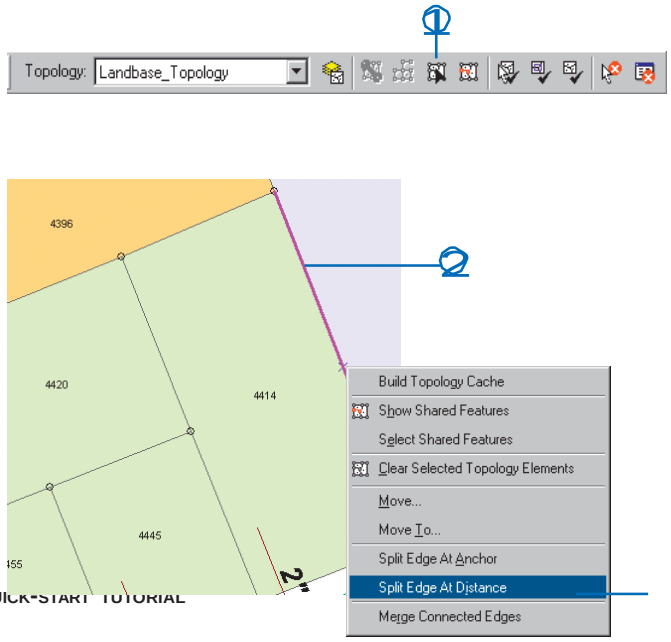
ArcGis· 9

Geodatabase QuickStart Tutorial – 2nd part

Editing the parcels

Now you'll use the Topology Edit tool to split the east and west boundaries to create topology nodes. You'll also check which parcels share the north boundary, then you'll be ready to move it.

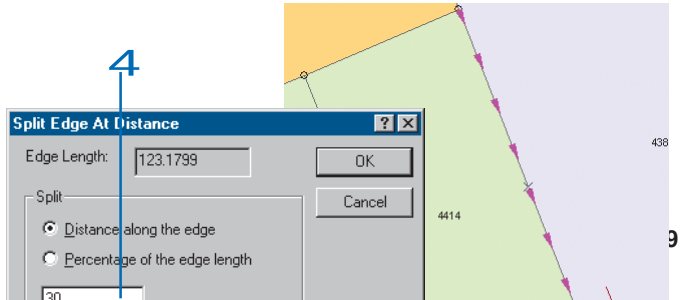
1. Click the Topology Edit tool.



The edge now has arrows to show what direction it points. When you split an edge, you need to know which end is the beginning of the edge. The arrows point from the beginning to the end of the edge.

The topological relationships between the features in the current map extent are discovered by the Topology Edit tool when you start editing with the tool and when you rebuild the topology cache. Since these relationships are discovered on the fly and are not stored, the direction of an edge may vary between edit sessions, depending on the current map extent.

4. Look at the arrows on the edge. If they point south, type "30" in the Split text box and press Enter. If they point north, type "30" in the Split text box, click From end point of edge, and press Enter.



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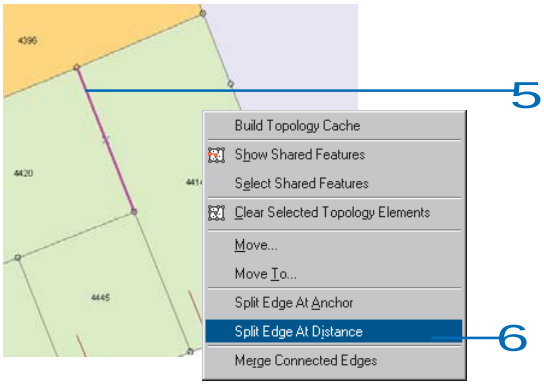
2. Click the eastern boundary of parcel 4414.

   The boundary edge is selected and changes color.

3. Right-click the selected edge and click Split Edge at Distance.

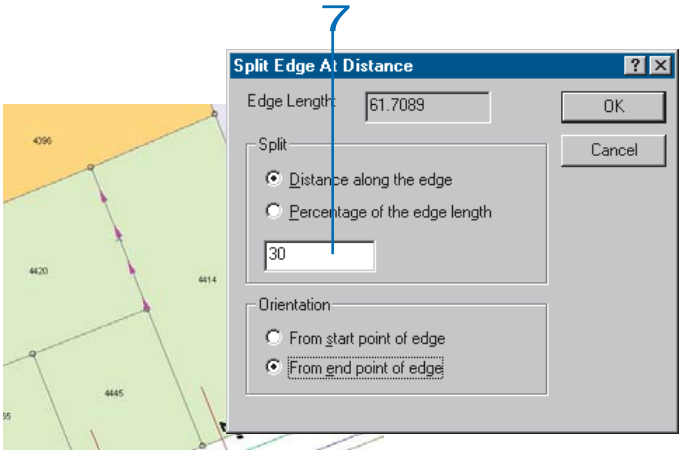
A new topology node is inserted at 30 feet from the north end of the edge.

