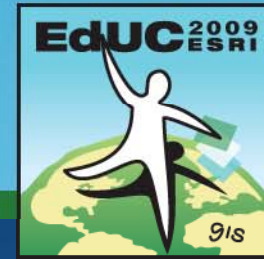


# 2009 ESRI Education User Conference

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## Creating and Editing Feature Geometry

*Miriam Schmidts*

# Exercise Overview

- **Editing tools**
- **Shortcuts**
- **Digitizing centerlines**
- **Digitizing curves**
- **Splitting lines / cutting polygons**
- **Planarizing lines**
- **Fixing overshoots and undershoots**
- **Reducing the number of vertices**
- **Constructing features**

# Creating features

The screenshot shows the 'Editor' window with the 'Task' dropdown set to 'Create New Feature' and the 'Target' dropdown set to 'Points'. A red arrow points to a red-bordered context menu that appears after a right-click. The context menu contains several icons for creating features, with the pencil icon highlighted by a red box. To the right of the context menu is a 'Snap To Feature' dropdown menu with various options and keyboard shortcuts.

**Right-click**

**Editor**

Editor ▾ | ▶ | 🖋️ ▾ | Task: Create New Feature ▾ | Target: Points ▾ | ✂️ | 🔄 | 📄 | 🖼️

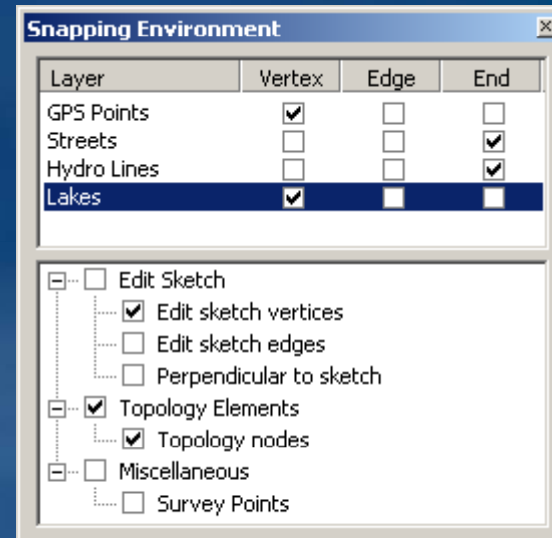
- 🖋️ Start Editing
- 🛑 Stop Editing
- 📄 Save Edits
- Move...
- Split...
- 🔴 Divide...
- 🔧 Buffer...
- 🔴 Copy Parallel...
- Merge...
- Union
- Intersect
- Clip...
- More Editing Tools ▶
- 📄 Validate Features
- Snapping...
- Options...

**Snap To Feature** ▶

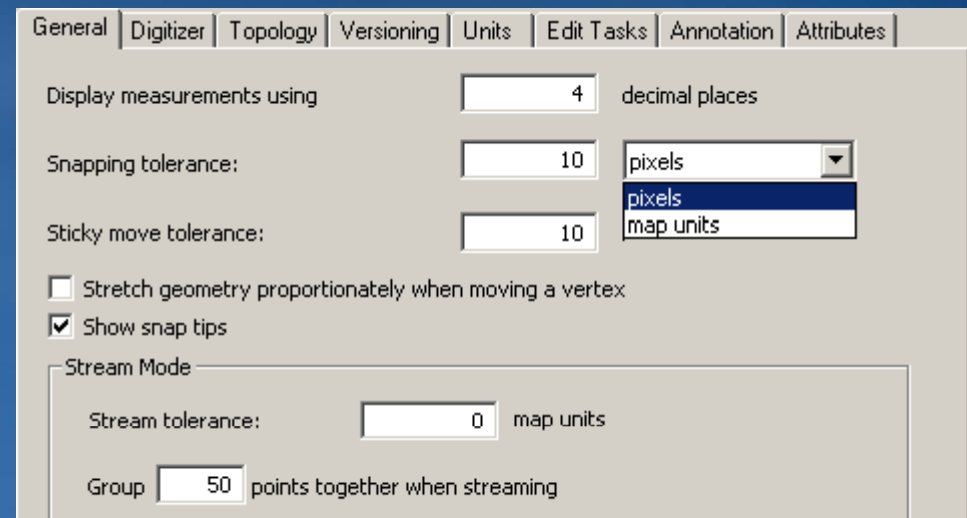
- Direction...
- Deflection... Ctrl+F
- Length... Ctrl+L
- Change Length
- Absolute X, Y... F6
- Delta X, Y... Ctrl+D
- Direction/Length... Ctrl+G
- Parallel Ctrl+P
- Perpendicular Ctrl+E
- Segment Deflection... F7
- Replace Sketch
- Tangent Curve...
- Find Text Ctrl+W
- Streaming F8
- Delete Sketch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

