This document presents information on the current County Section Number Key Sheet Specifications, and the County Key Sheet Application.

County Key Sheet Extension ArcGIS Version 10x

The following information describes how to use the Florida Department of Transportation (FDOT) Transportation Data and Analytics (TDA) County Key Sheet Extension. Contact the TDA Office to obtain the County Key Sheet Extension installation package. The office can be reached at 850-414-4848, or toll free 1-800-399-5503.

System Requirements

The Key Sheet Extension will run in ArcMap 10x. Keep in mind that the Key Sheet Extension may not support the most recent release of ArcGIS until the TDA has had the opportunity to recompile the code, if necessary and test against the latest version of ArcGIS. At present, we officially support ArcGIS 10.x.

An Internet connection is also required to install or update the extension as well as download the necessary data. It is strongly suggested that you have a broadband connection (DSL, Cable etc.). The Key Sheet Manager must download the latest extension version and affiliated data from a site on the Internet.

To install the extension successfully, your user ID will require sufficient permissions to read and write to the Windows registry. The Key Sheet Manager will not be enabled if user permissions are insufficient. If the installation process indicates that the extension was not installed correctly, please contact your system administration personnel or install with a user account that has sufficient power to write to the registry.

Note: After installing the extension and using the tools, you may find that the Key Sheet Extension mouse cursors are white (they should be black). We have determined that older video card drivers can create this issue. If you find that the cursor color is white, when using Key Sheet extension tools, please make sure that you have the latest video card driver installed. These drivers are usually available from the video card maker's web site.

Installing the Extension

The Key Sheet Extension must be installed via the Key Sheet Manager application. The Key Sheet Manager application installs the extension, downloads the necessary data and layer files, and creates the folders needed to store the Key Sheet map documents that are created. In addition, the manager will also uninstall the Key Sheet extension, provide a mechanism for updating the extension software should TDA implement changes, and allow the user to change the Key Sheet workspace.

- Before running the manager, create a folder that will be used to store your Key Sheet work, if you do NOT want to use the default location. The default location will reside under the "Local Settings" folder corresponding to your user ID. If you want an alternate location, create the folder and then run the manager. For this example, I have chosen to have my Key Sheet work reside on the hard drive, in a folder called "C:\KEYSHEET_WORK". This will be the root folder, or "home base" for all the Key Sheet mapping work.

- The manager package is contained in the KEYSHEET_manager_NET.zip archive. Copy this archive to a folder on your computer and unpack all the contents.
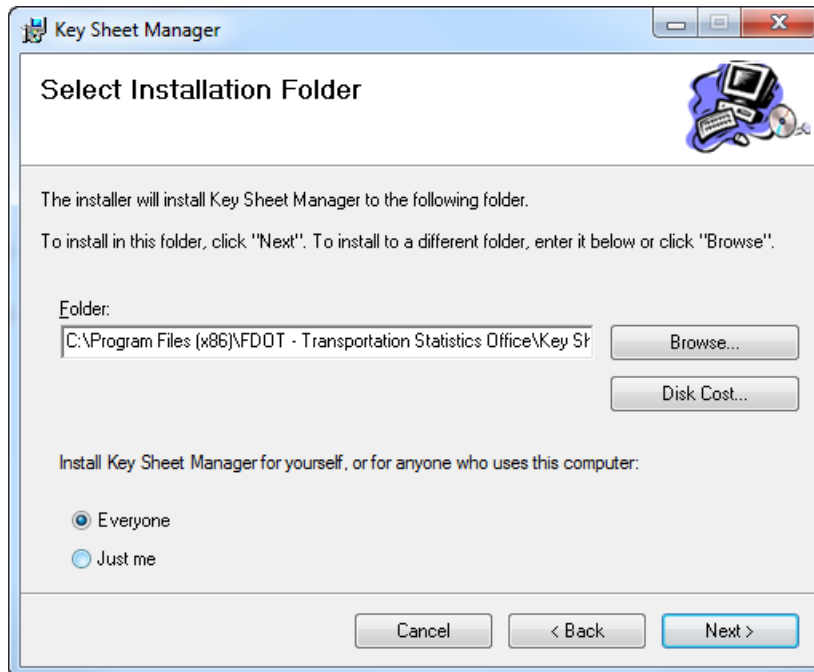
- After unpacking the archive, double-click on the setup.exe file. This will install the Key Sheet Manager application on your computer.
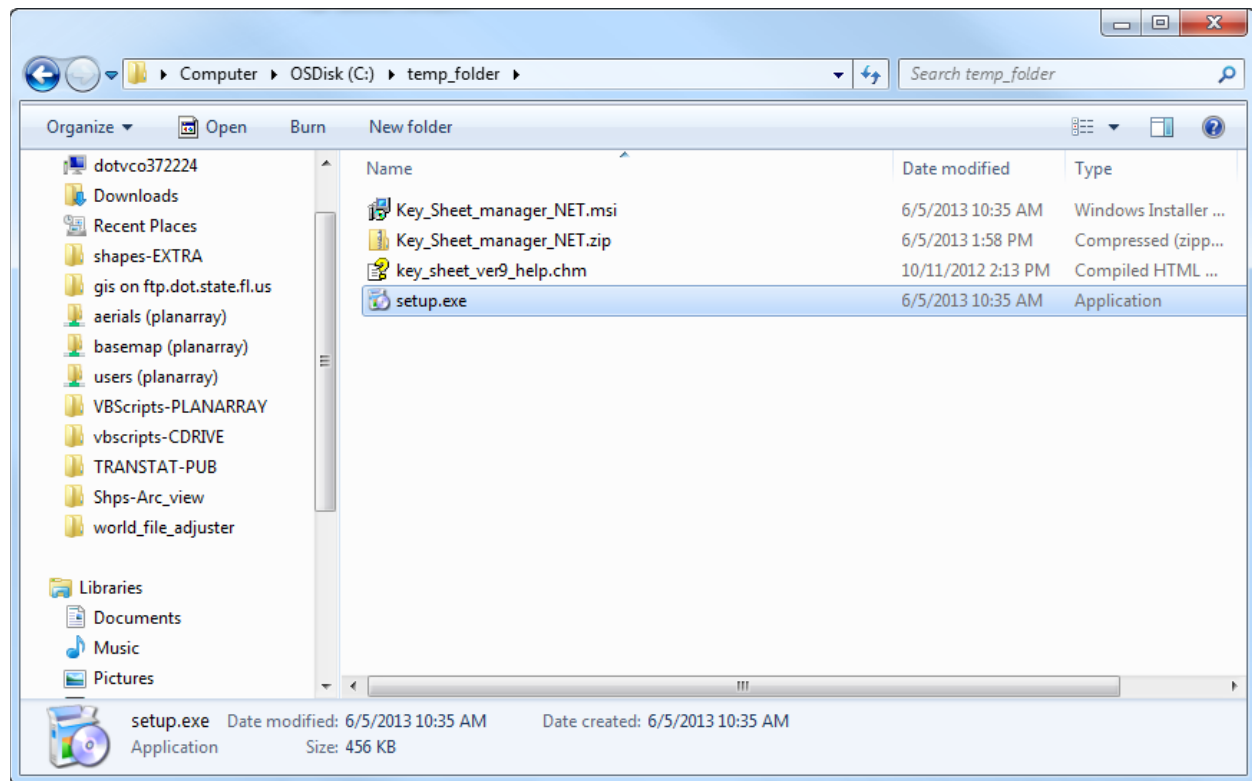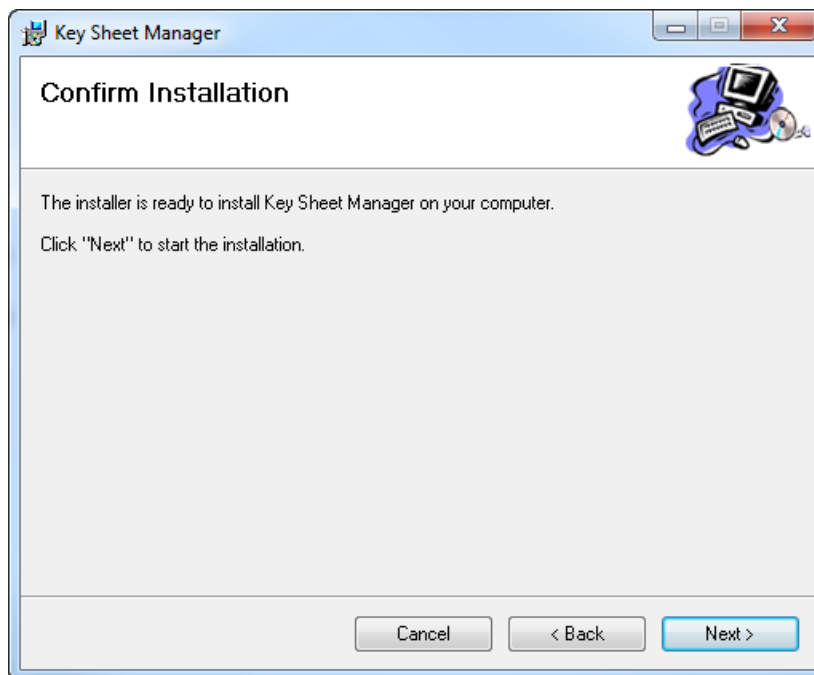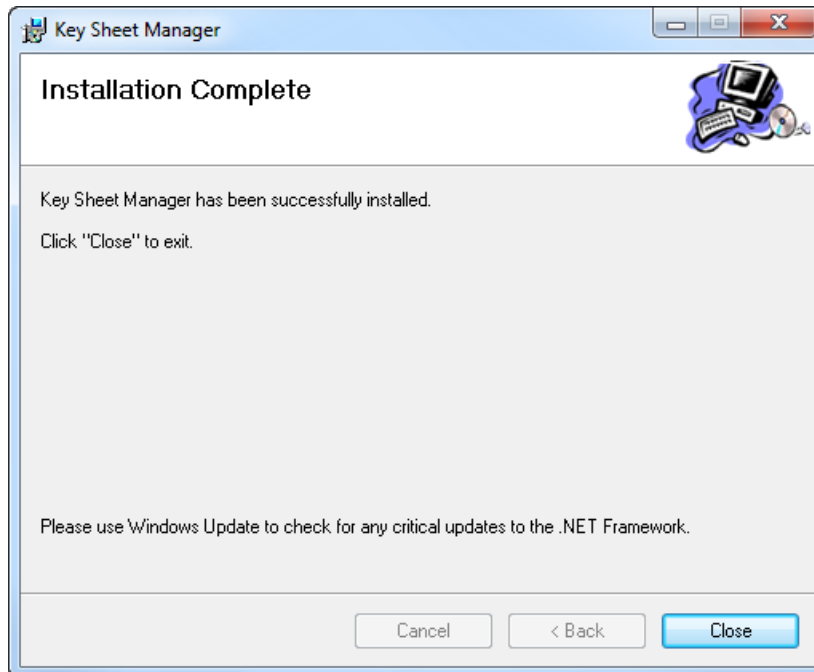

- Click "Next"

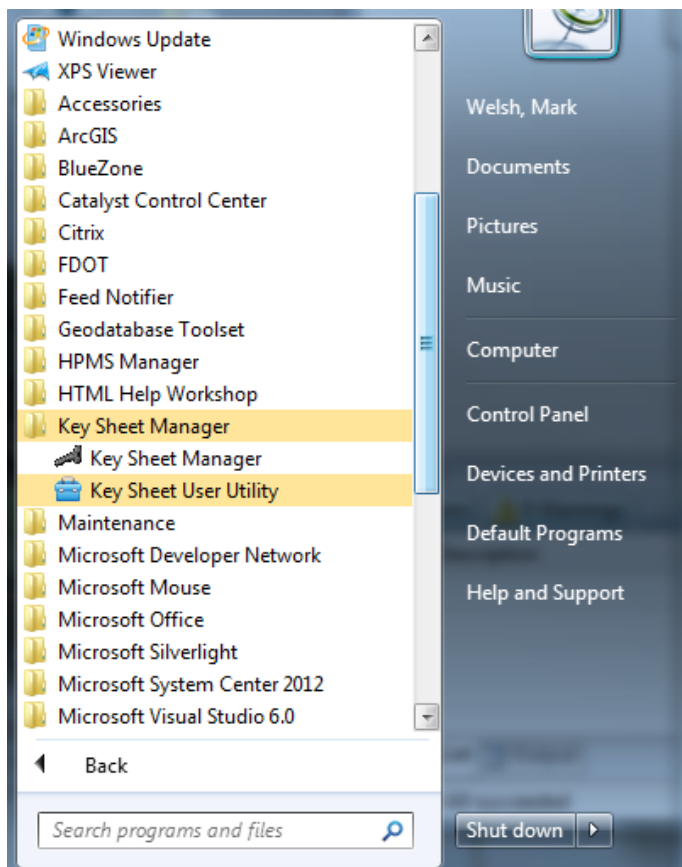- Accept the default folder for installation, then click "Next"

- Click on the "Next" to finish the installation:

- This indicates the manager was installed correctly:

- The Key Sheet Manager can now be run from this location:

Note: If you did not successfully install the Key Sheet Manager, please contact your System Administration staff to assist. You may also call the Systems Support Section in TDA, Central Office (850-414-4848 or toll free 800-399-5503).

The Key Sheet manager is used to install the Key Sheet Extension into ArcGIS, setup the Key Sheet work area, and update the Key Sheet Extension when new versions are available. In addition to the Key Sheet Manager, there is an additional utility (Key Sheet User Utility) that allows any user to refresh their Key Sheet Data, move their Key Sheet Home, and refresh necessary layer and/or graphics files.
Note: The Key Sheet Manager requires the user to have administrative authority. The Key Sheet Utility can be run by any user since its only purpose is to download and manage data.

