ArcGIS® 9

Geocoding in ArcGIS Tutorial

DATA CREDITS

Yellowstone Fire Data: National Park Service

Quick-Start Tutorial Data: Atlanta, Georgia

WRITER
Agatha Wong, Scott Crosier

Geocoding in ArcGIS Tutorial

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This tutorial introduces you to geocoding with ArcGIS® Desktop. You will learn the basic techniques for creating address locators and geocoding with ArcGIS. Exercises 2 and 3 demonstrate some advanced features—using alternate names and place name aliases and creating a dynamic feature class that is related to the address table.

Some procedures in this tutorial require that you be familiar with using ArcCatalog™ and ArcMap™. For example, you should know how to copy data to a new location and add data to a map. You should also have a basic understanding of what a geodatabase is and the objects it can contain. If you're new to GIS or feel you need to refresh your knowledge, please take some time to read *Getting Started with ArcGIS*. You might also find that working through the *ArcCatalog Tutorial* and *ArcMap Tutorial* will help you understand many of these basic concepts.

Exercise 1: Locating and rematching addresses

In the first part of this tutorial you'll learn how to create a new address locator, how to locate an address on a map, how to get an address of a location, and how to create point features representing street addresses stored in a table such as customer locations.

Before you begin, it is recommended that you make a copy of the data used in this tutorial so the original tutorial data will remain unmodified. Copy the Atlanta.gdb folder to a new location on your computer such as the C:\ disk; you'll find it in the ArcTutor\Geocoding folder on the local disk where the tutorial data was installed. You'll need 2.1 MB of free disk space to store a copy of the Atlanta.gdb folder.

The Atlanta.gdb folder contains a file geodatabase named Atlanta. Make sure the geodatabase is not read-only.
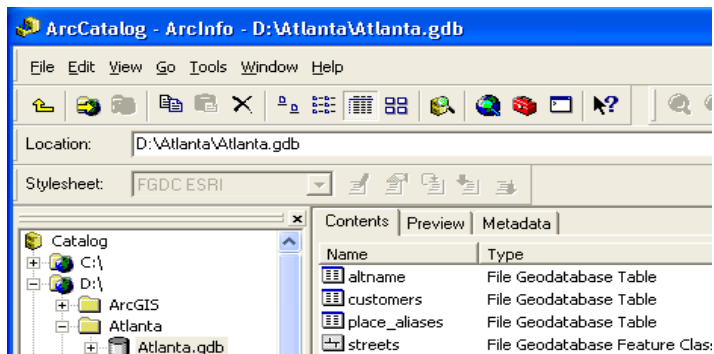
Creating a new address locator

An address locator lets you convert textual descriptions of locations into geographic features. Address Locators are stored and managed in a workspace you choose. The workspace can be a file folder, file geodatabase, personal geodatabase or SDE geodatabase. The first thing you'll do is create an address locator based on your copy of the Atlanta file geodatabase.

1. Start ArcCatalog.

2. Navigate to the Atlanta file geodatabase.

3. Click the Atlanta geodatabase in the Catalog tree.

4. Right-click within the empty space of the Contents list, point to New, then click Address Locator.
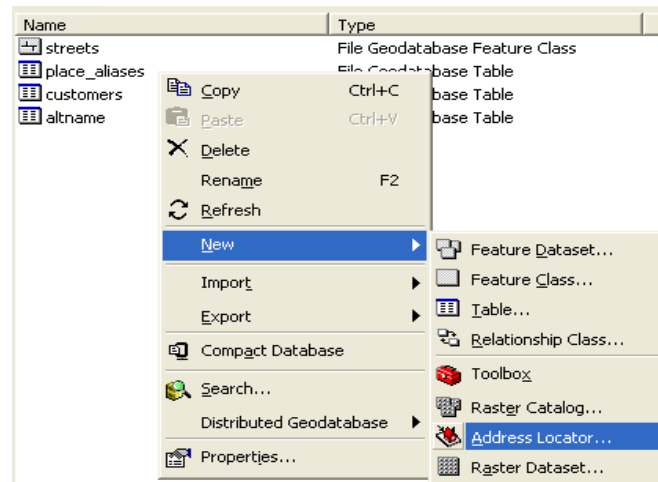
The Create New Address Locator dialog box appears.
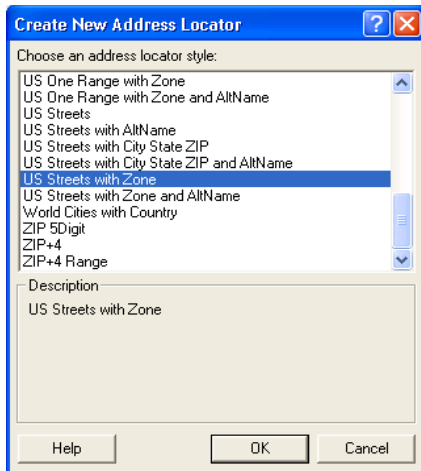
5. Click the US Streets with Zone address locator style, then click OK.

