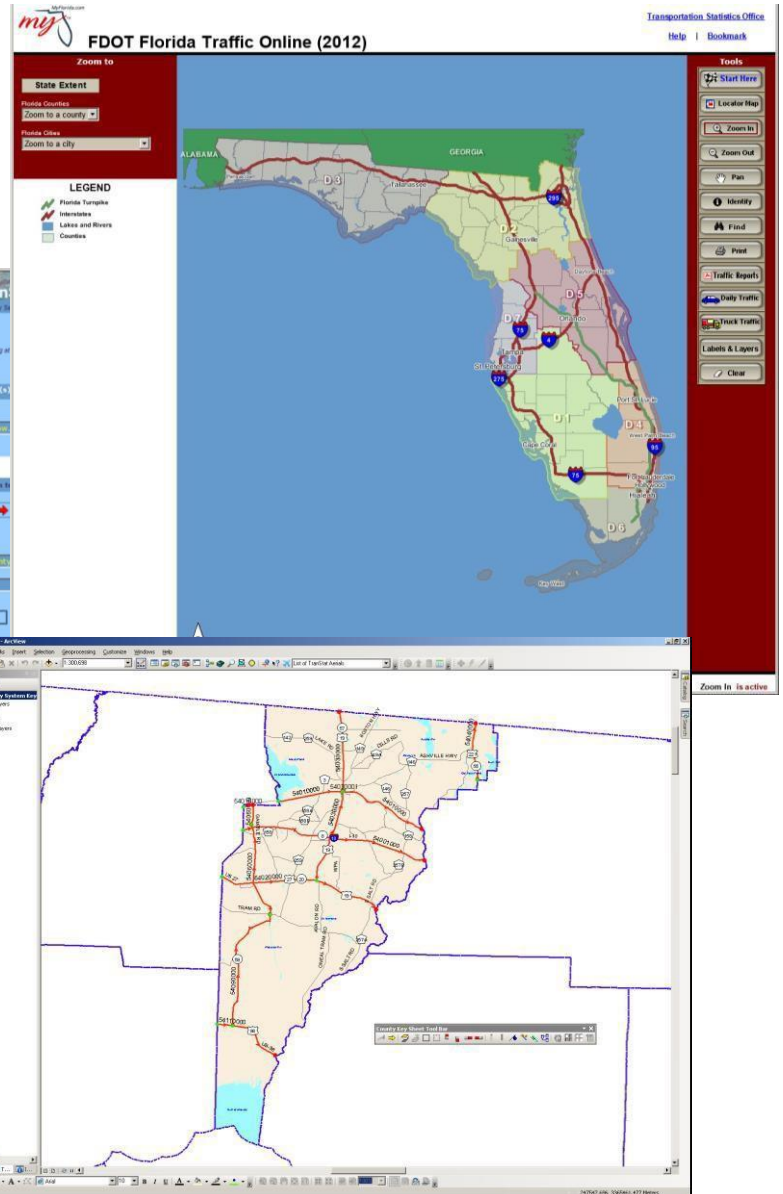
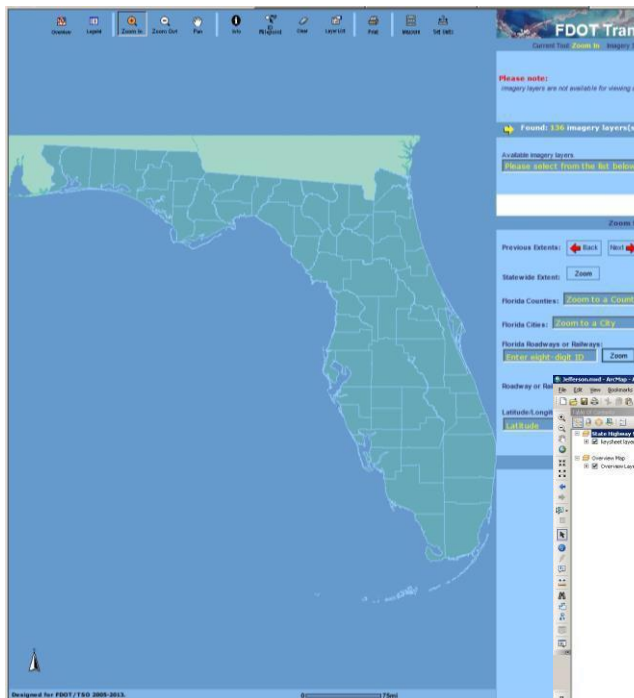


Transportation Data and Analytics Office

GIS HANDBOOK



Roadway Characteristics Inventory (General Interest Roadway Data Features and Characteristics)

Published March 2017

The **GIS HANDBOOK** is produced

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Florida Department of Transportation

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Introduction to the RCI/LRS

The RCI/LRS is an ESRI ARC/INFO based coverage made up of arcs and routes that geographically represent specific roadways in the Roadway Characteristics Inventory (RCI). These roadways include roadway IDs with an Overall Status of Active On the State Highway System (02), Active Exclusive (07), Active Off the State Highway System (09), GIS Route (10), Active with Combination (12), Local Roads with FM Projects (16), and Active Off Exclusive (17).

