

Spring 2010 - GIS 101: A Picture is Worth 1,000 Words...If You Can Get the One You Need

By Todd Lusk

Getting a DCGIS map into a PowerPoint presentation or a Word document can sometimes be a frustrating and time consuming task. Often the size or shape of the space available for the graphic doesn't match the size or shape of the map itself. This leads to "stretching" and "squeezing", which can ultimately lead to a less than desirable cartographic product in the finished presentation or document. Just by using a few tricks and tips that the Office of GIS has identified specifically to help get DCGIS maps into Microsoft Word and PowerPoint graphics, the process can be made much smoother and will result in a better final product.

The easiest way to get a map from a web browser into another program is by using the built-in "right-click" menu in Windows. Once the desired map is on the screen, simply right-click in the map area and choose "Copy" or "Save Picture As..." The "copy" option will place a version of the map on the computer "clipboard" and it can then be "pasted" into another program. The "Save Picture As..." option will save the map as either a JPEG or Bitmap image to any place on the computer, from which it can then be inserted into another program.

Moving from easiest to a bit more difficult, the next way to capture a DCGIS map is by using built-in screen capture capabilities in Windows. This technique literally takes a snapshot of what is displayed on-screen and places a copy of it on the clipboard. From there the image can be converted into a more graphic-friendly format and inserted into a PowerPoint slide, Word document, etc.

There are two primary ways of using the built-in capabilities of the computer; one captures what is displayed in the "active" window, while the other captures everything displayed on the desktop (all open windows, the desktop background, etc.). To do the first, simply click on a window to make it active and press the key combination of "Alt" and "Print Screen".

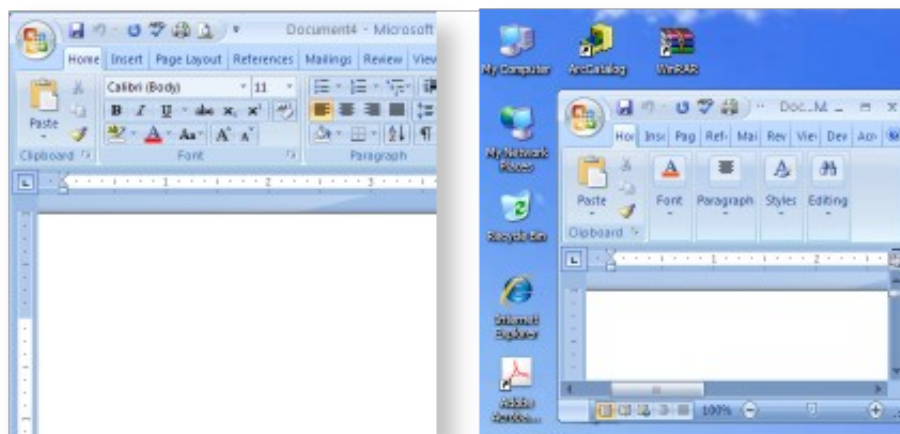


"Ctrl", "Alt" and "Print Screen" buttons on a keyboard. Locations of the buttons can vary.

(This combination may also be written as "Alt + Print Screen". Either notation literally means, "Hold down the 'Alt' button and press the 'Print Screen' key.") The other method is the same, except it uses the "Ctrl" and "Print Screen" buttons. The methods vary in what they capture from the monitor. The first method, Alt + Print Screen, captures an image of only the active window. The second, Ctrl + Print Screen, captures an image of the entire desktop and not just the active window. In either case, it will not appear to the naked eye that anything happens when the keys are pushed; however, in actuality an image captured from the monitor has been placed on the computer's "clipboard".

Using the second method can be useful if you are trying to display more than one application or window at once. However, using it may also mean that the resulting image will need to be cropped to keep unwanted background

clutter from being displayed in the image.