5. Click the west edge of parcel 4414.

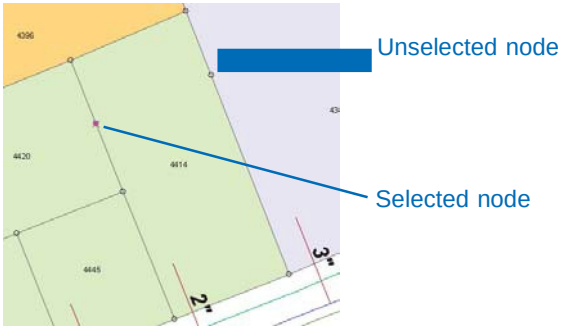


6. Right-click the west edge and click Split Edge At Distance.

7. Look at the arrows on the edge. If they point south, type "30" in the Split text box and press Enter. If they point north, type "30" in the Split text box, click From end point of edge, and press Enter.



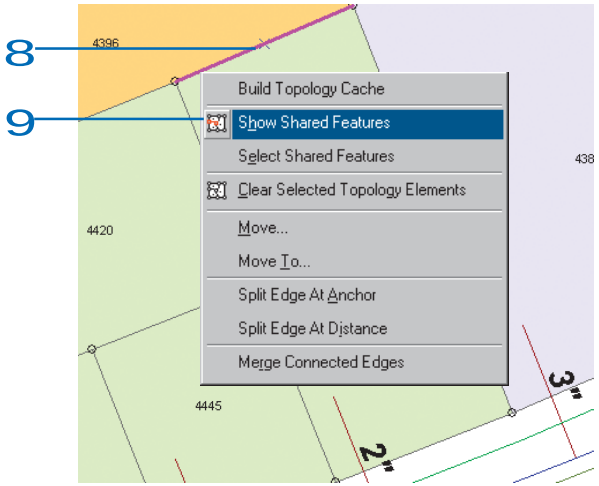
A second new topology node is inserted at 30 feet from the north end of the edge.



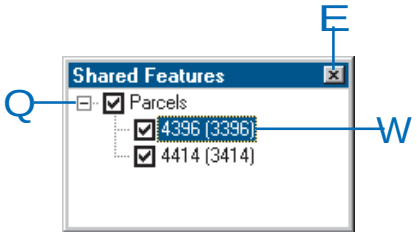
The new topology nodes you added will allow you to snap the northern, shared edge of the parcel to its new location.

Now that both edges have had topology nodes added, you will be able to snap the boundary to the topology nodes. Before you move the edge, you'll check to see which features share it.

8. Click the boundary between parcel 4396 and parcel 4414.



9. Right-click and click Show Shared Features.
10. Click the plus sign beside Parcels.



The Shared Features dialog box shows the features that share a selected topology element. This edge is shared by features 4414 and 4396 in the Parcels feature class.

11. Click 4396.

The parcel flashes on the map.

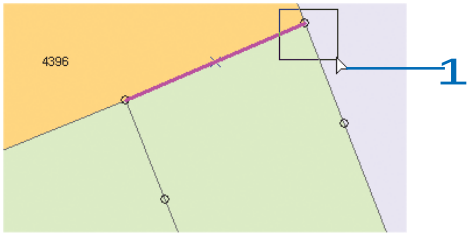
12. Close the Shared Features dialog box.

Next you will move the shared edge.

Moving the shared edge and nodes

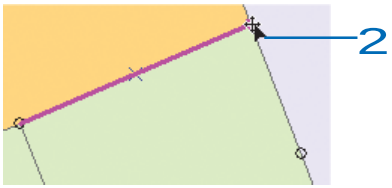
The endpoints of this edge are topology nodes that are shared by these two parcels but are also shared by some other parcels. To move the endpoints of this edge, you will need to select the nodes, along with the edge, and split–move them. A split–move breaks the topological association between a selected node and unselected edges.

1. Hold the N key and drag a small box around the node at the eastern end of the edge.

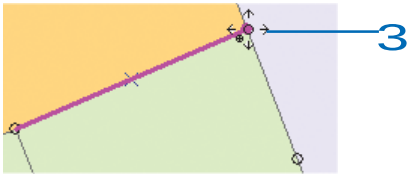


The topology node is added to the selection. Holding the N key allows you to select a topology node without selecting any more nearby edges.

2. Move the pointer over the selected node.

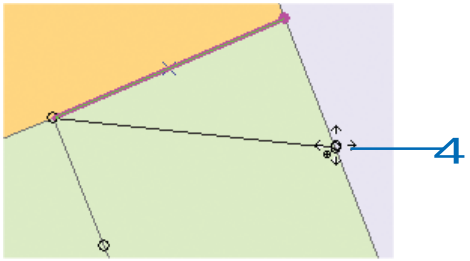


3. Press the S key with the pointer over the node.

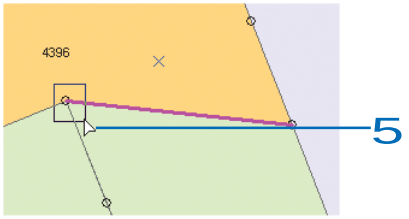


The pointer changes to indicate that you can split–move this node. A split–move breaks the topological association between the node and unselected edges and allows you to move an endpoint of an edge that is shared by other features.