- To install the Key Sheet Extension, launch the Key Sheet Manager:

- Click the "Set Up" button.
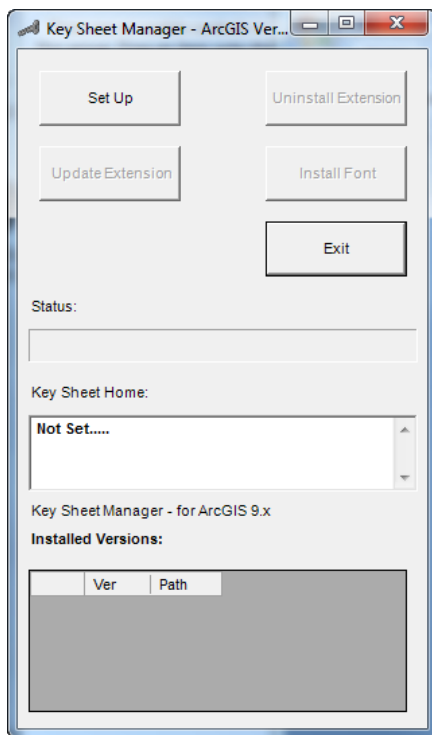
- Next, you will be prompted to specify your Key Sheet work home:
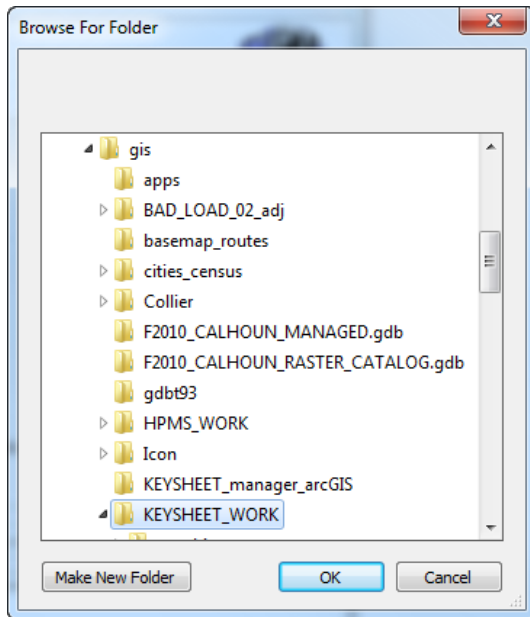
Note: For this example my Key Sheet home will be in a folder on my C: drive. This folder is "KEYSHEET_WORK".

- After you have selected the folder, click "OK".

- The manager will proceed to make the necessary folders, download the Key Sheet Extension and install it, and download the necessary data. If any problems arise during the installation, please contact TDA Systems Support Section, Central Office, or your System Administration staff.

If you have had a previous Key Sheet home specified, the manager may ask if you'd like to keep this location:
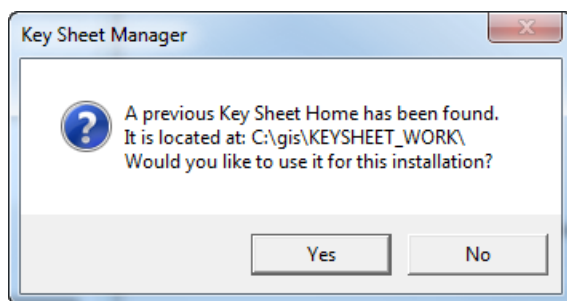

Note: You may see the following system warning. The Manager requires Internet connectivity, and your firewall may warn you. Please allow the Key Sheet Extension and Manager to have access to the internet. This is required to download the extension and necessary data.

Click "Unblock" to allow this application to proceed with the downloads.

- The Key Sheet Extension will now be installed on your computer. Click the "Exit" button on the Manager. You are ready to proceed with using the Key Sheet Extension.
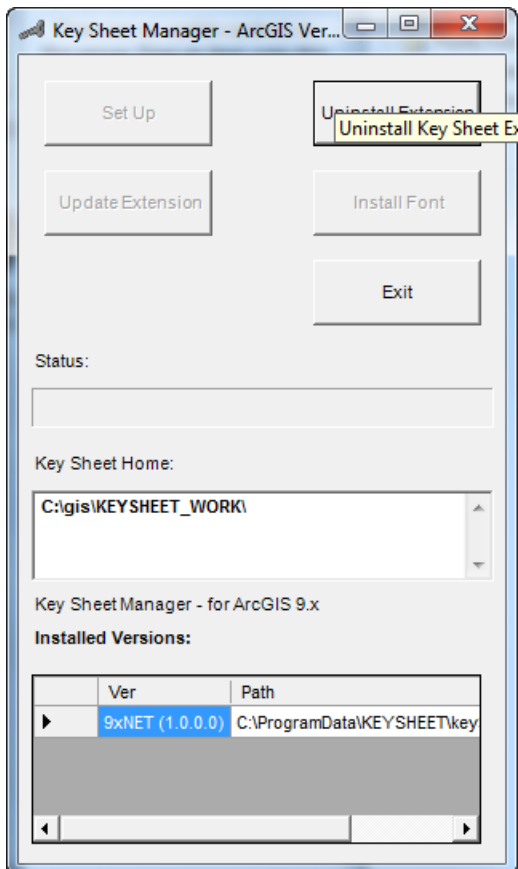
Note: The Key Sheet Manager will now show where the Key Sheet home folder is.

When you install the extension, a new set of necessary GIS data will also be downloaded for making Key Sheet maps.

The manager also installs the latest extension version, should an update become available. If your computer has an internet connection, you may be alerted through ArcMap or the Key Sheet Manager that a new extension is available for download. This alert will happen right after you start an ArcMap session:
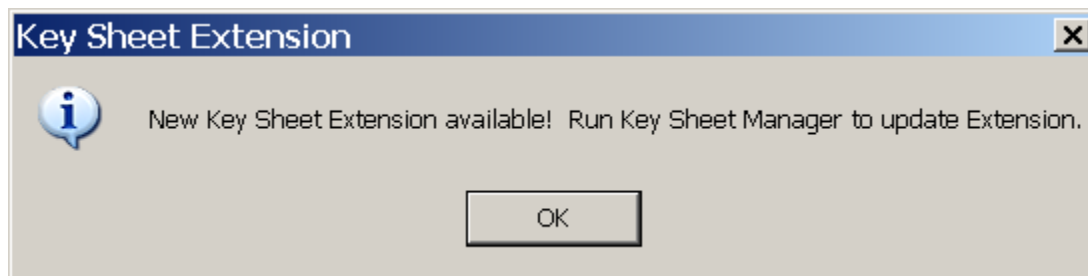

You can choose to ignore the update reminder and work with ArcMap as usual, or you can close ArcMap and run the Key Sheet manager to get the new extension. Start the manager and click on the "Update Extension" button to get the newest version.

Installing the Key Sheet Extension or updating it is only done through the Manager, as described above. These steps require a user with administrative capabilities.

If a user simply wants to download new data, move their key sheet home, or get the latest layer files or graphics, they will run the Key Sheet User Utility. This program does NOT require administrative rights. It can be found here:
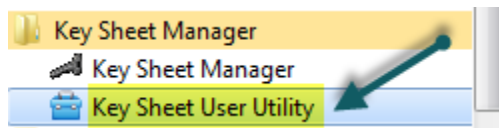
When you run the User Utility this is what the user interface looks like:
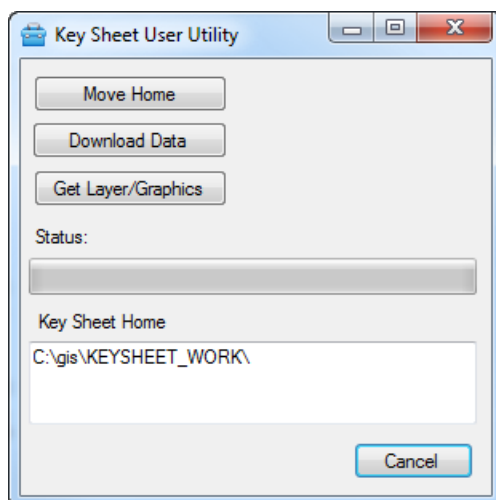
If you want to get the latest layer files, click on "Get Layer/Graphics". Layer files are used for the symbolization and some labeling aspects of the Key Sheet Extension. As map standards change, it would be prudent to periodically refresh the layer files in your Key Sheet work area. Also, you can use the utility to refresh the datasets used for the Key Sheet as well as moving the Key Sheet home to a new location.

Note: When moving your Key Sheet home to a new folder, make sure that you have properly configured ArcMap as it relates to relative paths. If you have not set the relative path option correctly, after you move your Key Sheet home, the layers in your map document may no longer point to the correct data sets. Please see ESRI documentation on relative paths for more information.

The Key Sheet Extension relies on a special font set. ***Please examine the first map that you make to make sure that the Florida toll road symbols show in the legend***. If they are missing, reboot your computer and then try making the map again. The green toll road shields should be present in the legend after rebooting. In the future, if this font is missing from your windows font folder, ArcMap will not enable the Key Sheet extension. If the Key Sheet Manager finds the font missing and/or not correctly registered, the Install Font button will be enabled. You can use the Key Sheet Manager to reinstall the font should this prove necessary.

Finally, by clicking on the "Uninstall Extension" button, you can remove the Key Sheet Extension from the computer. **Note:** the Key Sheet home folder and any work and datasets stored in that folder will *NOT* be deleted.

Using the County Key Sheet Extension
This next section describes how to use the Key Sheet Extension. To achieve the best results, it is suggested you follow the map production steps in the order outlined below. The basic process is to first create a county map document, delineate where insets are needed, clean up any Roadway label conflicts in the county map and any inset maps, add additional labels, and finalize Key Sheet layouts and create Portable Document Format (PDFs) versions of your maps.

Activate the Key Sheet Extension
After the Extension has been installed by the manager, start ArcMap. Click on the "Tools" option on the Menu bar. Then click on "Extensions…" You will see this dialog:
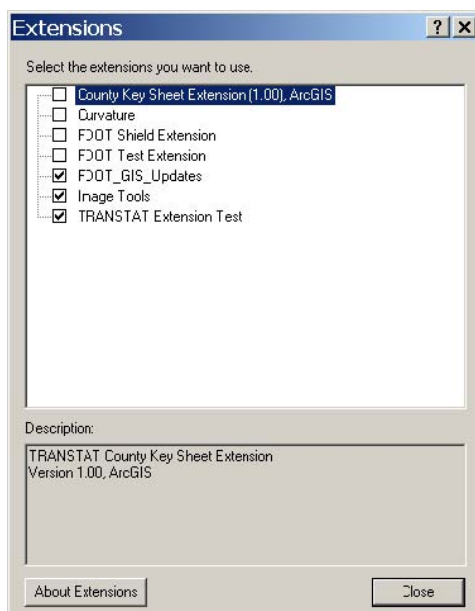
Check the box by the "County Key Sheet Extension…" This will make the toolbar visible. You can dock the toolbar anywhere on the ArcMap interface that you find convenient.

Note: The toolbar has a lot of buttons, select a location that makes all the buttons visible.

Dismiss the Extensions dialog by clicking on "Close".

Key Sheet Toolbar
The Key Sheet toolbar contains all the functionality needed to make a county Key Sheet map. The tools are arranged in the following manner:
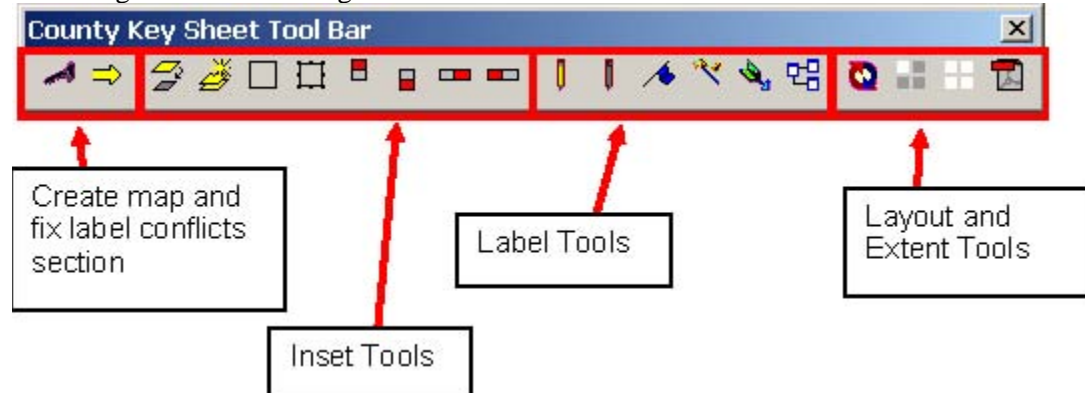
Note: Some tools may not be enabled, depending on the current state of your map document. If a tool is disabled it simply means that the state of the current map document does not support this tool's functionality.

Create a Map Document
After you have enabled the extension in an empty map document, the only tool that will be available is the initialize Key Sheet map button (the first on the toolbar):

Note: if you are in page layout view, switch to data view to enable this button. Also, the Key Sheet extension will allow you to render off-system or on-system features. This documentation describes the on-system maps, but the off-system maps are done in the same manner.

Click on the initialize button.

You will be prompted to select a county, and indicate if only Turnpike segments are to be shown (check the box by "Turnpike Only"). You can also specify if the map will show off-system roadways. The default behavior is on-system.

Select the county from the drop-down list.

Click "OK" and the map production process will begin. Please wait for the process to complete before attempting any other ArcMap functions.