# The editing environment

- Snapping environment
  - Change order by dragging layers up or down
  - Custom tool to visualize the snapping tolerance



- Editing Options
  - Snapping tolerance
  - Sticky move tolerance
  - Snap tips
  - Customizable Task menu
  - Option to display Attributes dialog

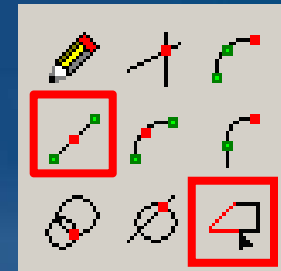


# Shortcuts

- **E** Toggle between Sketch tool and Edit Tool
- **T** Display snapping tolerance
- Spacebar Suspend snapping
- Toggle between Sketch tool and navigation tools
  - **Z** zoom in
  - **X** zoom out
  - **C** pan
- Zoom with the mouse wheel
- Ctrl+Z Undo
- Ctrl+Y Redo
- More at *ArcGIS Desktop Help*
  - Help topic: Shortcut keys for editing in ArcMap



# Digitizing Centerlines



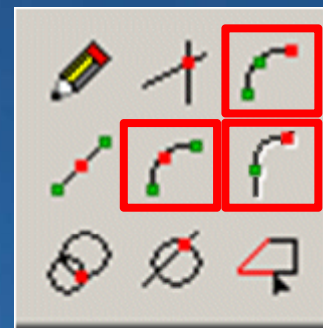
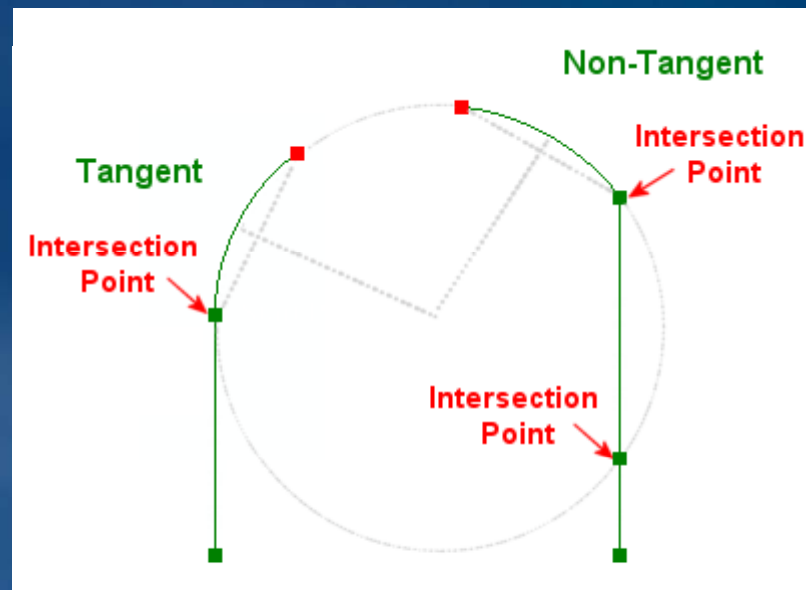
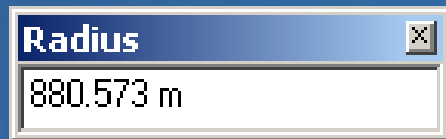
Source: City of Manhattan, KS,  
graphic enhanced for display purposes