Note: Roadway IDs with an Overall Status of 01, 04, 05, or 16 are not required to be included in the RCI/LRS. Only existing roadways are incorporated into the database and displayed on official maps.

The RCI/LRS serves several purposes, including:

- Providing a Quality Assurance tool for RCI Feature lengths and alignment locations
- Dynamic segmentation – the creation of GIS data layers from RCI Features
- Map production
- Creation of the State's city-to-city mileage matrix
- Data analysis, such as curve classification and compass bearing

RCI/LRS

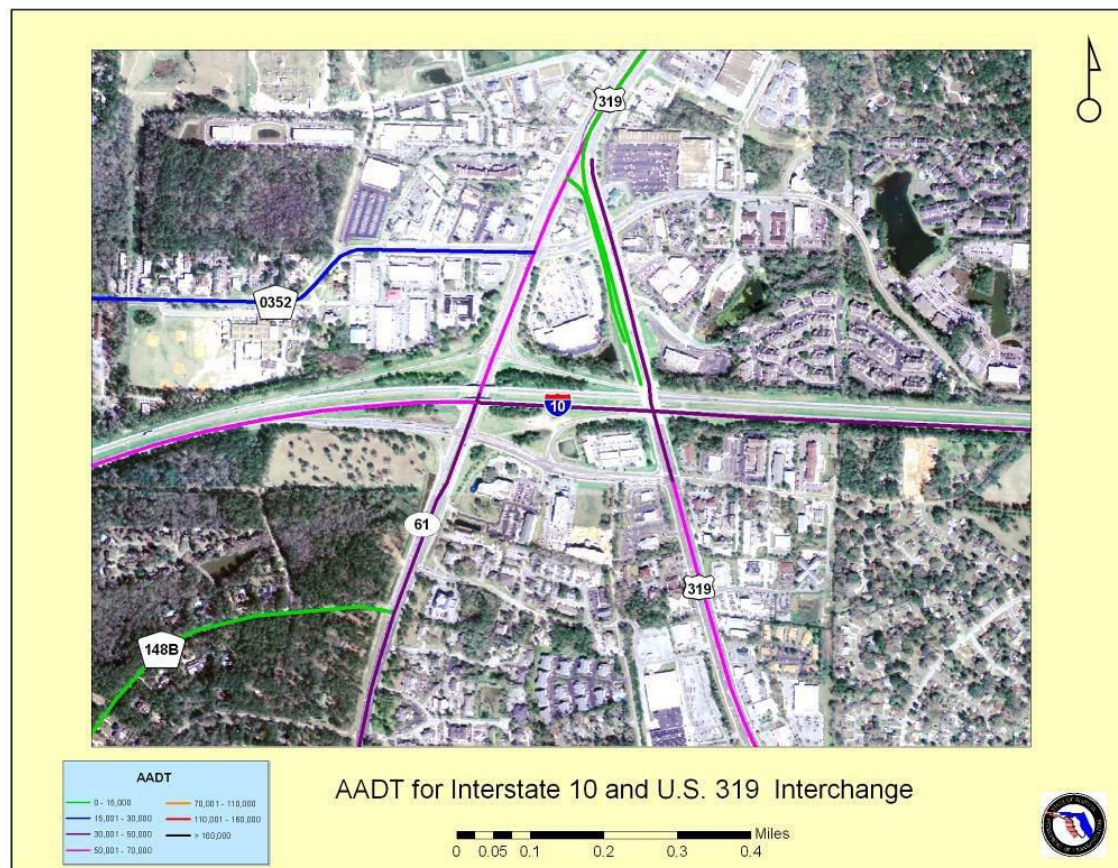
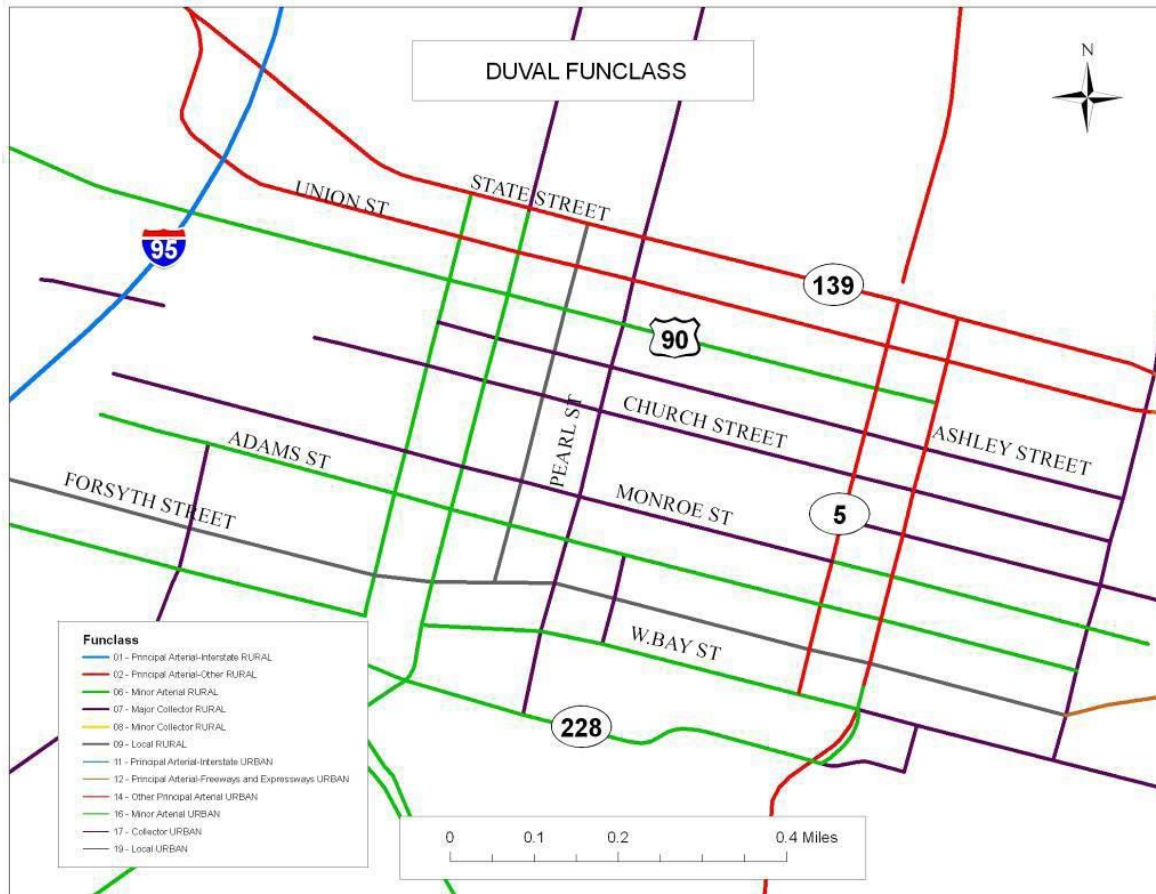
Basic RCI/LRS without aerial