Alt + Print Screen vs. Ctrl + Print Screen

From the clipboard, the graphic can be “pasted” into to just about any Windows program by simply going to that program’s “Edit” menu, then to “Paste”. There are options for “pasting” the graphic into other software packages and converting the format into something more standard, but generally that is not necessary if you are using Microsoft Office products running on Windows.

A common problem encountered is the final image not fitting perfectly into the space available. The temptation to “squeeze” or “stretch” the image without some careful consideration can result in an odd looking graphic. This problem can be avoided by being sure to only resize the image by grabbing onto any of the four corners and dragging to resize the graphic. Typically, using this technique preserves the aspect ratio of the image and does not result in the graphic looking like it was stretched to fit the space available. Sometimes there are tools built into the image handling capabilities of program that allow for the preservation, or “locking”, of the aspect ratio on the graphic, thus preventing it from being stretched.



Example of an image that has been “stretched” to fit.

A technique that eliminates any possible “stretching” problems is to size the window being captured into roughly the same size as the space available for the graphic, BEFORE you capture the image. For example, if inserting a DCGIS map into a PowerPoint slide, it is best to try to size the DCGIS window into about the same size as the PowerPoint slide. A PowerPoint slide is approximately 10” wide by 7” tall. So, making the DCGIS window roughly match that size will help make the image look its best in the slide. The window could also be sized to something more “square” (for example, 7” by 7”) to make room for text or other graphics on either side of the image.

All of these techniques have different advantages and disadvantages, depending on the situation. One drawback to all of them, however, is the quality of the graphic that is “captured” from the monitor. The quality of the image is only as good as the resolution of the monitor they are displayed on. In most cases, that is 96 dots per inch (or DPI). That resolution works well for display purposes like PowerPoint presentations, but it can be a limitation if the

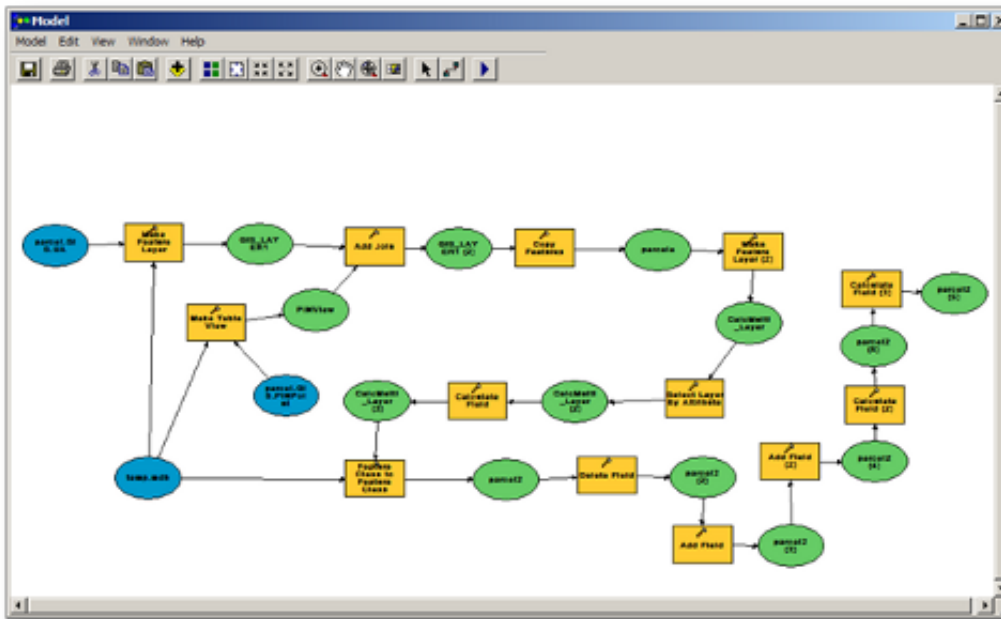
graphic ends up in a printed product. At some point it may be best to consult with a GIS Specialist who can easily and quickly design a custom graphic at an appropriate size and resolution to fit its targeted use.