If the map document already exists, you will be prompted to overwrite the existing map document with the new version. If you click yes, the previous version will be deleted and replaced with the new version. If you click no, the previous version will be "archived" with a file name that indicates the county name, map type, and date the archive was made (e.g.; **Bradford_backup_2_27_2007_12_35_56_PM.mxd**). If you want to, you can use this renamed map for other purposes.

You now have a new county Key Sheet map document:
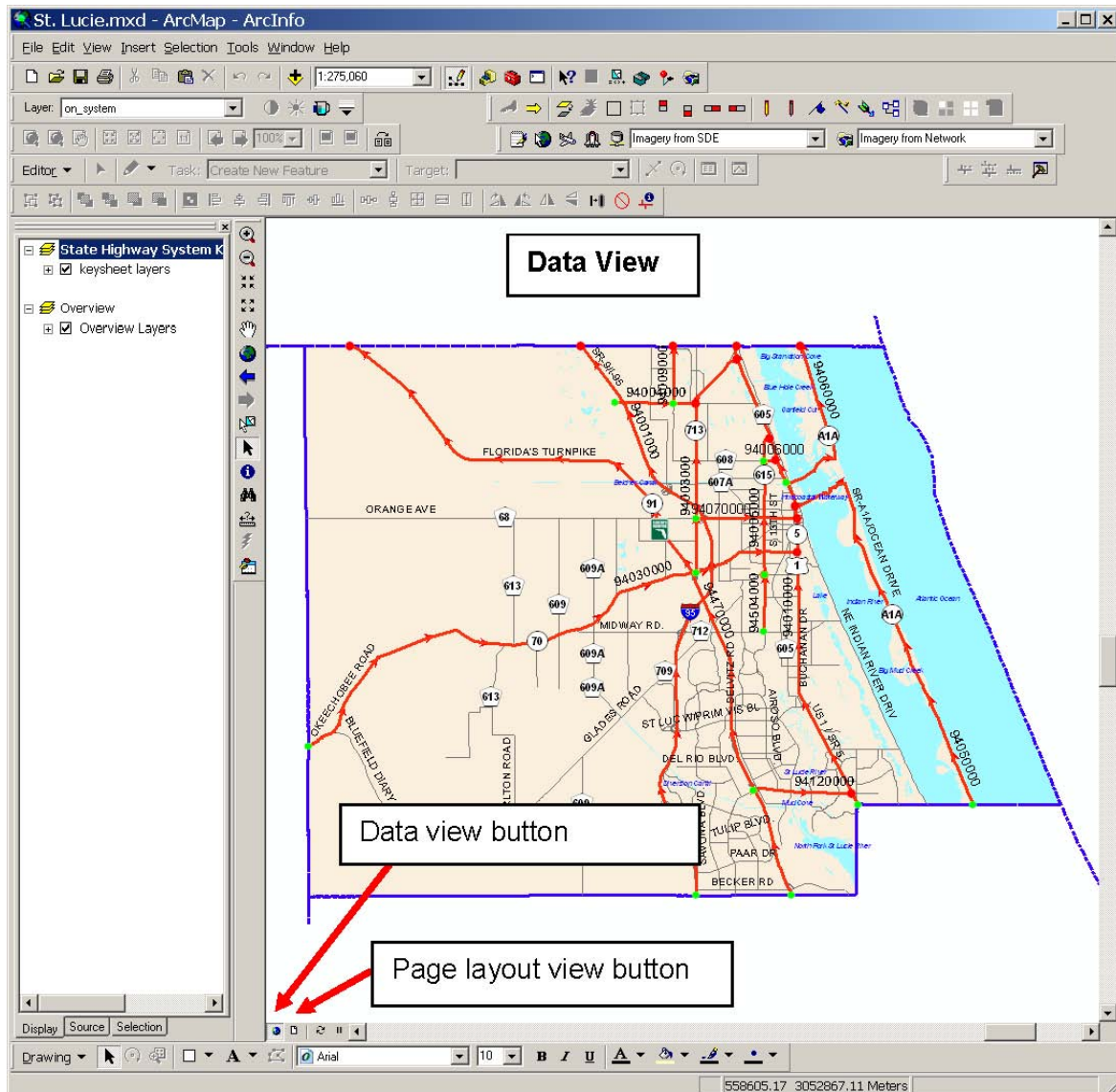
Note: the arrows on the on-system roadways indicate the digitized direction of the road. This means they show how the line was created in the GIS editing environment. They do not imply traffic flow direction or one-way traffic patterns.

If you click on the page layout button (see page 22), you will see the corresponding page layout for the county-wide Key Sheet map:
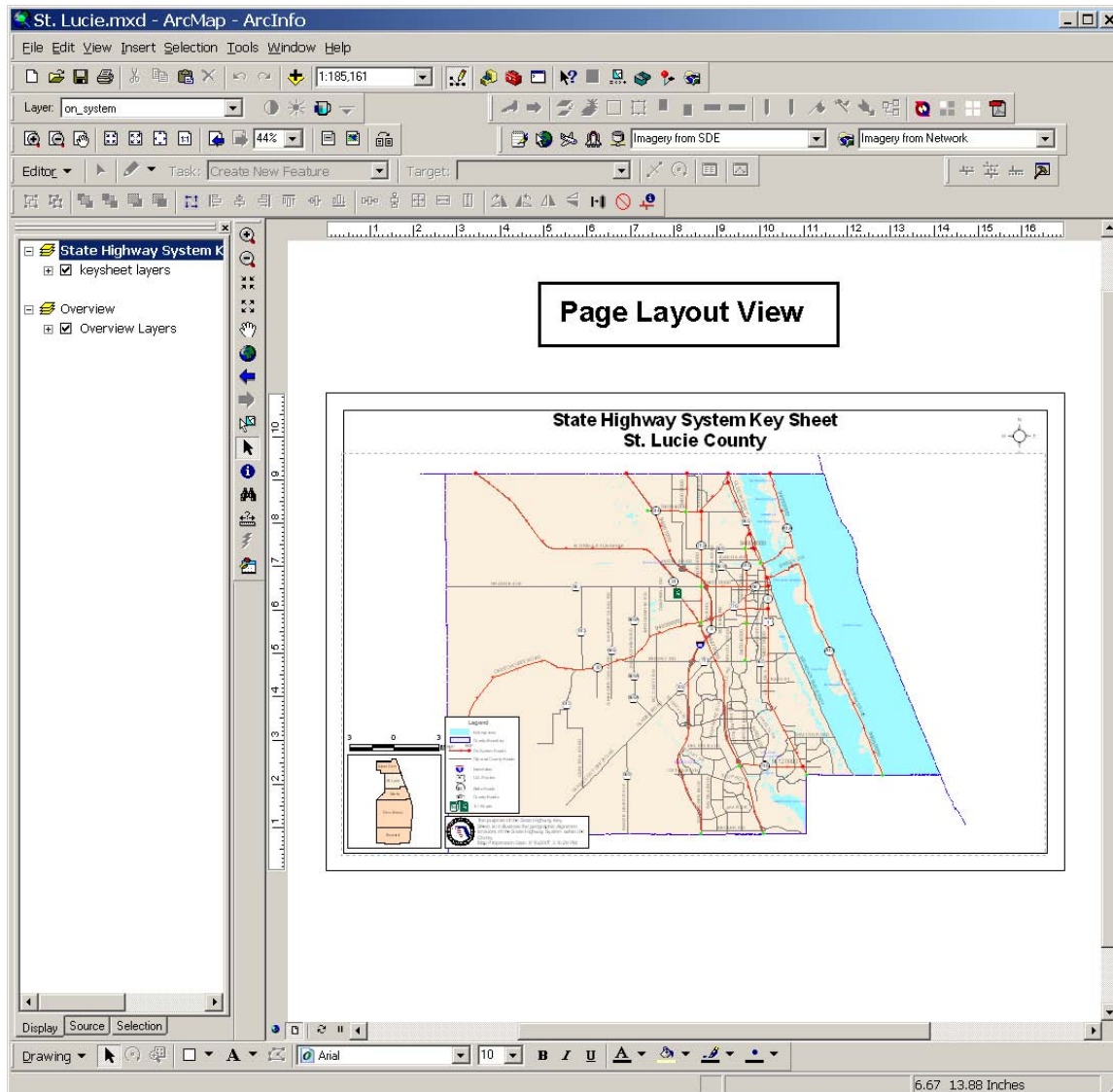
Note: The map documents, and any backups you may have created (see page 21) are stored in your Key Sheet home folder, in a folder called "map docs". You will also notice that now a lot more buttons have become enabled as your map document will now support their various purposes.

Click on the Data View button (see page 22) to switch ArcMap back to data view.

After you are back in Data View, the next step is to create insets.

Inset Creation

The purpose of insets is to help illustrate areas where roadway complexity is such that viewing these portions from the county-wide map is not adequate. In highly urbanized counties, you may need to create several insets in order to move these complex areas onto separate inset maps. Another benefit of insets is that they lessen the amount of time you would need to devote to roadway label conflict cleanup.

The Key Sheet extension keeps track of insets as they are created. Once a county map document has insets, these are stored in an inset database, and can be used to recreate the same insets for new map documents. This provides a consistent look and feel across different versions.

The Inset Tools (see page 20) on the Key Sheet Toolbar provide several different means of creating insets.

Manual Inset Creation

There are two ways to create insets manually. The first way is to use the automated inset tool and drag a rectangle around the area on the map you wish to make an inset. The inset gets made immediately and the inset database is updated. The second way is to use the inset rectangle graphic tool. This tool will draw a temporary inset rectangle on the map, but does not commit the inset immediately. Then you can zoom in and examine the area and adjust the rectangle graphic until it exactly captures the area you want. Then you can tell the Key Sheet Extension to commit this inset and the inset process will be completed.
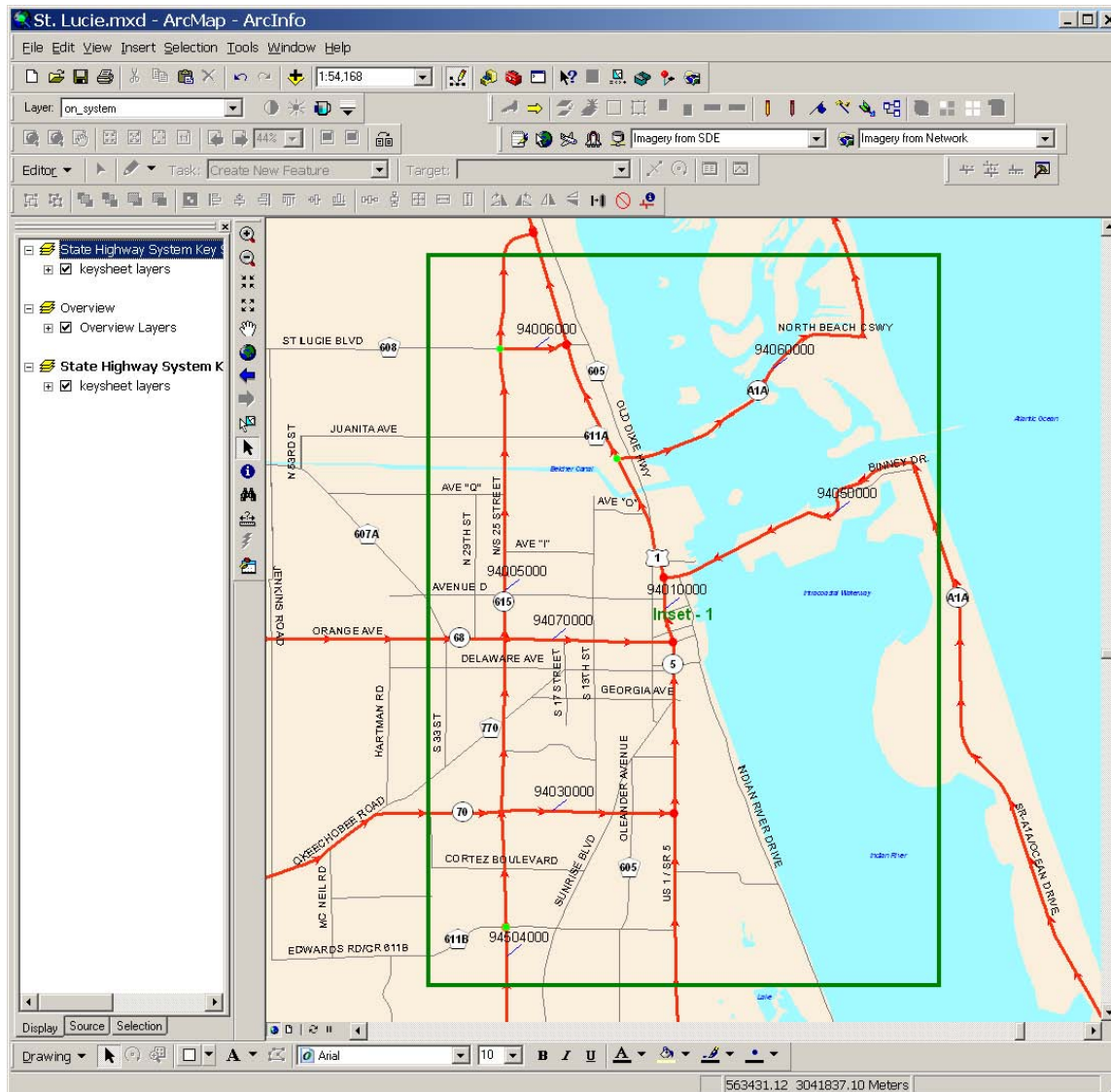
Automated Inset Tool

Select this tool . The cursor will display a pronounced crosshair symbol.

