

Maplex Tutorial



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Introduction to the Maplex tutorial

Introducing the Maplex tutorial

A good way to learn how to use ESRI's Maplex for ArcGIS is to work through the process of labeling a map. This tutorial introduces you to some labeling techniques in the context of mapping land parcels and streets.

In this tutorial, you will use Maplex for ArcGIS to do the following:

- Improve labels for parcel features by stacking and reducing the size of the labels.
- Place labels for parcel boundary features by aligning them to their features and reducing their size.
- Improve label placements for street features by applying a labeling style and an abbreviation dictionary.

Tutorial data

The exercises in this tutorial use the tutorial data distributed with Maplex for ArcGIS. The default installation location of the data is C:\ArcGIS\ArcTutor\Maplex.

In this tutorial

- [Exercise 1: Enabling Maplex for ArcGIS and adding the Labeling toolbar](#)
- [Exercise 2: Labeling the parcels with their serial and parcel numbers](#)
- [Exercise 3: Labeling the parcel boundaries with their length](#)
- [Exercise 4: Labeling the streets with their names](#)

Exercise 1: Enabling Maplex for ArcGIS and adding the Labeling toolbar

Imagine that you work for a small city and you need to make a map for the assessor. This map must have parcels labeled with a two-part parcel number, lot lines labeled with their length, and streets labeled with their names. You've almost finished the map, but the labels aren't quite right. Now you are going to use the Maplex for ArcGIS extension to complete the labeling; then you will share the map so it can be reused by other departments in the city.

Complexity:
Beginner


Data Requirement:
ArcGIS Tutorial Data Setup

Data Path:
C:\arcgis\ArcTutor\Maplex

Goal:
To enable the Maplex for ArcGIS extension, add the Labeling toolbar and turn on the Maplex Label Engine.

The first step to improve the labels on your map is to start ArcMap and turn on the Maplex for ArcGIS extension.

Steps:

1. [Start ArcMap](#).
2. Click the **Open** button  on the **Standard** toolbar.
3. Navigate to the Parcels.mxd map document in the Maplex directory where you installed the tutorial data. (C:\ArcGIS\ArcTutor is the default location.) If the **Getting Started** window opens, choose to browse for an existing map and open Parcels.mxd.

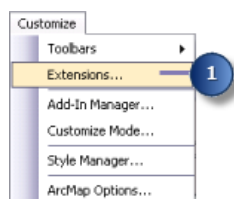
The Parcels map opens. This map contains several layers in a data frame named Parcel Map. Two of the layers, Streets and Parcels, have been labeled and have label expressions already built for them. You will improve the way their labels are drawn on the map. Another layer, Parcel Boundaries, is not currently labeled. You will add labels for this layer.

Enabling Maplex for ArcGIS

Before you can use Maplex for ArcGIS, you must enable the extension and set the Maplex Label Engine as the label engine for the data frame.

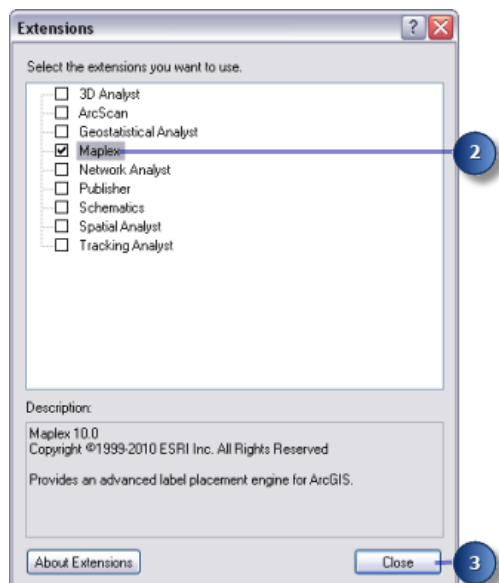
Steps:

1. Click **Customize > Extensions**.



The **Extensions** dialog box appears.

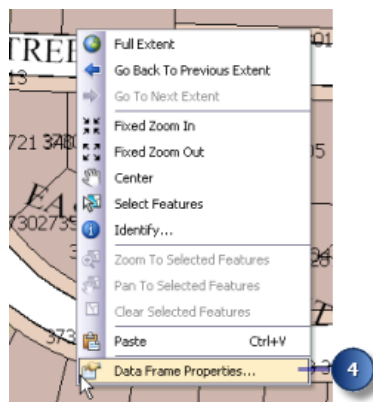
2. Check **Maplex** to enable the extension.



3. Click **Close**.

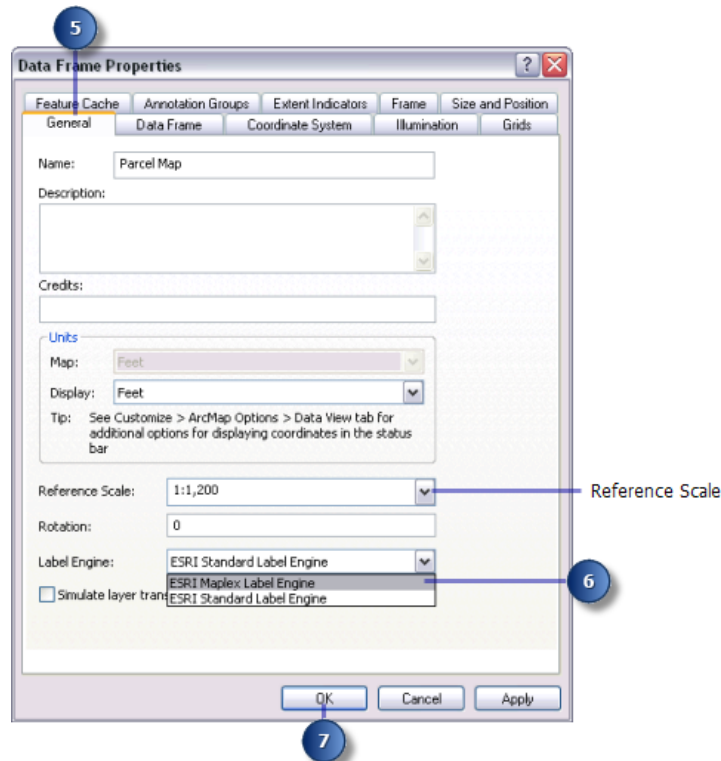
Now that the extension is turned on, you can switch from the default label engine to the ESRI Maplex Label Engine.

4. Right-click the data frame and click **Data Frame Properties**.



The **Data Frame Properties** dialog box appears.

5. Click the **General** tab.



This map has a reference scale of 1:1,200. This means that, regardless of the current map scale, the feature and font symbol sizes drawn on-screen are scaled relative to their size at 1:1,200 scale. Zooming out makes the symbols and fonts appear smaller, and zooming in makes them appear larger. When you are making a map that will be printed at a particular scale, it is a good idea to set the reference scale before you begin labeling the map. Otherwise, you will not have a clear idea how the map labels will appear when the map is printed; more labels will appear on the map when you are zoomed in and fewer when you are zoomed out. With a reference scale, labels function more like annotation.