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Spring 2010 - Tech Talk: Geoprocessing with Python

By Kent Tupper

If you have the need to do regular updates or processing of your GIS data, the tool you are looking for is Python. The Python scripting language is simple to learn, the code is easily readable, and Python is free and has a widespread community of users. Python is platform independent, but for the purpose of this article we will be describing its use on Windows with ArcGIS 9.3.



The ESRI geoprocessing object has access to over 500 geoprocessing tools. There have been some changes to the geoprocessing object between ArcGIS versions 9.2 and 9.3, so depending on your version you will need to consult the appropriate ArcGIS documentation.

The easiest way to create a Python script is to create a model in ArcGIS and then export it to Python. Use the ArcToolBox tools you need to achieve your desired model result, then from the "Model" pull down menu select "Export > To Script > Python...".

```

gp.AddToolbox("C:/Program Files/

# Local variables...
SDEPINPoint = "Database Connecti
ParcelShapes = sys.argv[1]

parcelp_shp = ParcelShapes+"\\pa

# Process: Feature Class To Feat
gp.FeatureClassToFeatureClass_co

try:
    # add a field to parcelp
    gp.AddField_management(p

except:
    #If an error occurs when
    print "Error" #gp.GetMes

```

At that point, you can be done if you want to be, because that's all it takes to create a Python script. You can then call your Python script from Windows Scheduler and run it nightly, weekly or with whatever frequency you desire. Now, depending on how, where or which user runs the script, you may need to modify your script to run properly. To do this, you need to edit your Python script by right-clicking your Python script file in My Computer or Windows Explorer and select "Edit with IDLE". IDLE is the Python script editing environment. Python scripts (.py extensions) are actually text files that could be opened and edited in Windows Notepad, but with IDLE you have some debugging capabilities and other aids to formatting your script. There are other tools available to help you edit and create Python scripts so check around.

Now that you've learned the basics, you can use Python scripting to create processes and ArcGIS tools. A simple example would be to take data from a SDE feature class and convert it to a shapefile, then add some attributes. There are also many other functions available to you through Python to process information beyond the capabilities of the geoprocessing object. One example is a script that Dakota County developed to give us the ability to

quickly add an event layer to our existing emergency response map PDF documents indexed using the US National Grid (USNG) and generated by the Map Book extension. Rather than regenerate the entire map series with the new event theme added, it was much faster to create a new series of PDF's with just the new event layer. Then, through Python, we used another custom object freely available to merge the two PDF documents into a new set of PDF's that displayed the new event on our emergency response maps. This saved the time of generating a large number of maps that contain multiple vector and raster feature layers with complex labeling and symbol rendering.

There is great potential available through Python scripting, and this article just barely scratches the surface. For more information on Python go to www.python.org or consult your ArcGIS documentation.

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Spring 2010 - Department Spotlight: Water Resources Department Brownfield and Contaminated Sites Program

By Cathy Udem, Dakota County Water Resources Department, and Randy Knippel, Dakota County Office of GIS

GIS makes it possible for a lot of different people to see data from a variety of sources. This creates the opportunity to find information useful to you that you didn't even know existed, or, conversely, to allow others to see your data and draw additional value from its availability. The Water Resources Department generates GIS data to support several of their business processes. That data can also be very useful to cities interested in redevelopment and economic development.

The Brownfield and Contaminated Sites Program within the Water Resources Department identifies and assesses sites that have or may have been contaminated by previous site activities. To help track their work, they maintain several GIS layers and make them available to city and county staff as an online reference through the Dakota County GIS (DCGIS) (see Figure 1 below).