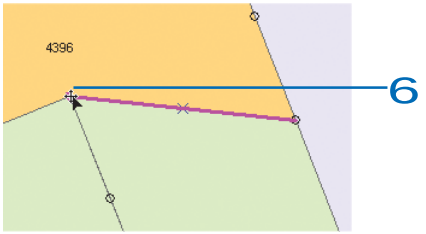
4. While holding the S key, click the node and drag it southeast until it snaps to the new topology node you created, then drop the node.



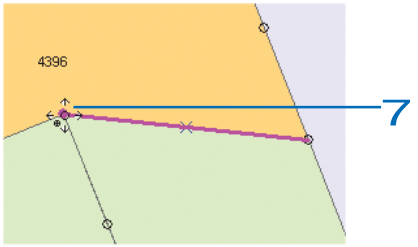
5. Hold the N key and drag a small box around the node at the western end of the edge.



6. Move the pointer over the selected node.

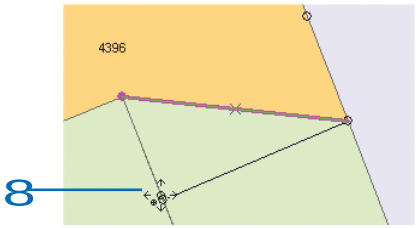


7. Press the S key with the pointer over the node.



Now you can split–move this node to the new location.

8. While holding the S key, click the node and drag it southeast until it snaps to the new topology node you created, then drop the node.



The shared parcel edge is moved to the new location. Because you split–moved the nodes at the endpoint of the edge, the corner of the parcel that did not share the edge (4420) was not modified.

9. Click the Validate Topology In Current Extent button.

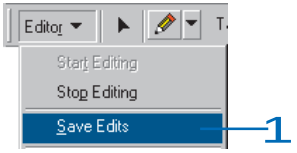
The edits you've made to the parcels are checked against the topology rules. Because no rules were violated by the edits, no errors are found.

You have edited the attributes and geometry of some geodatabase features that participate in a topology. Next you'll save your edits.

Saving your edits

Now that you've completed editing the parcels, you should save your edits.

1. Click the Editor menu and click Save Edits.

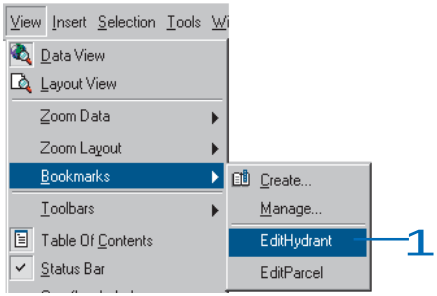


The edits are saved to the geodatabase. In the next section, you'll edit some geometric network features.

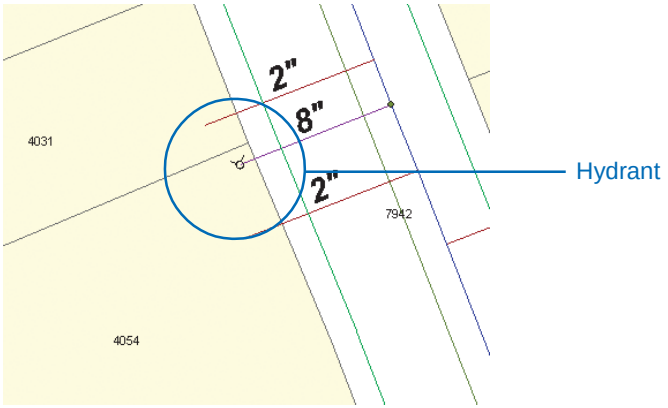
Editing geometric network features

Imagine that you work for the city water department. You've been asked to update the geodatabase to show the new position of a fire hydrant that has been moved and to add another hydrant and its associated pipes and fittings. The hydrants are connected to the city water system, which is modelled using a geometric network in the geodatabase. A geometric network is another sort of topological relationship that the geodatabase can maintain among feature classes. Just as you can edit edges and nodes shared by multiple features in a topology, a geometric network allows you to edit network edge and junction features and maintain network connectivity between them.

1. Click View, point to Bookmarks, and click EditHydrant.



You will move the hydrant in parcel 4054 in the center of the data frame.