6. Click the **Label Engine** drop-down arrow and click **ESRI Maplex Label Engine**.
7. Click **OK**.

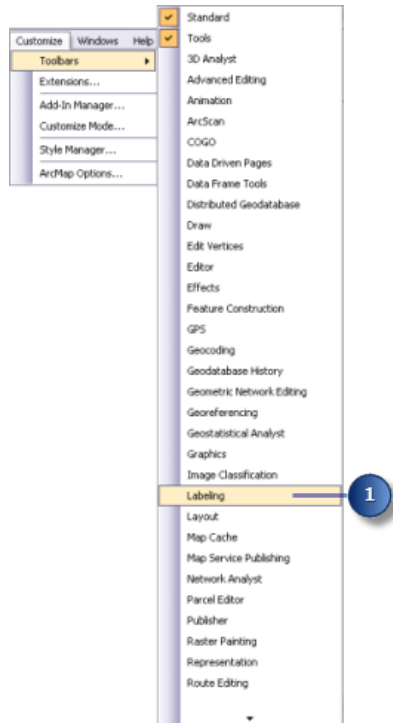
The Maplex Label Engine automatically starts to recalculate the placement of the map's existing labels. Some of the labels that were previously visible may disappear, and the formatting of others may change. You will adjust the label placement settings later to ensure that all the labels will be placed and formatted to suit your map design.

Adding the Labeling toolbar

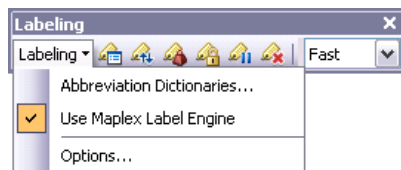
Maplex for ArcGIS adds some tools to the **Labeling** toolbar. You'll add the **Labeling** toolbar to ArcMap and use these tools to label your map.

Steps:

1. Click **Customize > Toolbars** and click **Labeling**.



Because the Maplex for ArcGIS extension has been installed and enabled on the **Extensions** dialog box, all items on the **Labeling** toolbar are active. You can dock the toolbar to the ArcMap window, or you can leave it floating.



The tools on the **Labeling** toolbar are as follows:

- Abbreviation Dictionaries—Lets you specify how words in labels are abbreviated.
- Use Maplex Label Engine—Lets you switch the Maplex Label Engine on or off for the active data frame.
- Options—Lets you set basic and advanced Maplex Label Engine options for the active data frame.
- Label Manager button —Lets you control all the label classes in your map from a single dialog box.
- Label Priority Ranking button —Lets you control the order in which label classes are placed. More of the labels from higher-priority classes are usually placed.
- Label Weight Ranking button —Lets you control the relative importance of features as barriers to label placement.

- Lock Labels button —Locks the labels displayed in the current extent. This allows you to navigate around a map without having to wait for the label placements to be recalculated each time you pan or zoom.
- Pause Labeling button —Lets you suspend the drawing of labels while you continue to work with your data.
- View Unplaced Labels button —Shows the labels that could not be placed in a different color (the default color is red).
- Placement Quality drop-down list—Choosing the Fast option allows you to place labels quickly using a simple calculation. Best uses a more complex calculation and takes longer.

Exercise 2: Labeling the parcels with their serial and parcel numbers

First, you'll review the labeling requirements for the map and use Maplex for ArcGIS to label the features according to the assessor's specifications.

Two pieces of information, a serial number and a parcel number, must be displayed on the map for each parcel. This information is stored in two different fields of the parcel attribute table, and for labeling purposes, they are concatenated using a simple label expression. Since all the information is numeric, the parts of the label should be stacked so that each number is placed on its own line where it can be clearly identified.

When you switched to the ESRI Maplex Label Engine, many of the labels were stacked to fit them on the map. You will change the labeling options so that all the labels will be stacked.

Complexity:
Beginner

Data Requirement:
ArcGIS Tutorial Data Setup

Data Path:
C:\arcgis\ArcTutor\Maplex

Goal:
To label the parcels with their serial and parcel numbers using the Maplex Label Engine polygon placement parameters

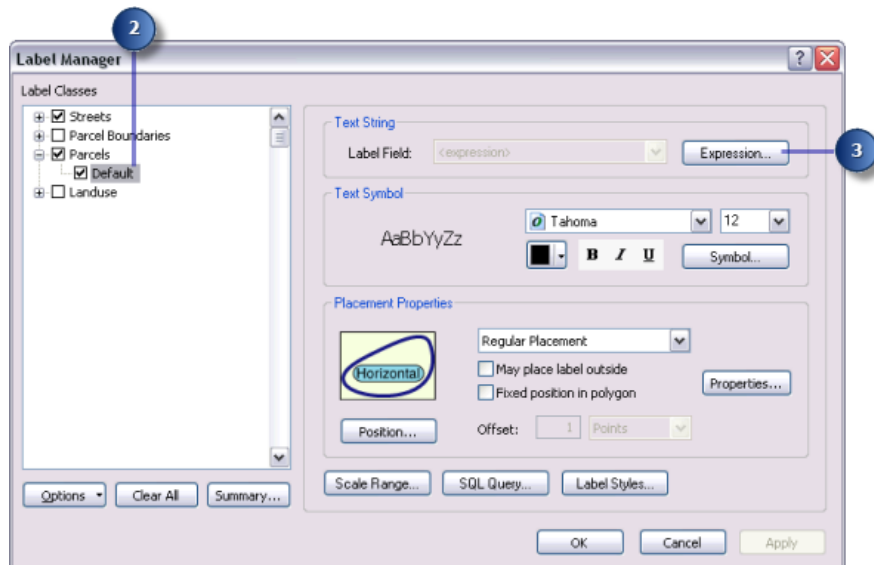
Viewing the Parcels layer label expression

Steps:

1. Click the **Label Manager** button on the **Labeling** toolbar to open the **Label Manager** dialog box.



2. Click the default label class under the Parcels layer.



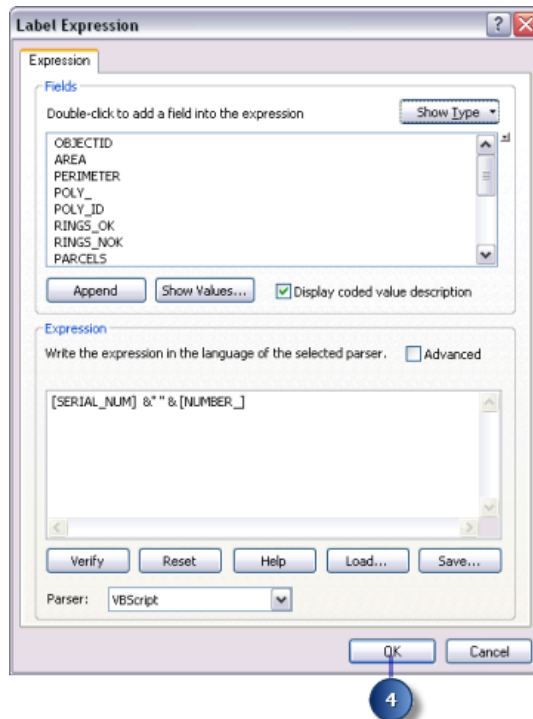
The check box next to the Parcels layer is checked, as the layer was saved with labeling turned on. If you were starting to label a new layer, you would need to check this box. The label placement method is set to label all the features the same way. In this exercise, you will use this method of labeling the layer.