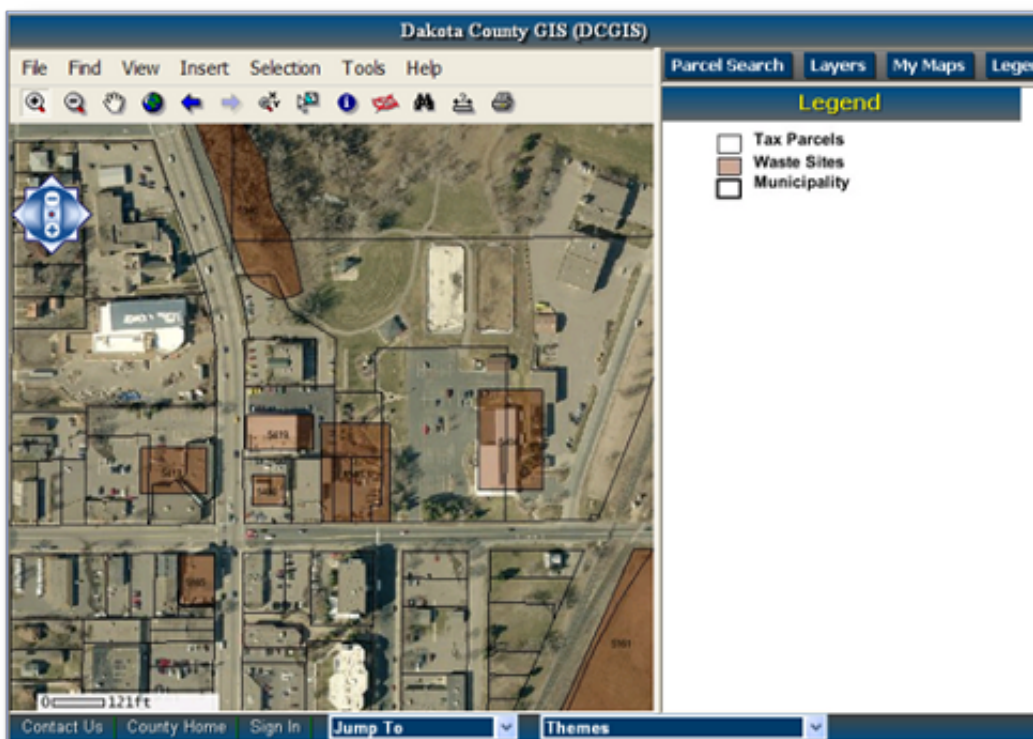


Figure 1 - Waste sites in DCGIS

A perceived or real environmental blight often leads to parcels of land that are unused or not receiving proper cleanup. In cities, this can lead to “Brownfields” – vacant lots serving no practical purpose. These Brownfield lots may sit idle for years because the owner, or a potential developer, is required to clean up the contamination, which could be an expensive operation.

At the same time, cities are actively involved in encouraging development and redevelopment. This can revitalize a city and encourage economic growth by increasing the value of property and corresponding tax revenue. This activity can be modeled with GIS by representing current and future development (see Figure 2 below).

Brownfields add complexities to these efforts and may be avoided in favor of property that is easier and has less upfront cost to develop.