- Midpoint tool
- Trace Tool
- Parallel command

Direction...	Ctrl+A
Deflection...	Ctrl+F
Length...	Ctrl+L
Change Length	
Absolute X, Y...	F6
Delta X, Y...	Ctrl+D
Direction/Length...	Ctrl+G
<b>Parallel</b>	<b>Ctrl+P</b>
Perpendicular	Ctrl+E
Segment Deflection...	F7

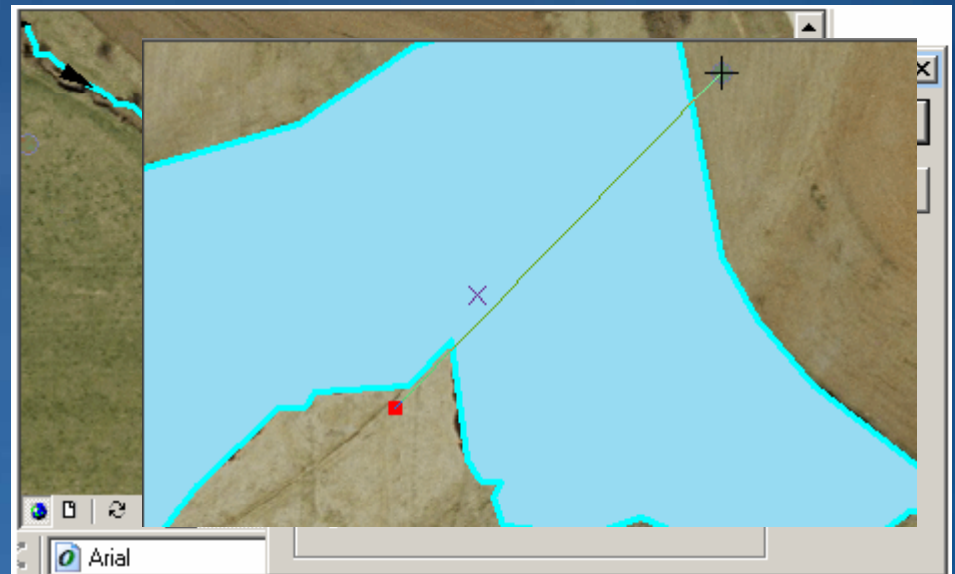
# Digitizing Curves

- Tangent to the previous segment
- Non-tangent
- Tangent tool for tangent curves
  - Requires one segment
  - Radius constrained
- Arc Tool and End Point ArcTool for non-tangent curves
  - Radius not constrained
  - Press R to type in the radius



# Splitting Lines or cutting Polygons

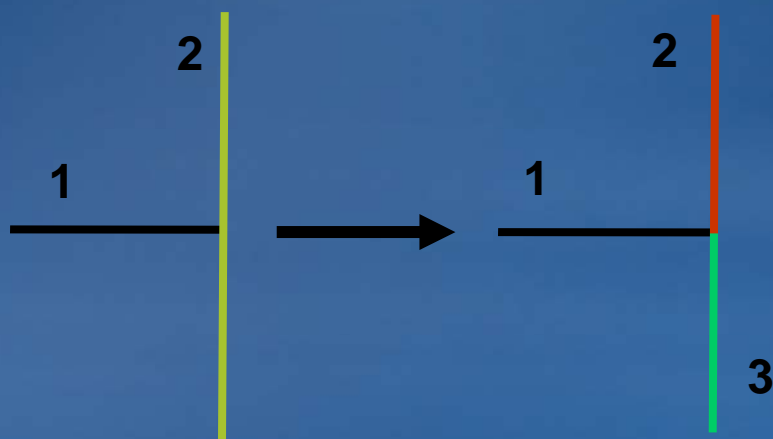
- **Split line features**
  - Interactively by clicking with the Split tool
  - Distance or percentage from the beginning/end of the line
  - Requires selected features
  
- **Cut Polygons**
  - Editing task
  - Use Sketch tool
  - Requires selected features