If you wanted to add a label class to this layer, you would click the Parcels layer, type a name for your new label class in the **Enter class name** box, then click **Add**. Adding label classes allows you to label subsets of features in a layer differently.

3. Click **Expression**.

This layer already has a label expression that concatenates the values of two numeric fields, SERIAL_NUM and NUMBER_, with a space character between them to produce the labels for the parcel polygons.

4. Click **OK**.



Stacking the parcel labels

Your map requirements state that, in addition to being separated by a space, the two parts of the parcel label should be stacked. When you switched to the ESRI Maplex Label Engine, many of the labels were stacked to make them fit within the parcels, though the labels in larger parcels may not have been stacked. Now you will force all the labels to be split and stacked at the space character.

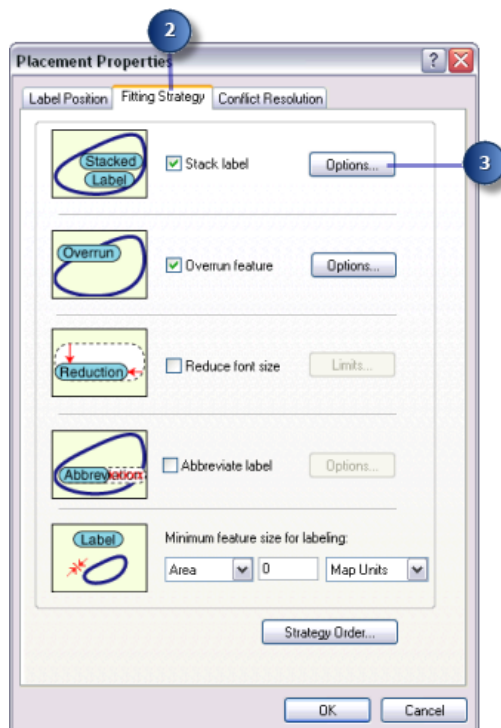
Steps:

1. Click **Properties**.



The **Placement Properties** dialog box appears. This dialog box has three tabs that vary in appearance depending on whether you are labeling a point, line, or polygon layer. These tabs allow you to control how the ESRI Maplex Label Engine places labels.

2. Click the **Fitting Strategy** tab.



Note that the first label-fitting strategy on this list, **Stack label**, is checked by default. This means that the ESRI Maplex Label Engine will try to make labels more compact by splitting and stacking them on two or more lines when space is an issue.

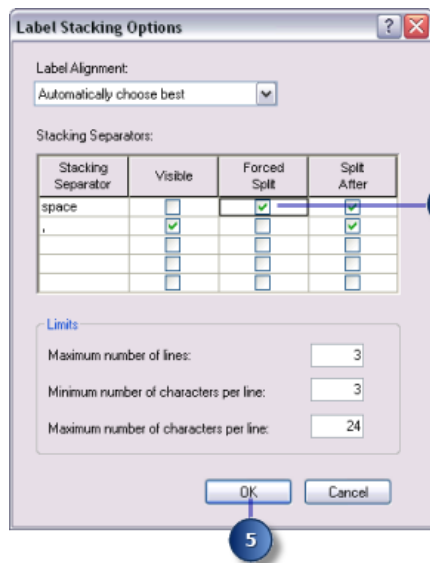
3. Click **Options** to change the label stacking options.
The **Label Stacking Options** dialog box appears.

This dialog box allows you to control how the stacked lines within the label are aligned, what characters will be used to split lines, where the split should occur relative to the stacking characters, and whether or not the stacking characters should be visible in the label. It also allows you control over whether stacking occurs only when space is an issue or whenever a stacking character is encountered in the label. Finally, it allows you to control the overall shape of the stacked label by specifying the number of lines and the minimum and maximum number of characters per line in the label.

The **Stacking Separator** table shows all the stacking characters that Maplex will use to split and stack labels. By default, two characters—a space and a comma—may be used to split a label. The **Stacking Separators** list can be changed by adding to and removing from the table. You can specify for each character in the list whether it will always split a label by checking **Forced Split**.

Space is the first stacking character in the default list, and it is the one that you want to use to split and stack the parcel labels.

4. Click **Forced Split**.



All labels will be automatically split and stacked at the space character.

5. Click **OK**.

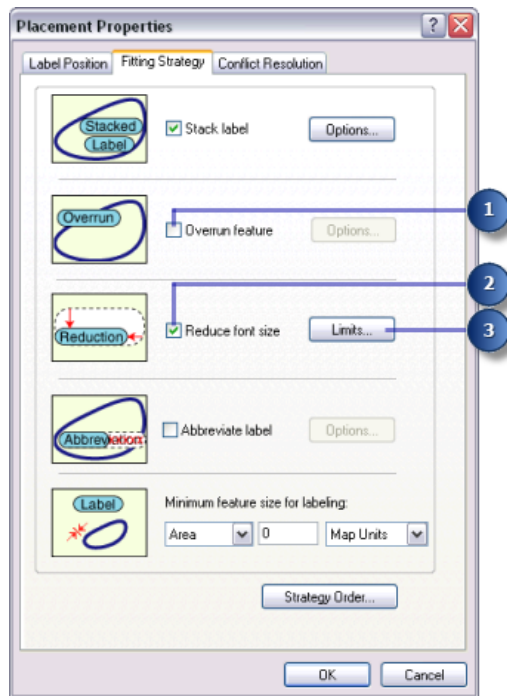
If a label contains the other stacking character, it might also be split at that character if it makes the label or its neighbors easier to place.

Making all parcel labels fit within parcels

To avoid ambiguity about which labels belong to which parcels, the labels must fit within the parcels. The assessor's office works with printed maps at 1:1,200 scale. This map already has a reference scale set to 1:1,200, so fonts and symbols on the map are drawn so that their size would be correct when printed at 1:1,200. Many of the parcels, when represented at this scale, are too small to contain the labels at their current font size. To allow labels for these parcels to be placed, you will let the Maplex Label Engine reduce the font size of labels, when necessary, to fit them in the parcels.

Steps:

1. Uncheck **Overrun feature**.



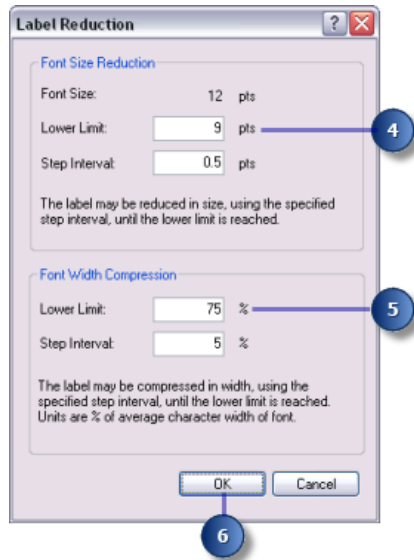
Labels may no longer overrun the boundary of polygons. However, this creates a new problem: Some of the labels are larger than the polygons at the 1:1,200 map scale. Now that they cannot overrun the polygons, these labels will not be placed. To place them, you'll need to allow the Maplex Label Engine to reduce their size.

