



# TRAINING wheels

Tutorials, Coaching and Empowerment from

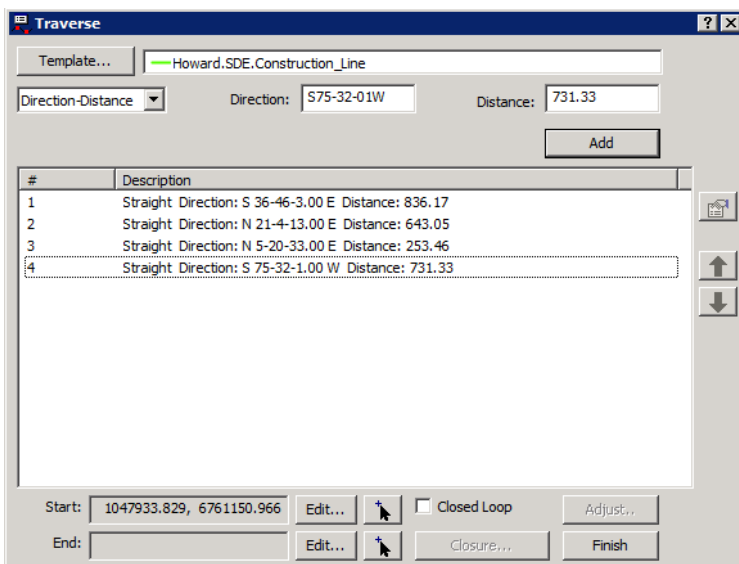


Intermediate ArcGIS Desktop

## Overview of ArcGIS Editing Procedures

### Traverse window

Traverse lets you create edit sketch geometry from a variety of traverse measurements. Once you've started a traverse, you can add segments or curves to the edit sketch using Direction–Distance, Angle–Distance, Curve, and Tangent Curve methods. The Traverse command adds each segment as a line in the Traverse course table and to the edit sketch. You can select each course segment by clicking it in the table—the corresponding segment will flash on the map.



### Populating COGO attributes

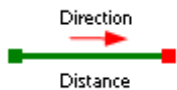
You can create features using the Traverse window to populate COGO attributes in a feature class and save each course in the traverse as a COGO two-point line feature.

The features must be either straight lines or circular arcs. They typically have two vertices, but more are allowed as long as each feature is consistently straight or consistently curved. In addition, the line feature class must have the following COGO attributes as text fields: Direction, Distance, Delta, Radius, Tangent, ArcLength, and Side.

By default, features are created as two-point lines when the feature class contains COGO attributes. Traverse creates individual line features for each course and automatically assigns the appropriate COGO attribute values.

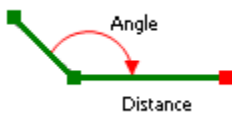
### Direction-Distance course

You need to have an edit sketch with at least one vertex. You can also use the Interactive Start Point tool to set a start point for the course. You enter a direction and a distance. A new straight segment is added to the edit sketch. The direction is based on the current direction type and direction units for the editing environment. The distance can be in any of the supported distance units.



## Angle-Distance course

You must have at least one segment in the edit sketch, either from a previous course or already existing in the edit sketch. You enter an angle and a distance. A new straight segment is added to the edit sketch. The angle is based on the current direction units. The distance can be in any of the supported distance units.



The angle—also called the backsight angle—is a clockwise angle between the last segment and the intended line. To add a line tangent to the last segment, you need to use an angle of 180 degrees.

## Curve course

You need to have an edit sketch with at least one vertex. You can also use the Interactive Start Point tool to set a start point for the course. You enter two curve parameters, a curve direction, and whether the curve is to the left or right. A new circular arc segment is added to the edit sketch. A curve can be created by entering two of the following parameters:

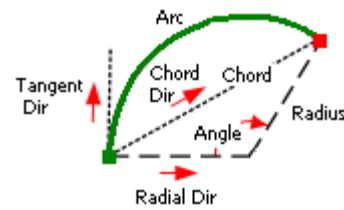
- Chord—Also referred to as the chord distance, the straight line distance between the endpoints of the curve.
- Angle—The angle formed between the endpoints of the curve and the center point.
- Arc—Length along the curve. The arc length needs to be greater than the chord distance.
- Radius—Length from the center point to the curve.