**RCI/LRS with Aerial**

Basic RCI/LRS with aerial



RCI/LRS Thematic Mapping Examples



RCI/LRS Maintenance

Maintenance of the RCI/LRS is ongoing work that includes the following tasks:

- Adding new roadways
- Deleting roadways
- Lengthening or shortening existing roadway alignments
- Adjusting roadway alignments to aerial photography
- Verifying/adding exceptions (valid overlaps)
- Eliminating gaps
- Eliminating duplicate arcs and nodes
- Verifying valid dangling arcs
- Verifying/adding dual carriageways

The RCI/LRS Coordinator works with appropriate staff from the District offices in order to make corrections to the LRS and to ensure that compatibility between the RCI and LRS roadway ID lengths and alignments is maintained. This work is accomplished using ARC/INFO GIS software and a customized set of functions to make LRS editing more effective.

The arcs are digitized onscreen from District provided GPS alignments or FDOT/DOR sub-meter aerial photos provided through a research contract with Florida Resources and Environmental Analysis Center (FREAC). According to FREAC, these sub-meter aerials have a positional accuracy of 4 to 6 feet. Each digitized arc in the LRS contains information including the RCI roadway ID, Exceptions (if any overlaps exist), and whether or not the arc is a GIS Connector or a Dual Carriageway (if so, then the arc is not included in the route information). Once the arcs are attributed, a route is created from those arcs that form the roadway. Each route contains information including the RCI roadway ID, beginning and ending milepoints, and the Overall Status. Also included with the route information is a field for the LRS digitized length in miles named RTLENGTH. This value is compared with the RCI length as a part of the RCI/LRS Reconciliation Process.