2. Check **Reduce font size**.

3. Click **Limits**.

The current font size is displayed at the top of the **Label Reduction** dialog box. In this case, it is 12 points. You'll allow the font size to be reduced by 3 points, to 9 points, in increments of one-half of a point. You'll also allow the width of the font to be compressed to three-quarters of its original width.

4. Type 9 in the **Lower Limit** text box under **Font Size Reduction**.



5. Type 75 in the **Lower Limit** text box for **Font Width Compression**.
6. Click **OK**.

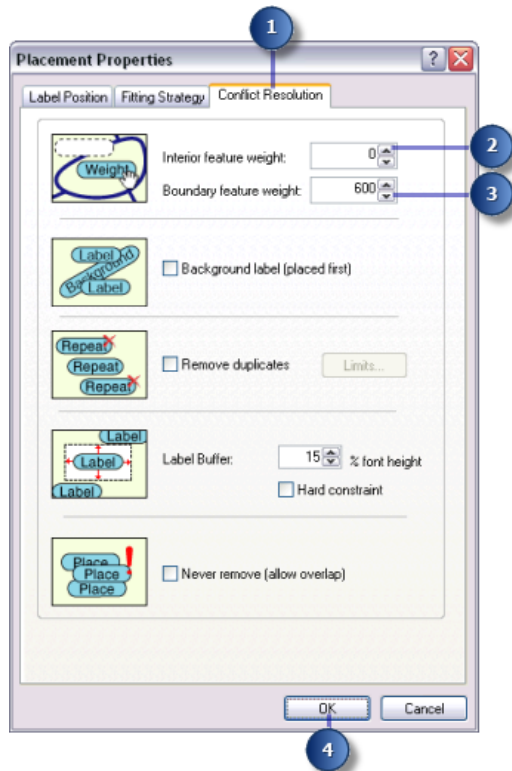
The labels will be placed inside the parcels and reduced slightly in size when space is an issue.

Setting the priority weighting of the parcels and labels

Maplex for ArcGIS first places labels in empty areas on the map. Sometimes, due to space constraints, labels must overlap features. You can control which labels have placement priority and how labels may overlap features by setting weights.

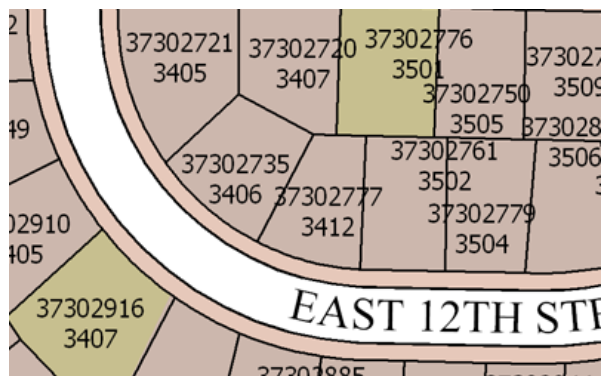
Steps:

1. Click the **Conflict Resolution** tab.

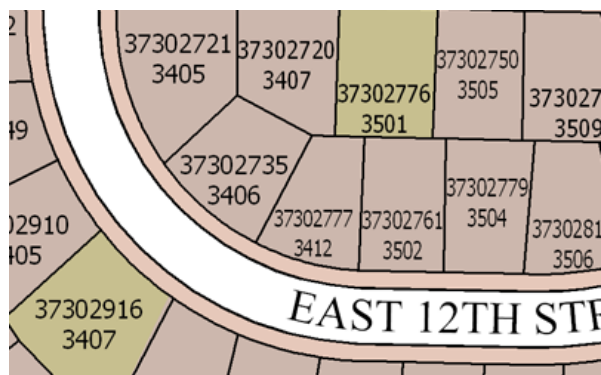


2. Type 0 in the **Interior feature weight** text box.
A weight of 0 means that the map space used by that feature or label can still be regarded as available for other map labels or features.
3. Type 600 for **Boundary feature weight**.
A label or feature with a weight of 1,000 may not be overlapped. A weight of 600 is an intermediate value that will tend to prevent labels from overlapping the parcel boundaries. If a feature or label must be overlapped by a label, Maplex will choose to overlap the feature or label with the lower weight.
4. Click **OK**.
5. Click **OK**.
The map labels are recalculated by Maplex for ArcGIS according to the new rules you have applied to the Parcels layer.

Take a moment to compare the labeling results from before and after you made these changes.



Before the changes you made, many labels were unplaced because of conflicts with features or other labels.



After you enabled stacking, font size reduction, and font width compression, more labels could be fit onto the map without space conflicts.

You've met the assessor's map specification for labeling the parcels. In the next section, you'll work on labeling the lot lines.

Exercise 3: Labeling the parcel boundaries with their length

The perimeters of the parcel polygons must be labeled with the length of the parcel boundaries. To make these labels easily legible, the text should be aligned with and slightly offset from the line symbol.

The lot lines between the parcels are stored in a separate line feature class. In this section, you will label the parcel boundaries with their length.

Complexity:
Beginner

Data Requirement:
ArcGIS Tutorial Data Setup

Data Path:
C:\arcgis\ArcTutor\Maplex

Goal:
To label the parcel boundaries with their length using the Maplex Label Engine line placement parameters

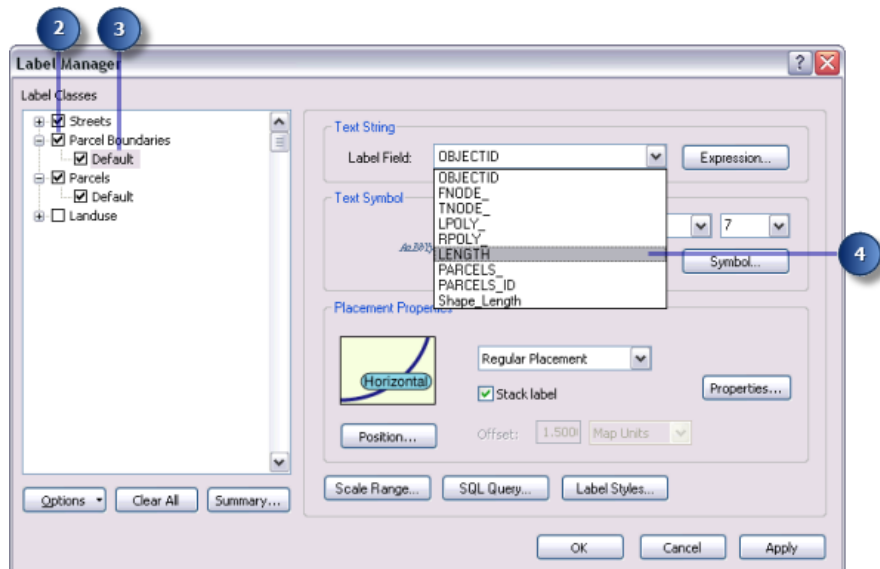
Setting the label field to LENGTH

Steps:

1. Click **Label Manager** on the **Labeling** toolbar to open the **Label Manager** dialog box.



2. Check the box next to the Parcel Boundaries layer to turn on labeling for this layer.
3. Click the default label class under the Parcel Boundaries layer.



