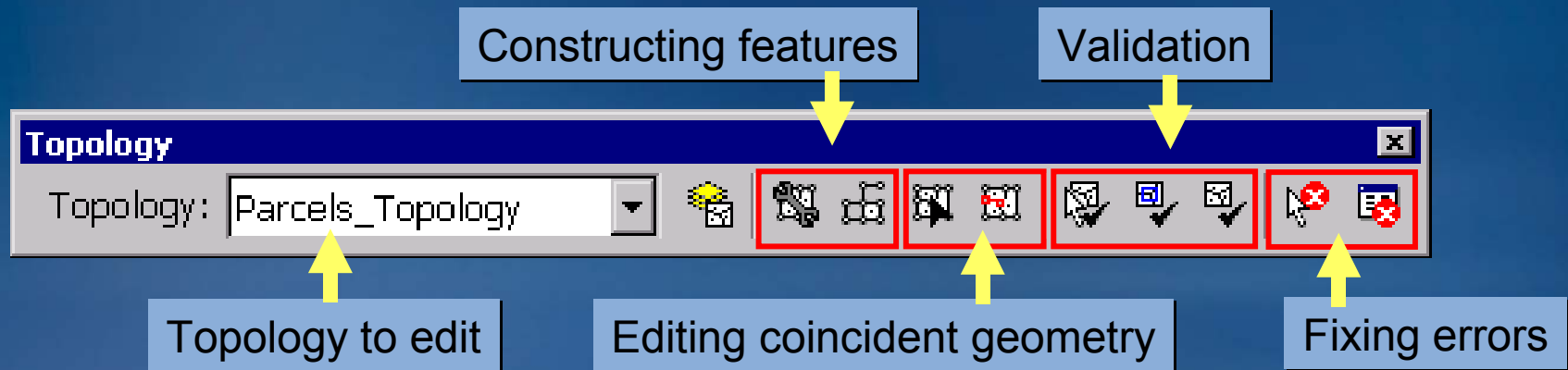
# Working with tables

- **Improved usability and navigation in tables (9.2/9.3)**
  - Mouse and keyboard shortcuts
  - Interact with the map from the table: flash, zoom to, pan to features
  - Select rows, work with fields, and edit attributes
- **Calculate Geometry (new for 9.2)**
  - Length, perimeter, area, endpoints, and x,y coordinates
  - Right-click field and click Calculate Geometry



# Editing coincident features

- **Topology editing tools – Topology toolbar**



- ArcEditor or ArcInfo license required to create and edit geodatabase topology

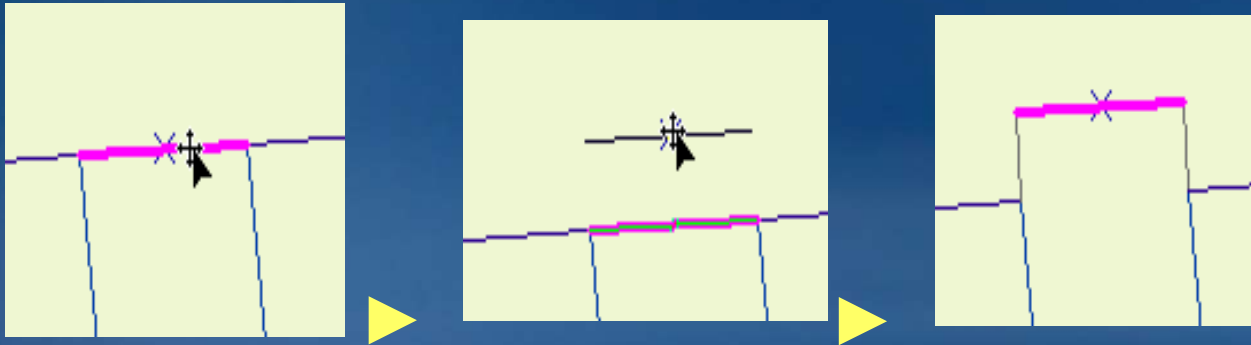


- **Map topology**

- Temporary for the edit session
- For shapefiles and feature classes without a topology
- Works with ArcView
- Enables some topology editing tools