You cannot add the tangent distance (the distance between the endpoints of the curve and their intersection point) as a parameter for the curve. If you have a tangent distance, use the [Curve Calculator dialog box](#) to determine one of the other curve parameters.

The curve direction can be one of three types:

- Chord direction—Direction from the start point of the curve to the endpoint of the curve.

- Tangent direction—Direction to the tangent point of the curve. This creates a curve where the center point of the curve is at 90 degrees from the tangent direction, on the same side as the turn direction.
- Radial direction—Direction toward the center point of the



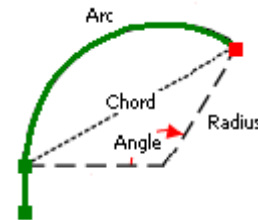
curve.

The curve direction is based on the current direction type and The angle is based on the current direction units. The distances the supported distance units.

direction units. can be in any of

### Tangent curve course

You must have at least one segment in the edit sketch, either from a already existing in the edit sketch. You enter two curve parameters curve is to the left or right. A new circular arc segment is added to the curve is created from the last point in the edit sketch with the center 90 degrees from the edit sketch, on the same side as the turn



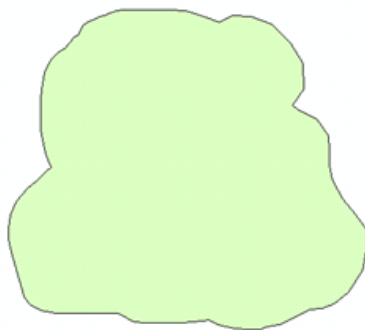
previous course or and whether the edit sketch. The point of the curve direction.

## Topology Editing

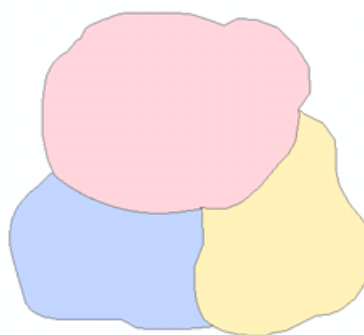
### Editing shared edges

When editing topological features, you often have a choice of several ways of doing a particular task. For example, suppose you manage a forest and there are two polygon feature classes, Forest and Stands, in your forest dataset. The two images below show the forest and stand polygons.

Forest Polygon



Stands Polygon



The Forest and Stands polygons are related by three topology rules: Stands must not overlap, Forest must cover Stands, and Stands must cover Forest. These rules prevent Stands polygons from overlapping, since no area can be in two stands at once. They also prevent stands from extending outside the official boundary of the whole forest or the forest boundary from covering an area not in a stand.

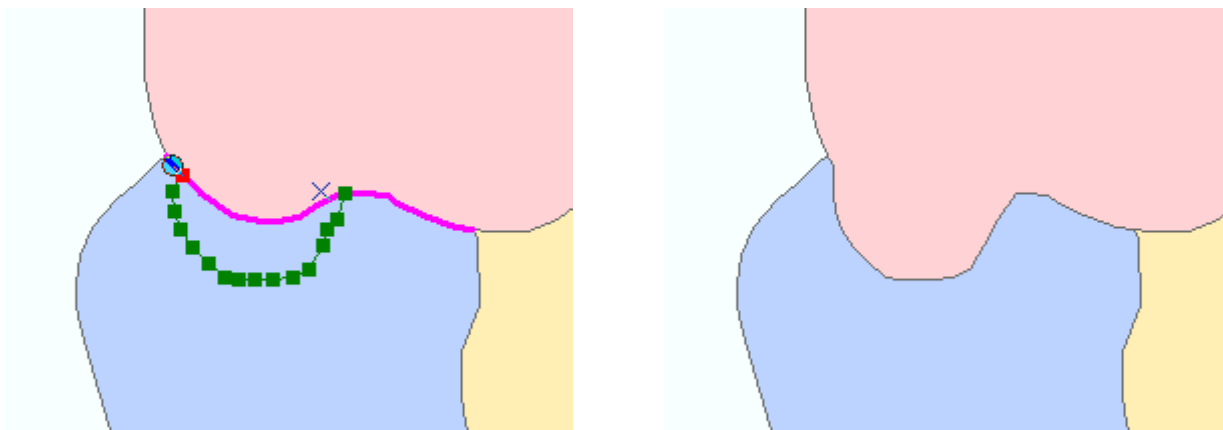
Suppose you are editing the Stands feature class and need to change the boundary between two of the stands. You could start editing; use the Topology Edit tool to select the shared edge; double-click the edge to edit its vertices; then add, remove, and move vertices along that edge to shape it to fit the new boundary.