4. Click the **Label Fields** drop-down arrow and click **LENGTH** so the parcel lines will be labeled with the right attribute.

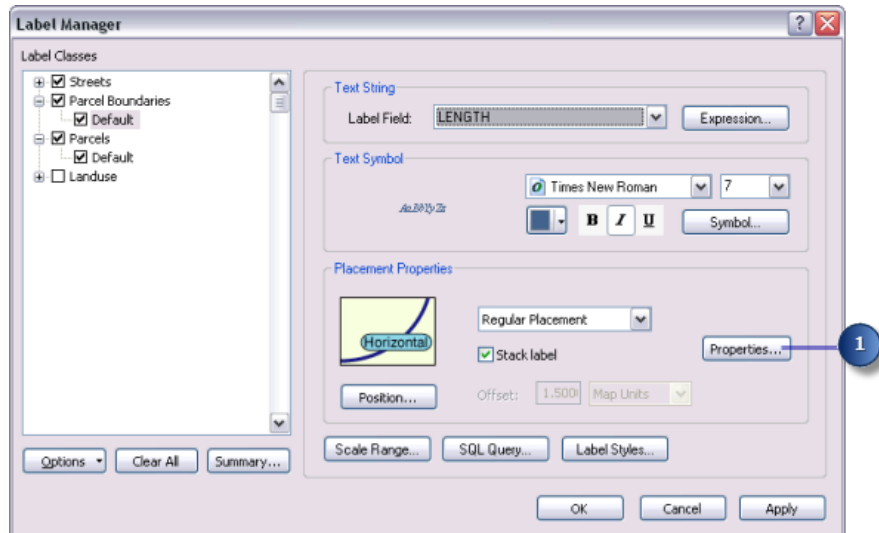
The parcel boundaries are labeled with their length.

Aligning labels with the parcel lines

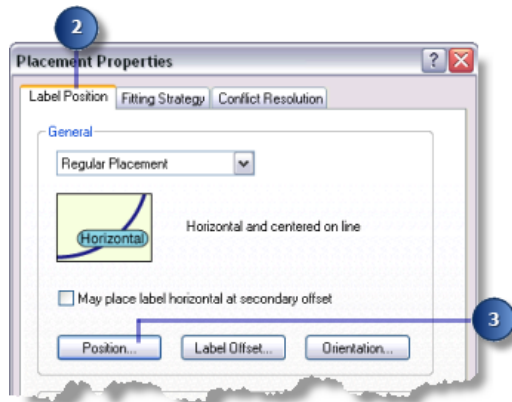
According to the assessor's map specification, the labels for the parcel lines should be aligned with the lines. You'll make sure that the label position aligns with the lines.

Steps:

1. Click **Properties**.

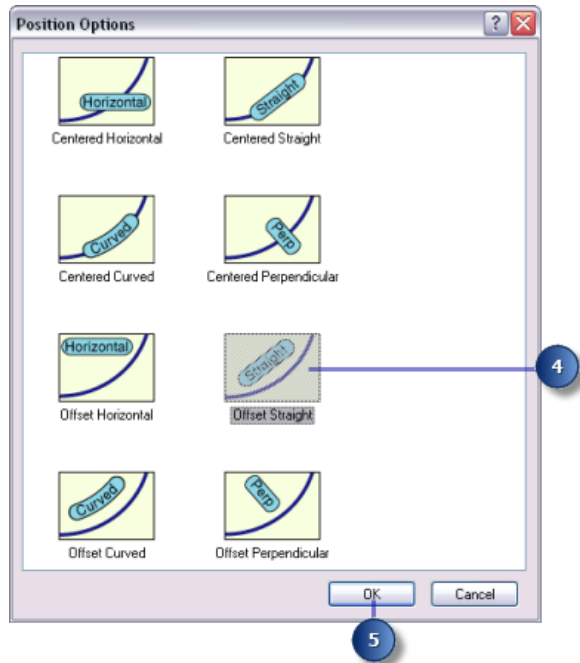


2. Click the **Label Position** tab.
3. Click **Position**.



The **Position Options** dialog box appears. There are different position options available for point, line, and polygon features. Because you are labeling the parcel lines, you see the label position options that are available for line features.

4. Click **Offset Straight**.



5. Click **OK**.

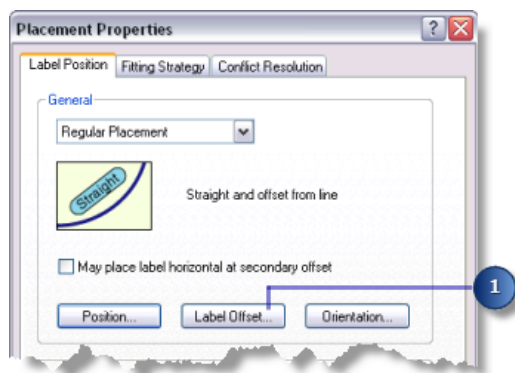
The parcel line labels are now aligned with the lines.

Offsetting labels from the parcel lines

To make the line lengths easier to read, you will offset the labels slightly from the parcel lines.

Steps:

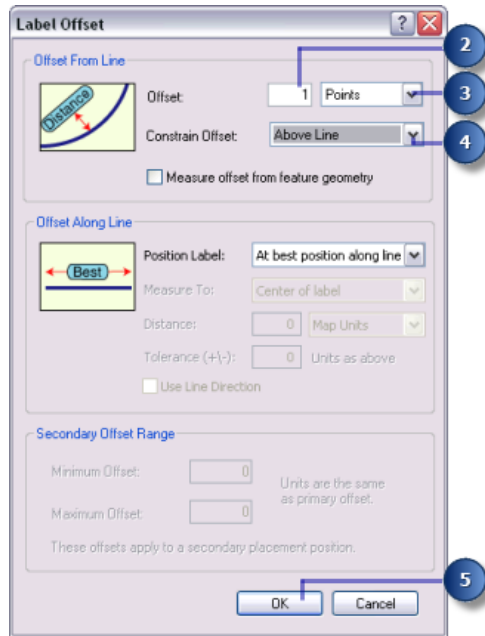
1. Click **Label Offset**.



The **Label Offset** dialog box appears.

You can set offsets at a distance from a line and from the end of a line. For this map, you want the labels to be offset from the lines by 1 point.

2. Type 1 in the **Offset** text box.



3. Click the drop-down arrow and click **Points**.
4. Click the drop-down arrow and click **Above Line**.
5. Click **OK**.

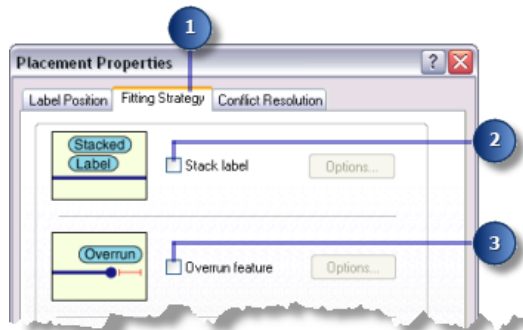
The parcel line labels are placed 1 point above the lines.