   The New US Streets with Zone Address Locator dialog box appears.

6. In the Name text box, type "Atlanta", replacing the default name.
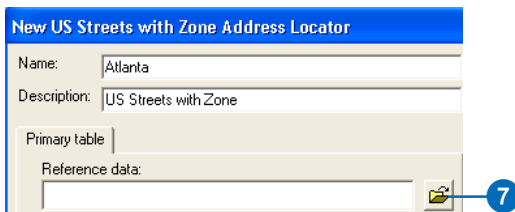
7. On the Primary table tab, click the Browse button next to the Reference data text box. This will open the Choose Reference Data dialog box.
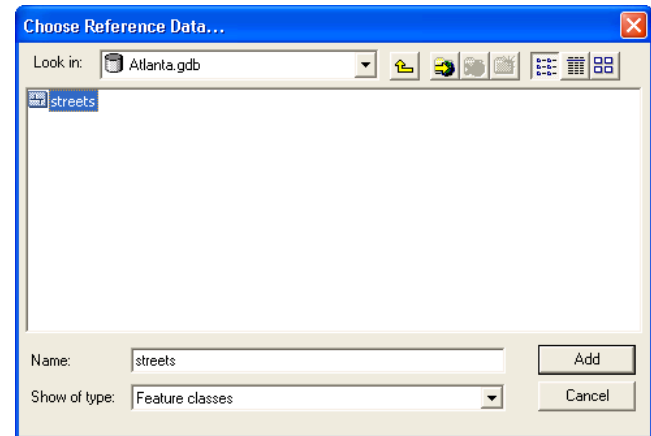
8. Navigate to the folder containing your copy of the Atlanta geodatabase in the Choose Reference Data dialog box. Double-click the geodatabase, click the streets feature class, then click Add. This will add the streets feature class as reference data to the Primary table tab and populate the fields.

9. Leave all other address locator settings as they are and click OK.

   The new address locator appears in the Atlanta file geodatabase.

The new address locator contains a snapshot of the reference database with standardized address attributes, indexes, queries and other geocoding parameters. With this address locator, the addresses you want to geocode can be quickly matched to the street features.

You will now modify the properties of the address locator you just created.

10. Right-click the Atlanta address locator and click Properties. The Address Locator Properties dialog box appears.

On the right under Matching Options, you can see that the default Minimum candidate score is 10. This setting determines the matching score needed to return a potential candidate.
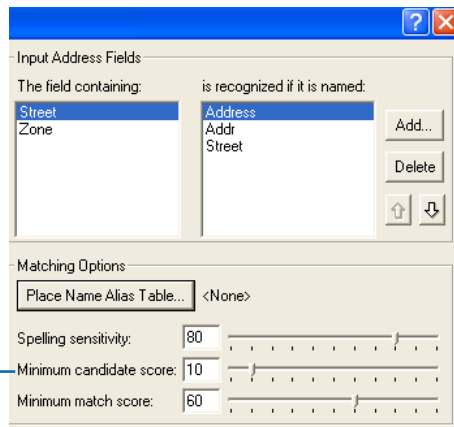

11. Click and drag the slide bar to change the Minimum candidate score to a value of 30.

12. Click OK, closing the Address Locator Properties dialog box.

Your changes are saved in the address locator. Use the address locator to find out where addresses are located on a map.

Finding an address interactively

You can use address locators to locate addresses while you are working in ArcMap. This process is commonly called geocoding.

1. Start ArcMap and click OK to create a new, empty map.

2. Add the streets feature class in the Atlanta geodatabase to the ArcMap document.

3. Click the Find button on the Tools toolbar.
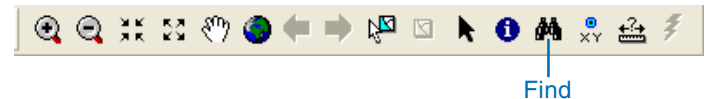
Find

4. In the Find dialog box, click the Addresses tab.

Before you can locate an address on your map, you must identify the address locator you want to use.

5. Click the Browse button to choose an address locator.

6. Navigate to the Atlanta geodatabase, click the Atlanta address locator, and click Add.

This populates the Choose an address locator text box and adds two additional text boxes that will be used to enter the address elements.

7. Type "150 Linden Ave NE" in the Street or Intersection text box. Type "30308" in the Zone text box.
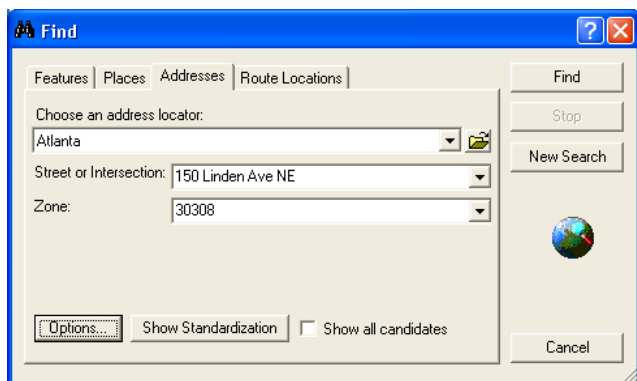
8. Click Find.