You could also use the Topology Edit tool to modify edges shared by the Stands and Forest polygons. For example, suppose the actual boundary of the forest has been determined to be 150 meters east and 20 meters north of the corner where two stand features meet at the edge of the forest. You could use the Topology Edit tool to select the topology node at this intersection of features and move it to the correct location, either manually or by right-clicking the node, clicking Move, and entering the delta x,y value. The stand and forest polygons will both have their boundaries updated.

## Modifying and reshaping shared edges

In addition to editing topology elements with the Topology Edit tool, you can also modify and reshape a selected topology edge using an edit sketch. The Modify Edge and Reshape Edge tools allow all features that share the edge to be updated at the same time.



Modify Edge takes the selected edge and makes an edit sketch from it. You can use the standard editing tools to insert, delete, or move the vertices that make up the edge, although you cannot move the endpoints when modifying edges. With the Reshape Edge tool, you can use the basic editing tools to create a new line to replace an existing edge line.




## Topology Errors

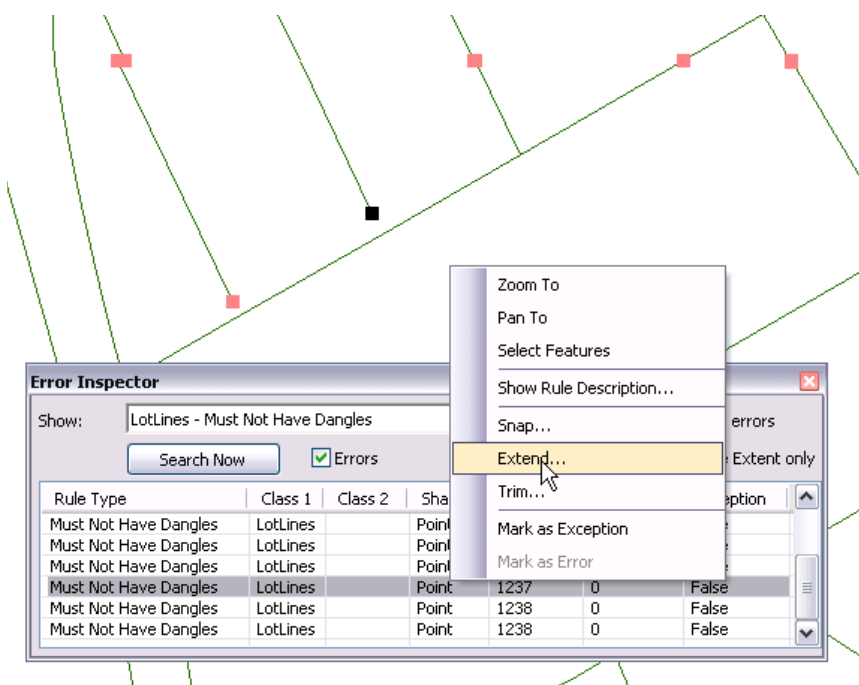
Once you have made edits to a feature that participates in a topology, the next step is to validate the topology. Validating the topology means checking the features to identify any violations of the rules that have been defined for the topology.

ArcMap allows you to validate a portion of a topology during an edit session. Use ArcCatalog or the Catalog window if you need to validate an entire topology, which may take awhile for complex or large datasets or where there are many topology rules. You may want to [compact your file or personal geodatabase](#) after validating to reduce its size and improve performance.

- Click **Validate Topology In Specified Area**  and drag a box around the area you want to validate. The features that fall within the bounding box will be validated.
- Click **Validate Topology In Current Extent** . Areas that are not currently visible on the map are not validated.

Topology errors can be fixed quickly using the Fix Topology Error tool . This tool allows you to select a topology error and choose from a number of fixes that have been predefined for that error type. You can also use the tool to get more information about the rule that has been violated or mark the error as an exception.