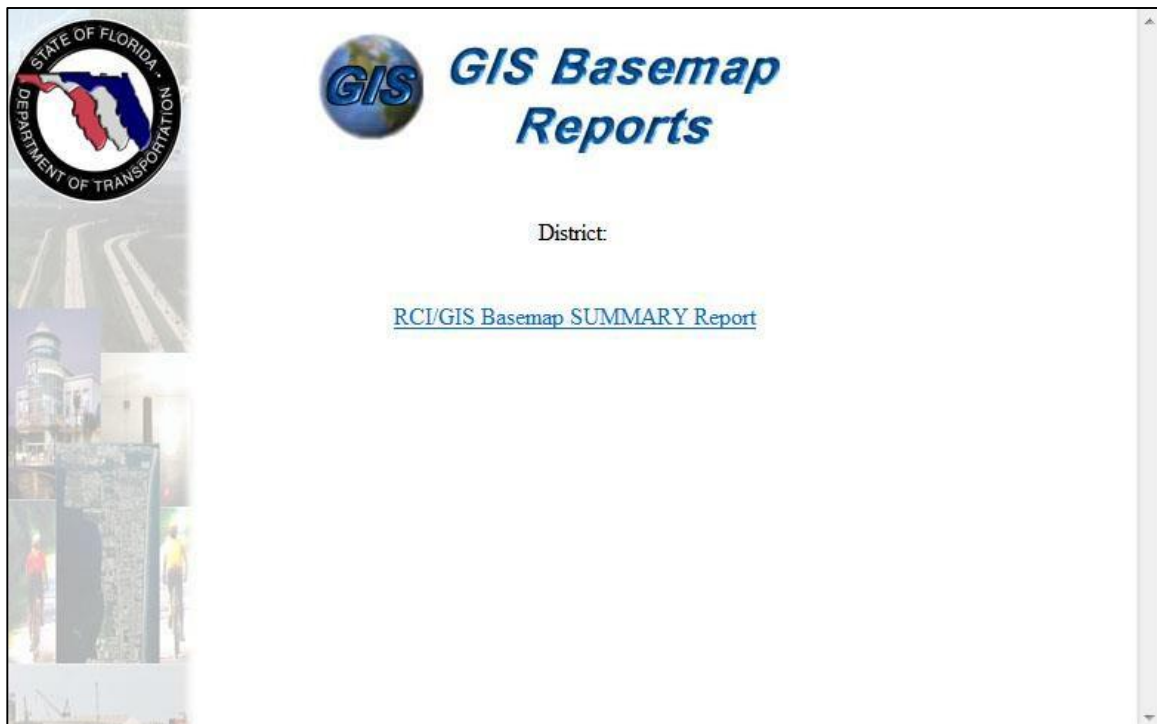
RCI/LRS Reconciliation Process

The RCI/LRS Coordinator is responsible for providing monthly reports identifying those roadway IDs which have alignment lengths in the LRS that do not match the RCI lengths within the discrepancy selection criteria. The results of these reports determine which roadway IDs should then be addressed by the Districts through RCI/LRS Package submittals which detail the remedies to correct the discrepancies.

District Access to LRS and Information Tables

District personnel can download the LRS and information tables for their District via the Intranet.

Access the Web page <http://cotranstat.dot.state.fl.us/pls/gis/welcome> and click the RCI/LRS SUMMARY Report. Proceeding from there, select the appropriate file(s) to download.



Discrepancy Selection Criteria

The acceptable deviation (as of 9/20/2006) between the LRS and RCI mileage lengths for each roadway ID should be less than 0.100 mile, less than 5% of the RCI gross length value, ignoring any that are less than 0.009 miles. Additionally, if the deviation is greater than 0.100 mile and less than 1.00% of RCI, such a route will be removed from both the Summary Report and the Detailed Listing Report (unless the discrepancy can be resolved). If an alignment has a valid roadway ID number in RCI and is missing from the LRS, it is automatically placed in the selection criteria list. Not considered are roadway IDs with RDSTATUS of 01, 04, 05, or 10.

RCI/LRS Discrepancy Summary Report

From the <https://fmw.state.fl.us:8890/apps/gis/welcome> site, the LRS Discrepancy Report can be accessed as seen in the example of the site. Discrepancies found by using the formula described in 'Discrepancy Selection Criteria' are reported using the aggregate numbers of roadway IDs by District and County. Each aggregate number of County roadway IDs is separated by type of discrepancy and overall Road Status and totaled for each County and District. A sample is shown below.