Drag a rectangle around the area of interest.
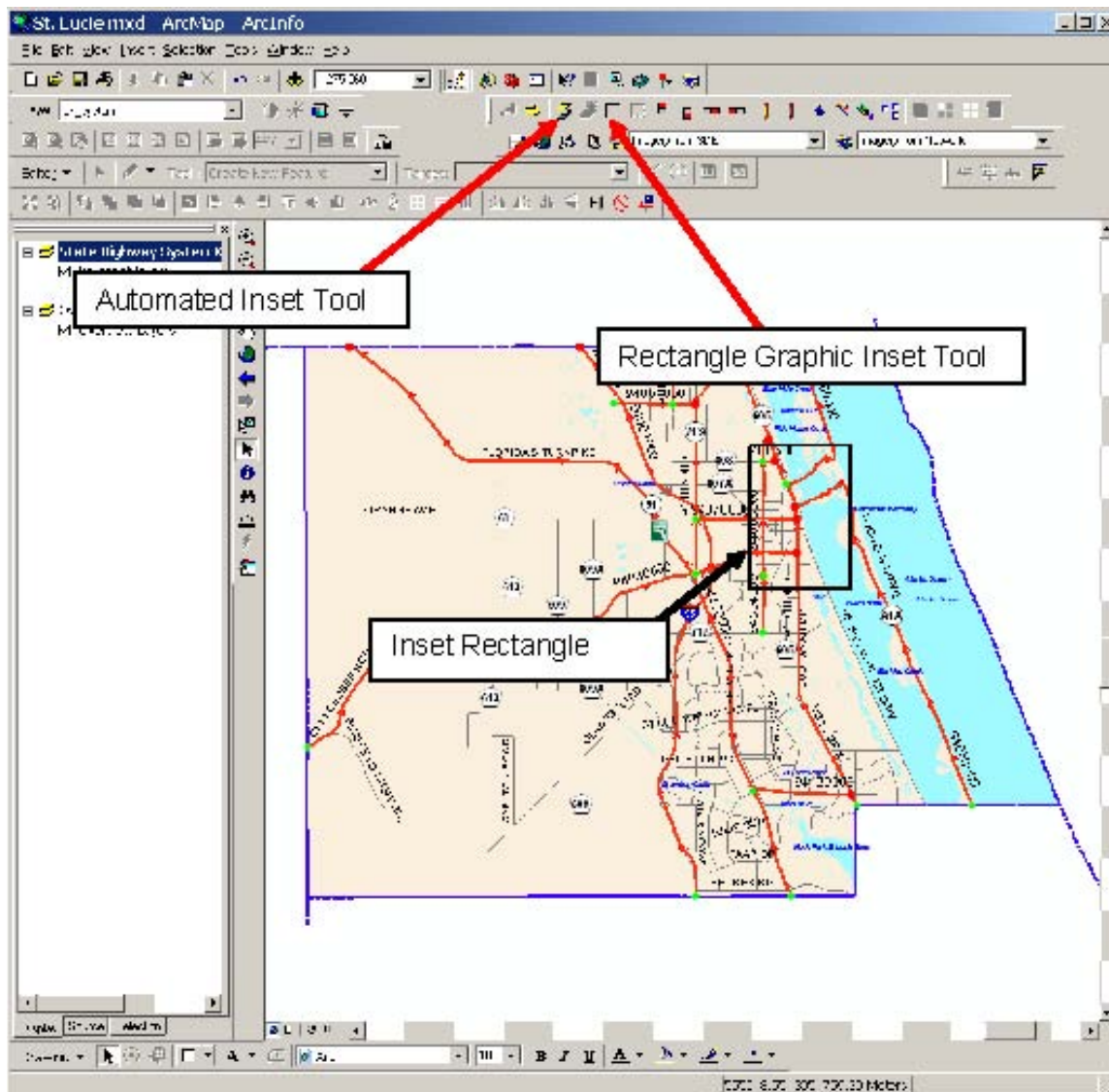
Let the inset map process complete. When done, the map document now has an inset map added to it:

Note: The map document now has an additional data frame in the table of contents (State Highway System Key Sheet - St. Lucie County - Inset 1). If you activate this map data frame, you can see the new inset in data view:

Activate the main county map to switch back to the original view.

Select the Rectangle Graphic Inset Tool ⊏ from the Key Sheet toolbar.

Drag a rectangle around an area that requires an inset:

Note: In this case, all that happens is a gray rectangle graphic is created, but nothing is added to the map document. The inset database only has the one inset recorded that was made previously:
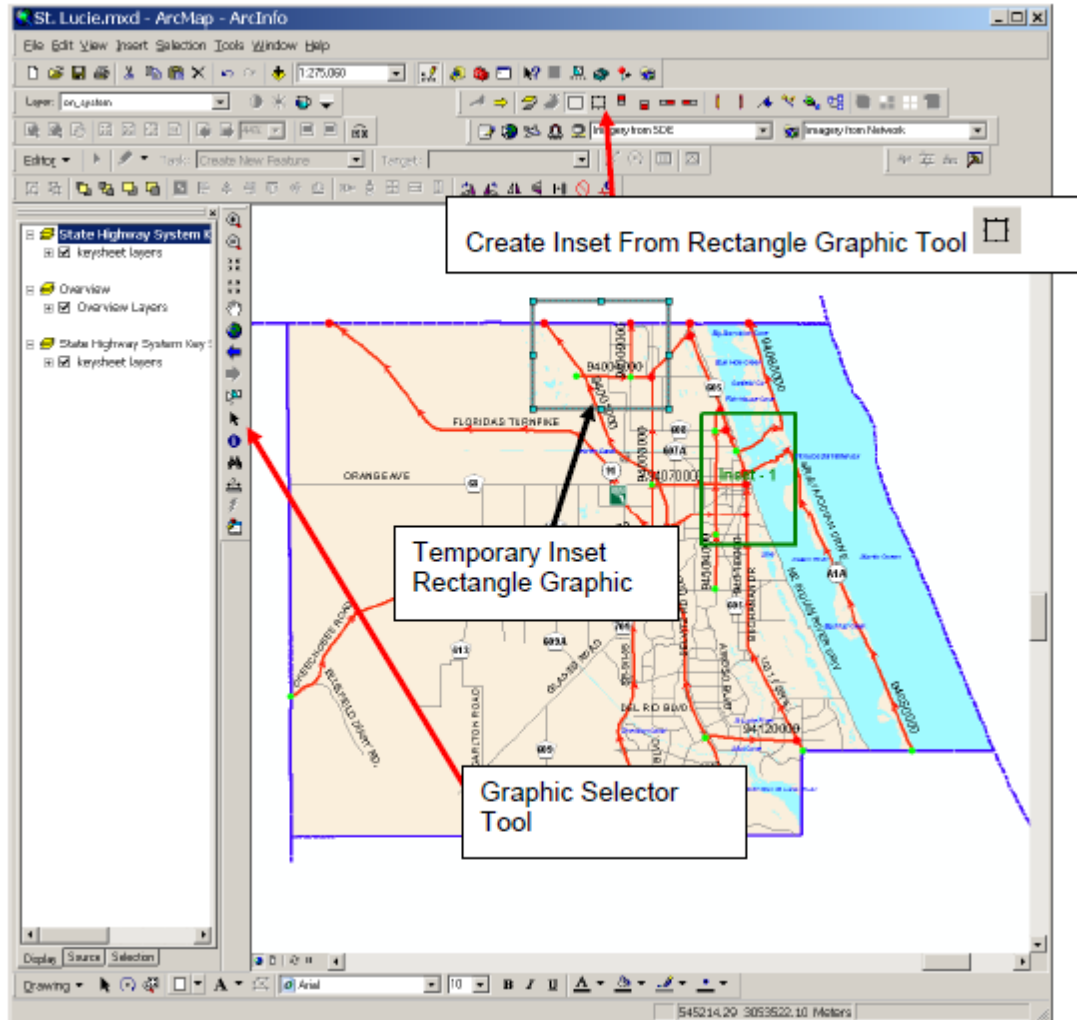
Zoom in, adjust the graphic's size, position, etc. until you have precisely captured the area that will be in the inset. Use the ArcMap Standard Toolbar graphic selector tool to resize and position the graphic. When satisfied, make sure the graphic is selected (use the graphic selector tool and click in the interior of the rectangle). It will have the selector handles present around it. Click on the Create Inset From Rectangle Graphic Tool.
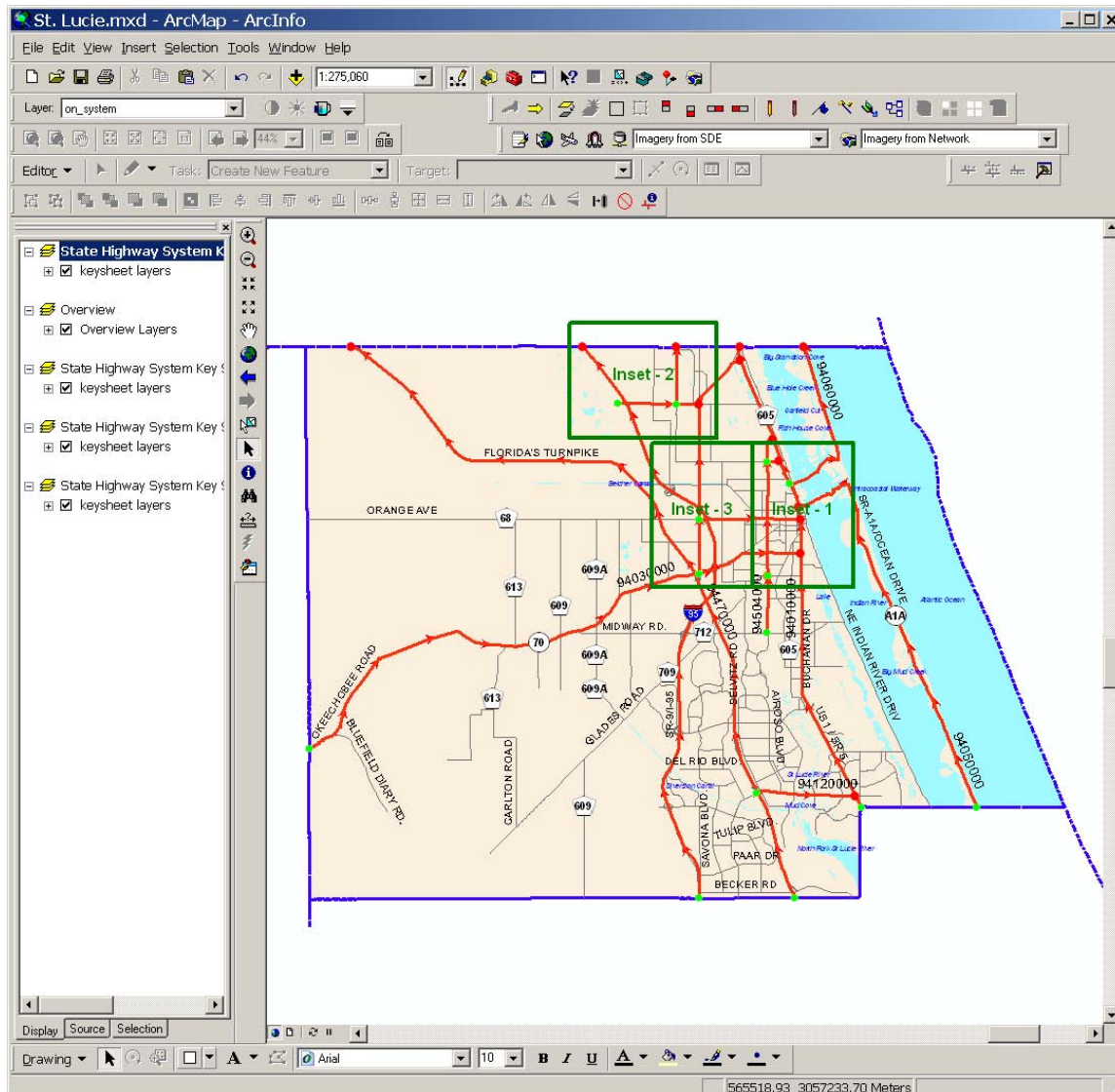
The map document will now commit this inset to the database and add the inset map data frame to the map document:

You now have two inset maps in your map document. Be sure to save your map document frequently to preserve the work you have done so far. You may proceed to make insets in similar fashion, or opt for using the create adjacent inset tools instead.

Create Adjacent Insets

Sometimes, in extremely urbanized counties, it may be advantageous to create insets that are spatially adjacent (i.e. same in size but directly north, or south, or east, or west) to an existing inset. The adjacent inset tools provide this functionality. The adjacent tools only work if you have at least 1 inset already present in your map document.

Select an existing inset. Use the graphic selector tool to select. In this example, an adjacent inset is made directly to the west of Inset 1:

The North tool has the red square at the top, the South tool at the bottom, the West Tool on the left, and the East Tool on the right. Once the inset is selected, click on the appropriate adjacent button and the adjacent inset will be automatically created:

The inset to the west appears in sequence directly adjacent to the inset originally selected. It is the same size as Inset 1. Inset maps made in this manner will all have the same scale as the "parent" inset.

Note: It is imperative that you not change the insets after they are created. If you delete or move the insets, the inset database will be out of synch with your current map document. Do not remove or rename any Key Sheet data frame. If you make a mistake on insets at this point, simply recreate the county map again and start creating your insets from scratch. You will be given the option to remove the unsatisfactory insets from the inset database after you create a "fresh" county Key Sheet map document.