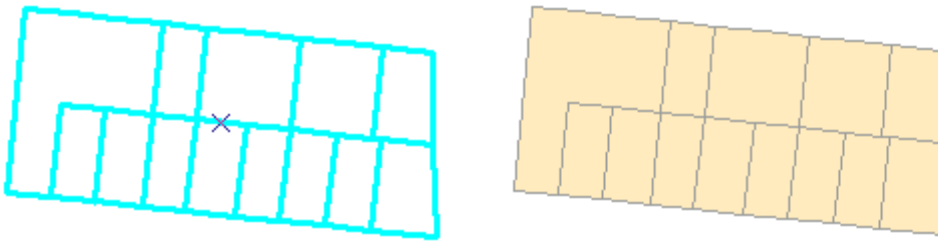
There are several ways to correct topology errors once you have discovered them. You can select the error on the map with the Fix Topology Error tool or select the error from within the Error Inspector, right-click, and apply one of the fixes listed in the shortcut menu for that error type.



## Other Useful Editing Tools

### Construct Polygons

You can use topology tools to make new features from existing ones. Construct Polygons on the Topology toolbar can create new polygons from selected lines or other polygons. For example, you might need to create a new parcel feature from some parcel boundary lines.

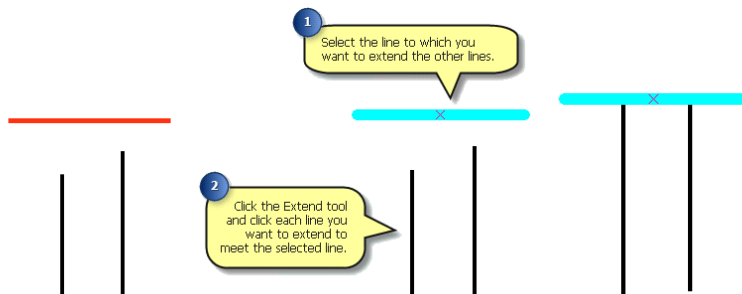


### Proportion Tool

The Proportion command on the COGO toolbar splits a selected line feature into a number of segments, based on specified distance values. If there is a difference between the feature length and the entered values, this difference is proportioned between all the new segments. Proportion is useful when you are working with exact measurements, such as COGO or survey data.

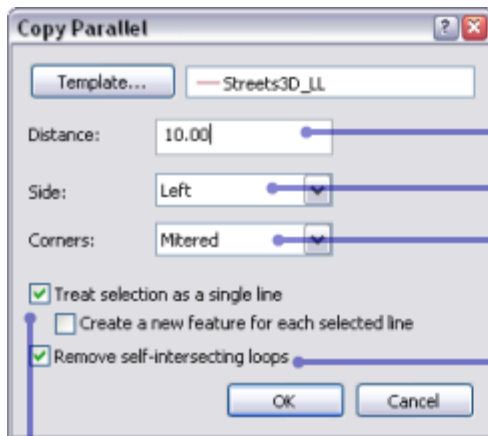
### Extend Line

The Extend tool on the Advanced Editing toolbar lets you click a line feature and extend it to another selected line feature. To use the Extend tool, select the feature that you want to extend lines to, then start clicking the lines you want to extend.



## Copy Parallel

Copy Parallel makes a copy of selected lines at a distance you specify. You can choose to copy the new lines to the left, right, or both sides of the selected lines. You can use the Copy Parallel command, for example, to create a street centerline or a gas line that runs parallel to a road. If you use Copy Parallel to copy lines on both sides of the selected line, you can create road edge of pavement lines from a street centerline. When using Copy Parallel, you need to choose a feature template, which specifies the layer that will store the new feature and the default attribute values that will be applied to the feature.



A distance value is required to successfully Copy Parallel.

Specify Left, Right, or Both sides.

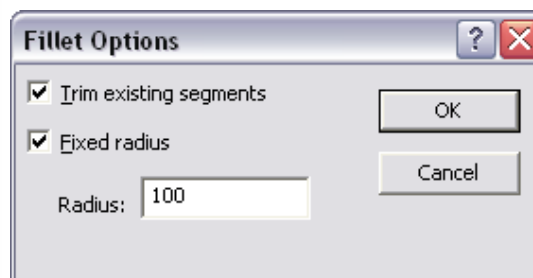
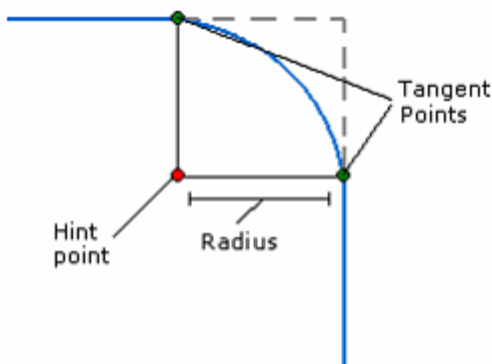
Specify the shape of the corners of the offset lines.