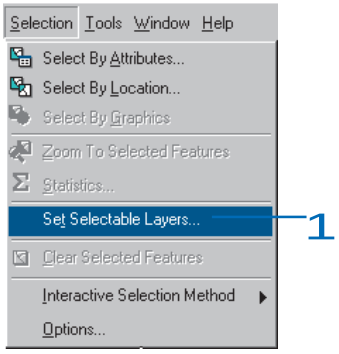


Moving a fire hydrant feature

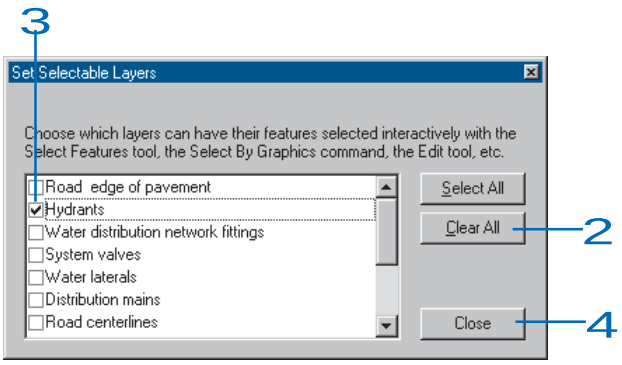
This fire hydrant feature is a part of the geometric network. It is connected to the rest of the network by a hydrant lateral feature, a subtype of the water lateral feature class. You will see that network connectivity is maintained when the hydrant feature is moved.

First, you will change the selectable layers from all layers to Hydrants. This will make it easier to move the hydrant.

1. Click Selection and click Set Selectable Layers.

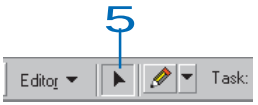


2. Click Clear All. You will change the selectable layers from all layers to only Hydrants.

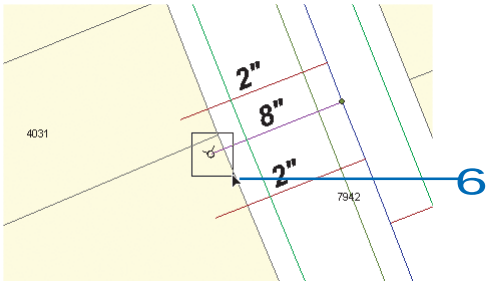


3. Check the Hydrants layer.
4. Click Close.

5. Click the Edit tool.

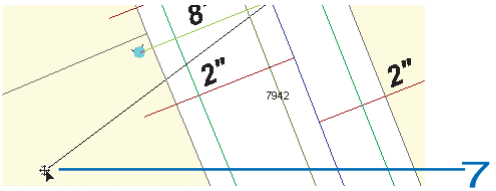


6. Drag a box around the fire hydrant.

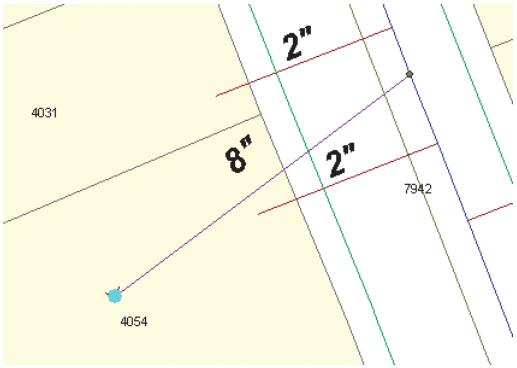


The fire hydrant should now be selected, but no other features are selected.

7. Click and drag the selected hydrant to the southwest, toward the middle of the parcel, then drop the hydrant into its new position.



When the hydrant was moved, the lateral stretched to maintain its connectivity with both the hydrant and the valve. This is an example of how ArcGIS maintains network topology during editing.

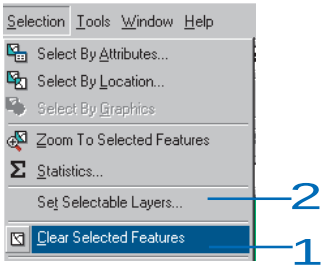


Also notice that the annotation for the lateral moved to fit the new location of the lateral. The annotation feature is linked to the lateral feature by a geodatabase relationship class.

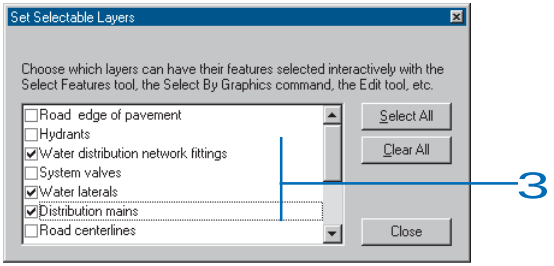
Creating a new hydrant lateral

Now you will add a new hydrant lateral to a distribution main in the water network. This task will involve a combination of network editing, connectivity rules, attribute rules, and feature-linked annotation.