Create Insets From Previous Insets
After a county map is completed and the final PDFs have been generated, it may be the case that in the future you need to make a new On-System Key Sheet for this same county. After you generate the new Key Sheet for this county (and decide to overwrite or archive the previous map document) you can recreate the insets from the previous insets that have been stored for this county in the inset database. Here is how:

Create a new Key Sheet Map Document (as outlined previously).

Drag the auto-inset tool anywhere on the map, if insets previously existed for this county, you will be prompted to either create insets from previous insets, or to go ahead and delete all the previous insets from the database and use the new rectangle as the first in a new series of insets:
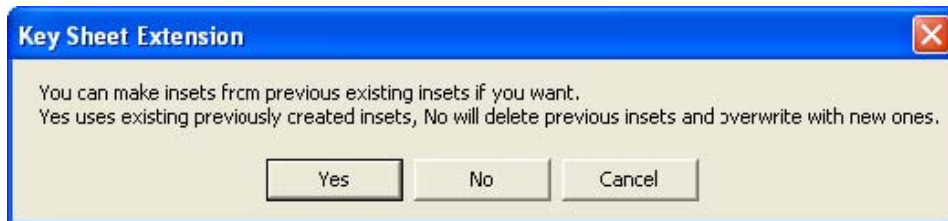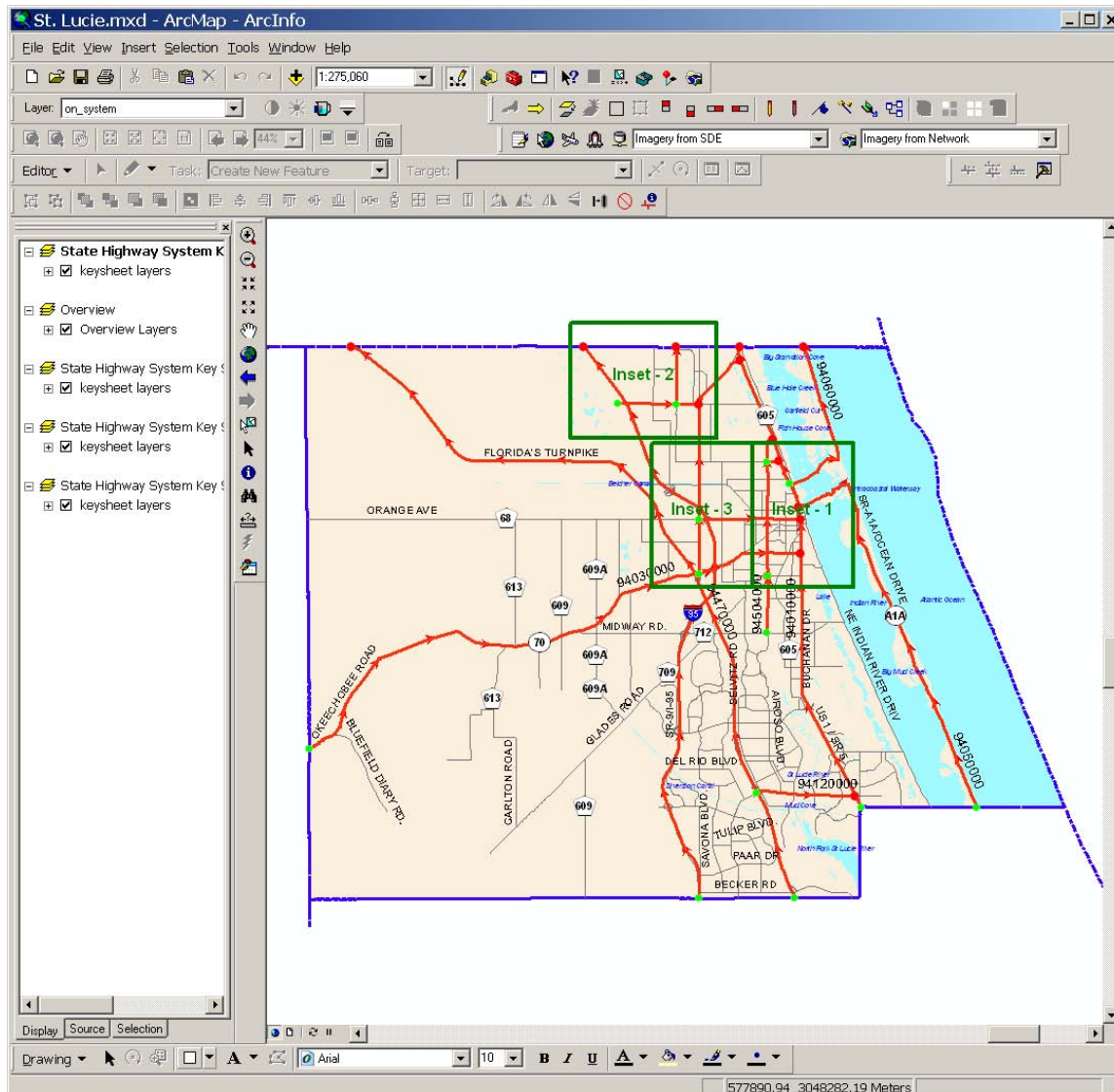

Or, you can use the Create Insets from Existing Insets tool:

Click on the Create Insets from Existing Insets button:
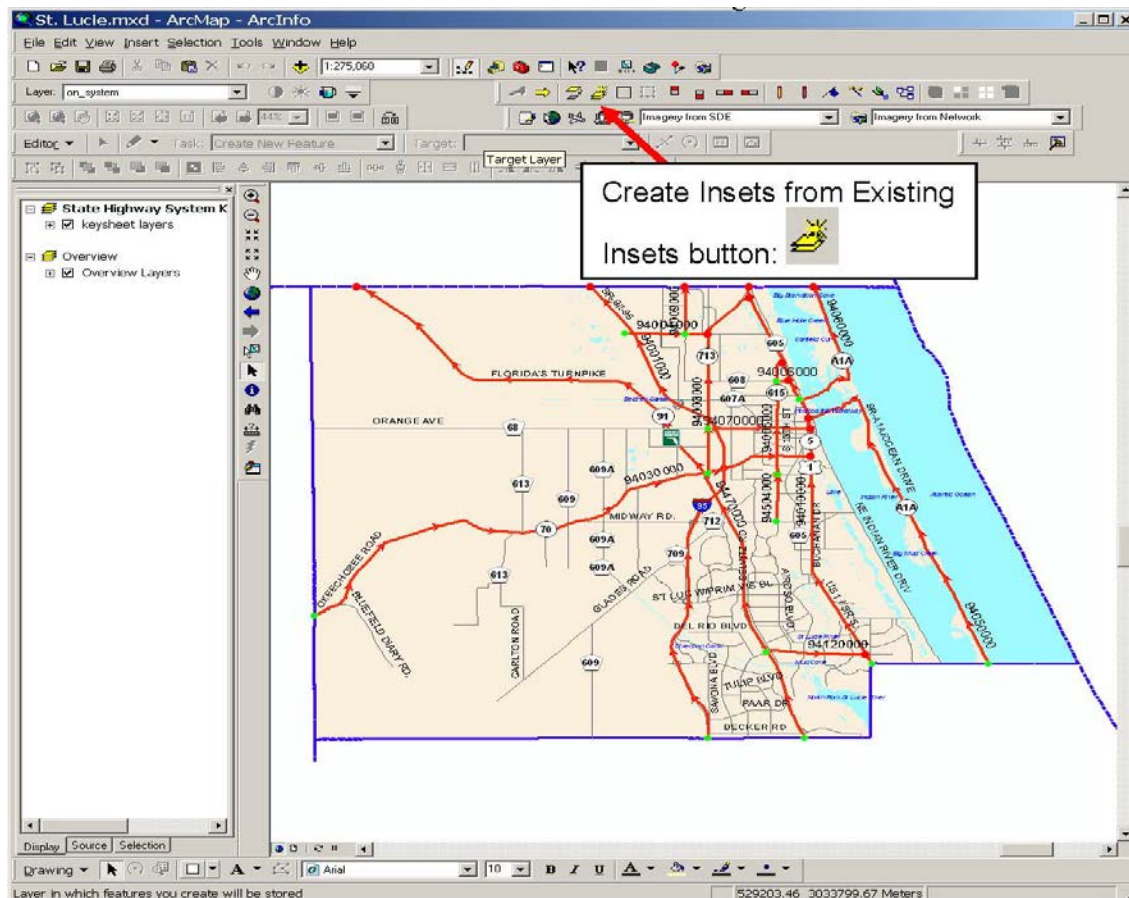
The previous set of insets will be created from the inset database. Please wait for the process to complete before using other ArcMap functionality:

Inset Errors

Because insets must be numbered sequentially, if you manipulate an existing Key Sheet document that had ordered insets in the past, but now the map document (or inset database) has a sequencing problem, you will be given an error message. These errors will happen most often if you delete an inset rectangle graphic from the data view (the green rectangle with the inset label in it) or if you delete an inset data frame from the map document's table of contents, or rename a data frame. The best practice is to avoid these actions, and your insets will remain in sequence and you will be able to proceed without problem.

If your insets for a map document have sequence problems, the error message that appears will suggest ways to solve the problem. In some instances, if the inset database is corrupt, the Key Sheet Extension will suggest deleting these and the sequencing problem will be solved. In other cases, it may require creating a new "fresh" Key Sheet map document and then either deleting the insets from the database and creating brand new insets or using the existing insets from the database, if possible.

If you follow the inset protocol, however, you will not have to deal with any of these errors.

Graphic Conflict Cleanup and Labeling

After you have your map document insets in order, the next step is to clean up the roadway label conflicts in the county view and any inset views you may have created. You should start with the main county view and then work through the inset views. In all cases, however, the cleanup method is the same:

Click on the Zoom to Next Graphic Conflict Tool
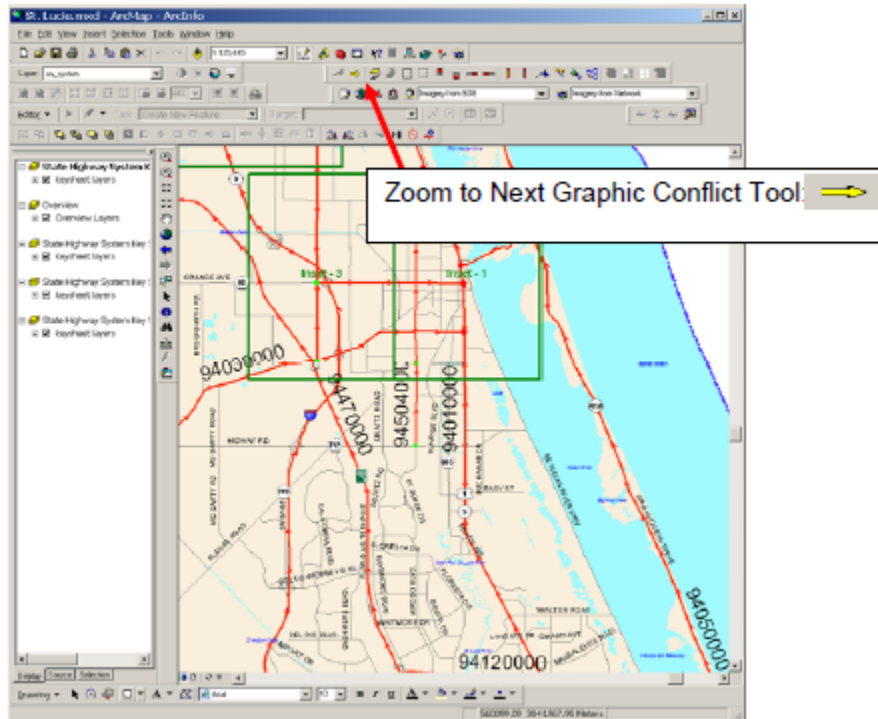
You will see the map document zoom to the graphic conflict, and the conflict area will flash to help you recognize it. In this example, roadway label "94010000" is intersected by the inset rectangle graphic. Using the ArcMap graphic selector tool, this label can be moved to a more suitable location:
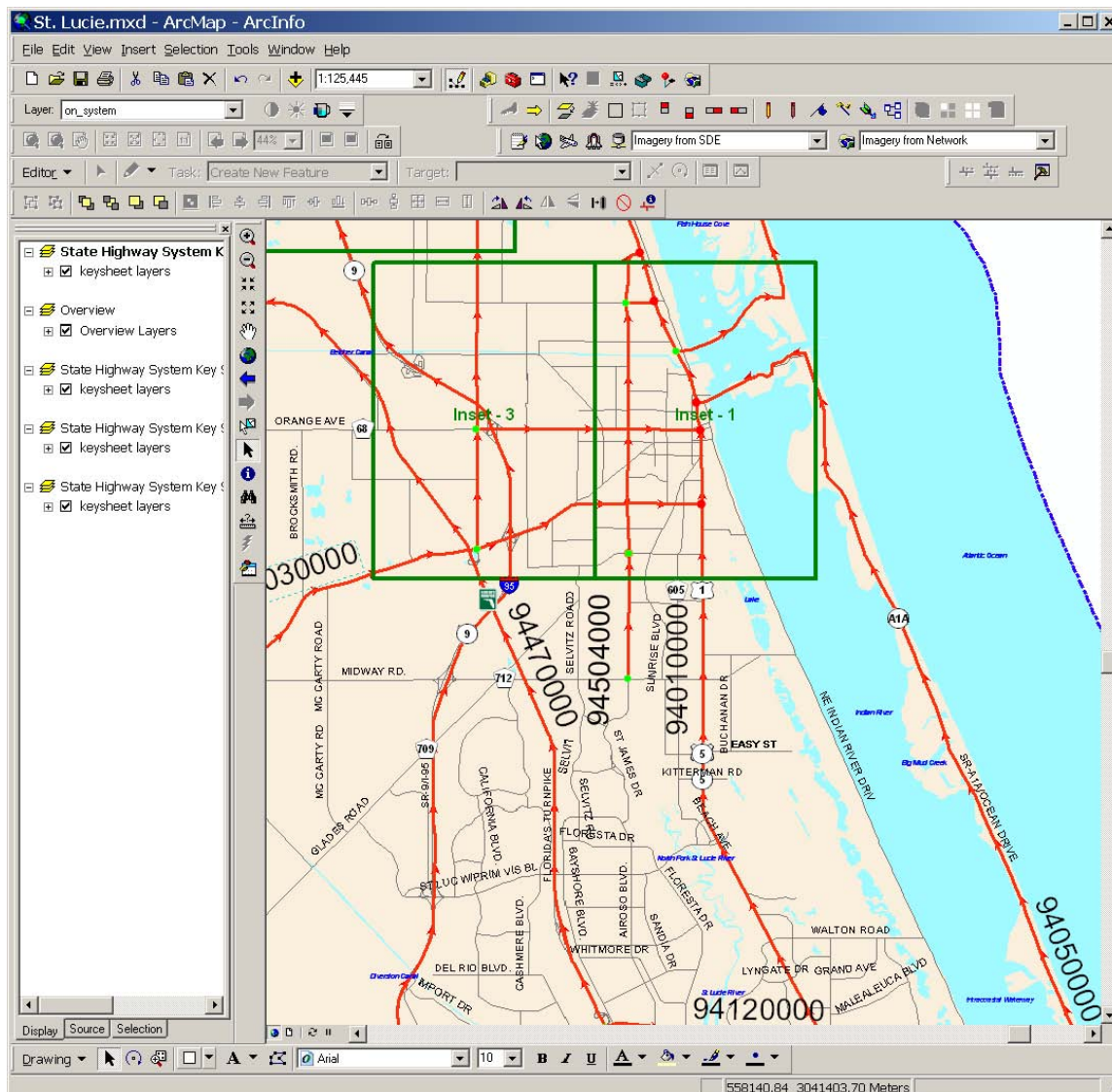
In this example, while zoomed in to deal with the immediate problem, other roadway labels that had conflicts (overlaps) with the inset rectangle graphics could also be moved.