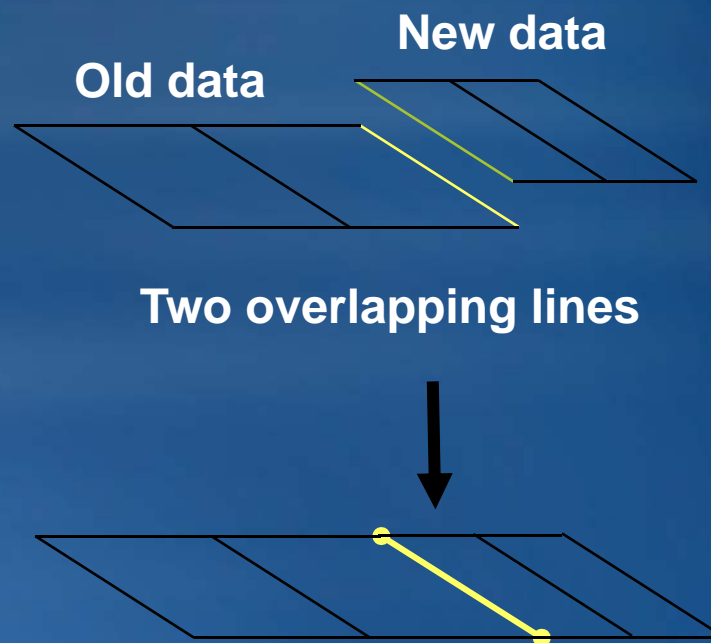


# Planarizing Lines

- Planarize Lines tool on the Topology toolbar
- Splits lines where they cross
- Removes overlapping lines
- Uses cluster tolerance



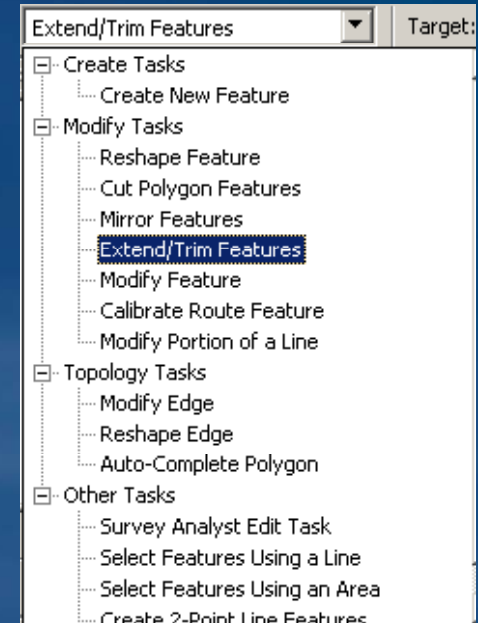
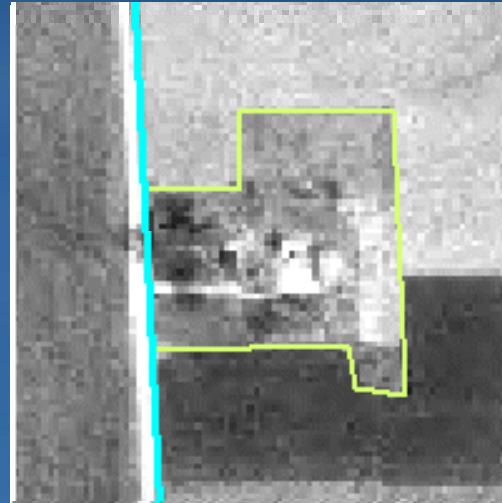
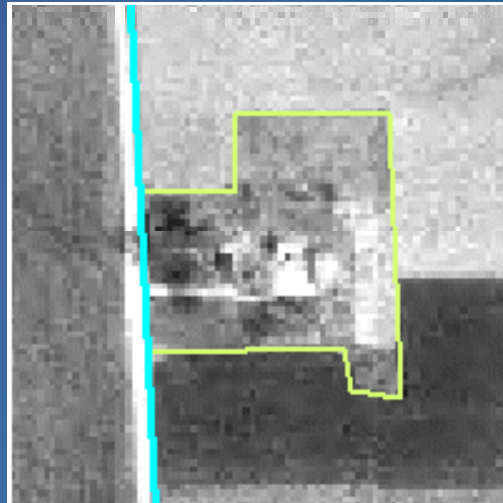
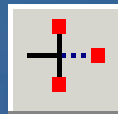
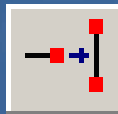
Creates intersections