# Moving coincident/shared geometry

- Topology Edit Tool 

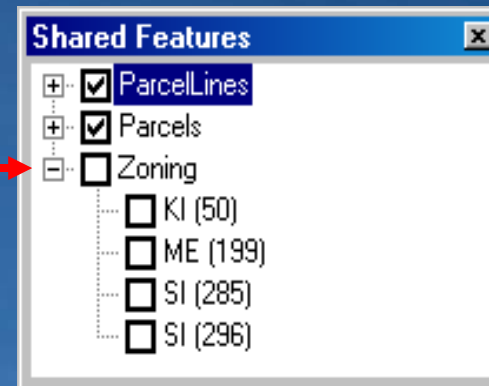


- Selects and modifies edges and nodes
- Press **E** to select only edges, and **N** to select only nodes

- Show Shared Features 

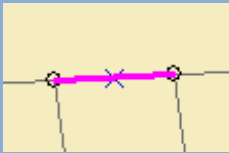
- To pull apart coincident geometries

Uncheck layers so they are not modified with the coincident geometry

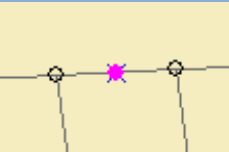


# Splitting topology edges

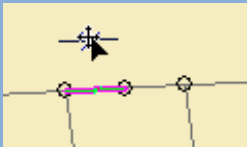
- Temporarily splitting edges



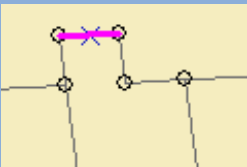
Select an edge



Temporarily split the edge



Select and modify one of the edges



All polygons are modified

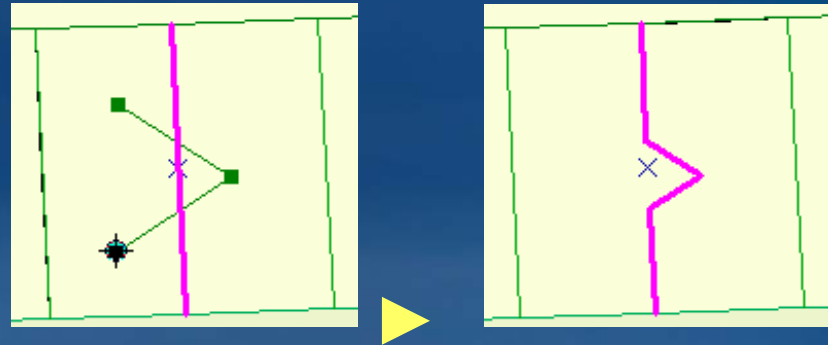


Rebuild cache to remove temporary nodes

# Reshaping and modifying topology edges

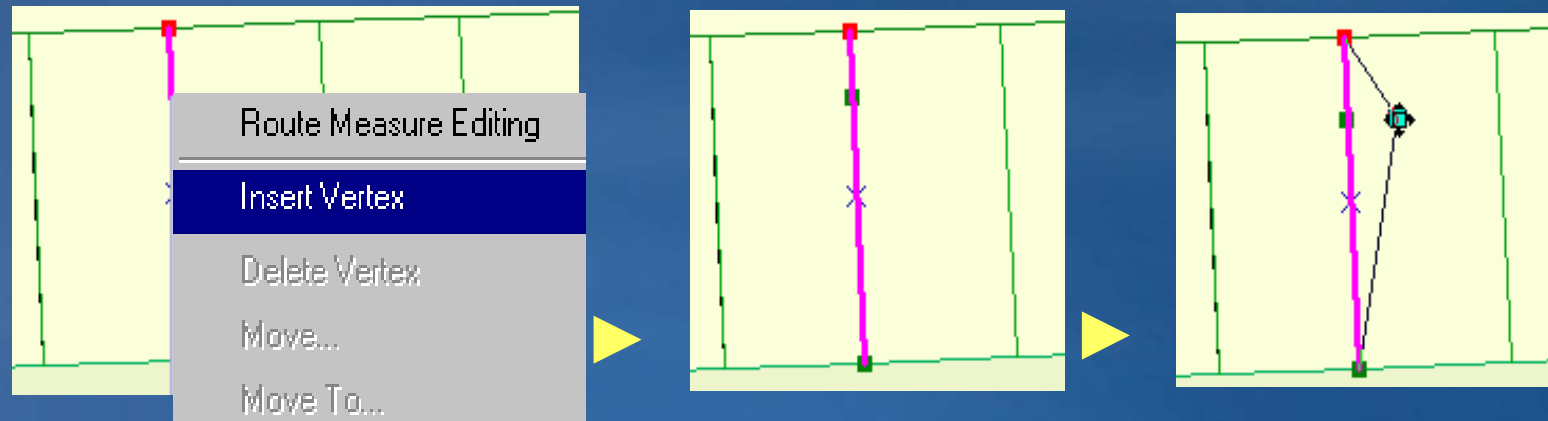
- **Reshape edge**

- Reshape an edge with a sketch




- **Modify edge**

