

Editing in ArcGIS: Sketch Tools and Tasks

Transcript

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Welcome to our ESRI Instructional Series podcast entitled Editing Tips and Tricks. I am Colin Childs from the Educational Services Department at ESRI in Redlands, California, and I teach a host of ArcGIS classes ranging from geodatabase design to working with Spatial Analyst.

Today, I will be exploring a collection of general editing tips and tricks that will help you become more efficient and productive while sketching new features, or using the sketch tools to edit existing features.

This discussion is tailored to users of the ArcGIS software who perform edits to data on a regular basis and who would like to pick up a series of useful techniques and pointers to improve workflow and productivity while sketching features. I will also be exploring some of the sketch constraints that can be applied to guide the construction of vertices for the features being sketched. During the presentation, I will present you with some challenges of scenarios and then provide you with the solution to solve those challenges.

To create a new feature in ArcMap, you need to create an edit sketch. The sketch is a shape that is used to complete the current edit task. A sketch, as you may recall, is composed of vertices (the points at which the sketch changes directions, such as corners), and it also is composed of segments (the lines that connect those vertices). You create a sketch using the Sketch Construction tools located on our Tool palette. You may recall some of these: the actual Sketch tool represented by a pencil-type symbol, an Intersection tool, the Arc tool, a Tangent tool, a Trace tool, the Direction-Distance tool, perhaps Distance-Distance tool, a Midpoint tool, and even the Endpoint Arc tool. These are all typical sketch tools that you would use to construct new features.

Now, the Sketch tool is used to create point features and digitize the vertices of line or polygon features, and after you finish sketching, ArcMap will add those final segments, and the sketch will turn into a feature. The feature, in turn, will be committed to the database, or to the shapefile, once you save your edits.

The Arc tool is used to create a segment that is a parametric, or true curve, so instead of being made up of numerous vertices, this Arc tool creates a parametric curve that has only two vertices at the endpoints. You may, for example, use the Arc tool to digitize a cul-de-sac using an aerial photograph image as a backdrop, for example.

The Direction-Distance tool will allow you to create a vertex using a distance from a known point, plus a direction from a known point, to define a bearing line. So, we often use this tool as a kind of construction tool for a new *begin* point for us to start sketching. Another example of where we may use the Direction-Distance tool would be, for example, where a light pole needs to be located at a specified distance from the corner of one building, and at a defined angle from the corner of another building.

The Distance-Distance tool, again is one of those tools that we use as a base construction tool, and this lets us create a point of vertex at the intersection of two distances from two other points. So, we use Distance-Distance as a construction tool to define the point, then we switch to our Sketch tool and continue sketching our feature.

The Endpoint Arc tool will allow you to specify the start and endpoints of a curve, and then define the radius for that curve. Again, this is particularly useful when sketching things like a cul-de-sac, where the beginning and endpoints of the arc, as well as the radius of the cul-de-sac, might be known.

The Intersection tool is used to create a point or a vertex construction, in other words, point at the place where two segments would intersect if extended far enough.

The Midpoint tool lets you define the location of the next vertex by clicking two points. The new vertex is placed at the midpoint of the line between these points. Again, this is particularly useful for creating road centerlines if we have the road right-of-way.

The Tangent tool is a tool that allows us to add a segment that is a tangent to the previously sketched segment. This tool is particularly practical when sketching railway lines in which the curves are nearly always a tangent to the previous section.

And finally, the Trace tool. Now the Trace tool helps you create segments that follow along existing segments. Suppose you want to add a new road casing feature that is offset, say 15 feet, from the front of a parcel subdivision. You could use the Trace tool to trace along the existing line feature, instead of typing the angle ending for each individual segment.

Let's take a look at some of these challenges, and let's see how we would construct a feature that is offset from other features. So my scenario is, the owners of a commercial property have a reserved portion of a land parcel that they plan to develop for parking space. But the building inspector, before granting permission, has required that this land reserved for the parking space be increased. So, rather than resurvey the reserved portion of land, we want to increase the size by defining a new parking space boundary with exactly the same angles as the old, but offset to increase size. The challenge is what method should we use?