One line after Planarize Lines

# Fixing overshoots or undershoots

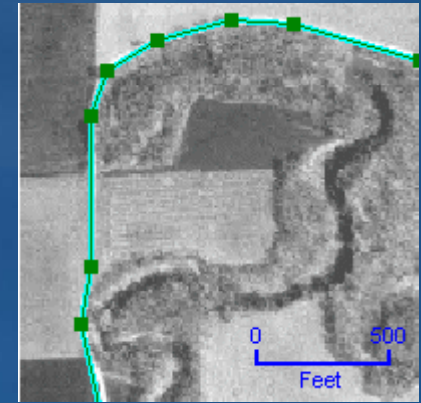
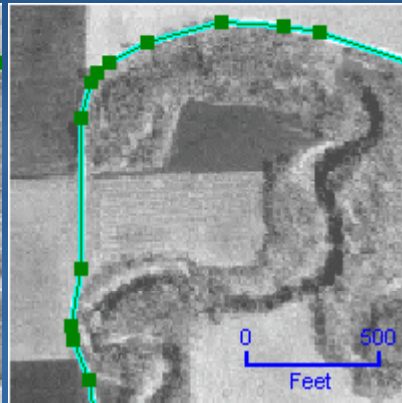
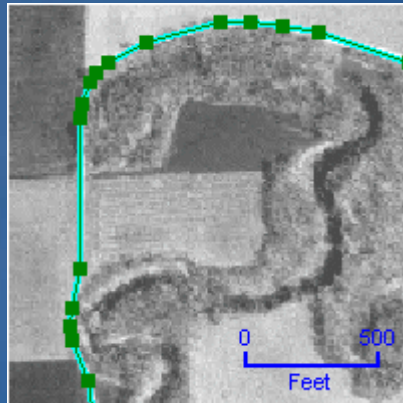
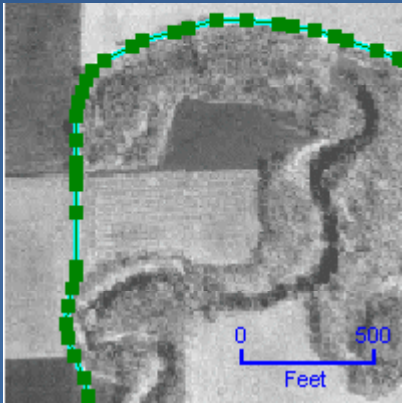
- **Extend /Trim lines**
  - Editing task
  - Tools on the Advanced Editing toolbar



# Reducing the number of vertices

- **Generalize**

- Reduces the number of vertices in a feature, simplifying its shape
- Based on maximum allowable offset



Road  
vertices

MAO= 5'

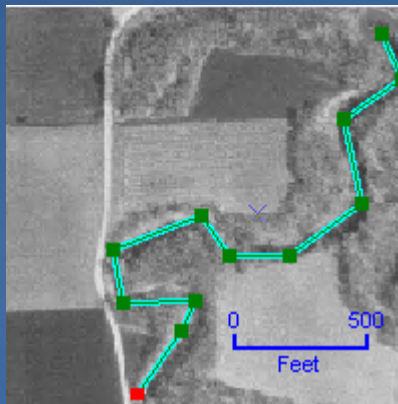
MAO= 10'

MAO= 20'

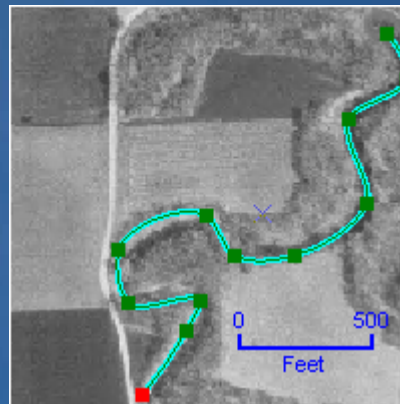
# Improving a line's aesthetic appearance