   One candidate address appears in the list at the bottom of the Find dialog box.
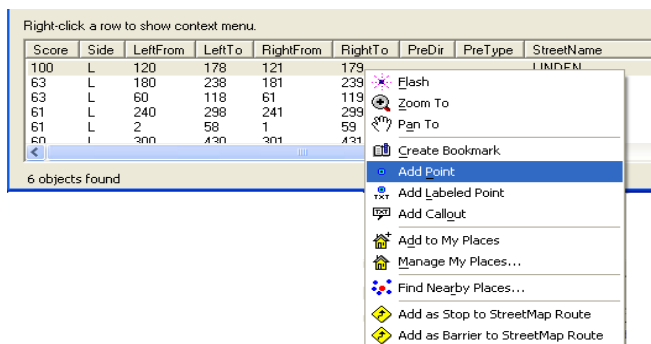
9. Right-click the candidate and click Add Point.

A graphic point representing the address's location appears on the map.
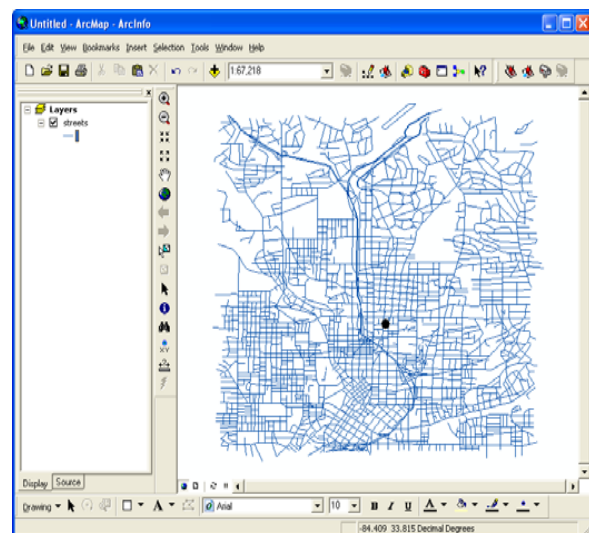
10. Click Cancel to close the Find dialog box.

Getting an address of a location

Sometimes you may want to know the address of a location on the map. You can use the Address Inspector tool to click on the map and get the addresss of the location. This process is also called reverse geocoding.

1. Start ArcMap and click OK to create a new, empty map.

2. Add the streets feature class and the Atlanta address locator in the Atlanta geodatabase to the ArcMap document.

3. Click the Address Inspector button on the Geocoding toolbar.

Address Inspector

4. Hold down the left mouse button over any street location. An address for the location will be displayed in a tooltip text box.
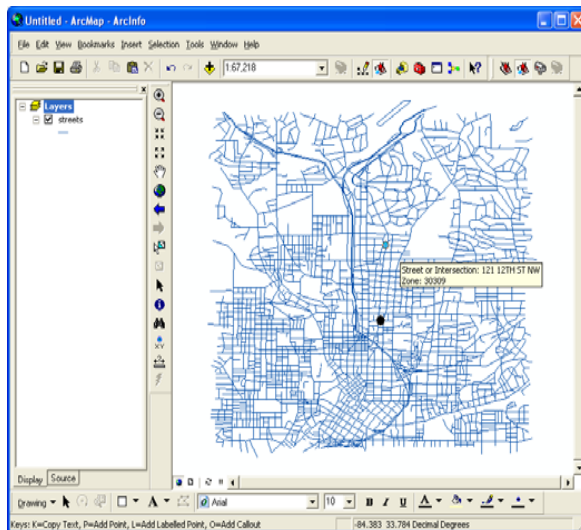
5. Hold down the right mouse button to display the context menu. Click Search Intersections.

6. Hold down the left mouse button over any street location. An interesection address of the location will now be displayed in a tooltip text box.

Geocoding addresses in a table

If you have a table that contains address information, you can geocode all of the addresses at once. In this exercise you will begin with a table containing the addresses of customers and geocode the entire table, showing where the customers are located.

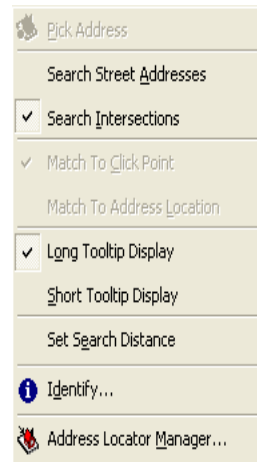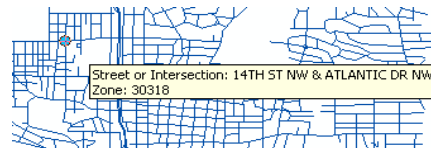1. Open a new map document in ArcMap. You do not need to save the map you created in the previous task.