Well in this case, the solution would probably be to use the Trace tool, where you can create new sketch segments by tracing over segments of the selected parcel boundary. If you apply an offset, as I mentioned was possible, the segment will follow the angle of the selected parcels, but be created away from the boundary. The offset operation obviously will retain the vertices from the selected feature, but in their newly created position. So, how do you get to the offset option? Well, while using the Trace tool, if you hold your O key down on your keyboard, it will return a menu for you with Trace Options, and within the offset area, you can type in the offset amount, either positive or negative, which will define whether you're going to offset in the digitized direction from-to or to-from, positive or negative, in this case.

You'll also notice, if looking at the Trace Options, you have options to define how corners should be created. Mitered corners will extend line segments until they intersect, beveled corners will add line segments to create a beveled corner, and rounded corners will add curved segments at every corner for you when using the tool. As you're tracing, you can change the selected features that you're using as a basis for tracing, by clicking on the Edit tool, changing the selection, and then returning back to the Trace tool. So, you can, if you wish to, temporarily suspend the action of one of the sketch tools, use another, and then come back to the original one again.

A second challenge: Adding new features using existing features. So, I need to capture features that represent natural resources such as soil types, vegetation, polygons, lakes, and shorelines. Generally, these don't involve any sketch constraints. But, often the creation of, say a lake boundary, needs to use the boundary of vegetation polygon as a basis. So, how do I go about using segments of one feature to define or generate features or segments in another feature? My solution would be to create a new line or polygon feature that could be done with a standard Sketch tool located in our Tool palette. So, we go ahead and we start sketching our feature, but we can move our cursor over the existing, say, vegetation polygon boundary, right-click, and use

a sketch constraint called Replace Sketch. Now, this is particularly useful because what it will do is, it will basically *suck in* (is the term we could think of), these coordinate values from the underlying feature and use them in the new sketch that we're busy generating. So, it's really incorporating, or cloning, the coordinates from the underlying feature that we have used when pointing at Replace Sketch.

Now, a few additional tips while sketching: You can delete a single vertex from the sketch by centering your pointer over a vertex until the pointer changes, then right-click and choose Delete Sketch. You can delete the entire sketch of a feature that you are making by positioning the pointer over any part of the sketch, right-click, and click the Delete Sketch option. You may also just press the Ctrl Delete keys if you wish to do the same thing. To finish a sketch, you either double-click on the last vertex, or press F2 on your keyboard to do so as well. Also remember, you can undo the last vertex that you've created by clicking the Undo button in the ArcMap menu Standard toolbar. You can also click the button again to undo the second to last vertex you created, and so on if you wish to. Basically, there is an ordered trail of edits up until your last save, that you can undo. Also remember you can redo, so you can use the Redo button on the ArcMap Standard toolbar, as well to redo something if you had inadvertently made a mistake.

Our last challenge we're going to look at is constructing centerlines with the Midpoint tool. So, if you have street casings as a scenario, and you're required to construct street centerlines, where the centerline vertices need to be created relative to the street casings, what method would you go ahead and use? Well, when constructing a new centerline, you may begin the construction using the standard Sketch tool, but since the Sketch tool doesn't allow for vertices to be constructed relative to other features, you want to switch from the initial Sketch tool to the Midpoint tool. The Midpoint tool will let you define the location of the next vertices by clicking two points. The new vertex generated by the tool is placed at the midpoint of those points you've just clicked. So, important when using this of course, is to create a snap agent and set an appropriate snap tolerance. Always remember that, while using the Midpoint tool, you can hold down z or x or c keys to zoom in, and pan, and zoom out, if you want to as well. It's also interesting, you can hold down the v key while you're busy using Midpoint, and you can see the vertexes that you may be snapping to.

So, in conclusion, as you've heard, ArcGIS again has a wide variety of tools and commands to edit and manipulate your data. The content of this presentation just covers a few editing tips and tricks related to sketching new features that you can integrate into your daily GIS tasks.

I'd highly recommend looking at two new instructor-led classes that cover data editing and data quality control. These classes are entitled the *Data Production and Editing Techniques* class and the *QA/QC for GIS Data* classes. These are both instructor-led classes. There are also several virtual campus classes you may want to consider looking at. One entitled *Creating and Editing Geodatabase Features in ArcGIS 9* and another entitled *Creating and Editing Geodatabase Topology in ArcGIS 9*. For further resources, please check out our instructor-led training courses at www.esri.com/training.

Thank you for tuning into this session of our ESRI Instructional Series podcasts. Stay tuned for future broadcasts.