Vertices are removed to prevent this occurrence if the offset distance is large enough.

Choose how the offset lines are created. If unchecked, lines are offset on the side specified. If checked, the feature is offset as a whole, to the side specified. Optionally, create a new feature for each selected line in the offset.

## Fillet

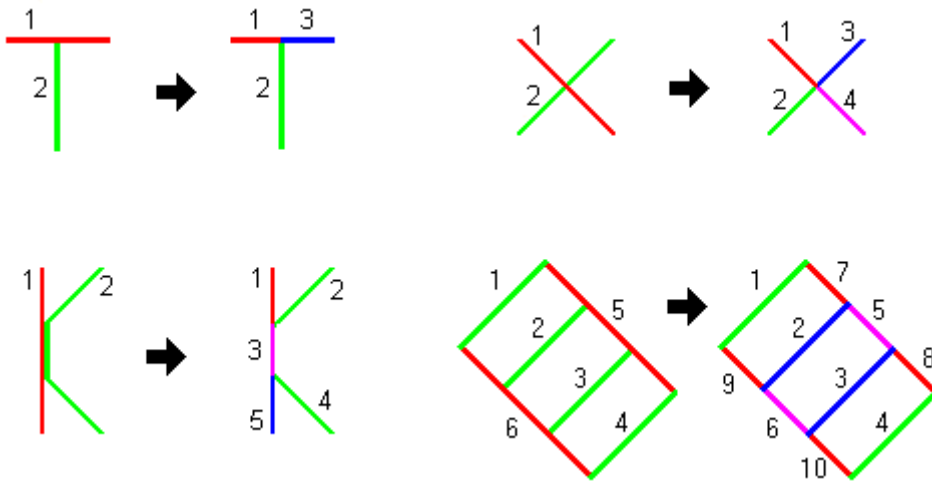
Fillets are segments of a circular arc that are often used to connect two intersecting lines. Fillets are used to create smoothly curving connections between lines, such as edge of pavement lines at street intersections or rounded corners on parcel features.





## Planarize Lines

You can split selected lines where they intersect using Planarize Lines on the Topology toolbar. You do not need to have a map topology or geodatabase topology to use Planarize.



## Creating a cul-de-sac

There are several ways to create a cul-de-sac line, which is the end of a dead-end street or alley that widens to provide a circular turnaround for vehicles.

If you have an ArcGIS for Desktop Standard or ArcGIS for Desktop Advanced license and are working with precise measurements, such as with survey plans or data with COGO attributes, use the Cul-de-sac command on the COGO toolbar to create the feature.

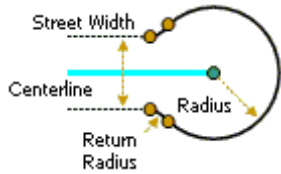
Otherwise, you can use the regular editing tools, switching between them, to construct a cul-de-sac shape. For example, you can draw the straight segment, switch to a tool that allows you to create an arc, then switch back to create the remaining straight segment.

### ***Creating a cul-de-sac using COGO tools (ArcGIS for Desktop Standard and ArcGIS for Desktop Advanced)***

The Cul-de-sac command on the COGO toolbar creates a symmetrical or asymmetrical cul-de-sac from a street centerline. A cul-de-sac is the end of a dead-end street or alley that widens to provide a circular turnaround for vehicles.



A cul-de-sac consists of two or three circular line features, depending on your input values. The main circular feature is centered on the end of the selected centerline with a radius that you specify. Two other minor circular features (known as return or reverse curves) are created at the intersection between the main circular feature and lines parallel to the centerline. These fillet curves have a (return) radius that you specify.



You can create a cul-de-sac from either a straight or curved centerline. Sometimes a cul-de-sac is designed with the main circular feature being offset 90° from the end of the centerline. This is an asymmetrical cul-de-sac.