2. Add the streets feature class and the customers table from your copy of the Atlanta geodatabase to your map.

3. Right-click the customers table on the Source tab of the table of contents and click Geocode Addresses.

4. Click Add on the Choose an address locator to use dialog box.

   The Add Address Locator dialog box opens.

5. Navigate to the Atlanta geodatabase, click the Atlanta address locator, then click Add.
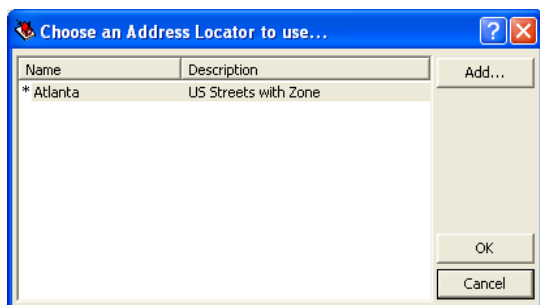
6. Click Atlanta in the Choose an address locator to use dialog box, then click OK.

This will open the Geocode Addresses: Atlanta dialog box.

7. Under the Output section click the Browse button to define the Output shapefile or feature class. This will open the Saving Data dialog box.

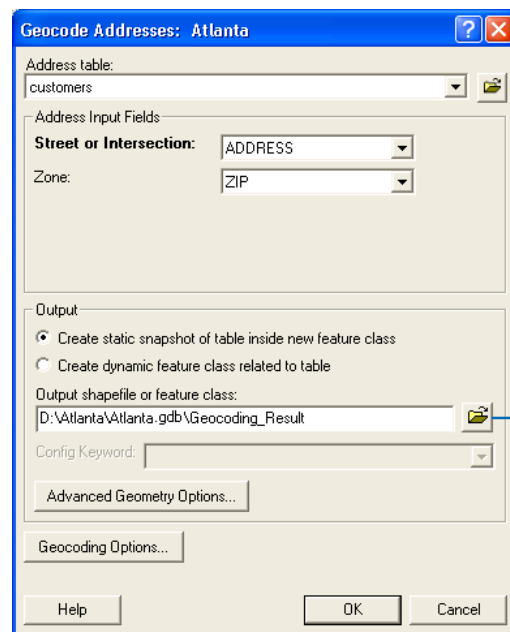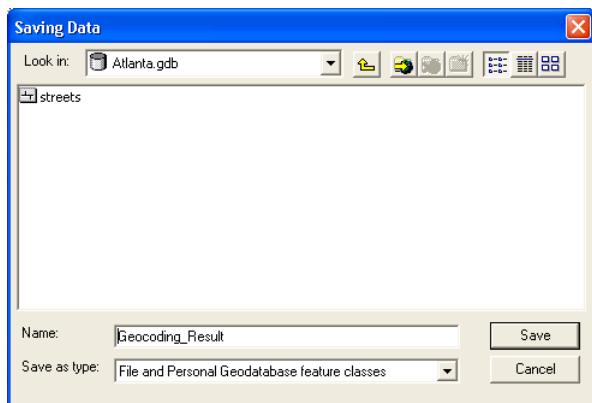8. Click the Save as type drop-down arrow, then click File, and Personal Geodatabase feature classes.

9. Navigate to your copy of the Atlanta geodatabase, then double-click the geodatabase. In the Name text box, type "atlanta_results".

10. Click Save.

A new point feature class named atlanta_results will be created in the Atlanta geodatabase. The point features generated by the geocoding process will be saved in that feature class.

11. Click OK to start geocoding. The Geocoding Addresses dialog box will be displayed showing the matching statistics and the progess bar for the matching process.

When the geocoding process is finished, the Geocoding Addresses dialog box will show the final statistics of the addresses that were matched or not matched. You'll rematch the unmatched addresses later in the tutorial.
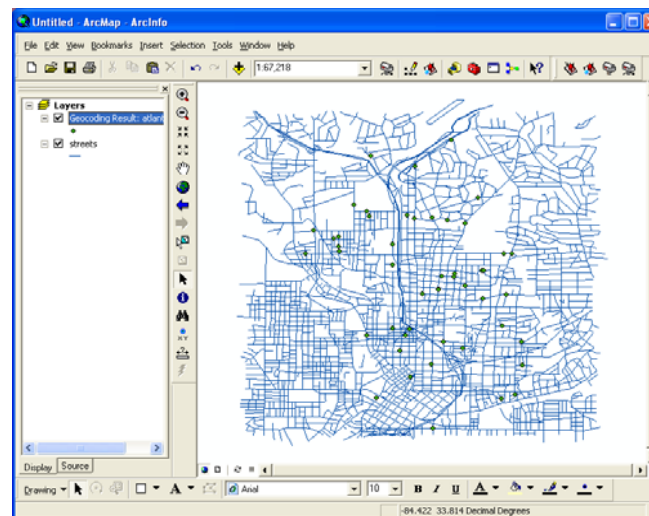
12. Click Close to close the Geocoding Addresses dialog box.