Adjusting the label-fitting strategies for parcel lines

Now that you have set up the placement for the parcel line labels, you will adjust the label-fitting strategy. You will turn off stacking, allow the labels to extend slightly beyond short parcel line features, and let the label engine reduce the font size where that will allow it to place more labels.

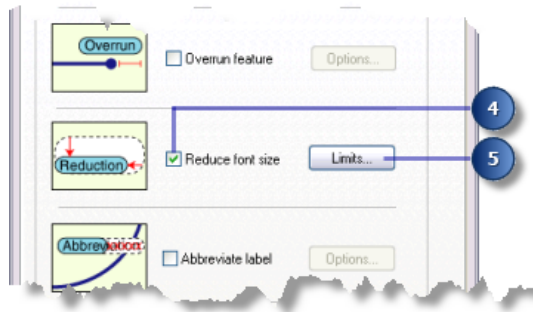
Steps:

1. Click the **Fitting Strategy** tab.

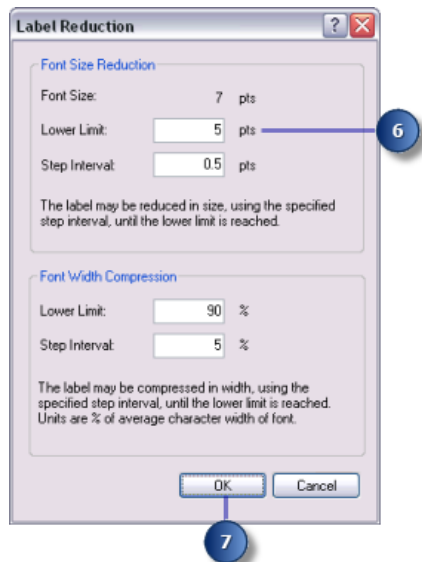


2. Uncheck the **Stack label** box so the labels won't be stacked.

3. Uncheck the **Overrun feature** box so the labels will not extend beyond the ends of the parcel lines.
4. Click the **Reduce font size** box.



5. Click **Limits**.
6. Type 5 in the **Lower Limit** text box to set the lower limit on the font size for the parcel line labels.



7. Click **OK**.

When necessary, parcel line labels are reduced to as small as 5 points from their base font size of 7 points. This allows a greater number of larger labels to be placed where there is more space available and smaller labels where there is less.

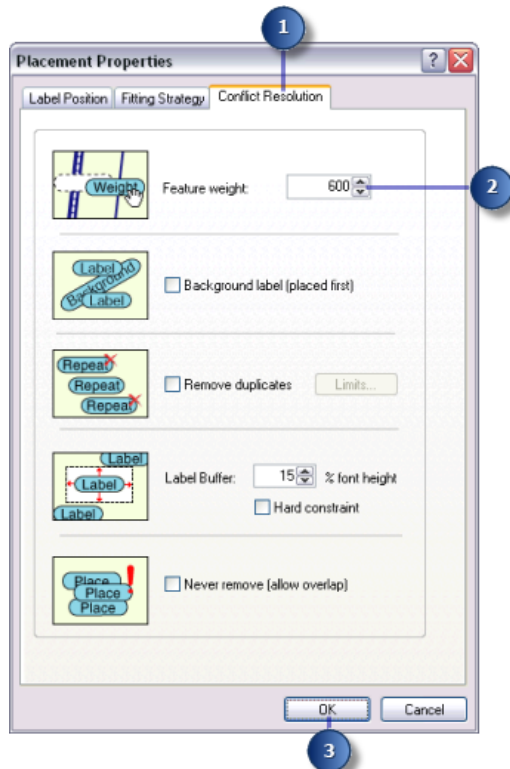
Adjusting the conflict resolution strategy for parcel lines

Now that you have set the label-fitting strategy for the parcel line labels, you will adjust the conflict resolution strategy.

Steps:

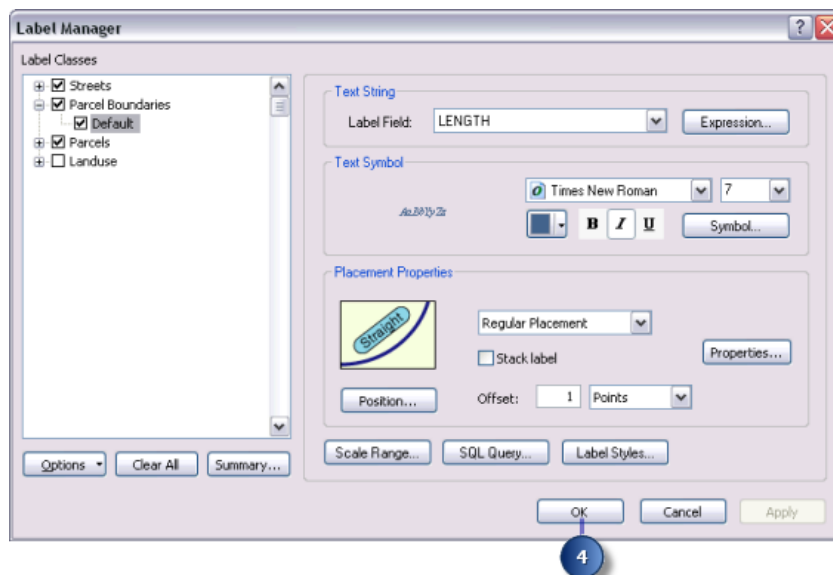
1. Click the **Conflict Resolution** tab.

2. Type 600 in the **Feature weight** text box.

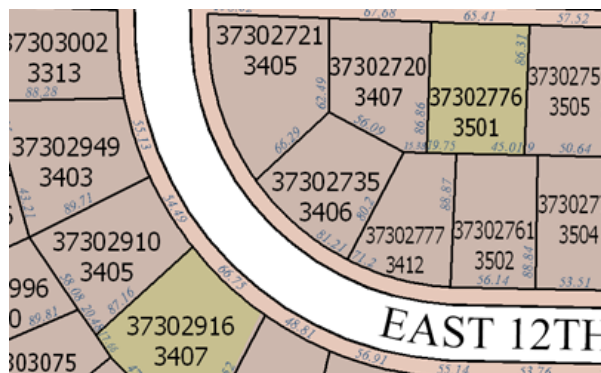


This is an intermediate weight value that will usually prevent labels from overlapping the parcel line features, unless the other positions are blocked by more highly weighted features.

3. Click **OK**.
4. Click **OK**.



You've finished setting the labeling parameters for the parcel line features; they are now placed according to the assessor's map requirements.



The perimeters of the parcel polygons are now labeled with the length of the parcel boundaries.

Exercise 4: Labeling the streets with their names

The streets are currently labeled with their street names. A common problem with street labels is that there are too many labels, because each street is represented by multiple features. You'll improve the street labeling by identifying these line features as streets for the Maplex Label Engine, which will then consider all street segments of the same name to be one feature for labeling purposes. Another common issue with street labeling is that the names of streets are often longer than the street features themselves. You will apply an abbreviation dictionary to the street feature labels to shorten the placed label when necessary.