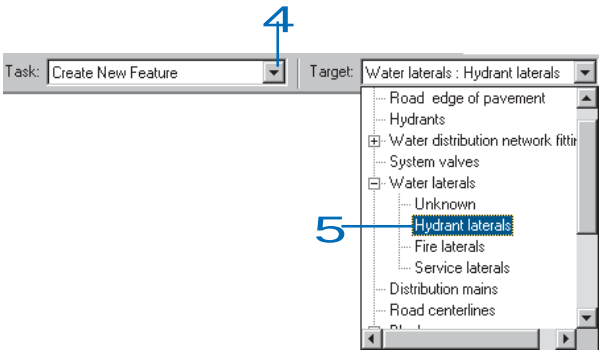
1. Click Selection and click Clear Selected Features to deselect the hydrant you just moved.



2. Click Selection and click Set Selectable Layers.
3. Uncheck Hydrants; check Distribution mains, Water laterals, and Water distribution network fittings; then close the dialog box.



4. Click the Task dropdown arrow and click Create New Feature.

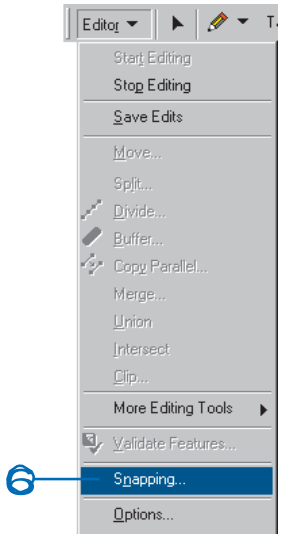


5. Click the Target dropdown arrow. You will see a list of the layers in this database. The Water laterals layer has a plus sign next to it. The plus sign indicates that this layer has subtypes. Click the plus sign and click Hydrant laterals.

   The new feature will be created in the Water laterals feature class and will be assigned the Hydrant Lateral subtype.

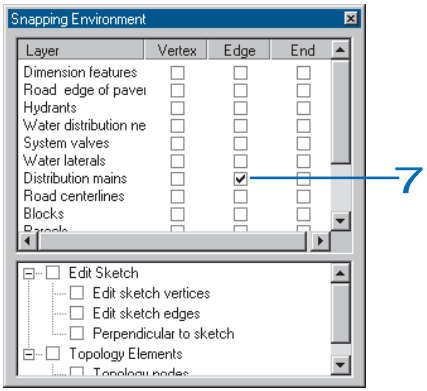
   To establish network connectivity when you add your new hydrant lateral, you must snap it precisely to the distribution main.

6. Click Editor and click Snapping.

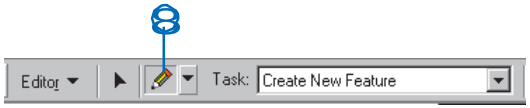


   The Snapping Environment window appears. When you add the hydrant lateral, you want it to connect to a distribution main.

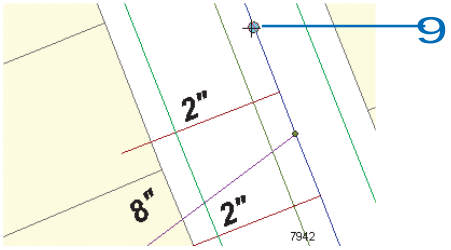
7. Check the Edge check box next to Distribution mains and uncheck any other boxes that may still be checked. Close the Snapping Environment window.

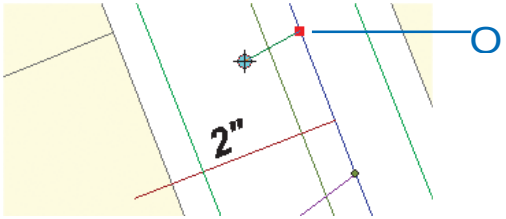


8. Click the Sketch tool.



9. Move the pointer over one of the distribution mains. The pointer snaps to the edge of the distribution main.



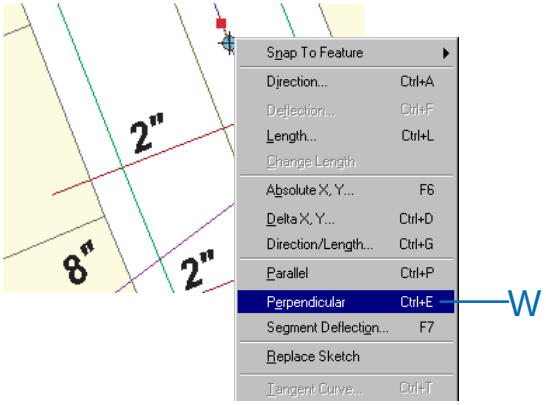


10. With the pointer snapped to the main, click once to start the new hydrant lateral.

    You have just started an *edit sketch*. You create an edit sketch of the geometry when you use the editor tools to create a new feature. After you finish the sketch, the new geometry becomes a feature. You can choose to save or discard your edits when you stop editing.

    You will constrain the hydrant lateral to be perpendicular to the distribution main.

11. Move the pointer over the distribution main just south of where you attached the lateral, right-click, and click Perpendicular.