A Geocoding Result layer is added to the map. It shows the points that were added to the atlanta_results feature class.

You can also geocode a table of addresses in ArcCatalog. To do so, right-click the customers table in the Atlanta geodatabase and click Geocode Addresses. This will display a series of dialog boxes identical to those identified in this exercise. You can then add the created feature class to an ArcMap document.

Rematching addresses

1. Click the Tools menu in ArcMap, point to Geocoding, point to Review/Rematch Addresses, then click Geocoding Result: atlanta_results.

   The Interactive Rematch dialog box opens.
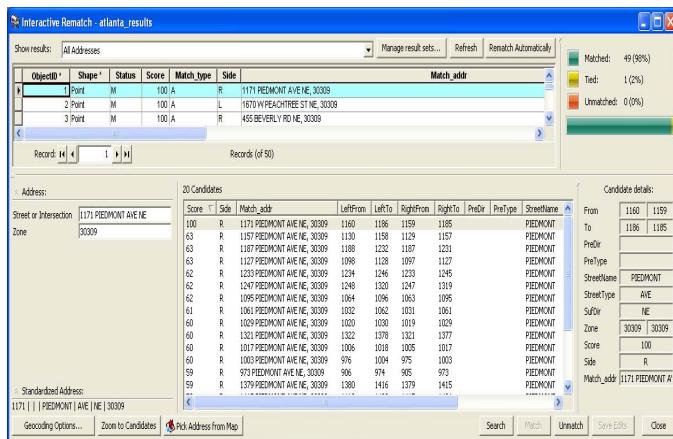
2. The Interactive Rematch dialog box may display all the records in the geocoded feature class at the top of the dialog box. In this exercise there is one record in the feature class that has two candidates that are tied for the highest match score. To rematch the address records with a tied score, click the Show results drop-down list and click Matched Addresses with Candidates Tied. The tied candidates will be listed in the candidate section of the dialog box.

3. Arrange the ArcMap window and the Interactive Rematch dialog box so you can see the map.

   Near the center of the map, you will notice two points that are highlighted: one in yellow and the other in blue. These are the locations of the two candidates listed in the bottom window of the Interactive Rematch dialog box. The selected candidate is highlighted in yellow on the map.

4. Click the Zoom In tool and drag over the area of the two candidates to zoom in on that area.

5. Click the second candidate in the candidate list in the Interactive Rematch dialog box. The location of the yellow highlighted candidate changes on the map.

6. Click Match in the bottom-right corner of the Interactive Rematch dialog box. The selected address in the list at the top of the dialog box is now associated with the second candidate in the list at the bottom.

Rematching addresses by picking a point location on the map

1. Click the Show results drop-down list and click Unmatched Addresses. It will display one address that was not matched.

2. Arrange the ArcMap window and the Interactive Rematch dialog box so you can see the map.

3. Click the Zoom In tool and drag over the area of the candidates—the yellow and light blue points—to zoom in on that area.

4. Assuming that you know where the address should be located on the map, you will match the address by picking a point location on the map. Click the Pick Address from Map tool on the Interactive Rematch dialog box.
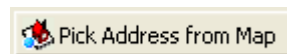
5. The cursor changes to a cross with a blue dot center. Click and hold the mouse button along a street segment to display the nearest qualifying address in a tooltip box.

6. Place the mouse pointer on the location you want the address to be matched to.

7. Right-click on the location and click Pick Address from the context menu.
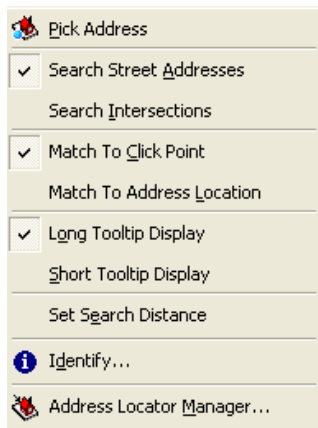
8. The unmatched address is now matched to the point location you just picked. Click the Close button to close the Interactive Rematch dialog box.

9. Close ArcMap.

Exercise 2: Using alternate street names and place name aliases

When you create an address locator, you have the option to use alternate street names and place name aliases. Place name aliases let you associate names of well-known places with street addresses—for example, the names of museums, hospitals, or landmarks. When geocoding an address, the place name alias table is consulted first. If a place name is found, the street address from the place name alias table is geocoded. Similarly, alternate street names can be defined for features in the reference data. When geocoding an address, the alternate street name table is also searched to find potential candidates where streets have more than one name.

## Creating an address locator that uses alternate names and place name aliases

In this task you'll create a new address locator that uses alternate street names and place name aliases, then use it in ArcMap to find addresses.