Once you are finished in an area, click on the Zoom to Next Graphic Conflict Tool .

In similar manner, keep resolving label conflicts until the following message appears:

This indicates that this particular map (in this example, the main county map for St. Lucie County) has no overlapping graphics issues. You can proceed to dealing with any inset map data frames you have in your map.

Activate an inset data frame:
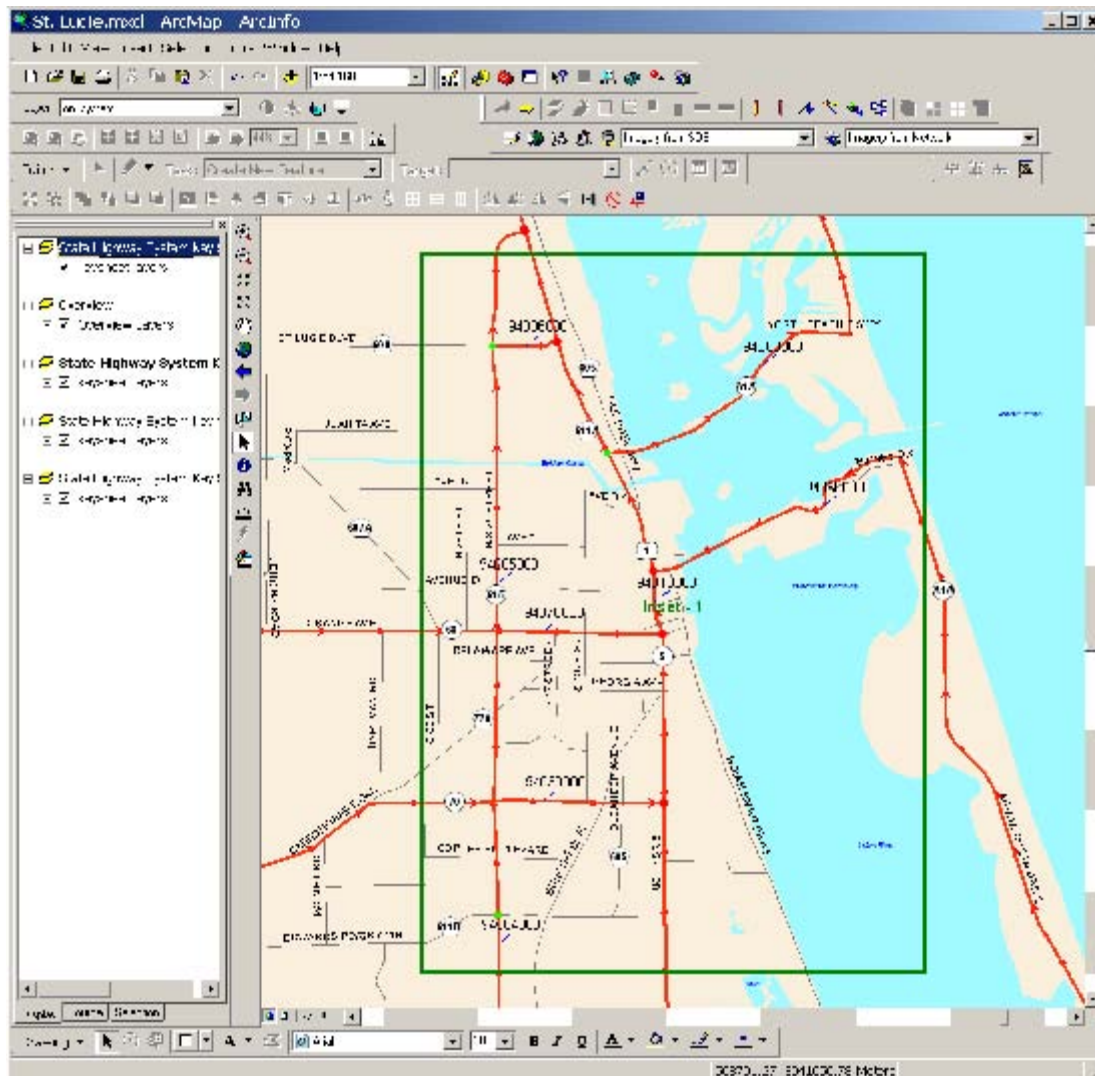
Because an inset is more compact in area, the graphic label conflicts are easier to fix. In this example, you could probably fix the conflicts by simply moving the labels to suitable locations if they overlap an adjacent roadway label. However, if you use the Zoom to Next Graphic Conflict tool, the procedure is still the same. After the inset view is clean, you will be given an all clear message box (see page 34).

Roadway Label Leader Lines

As you work with the roadway labels, you will notice that some labels have a blue leader line graphic. The Key Sheet Extension will automatically create labels with leader lines for shorter roadway segments.
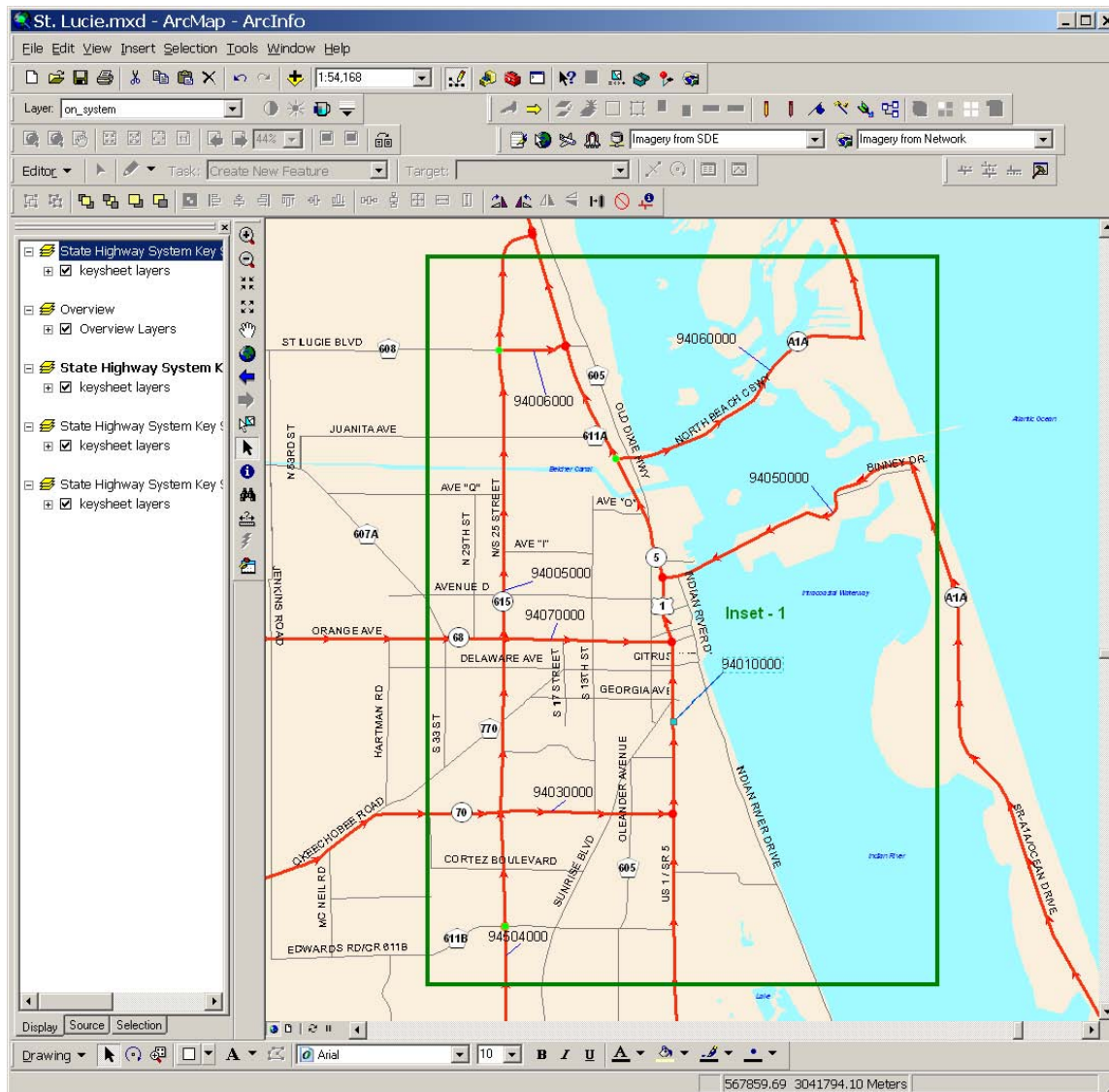

When you select a roadway label with a leader line (using the ArcMap graphic selector tool) and move that label to a new location, the leader line will adjust its position automatically.

You may also move the leader line anchor point (the point on the leader line that touches the road segment) to an alternate location if you want.

Select the label you want that you want to adjust the leader line anchor point:

Leader line anchor point

Leader line anchor dragged to new location

You may also opt to have all labels in a data frame have leader lines. Prior to this operation, the data frame would look like this (**Note:** only a few roadway labels have leader lines):