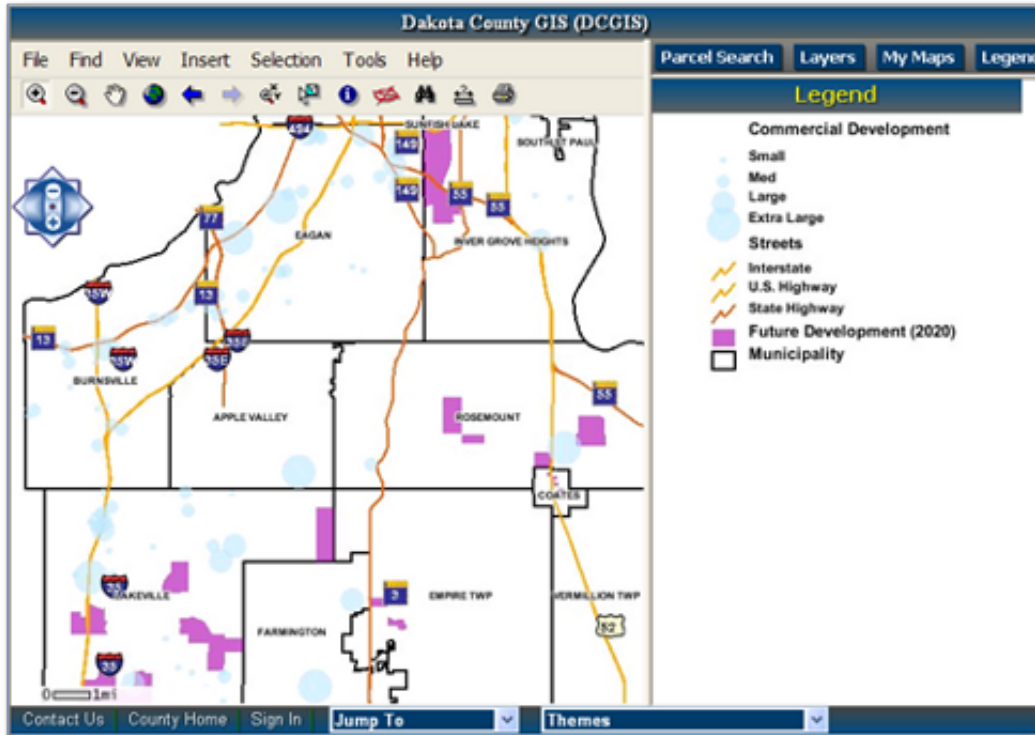


Figure 2 – Development activity in DCGIS

However, with GIS, these two interests can be aligned to create synergy by finding where the priorities of each overlap. Brownfields can be analyzed and prioritized based on the materials present and the risk to surrounding residents. Redevelopment areas can be prioritized based on economic development potential and proximity to complementary features in the community. The two priority areas can then be overlaid to create a cumulative priority where both interests have high priorities. Or, one priority can influence the other based on specific opportunities that may arise at any time. Additionally, new layers can be added to represent current redevelopment priorities or areas with high potential. Finally, derivative GIS layers can be produced representing the intersection of agreed-upon criteria in multiple layers that best represent mutual interests.

A variety of funding sources are available for acquisition, investigation, clean up and redevelopment of Brownfield sites. Brownfield redevelopment funding is available through numerous Federal and State sources that counties and cities may apply for independently. However, if the County and the cities work together to apply for funds based on common goals and priorities and sound analysis using GIS, it could increase the chances for being granted those funds and lead to greater benefits to the community and its residents.

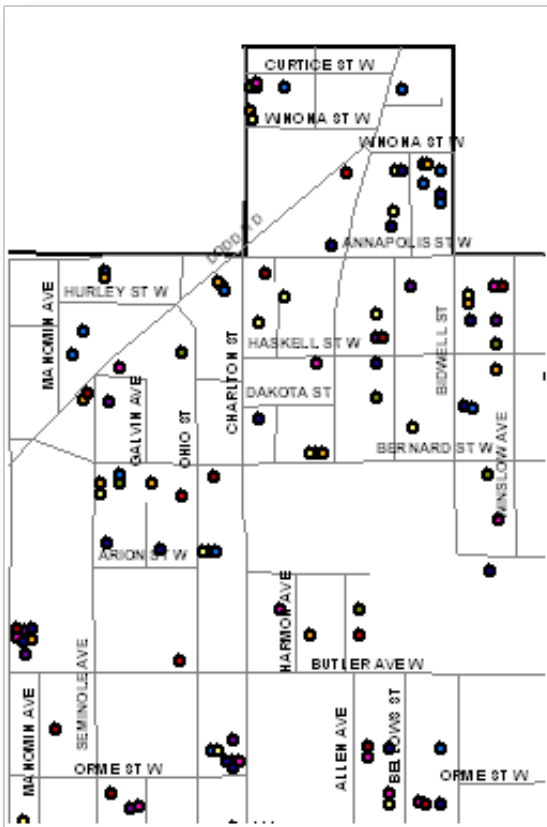
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Spring 2010 - Desktop GIS: Auto-labeling in ArcMap