1. In ArcCatalog, navigate to the Atlanta geodatabase.

2. Right-click the Atlanta geodatabase, point to New, and click Address Locator. This opens the Create New Address Locator dialog box.

3. Click the US Streets with AltName address locator style, then click OK.
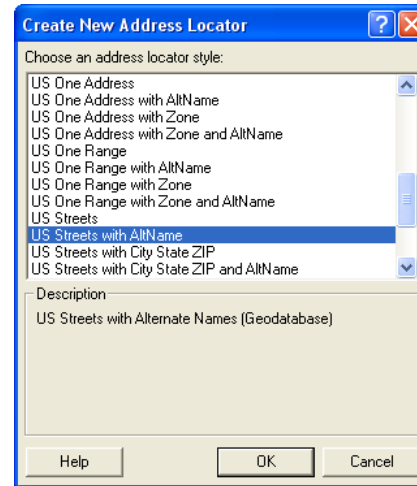
The New US Streets with AltName Address Locator dialog box appears.

4. In the Name text box, type "Atlanta_AltName", replacing the default name.
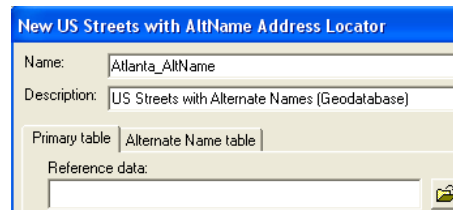
5. On the Primary table tab, click the Browse button next to the Reference data text box.

6. From the Choose Reference Data dialog box, navigate to the Atlanta geodatabase.

7. Double-click the Atlanta geodatabase, click the streets feature class, then click Add.

8. Click the Alternate Name table tab.

9. Click the Browse button next to the Reference data text box.

10. In the Choose Reference Data dialog box, navigate to your copy of the Atlanta geodatabase.

11. Double-click the Atlanta geodatabase, click the altname table, then click Add.

12. On the Alternate Name table tab, if not yet selected, click the Join ID drop-down list and click JOINID.

The JoinID column in the altname table and the JoinID column in the streets feature class are used to relate the records in the altname table to the records in the streets feature class.

13. On the right of the dialog box, under Matching Options, click Place Name Alias Table.

The Alias Table dialog box appears.

14. Click the Browse button, then navigate to the Atlanta geodatabase.

15. Double-click the Atlanta geodatabase, click the place_aliases table and click Add.

16. Click the Alias field drop-down arrow and click NAME.

17. Click OK.

18. Click OK in the New US Streets with AltName Address Locator dialog box. The new Atlanta_AltName address locator appears in the Atlanta geodatabase.

🐾 Atlanta_AltName	Locator
🐾 Atlanta	Locator
🔠 altname	File Geodatabase Table
🔠 customers	File Geodatabase Table
🔠 place_aliases	File Geodatabase Table
🔢 streets	File Geodatabase Feature Class

19. Close ArcCatalog.

You can now use this address locator to find out where an address is located on a map.

Finding locations using alternate street names and place name aliases

1. Open a new map document in ArcMap.

2. Add the streets feature class from the Atlanta geodatabase to your map.

3. Click the Find button on the Tools toolbar.

4. In the Find dialog box, click the Addresses tab.

5. Click the Browse button to choose an address locator.

6. Navigate to the Atlanta geodatabase, click the Atlanta_AltName address locator, and click Add.

   A street may have more than one name. For example, "Atlanta Blvd" is defined as an alternate name for "Old 10th St NE" in the Atlanta database. With the Atlanta_AltName address locator, "30 Old 10th St NE" and "30 Atlanta Blvd" will both find the same location.

7. Type "30 Old 10th St NE" in the Street or Intersection text box.
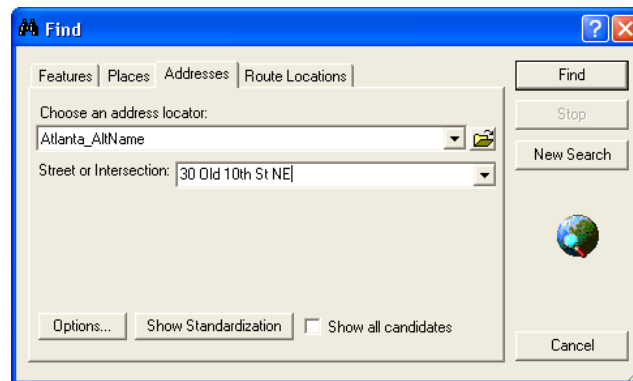
8. Click Find.


9. Right-click the candidate and click Add Point.

   A graphic point representing the address's location appears on the map.

10. Type "30 Atlanta Blvd" in the Street or Intersection text box.

11. Click Find.

12. Right-click the candidate and click Flash. You can see that both addresses are matched to the same location on the map.

   In addition to geocoding addresses, you can also geocode place names that have been defined in the place_aliases table.