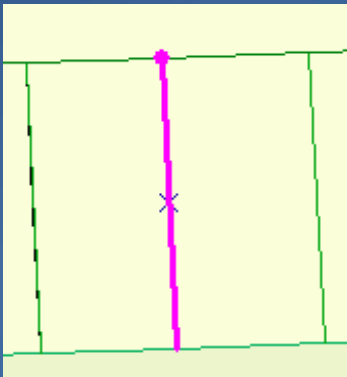
- Edit the vertices of an edge in the sketch



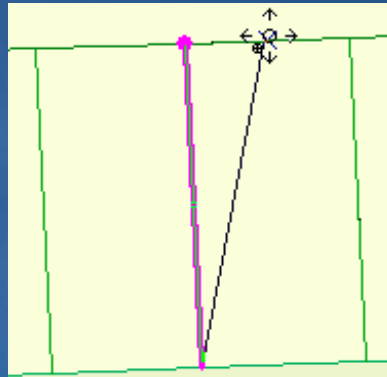
# Splitting and moving topology nodes

- Temporarily disconnects one node and one edge from topology 
  - Move a polygon boundary without creating slivers
  - **S** key while dragging node with Topology Edit Tool

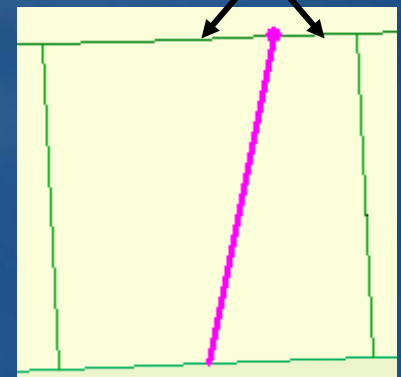
Select one node and one edge with N and E keys



Press S key and snap node to some other part of the polygon



These edges don't rubber band

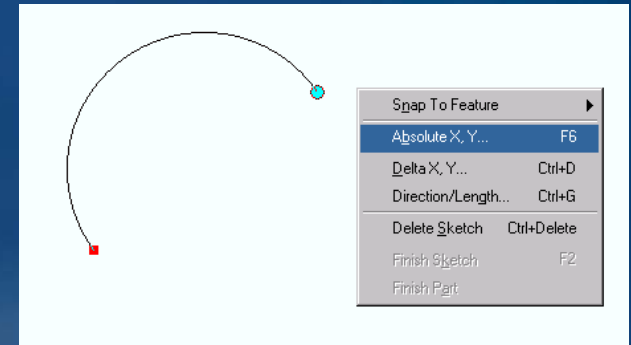


Polygons will be deleted if you don't snap the node to the edge of the polygon

# Demonstration

# Added in ArcGIS 9.3

- New shortcuts
  - All sketch tools have a shortcut menu
  - Shortcuts in Error Inspector window
- Better feedback
  - Split tool and Fillet tool
  - Sketch tool shows length, direction, perimeter, and area in status bar