By Scott Laursen

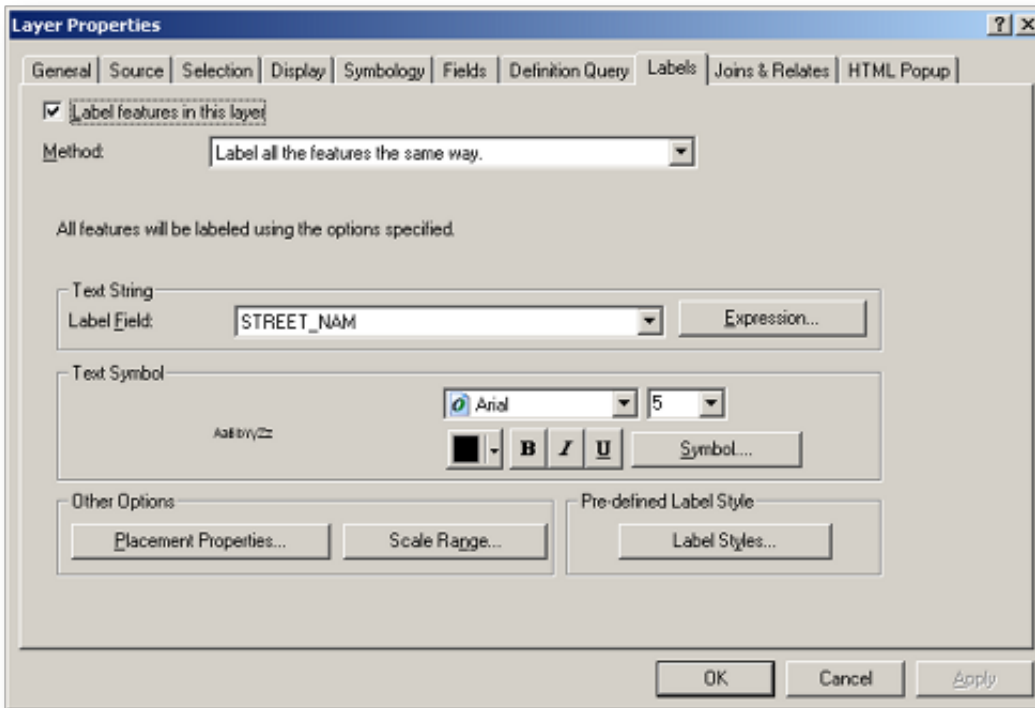
Labeling is one of the most common tasks that a GIS professional does. Practically every map contains features that require some kind of label. Unfortunately, labeling every feature by hand can be tremendously tedious and time-consuming. Sometimes it is necessary to do it that way, but oftentimes it is easier and just as effective to let the software do it for you.

Look at the street names on this map image. The map shows the locations of properties that have received home improvement grants over the past several years from the City of West St. Paul. The purpose of the map is to show the relative locations of the properties throughout the city. The precise location of each individual property is not important - what matters is the overall trend over time. As a result, it is not important that each street be clearly identified - the street labels are just there to serve as references. Labeling the streets on this map by hand probably would have taken me at least ten minutes to do, including time it would take to tweak each of the locations. On this map, however, the street names were auto-labeled. In other words, ArcMap did the labeling for me. I set up a few simple rules to guide the placement, and then let the software make the placement decisions, which it did within seconds. Many of the streets have at least one label on them; the ones with multiple labels are nicely spaced; and all of the labels are uniformly located above the street centerline. Is every label placed in the perfect position, exactly where I would have put it myself? No. Is the placement good enough for this particular map, based on its stated purpose? Definitely.