13. Type "Children's Hospital" in the Street or Intersection text box.

14. Click Find.

15. Right-click the first candidate in the candidates list, which has a score of 100, and click Add Point.
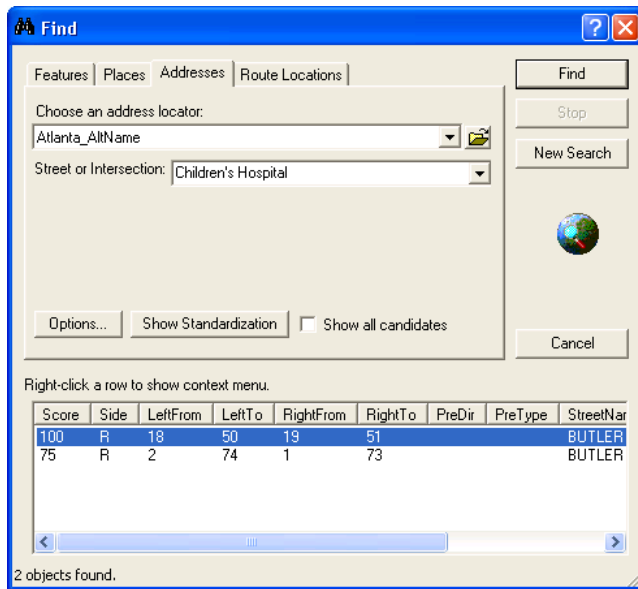
The location of the hospital appears on the map as if you had typed its complete address.
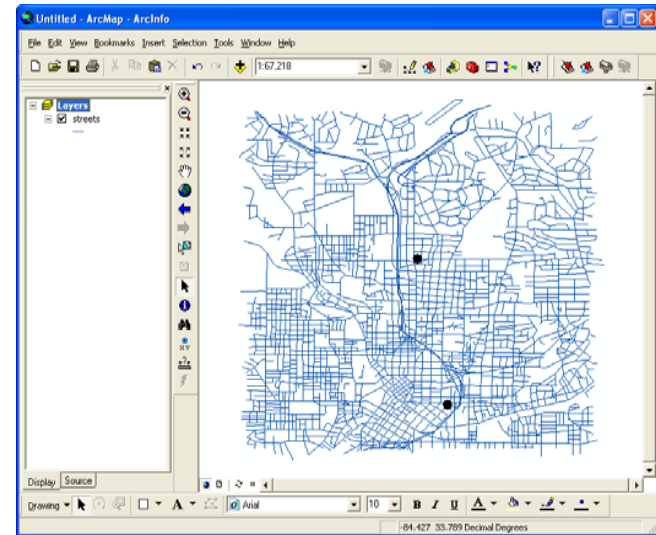

16. Click Cancel to close the Find dialog box.

Creating address locators that use alternate names and place name aliases is beneficial for people who know a landmark's name but not its address. It will also help in situations where a street has more than one name.

Exercise 3: Creating a dynamic geocoded feature class

With an ArcInfo® or ArcEditor™ seat, your geocoding results can be dynamically linked to the original addresses if the address table and the result feature class are stored in the same geodatabase. With dynamic results, modifications to the primary address table will cause the geocoded feature class to be updated automatically. ArcView® users will not be able to complete this exercise.

1. Open a new map document in ArcMap. You do not need to save your previous map document.

2. Add the customers table and the streets feature class in the Atlanta geodatabase to your map.

3. Right-click the customers table in the Source tab of the map's table of contents and click Geocode Addresses.

4. Click Add in the Choose an address locator to use dialog box.

5. In the Add Address Locator dialog box, navigate to the the Atlanta geodatabase, and choose the Atlanta address locator, then click Add.

6. Click Atlanta in the Choose an address locator to use dialog box, then click OK.
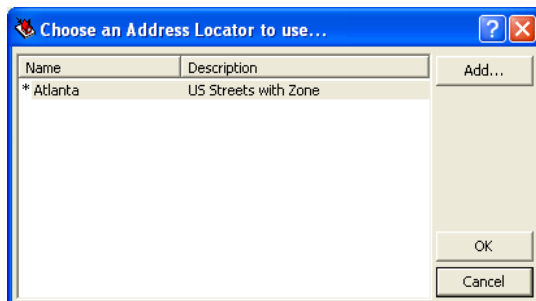
7. In the Geocode Addresses: Atlanta dialog box, click the Output shapefile or feature class Browse button to define the output feature class.

8. In the Saving Data dialog box, click the Save as type drop-down arrow, and click File and Personal Geodatabase feature classes.