Length: 592.654 km, Direction: 204.4440, Perimeter: 3048.862 km, Area: 200729.272 sq km

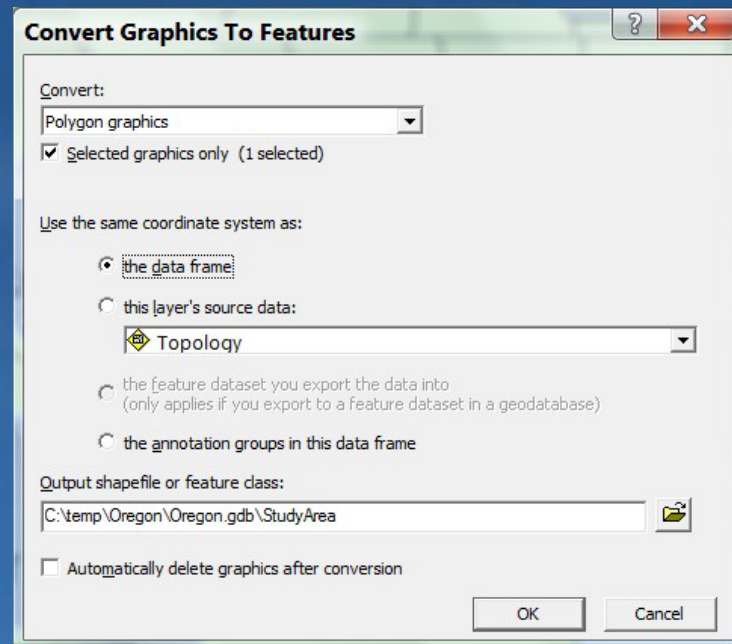
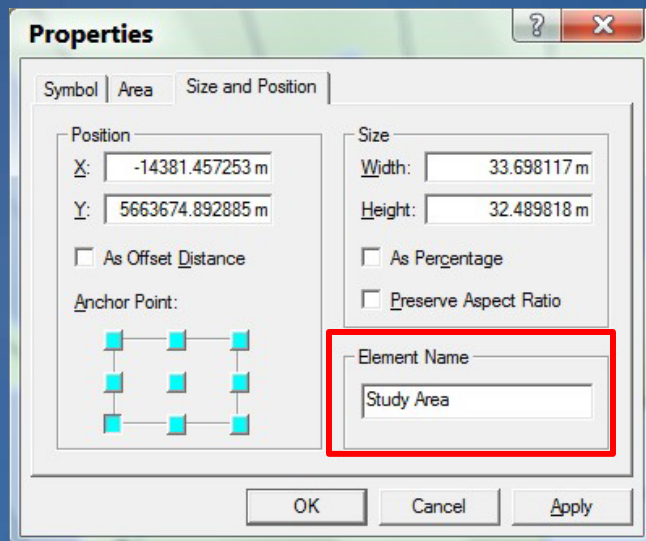
- More support for unit abbreviations, including entering XY in DD, DMS, or DDM
- Editing features that have z-values
  - Logical default z-value assignment
  - Capture z-values directly from a surface (requires code or a developer sample)



# Converting graphics to features

## Added at ArcGIS 9.3

- Draw a graphic or text with drawing tools
- Assign name property to graphic element
  - Name becomes feature attribute
- Convert to shapefile or geodatabase feature class



# Questions