- **Smooth**

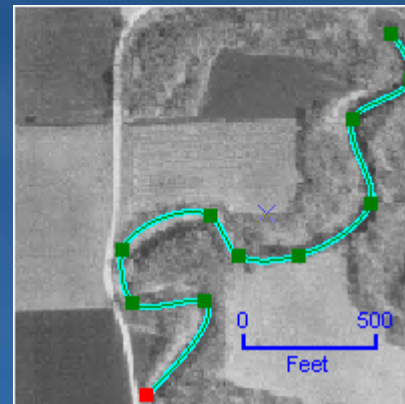
- First generalizes
- Then creates Bézier curves through resulting subset of vertices
- Based on maximum allowable offset



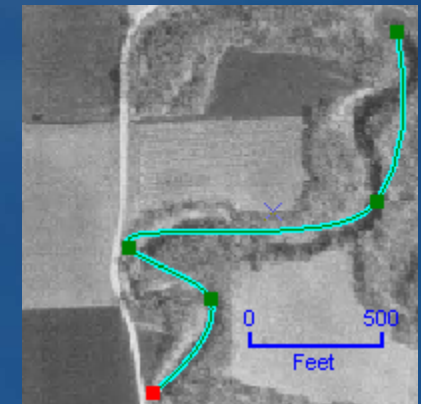
**Stream  
vertices**



**MAO= 10'**



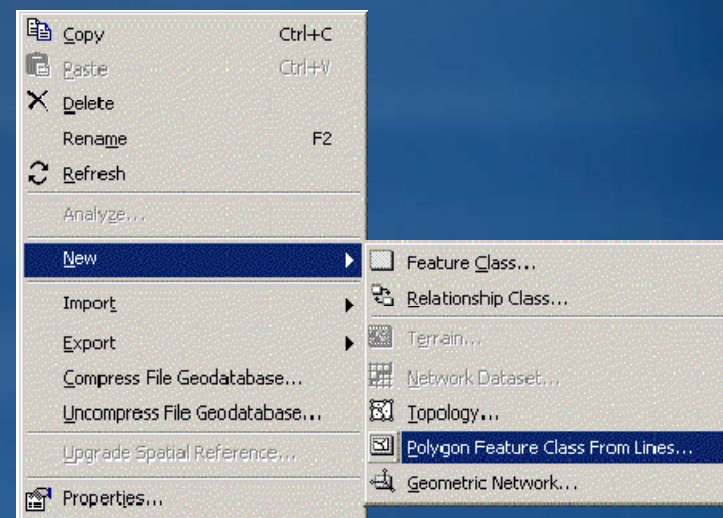
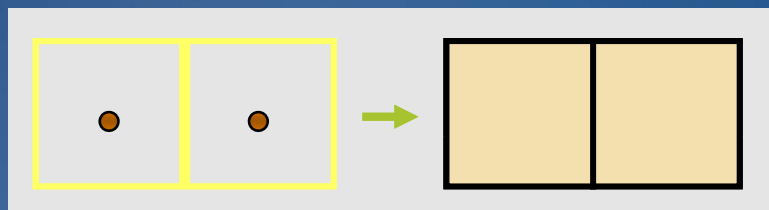
**MAO= 100'**



**MAO= 200'**

# Constructing features

- **Construct features tool on the Topology toolbar**
  - Takes any line and/or polygon geometry
  - Creates geometry of the target layer
  - No attributes



- **Create polygons from lines**
  - ArcCatalog: Feature dataset context menu item
  - Or ArcToolbox tool
  - Option to create attributes from label points

# Exercise Overview

- **-Split line features**
- **-Create centerlines**
- **-Use ArcMap curve tools**
- **-Digitize true circles**
- **-Trim and Extend lines**
- **-Generalize and smooth features**
- **-Convert polygons to lines**