Make Leader Lines for all System
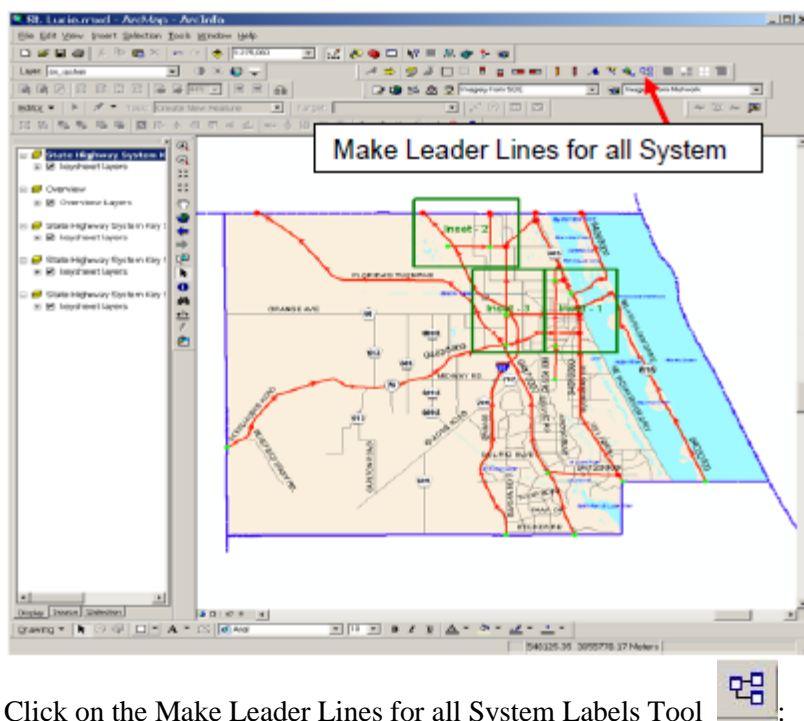
Click on the Make Leader Lines for all System Labels Tool :
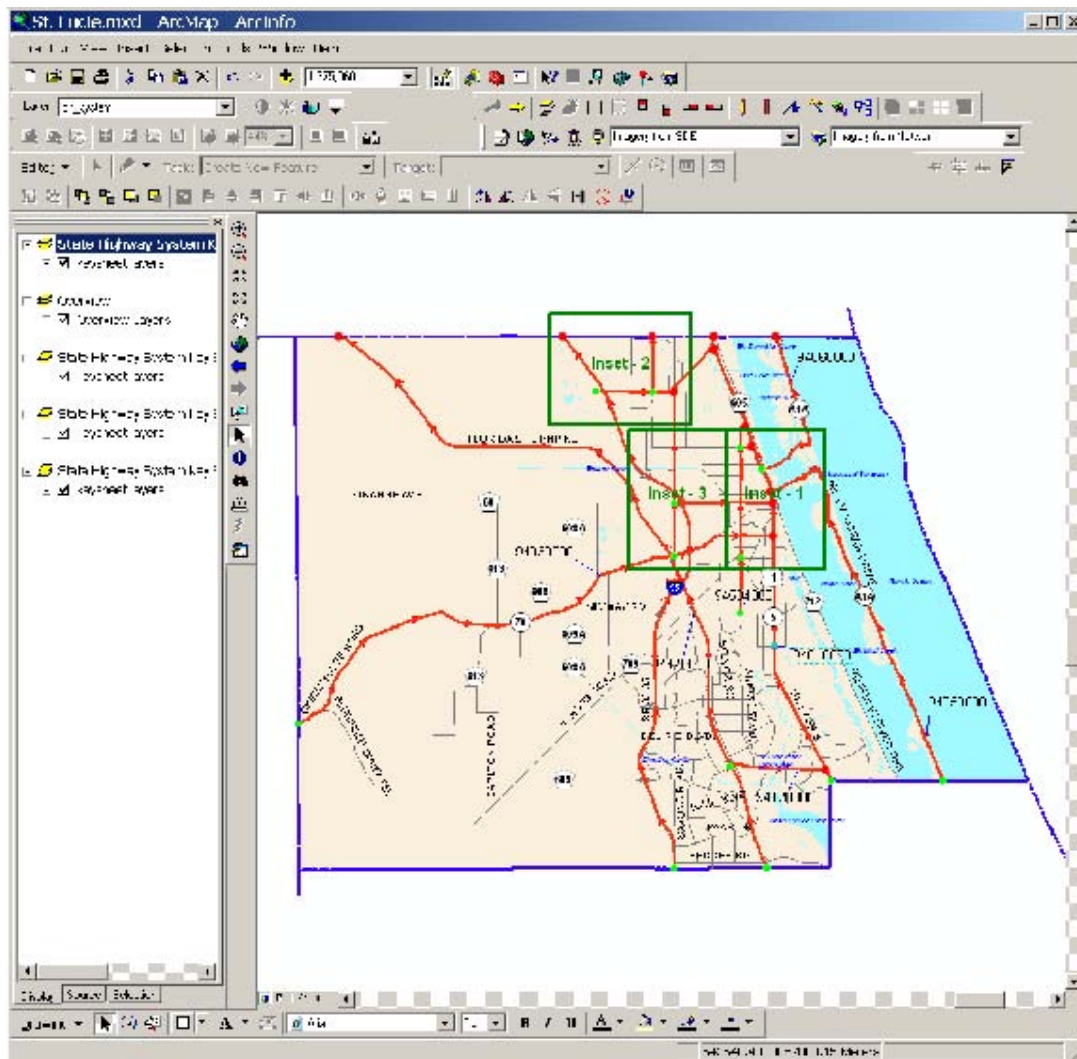
All the roadway labels have leader lines now and the labels have a horizontal orientation. **Note:** this operation cannot be undone. You may need to reposition the labels by using the Zoom to Graphic Conflict tool again (see page 34).

Create a leader line for a single graphic. To create a leader line for a single roadway label, first select the label with the ArcMap graphic selector tool:

Click on the Create label leader line tool:

The roadway label now has a leader line.

Add Additional Labels

The Key Sheet Extension features two tools for adding additional roadway and local road name labels, in the case where additional labels would be useful for clarity or contextual support.

Here is an example of a document that would benefit from some additional roadway labels:
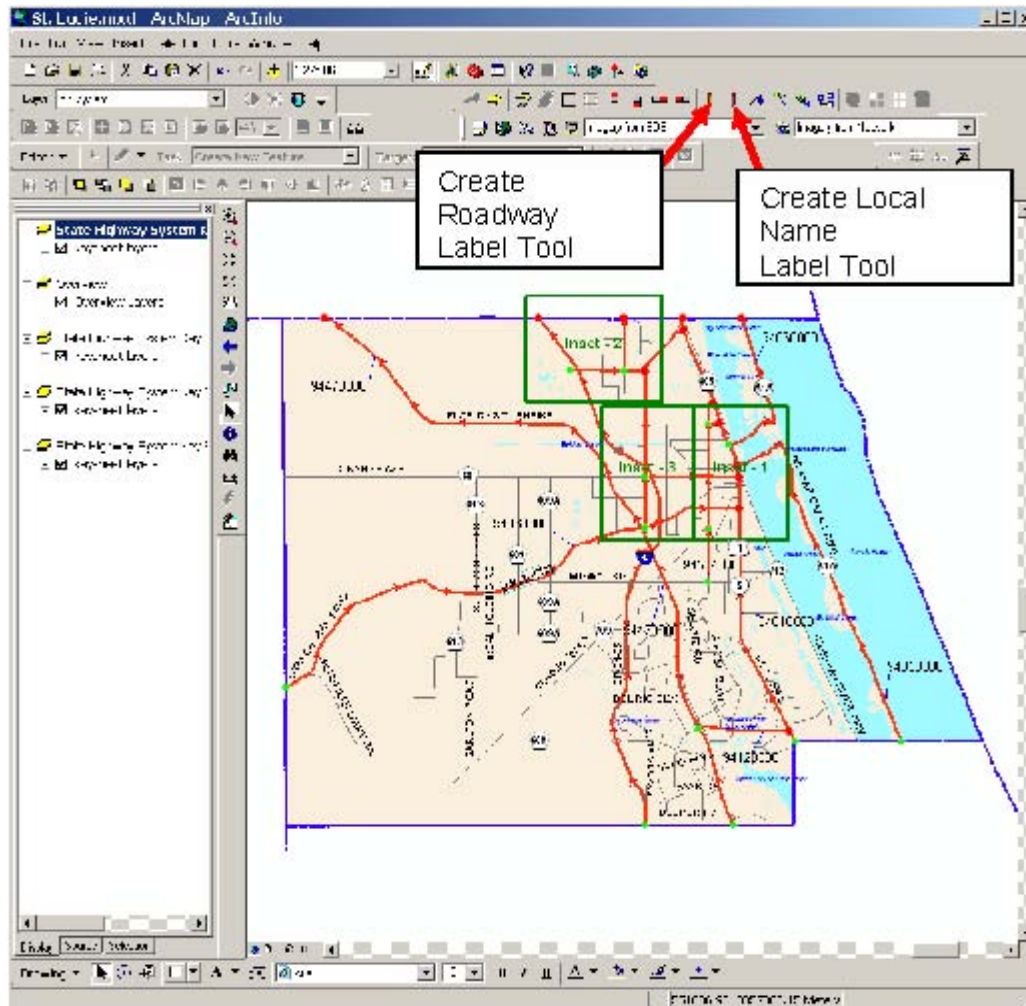
Click on the Create Roadway Label tool

The mouse cursor will change to a cross-hair pattern. Click on an on-system roadway where you want a new label to appear.

Note: You may need to manually adjust the location and/or angle of the label after it is placed. Please see the ArcMap help system for information on how to adjust the label properties. You can also use the ArcMap graphic selector tool to move the label to a new position.

To add a local name label tool, click on the Create Local Name Label tool .

As outlined above, click on a road segment location where you would like to add an additional label.

The final label step is to add adjacent county names to the county data frame. Make sure this data frame is activated.

Click on the Create County Label Tool .

Click in the white areas adjacent to the county being mapped. The county labels will appear. You may need to adjust their placement or set the rotation angle (to create north-south running county labels). Please see the ArcGIS help system on graphic label properties.
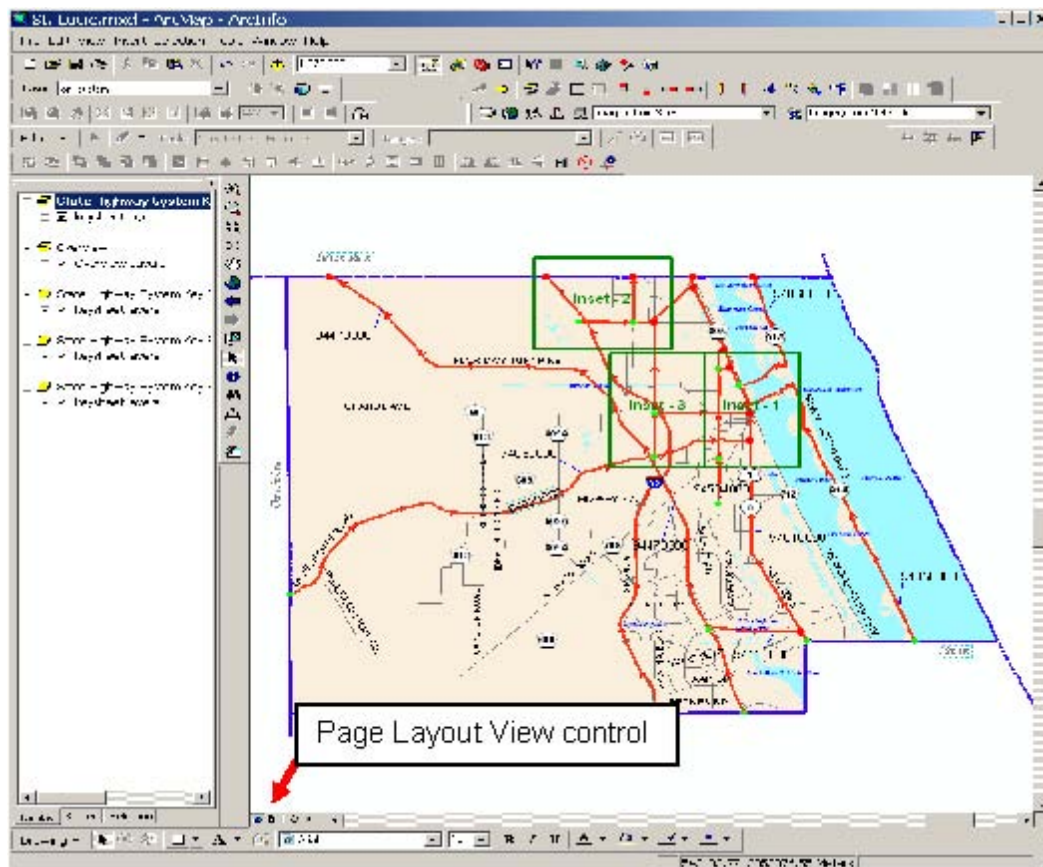
Note: The Key Sheet maps have a clip feature applied to each county map. This means that only a small portion of adjacent county features are visible immediately next to the county you are mapping. If you place a label too far away from the edge of the county, all or part of the label may not be visible. Move the label closer to the county in order to make it completely visible.

Create Highway Shields
In some instances, especially under inset rectangle graphics in the main county map, you may also find it useful to manually place highway shields.

This is done using the Highway Shield Tool .

Activate the Shield Tool and then click on a road segment. All possible shields will be placed. The Shield tool uses an algorithm to try and determine the best possible placement along the road segment, but you may need to move them to a more suitable location.

Now you may be ready for layout and PDF production. However, it is up to you to inspect the map data frames for appropriate labeling and label positioning. Take some time to do a careful inspection and make adjustments as outlined above. Also, be sure to frequently save your map document.