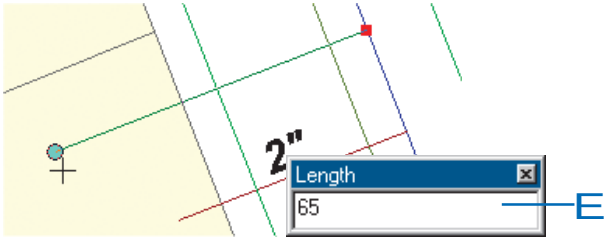


As you move the pointer, you can see that your sketch of the hydrant lateral is constrained to be perpendicular to the distribution main.

Many of the editing tools and commands have keyboard shortcuts associated with them to make editing quicker. You can see the keyboard shortcuts next to the command names in the Edit context menu and on some of the tool windows.

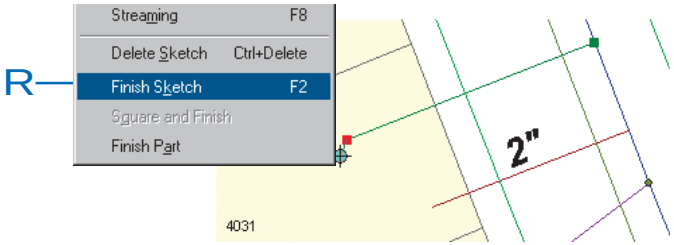
You will now make the lateral 65 feet long.

12. Drag the sketch line to the southwest, then press Ctrl+L. Type “65” and press Enter.

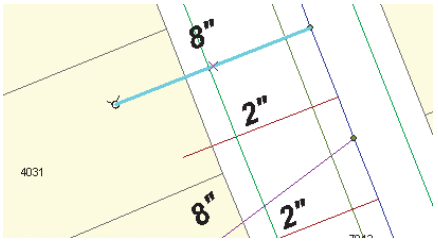


A new vertex is added to the lateral, perpendicular to the distribution main and 65 feet away.

13. Right-click and click Finish Sketch to finish the edit sketch and create the new hydrant lateral.



When the new hydrant lateral is created, a number of things happen.



First, a junction between the distribution main and the hydrant lateral is created, and they are topologically connected in the network. The network was created with a *connectivity rule* between these feature types that specifies a default junction, so the new junction is the default junction—in this case, a tap feature.

Next, a junction feature is also added to the other end of the new hydrant lateral. Another connectivity rule exists between water laterals and hydrants. For this rule hydrants were the default junction, so the new junction feature at the southwest end of the lateral is a hydrant.

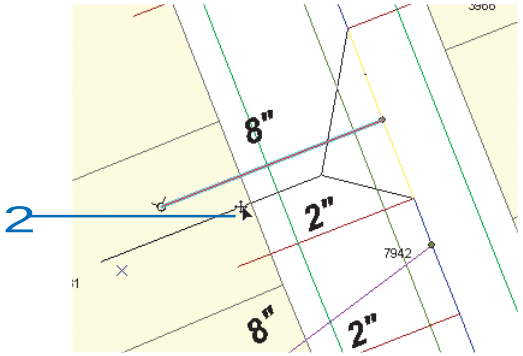
In addition, when the new hydrant lateral was added, its annotation was also added. A relationship class in the geodatabase links laterals to the LateralDiam annotation feature class. The annotation feature class was created with an advanced labeling expression that labels features longer than 200 feet with their diameter and material type. Since this lateral is less than 200 feet in length and the default value for diameter is 8 inches, the annotation text is 8".

Modifying the hydrant lateral

You'll now modify the hydrant lateral to explore some more geometric network and geodatabase behaviors.

1. Click the Edit tool.

2. Click the lateral and drag it away from the distribution main, then release the mouse button to drop the lateral.



The distribution main stretches to stay connected with the lateral. The distribution main feature is a complex edge feature—it is split in the *logical network* by the addition of the lateral, but it remains a single feature in the geometric network. The annotation also moves with the feature.

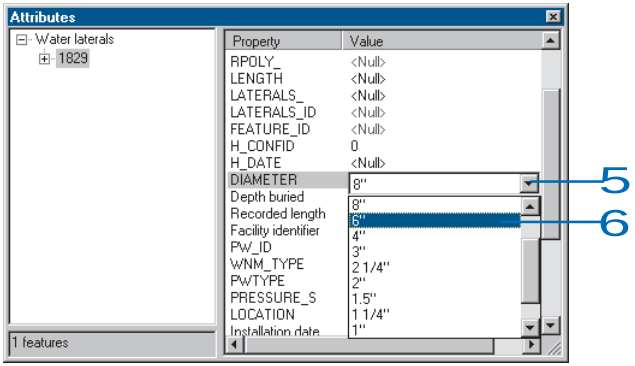
3. Click the Undo button to undo the move.

Now you will change the value for the diameter of the lateral.