Complexity:
Beginner

Data Requirement:
ArcGIS Tutorial Data Setup

Data Path:
C:\arcgis\ArcTutor\Maplex

Goal:
To label the streets with their names using the Maplex Label Engine line placement parameters

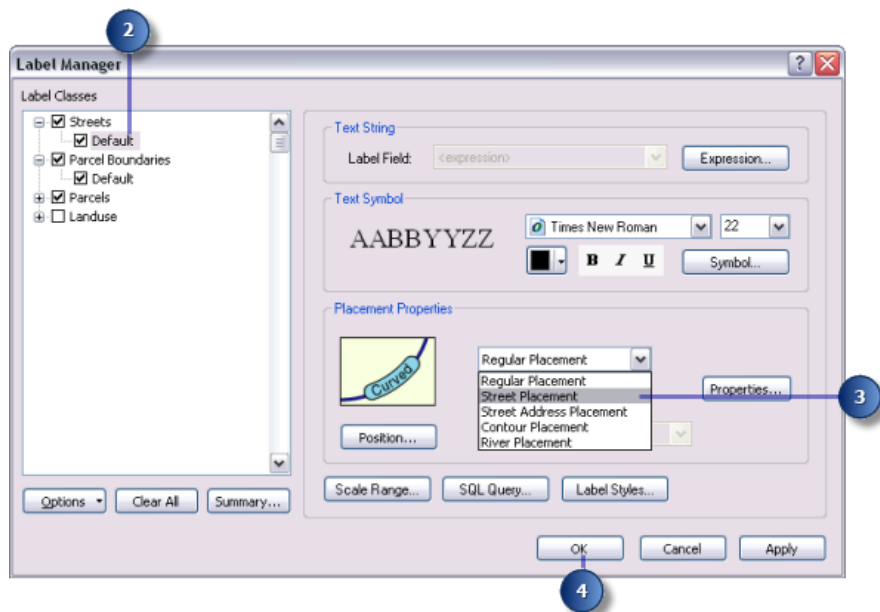
Applying the Street Placement style

Steps:

1. Click **Label Manager** on the **Labeling** toolbar to open the **Label Manager** dialog box.



2. Click the default label class under the Streets layer.



3. Click the **Placement Style** drop-down arrow and choose **Street Placement**.
Selecting **Street Placement** makes the ESRI Maplex Label Engine merge connected features with the same label for purposes of labeling.
4. Click **OK**.
The map is redrawn, and street labels are placed spread along their features.

Abbreviating the street names

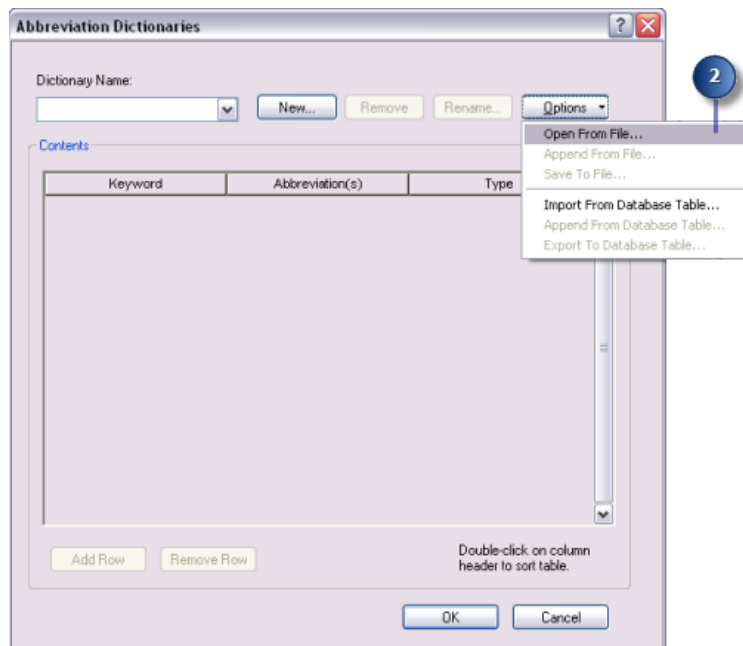
Several of the street features have names that are longer than their feature and result in a stacked label. Using an abbreviation dictionary will abbreviate the label if it will help the name fit along the length of the street.

Steps:

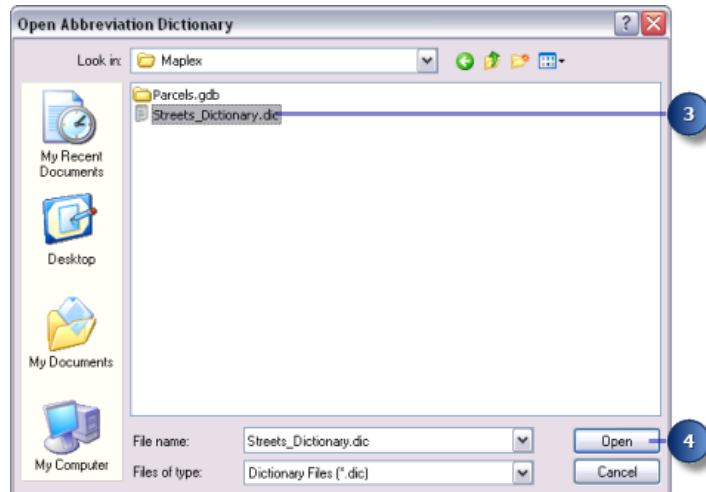
1. On the **Labeling** toolbar, click **Labeling > Abbreviation dictionaries** to open the **Abbreviation Dictionaries** dialog box.



2. Click **Options > Open From File**. The **Open Abbreviation Dictionary** dialog box appears.



3. Navigate to the Streets_Dictionary.dic dictionary in the Maplex directory where you installed the tutorial data. (C:\ArcGIS\ArcTutor is the default location.)



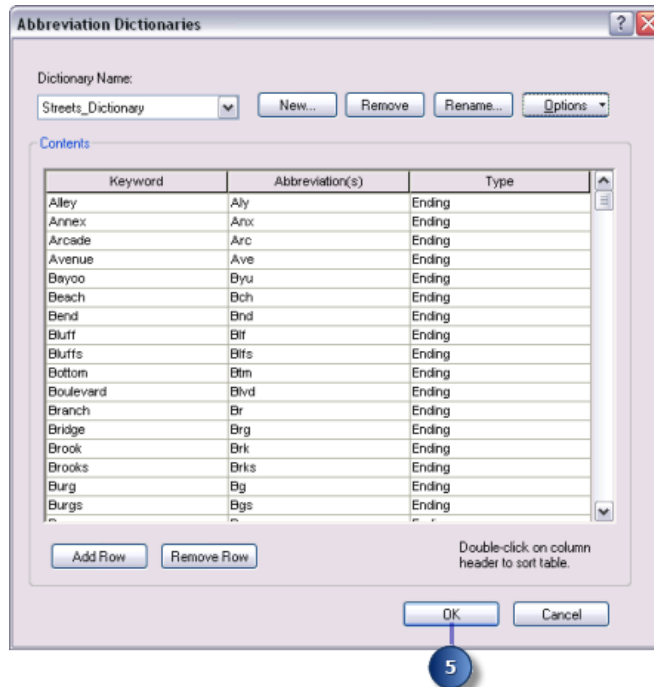
4. Click **Open**.