9. Navigate to the Atlanta geodatabase, then double-click the geodatabase.

10. In the Name text box, type "dynamic_results".

11. Click Save.
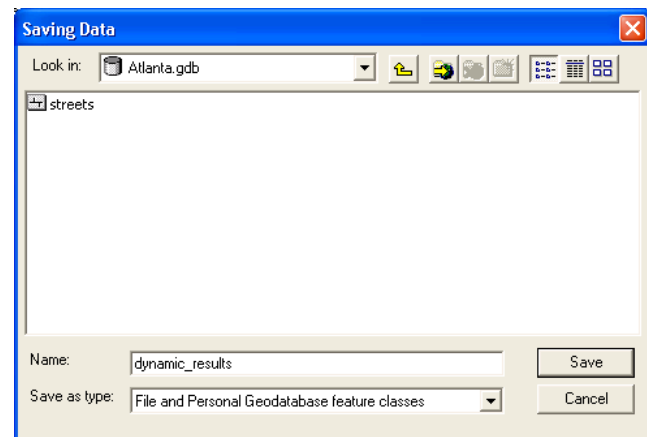
ArcInfo and ArcEditor

12. Click Create dynamic feature class related to table.
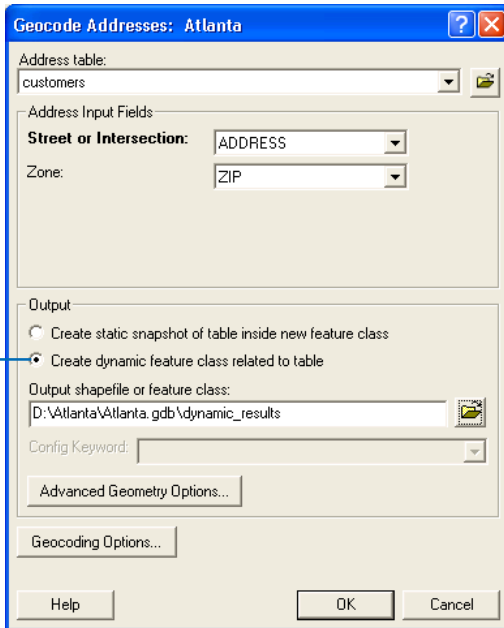
A new point feature class named dynamic_results will be created in the Atlanta geodatabase. The point features generated by the geocoding process will be saved in that feature class. A relationship class between the table and feature class will be created.

13. Click OK to start geocoding.

When the geocoding process is finished, the Geocoding Addresses dialog box appears.

14. Click Close to close the Geocoding Addresses dialog box.

A Geocoding Result layer is added to the map. It shows the points that were added to the dynamic_results feature class.

15. Right-click the Geocoding Result layer in the map's table of contents and click Open Attribute Table.


The first record in the table has the address 1171 PIEDMONT AVE NE in the Street or Intersection column. The Status (M: matched, U: unmatched, or T: tied), Score (match score), and Side (R: right side of the road or L: left side of the road) columns contain the values M, 100, and R, respectively. To see where this customer is located on the map, click the button at the far left of this row to select this record in the table. The feature will be highlighted on the map.

16. Minimize the Geocoding Result layer's attribute table.

17. Right-click the customers table in the map's table of contents and click Open.

The address that appears for the first customer in the table, Ace Market, is 1171 Piedmont Ave. NE. That customer has moved to a new address, 30 12th St. The ZIP Code remains the same. The customers table must be updated with this information.

18. If the Editor toolbar is not showing, click the Editor Toolbar button to show the Editor toolbar.
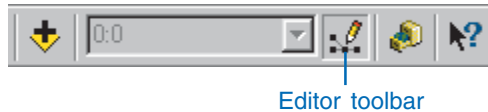
Editor toolbar

19. On the Editor toolbar, click the Editor menu and click Start Editing.
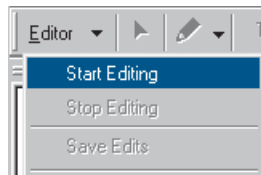
20. Type "30 12TH ST" in the Address column next to Ace Market.

21. Click another record in the table.

22. Minimize the customers table and maximize the Geocoding Result layer's attribute table.

The new address was geocoded automatically, and the corresponding values have been updated in the layer's attribute table. The Status, Score, and Side columns now contain the values T, 81, and L, respectively. The value "T" in the Status field stands for tied; two or more candidates had the highest score. To see on the map where Ace

Market is now located, click to select this record in the layer's attribute table.

Now add a new customer to the customers table.

23. Minimize the Geocoding Result layer's attribute table and maximize the customers table.

24. Scroll down to the bottom of the customers table.

25. In the blank record after the last record in the table, click in the NAME column. Type "Vine Cafe".

A new blank record is added to the bottom of the table.

26. In the same record, type "379 VINE ST NW" in the ADDRESS column.

27. Type "30314" in the ZIP column.

28. Type "Cafe" in the TYPE column.

29. Type "10000" in the SALES column.

30. Click another record in the table.

ArcInfo and ArcEditor

31. Close the customers table. Maximize the Geocoding Result layer's attribute table, then scroll to the bottom.

    A new feature was automatically added to the result feature class representing the new address.

32. On the Editor toolbar, click the Editor menu and click Stop Editing. Click Yes to save your changes.

33. Close ArcMap. Click No to stop ArcMap without saving this map.