4. Click the Attributes button.

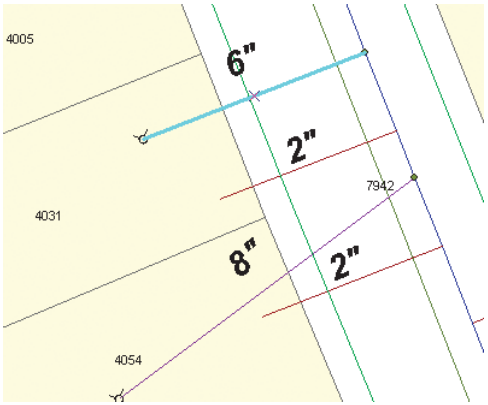
The new hydrant lateral's attributes are displayed. Some of the fields already have default values that were defined in the geodatabase for this subtype of Water laterals, while other fields have null values.

5. Click the DIAMETER value.
6. Click the dropdown arrow and click 6".



This geodatabase has a coded value domain of valid pipe diameters. The diameter field for hydrant laterals references this diameter value domain. Several different feature classes or subtypes can reference the same coded value domain.

Since the annotation for laterals is derived in part from the value of the DIAMETER field, when you clicked the new value for the diameter, the annotation was automatically updated to reflect the change.

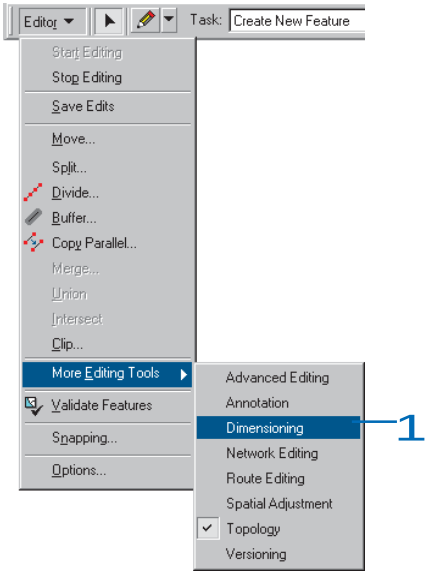


7. Close the Attributes dialog box.

Creating a new dimension feature

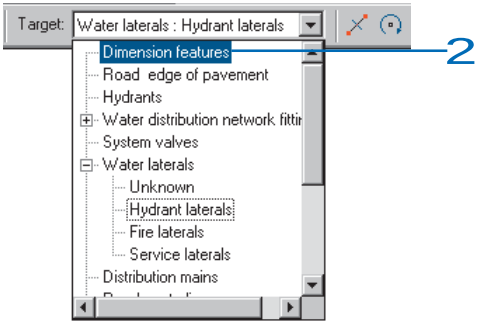
The water department wants the geodatabase to show how far the hydrant you added is from the one you moved. You will create a new dimension feature to display this distance. You will create this new dimension feature using the Dimensions feature class in your geodatabase.

1. Click Editor, point to More Editing Tools, and click Dimensioning.



The Dimensioning toolbar lets you choose dimensioning construction methods and styles for your new dimension features.

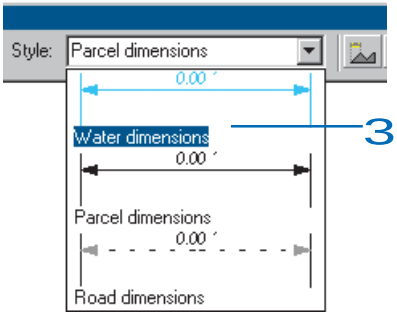
2. Click the Target layer dropdown arrow on the Editor toolbar and click Dimension features.



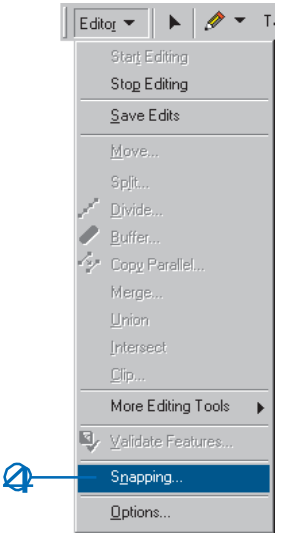
The Dimensioning toolbar becomes active.

You will use the Aligned construction method to construct an aligned dimension feature. This is the default construction method, though there are several others available. Since you are dimensioning features in your water network, you will use the Water dimensions style.

3. Click the Style dropdown arrow; the dimension styles in the Dimensions feature class are listed. Click the Water dimensions style.