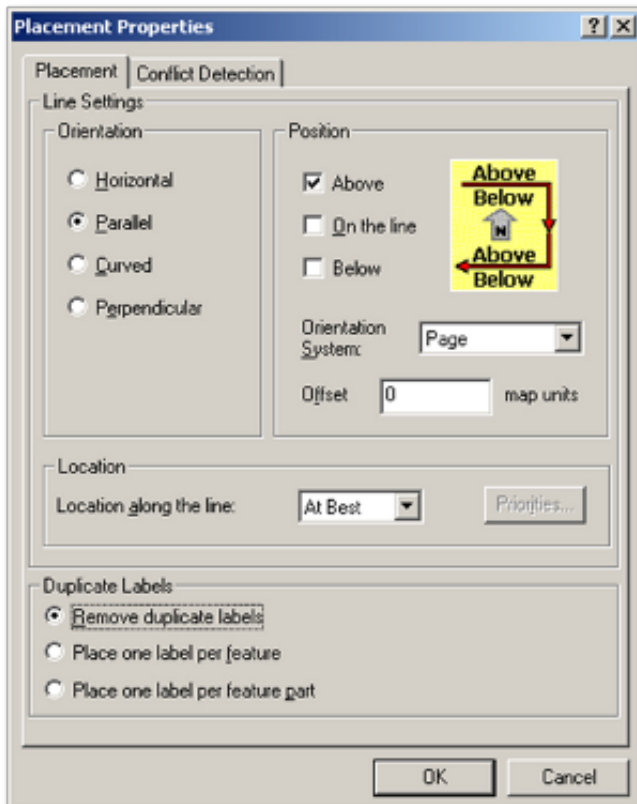
When ArcMap auto-labels a layer, it looks at one of the fields in that layer's attribute table and puts a text string of what it finds there for each record onto each corresponding feature on the map. Basic auto-labeling in ArcMap is very simple to do. The easiest way to auto-label something is to simply right-click on the layer name in the Table of Contents and then select Label

Features. That will turn on the auto-label function, and labels will appear on your features. Now you have your labels, but at this point you have no control over what shows up or where it appears. To define some basic issues and set some rules, you need to open the Layer Properties window, again by right-clicking on the layer name in the Table of Contents. Auto-labeling is flexible enough to offer multiple labeling options to allow you to generate simple labels or more complex ones, as you desire.



Here is the Labels tab in the Layer Properties window. This is where you control the specifics of auto-labeling for each layer. Note the check box in the upper left corner. Putting a check there is the same as selecting Label Features after right-clicking on the layer name in the Table of Contents – it simply turns on auto-labeling. In the middle of the window is the Text String definition area. You can choose an existing attribute field to use as your labels, or you can create your own label using the Expression... option.

Clicking on the Placement Properties button, in the bottom left corner, brings up this window:



This is where I set up the rules that I want ArcMap to follow when it decides where to place my labels. Since this layer is a line layer, it gives me Line Settings options. Different options are offered when labeling points or polygons. As you can see, I can tell ArcMap where I want the label to go in relation to the line, and also how many labels I want each feature to have. If I click on the Conflict Detection tab I get options for defining how important these labels are in relation to other labels and features. I can also force the software to override the conflict-detection rules and simply put a label down, whether it overlaps with another label or not.

Auto-labeling has its limitations. While I can set up rules to guide the placement of the labels, ultimately the software is deciding where to put them. It can be frustrating when labels don't appear in the places where you need them to go. Also, if your map has a lot of layers with a lot of labels, the basic rules you can set up may not allow you the flexibility you need to get the look you want. High-end users with complex labeling needs would probably be best served by using the Maplex extension, which offers many more options to the user. However, for basic maps that just need simple labels, I recommend trying out ArcMap's auto-label function.

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