The dictionary opens in the **Abbreviation Dictionaries** dialog box.

There are three types of abbreviation dictionary entries: keywords, endings, and translations. Two of these types, keywords and endings, are only applied to words when the original string can't be placed because of space or label-to-label or label-to-feature conflicts. Translation entries are always applied to all matching words.

- Keywords can be applied to all words in a string except the last word. Use keywords to replace common words, such as Mount and International, with abbreviations such as Mt and Intl.
- Endings can be applied to only the last word of a string. Use this type of abbreviation to shorten street endings, such as Street to St, Road to Rd, and Avenue to Ave.
- Translations always apply to all words of a string. Translation entries may be useful when you translate a map into another language, when you want to remove words from a label string, or when you want all occurrences of a word to be abbreviated. Use this type of abbreviation to shorten long street names, such as Martin Luther King Boulevard to MLK Blvd.

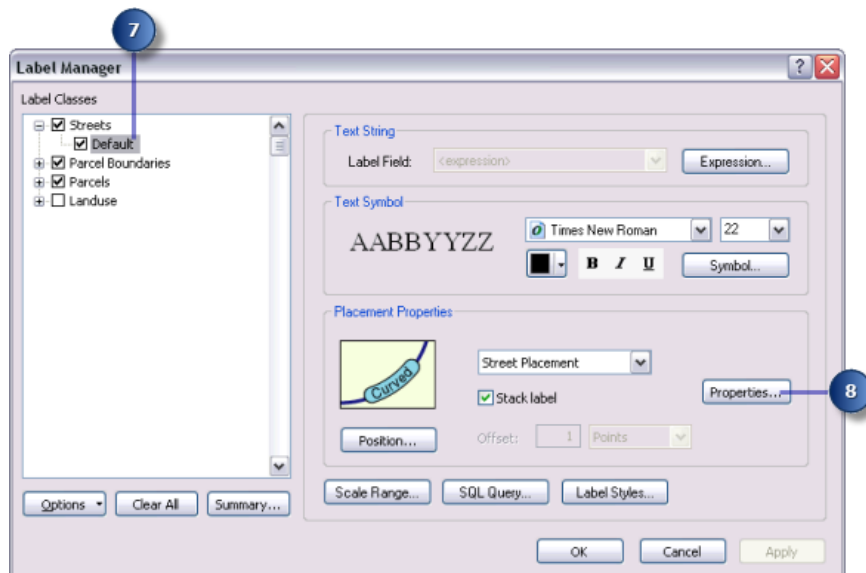
5. Click **OK**.



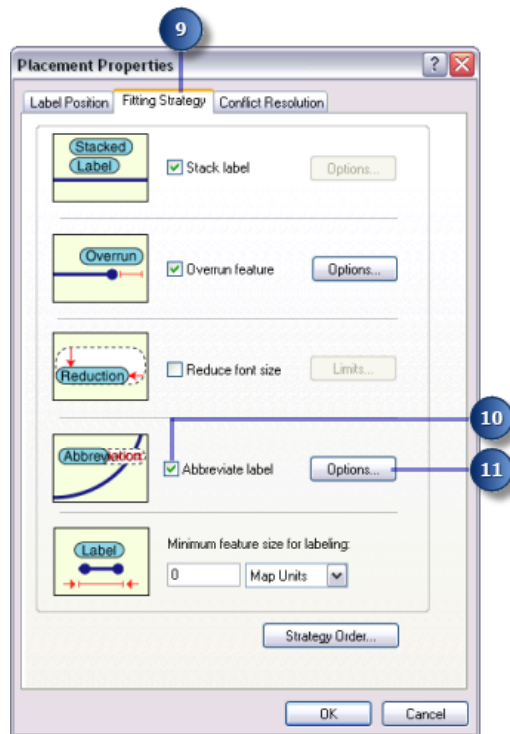
- Click **Label Manager** on the **Labeling** toolbar to open the **Label Manager** dialog box.



- Click the default label class under the Streets layer.



- Click **Properties**.
- Click the **Fitting Strategy** tab.



10. Check **Abbreviate label**.

11. Click **Options**.

The **Abbreviation** dialog box opens.

The current abbreviation dictionary is displayed in the **Dictionary Name** drop-down list. In this case, there is no dictionary being used.

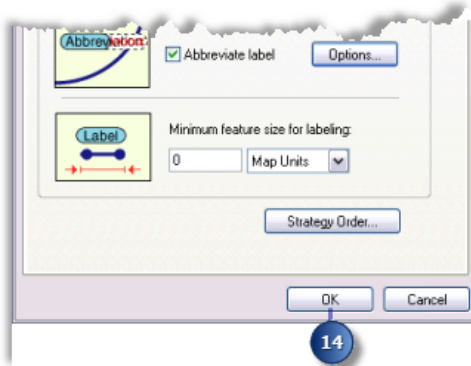
12. Click the **Dictionary Name** drop-down arrow and click **Streets_Dictionary**.



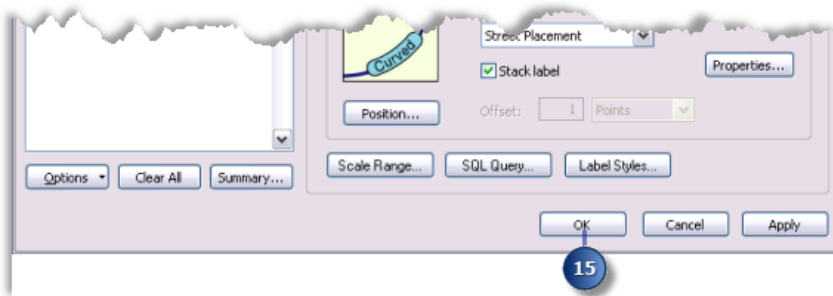
This applies the abbreviation dictionary to the label class.

13. Click **OK**.

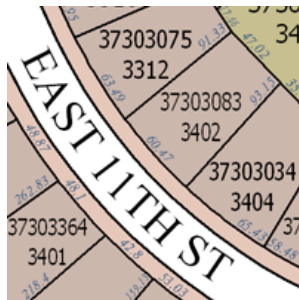
14. Click **OK**.



15. Click **OK**.



The labels are redrawn, and the abbreviation dictionary is applied. Areas where the full street label was unable to fit before now have the label abbreviated.



Change the label placement quality for the map

On the Labeling toolbar, there are two placement quality options: **Fast** and **Best**. **Fast** presents a quicker preview of the placed labels and is the default option. The **Best** option uses more complex placement calculations and places the labels in their final position.

Steps:

1. Click the **Placement Quality** drop-down arrow and click **Best**.



You've succeeded in using Maplex for ArcGIS to make the map labels conform to the assessor's requirements. At this point, you could switch to layout view; add map elements such as a scale bar, north arrow, and legend; and print the map for the assessor.

When you save this map with ESRI Maplex labels, it can be shared with others who have Maplex for ArcGIS installed on their computers, and the same parameters will be used to place the labels. People who have ArcMap but not Maplex for ArcGIS can also open your map and see the labels created using Maplex for ArcGIS. When Maplex for ArcGIS is not present, the map will open with the labeling parameters in a read-only state.