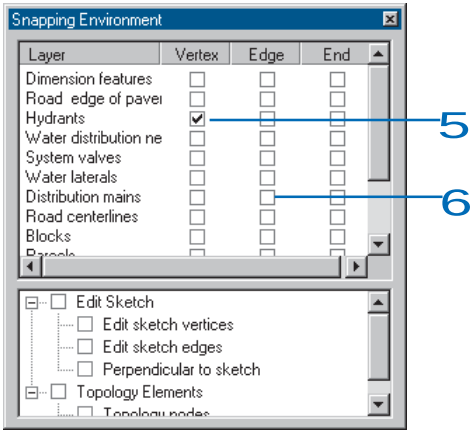


4. Click the Editor menu and click Snapping.



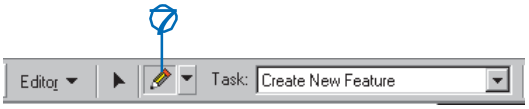
The Snapping Environment window appears. Since you are creating a dimension feature to display the length between two hydrants, you need to set your snapping to the vertices of hydrants.

5. Check Vertex next to Hydrants.

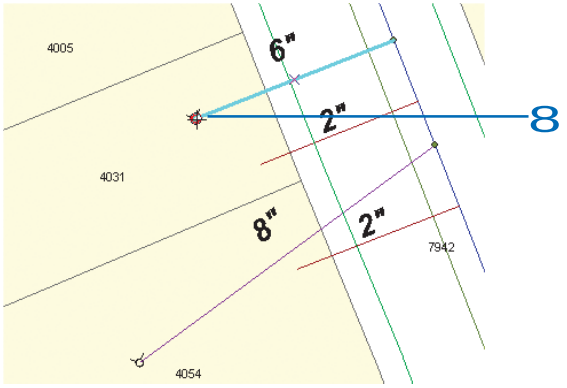


6. Uncheck Edge next to Distribution mains, then close the Snapping Environment window.

7. Click the Sketch tool.

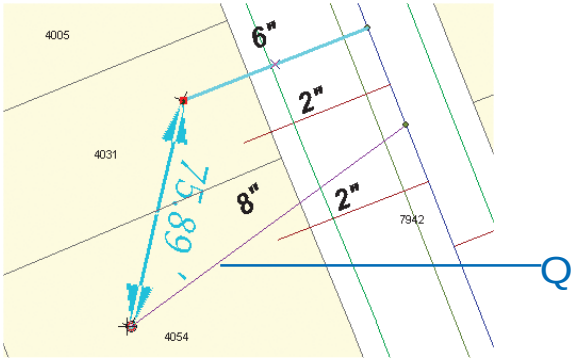


8. Move the pointer over one of the hydrants. The pointer snaps to the hydrant.



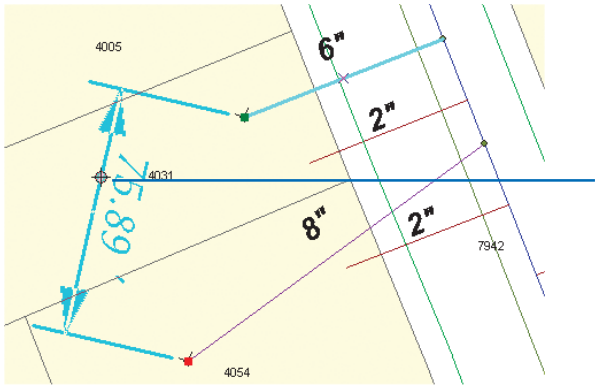
9. With the pointer snapped to the hydrant, click once to start an edit sketch.

10. Move the pointer over the other hydrant.



As you move the pointer, the edit sketch draws a preview of the first part of the dimension feature and updates its length.

11. With the pointer snapped to the second hydrant, click once.
12. Move the pointer away from the hydrant.



As you move the pointer, the dimension feature's height changes.

13. When you have dragged the dimension feature to the height you want, click once.

Since you are using the Aligned construction method, the sketch is automatically finished after the three points are input and your dimension feature is finished. You can save your edits and your map document if you want.

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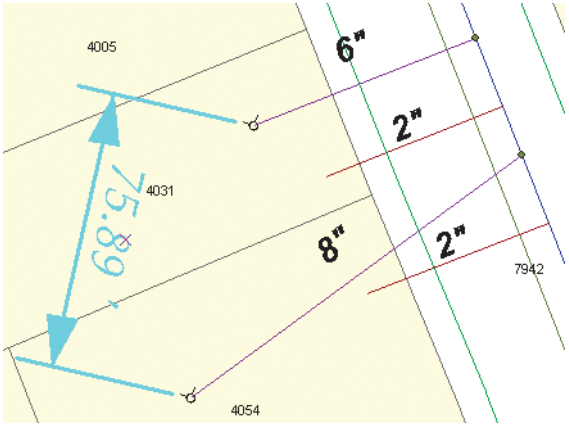

In this quick-start tutorial, you have used ArcMap to take advantage of advanced geodatabase capabilities, including topology, geometric networks, relationship classes, feature subtypes, attribute domains, default values, feature-linked annotation, and dimension features.

The next section of this Tutorial contains exercises to help you learn how to use ArcMap to edit features. The last section of the book contains exercises to help you learn how to construct a geodatabase with the advanced capabilities you've worked with in this quick-start tutorial.