Layout and PDF creation

The layout process and PDF creation involves working with your map in page layout view. You will need to switch to page layout view (see page 22). Whatever map is activated in the table of contents will have the correct layout showing in the page layout view. As you change the activated map from the county map to the inset maps, the layout will update itself automatically. This example will start with the main county map layout first:
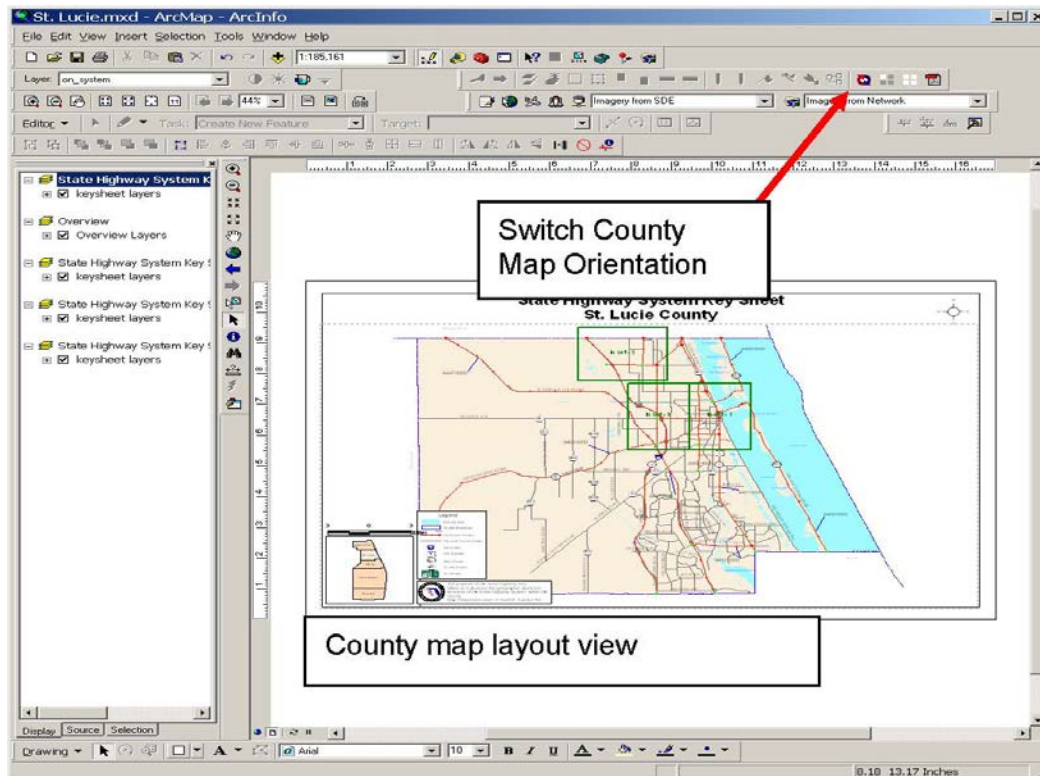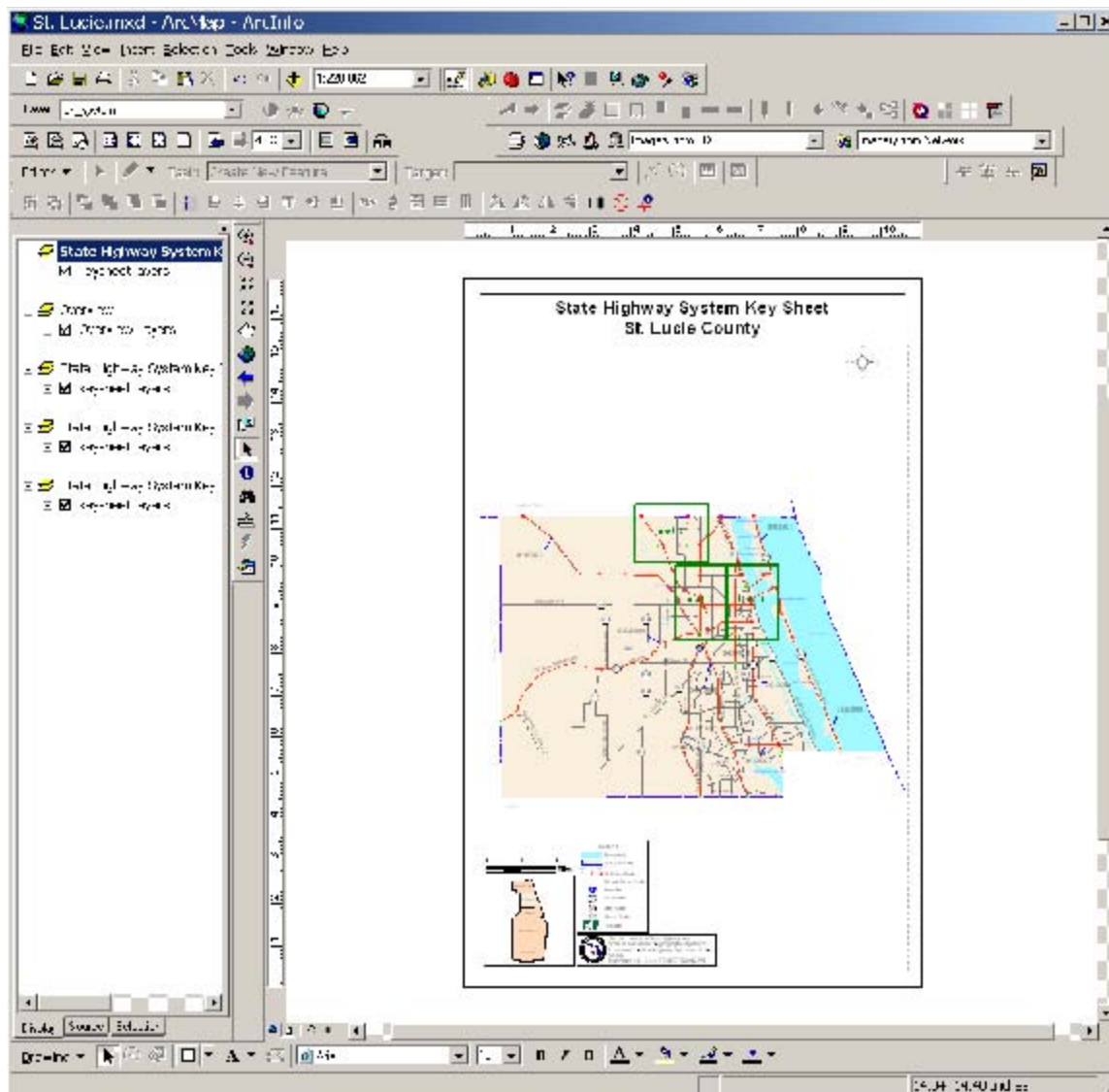

Change County Map Orientation

Sometimes, a county has a greater north-south extent, than it does east-west. In these cases, you might decide to change your page layout orientation to portrait rather than landscape. Click the Switch County
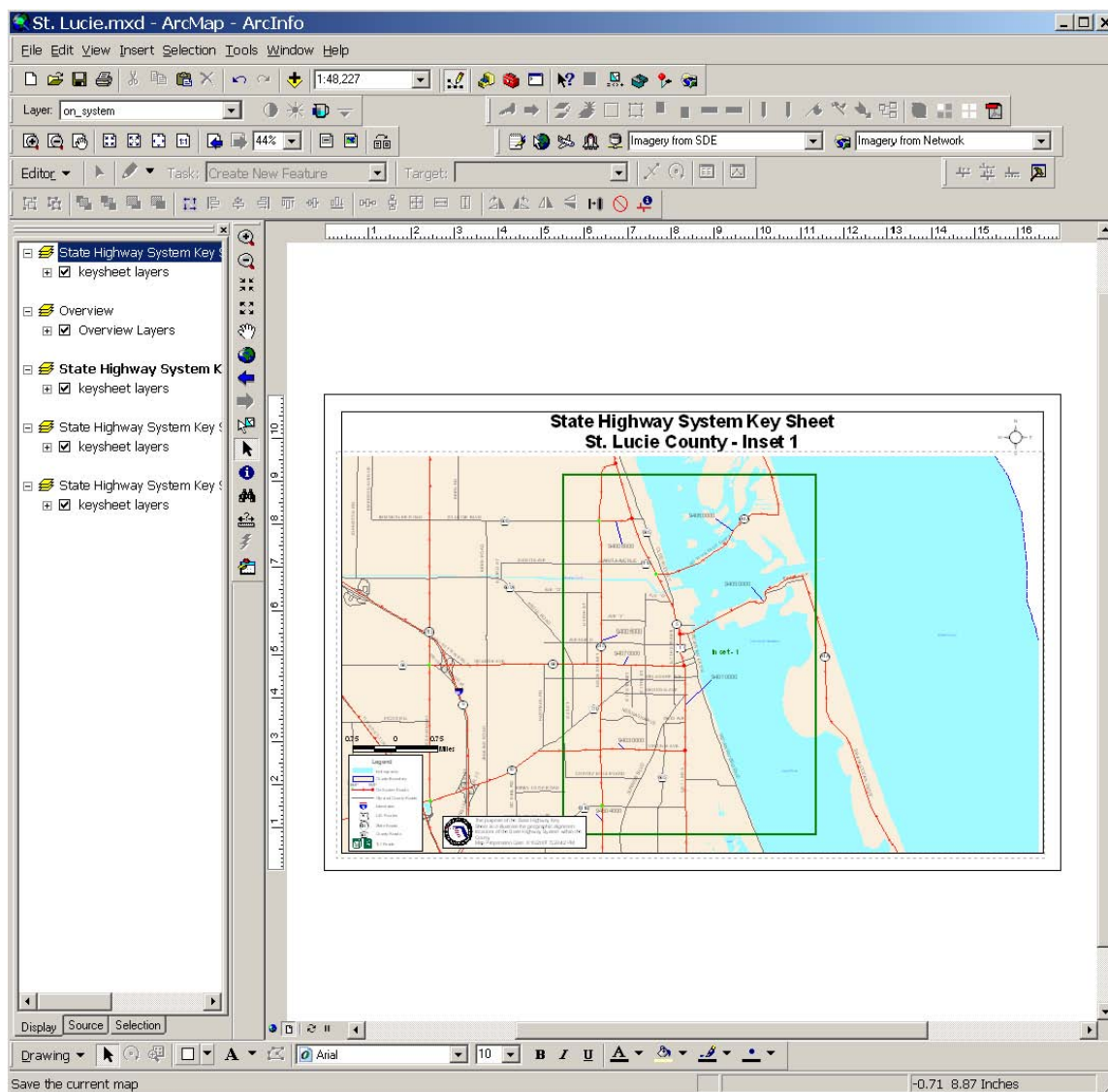
Map Orientation button .

The page layout orientation changes to portrait:

If you do not like the portrait orientation, switch back to landscape using the same process.

Activate an inset map data frame, and the layout automatically switches to match the inset:

Note: You cannot change the orientation of inset maps.

For each map (the county map and any inset maps) the procedure is to activate the map, examine the layout, move layout elements around to more acceptable locations if needed. The maps should then be ready for PDF production. However, before you make the PDFs you should make sure all the map data frames in your current document have the correct spatial extent. To do this, use the set spatial extent buttons.

To set the spatial extent for just the current map that is activated, use the set active extent button:
To set the spatial extent for ALL map data frames in the map document, click the set all extents button:

This action will guarantee that the correct zoom factor is applied to your map data frames. This is helpful in case you zoomed in tight, say, in the county map, and forgot to zoom back out to the county extent. You should use this button before you proceed to PDF creation.

Once you are happy with your page layout, click on the Make PDF Map button:
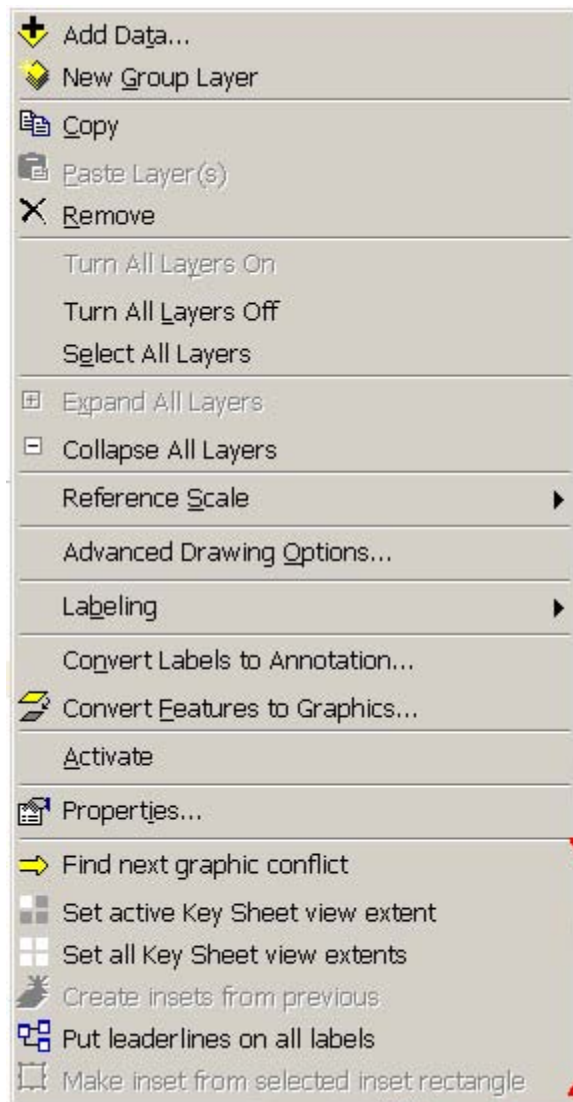
The PDF process may take a few moments to complete, depending on the complexity of the map. Please wait until you receive the PDF process completed message box:
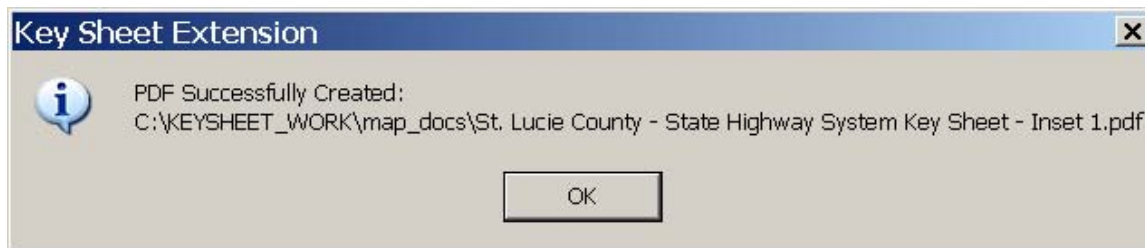
Note: When you move map elements (legend, north arrow, scale bar, disclaimer) to new locations, you should make the PDF before you activate a different map data frame. When you go to a different map and then switch back to the map you had moved layout elements for, the page layout will be reset back to default conditions and you will have to move the elements again.

Context Menu
If you right-click in the data view for any Key Sheet map data frame, some of the tools described above, are also present in the popup context menu for your convenience. There is no additional functionality in the context menu that is not already present in the Key Sheet toolbar:

Add Data...
New Group Layer
Copy
Paste Layer(s)
Remove
Turn All Layers On
Turn All Layers Off
Select All Layers
Expand All Layers
Collapse All Layers
Reference Scale ▶
Advanced Drawing Options...
Labeling ▶
Convert Labels to Annotation...
Convert Features to Graphics...
Activate
Properties...
Find next graphic conflict
Set active Key Sheet view extent
Set all Key Sheet view extents
Create insets from previous
Put leaderlines on all labels
Make inset from selected inset rectangle

Key Sheet context menu