RCI/GIS Basemap Discrepancy SUMMARY 03/2017

Districts/Counties with Zero(0) Discrepancies have been removed
January 2005 began utilizing revised criteria

| District County Name | Difference >= .10 mi OF RCI LENGTH | | | | Difference >= 05% OF RCI LENGTH | | | | Missing Listed BY RCI Status | | | | Total |
|-------------------------|------------------------------------|----------|----------|------------|---------------------------------|----------|----------|------------|------------------------------|----------|----------|------------|----------|
| | [02] | [12] | [07] | [09,16,17] | [02] | [12] | [07] | [09,16,17] | [02] | [12] | [07] | [09,16,17] | |
| 1-04-DESO | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 1-91-OKEECHOBEE | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1-District Total | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 |

| District County Name | Difference >= .10 mi OF RCI LENGTH | | | | Difference >= 05% OF RCI LENGTH | | | | Missing Listed BY RCI Status | | | | Total |
|-------------------------|------------------------------------|----------|----------|------------|---------------------------------|----------|----------|------------|------------------------------|----------|----------|------------|----------|
| | [02] | [12] | [07] | [09,16,17] | [02] | [12] | [07] | [09,16,17] | [02] | [12] | [07] | [09,16,17] | |
| 5-79-VOLUSIA | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| 5-District Total | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |

| District County Name | Difference >= .10 mi OF RCI LENGTH | | | | Difference >= 05% OF RCI LENGTH | | | | Missing Listed BY RCI Status | | | | Total |
|-------------------------|------------------------------------|----------|----------|------------|---------------------------------|----------|----------|------------|------------------------------|----------|----------|------------|----------|
| | [02] | [12] | [07] | [09,16,17] | [02] | [12] | [07] | [09,16,17] | [02] | [12] | [07] | [09,16,17] | |
| 7-08-HERNANDO | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7-14-PASCO | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7-District Total | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |

| District County Name | Difference >= .10 mi OF RCI LENGTH | | | | Difference >= 05% OF RCI LENGTH | | | | Missing Listed BY RCI Status | | | | Total |
|------------------------|------------------------------------|----------|----------|------------|---------------------------------|----------|----------|------------|------------------------------|----------|----------|------------|----------|
| | [02] | [12] | [07] | [09,16,17] | [02] | [12] | [07] | [09,16,17] | [02] | [12] | [07] | [09,16,17] | |
| Statewide Total | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 7 |

[District RCI/GIS Basemap Detail Report](#)

RCI/LRS Detail Report

At the bottom of the LRS Discrepancy Report, a link (District RCI/LRS Detail Report) is provided to each District's Detail Report (sample below). This listing is used to identify individual roadway IDs, their discrepancy type, whether they are excluded and any brief comments which might be of use. The roadway IDs are grouped by County and are in ascending order.

RCI/GIS Basemap Detail Report for District: 1 For Period 03/2017

| CNTY | SECTION | RDST | BGN | END | BM_LNGH | DIFF | ERR | IND | EXC | COMMENTS |
|-----------------------|----------|------|-------|--------|---------|-------|-----|-----|-----|--------------------------------|
| 03 | 03000524 | 12 | 0.000 | 6.700 | 4.057 | 2.643 | .10 | N | E | part Pending 9/14/15 |
| END COLLIER | | | | | | | | | | |
| CNTY | SECTION | RDST | BGN | END | BM_LNGH | DIFF | ERR | IND | EXC | COMMENTS |
| 04 | 04900002 | 16 | 0.000 | 0.800 | | | MIS | N | | FM proj - no map 10/7/13 |
| 04 | 04900003 | 16 | 0.000 | 0.410 | | | MIS | N | | FM proj - no map 10/7/13 |
| END DESOTO | | | | | | | | | | |
| CNTY | SECTION | RDST | BGN | END | BM_LNGH | DIFF | ERR | IND | EXC | COMMENTS |
| 12 | 12015000 | 12 | 0.000 | 10.000 | 1.266 | 8.734 | .10 | N | E | 0.000-8.000 pending 4/6/09 |
| 12 | 12900002 | 16 | 0.000 | 1.134 | | | MIS | N | E | nonroad FM proj - 9/14/15 |
| END LEE | | | | | | | | | | |
| CNTY | SECTION | RDST | BGN | END | BM_LNGH | DIFF | ERR | IND | EXC | COMMENTS |
| 16 | 16390000 | 12 | 0.000 | 7.000 | 2.058 | 4.942 | .10 | N | E | part Pending 3/3/14 |
| 16 | 16900001 | 16 | 0.000 | 0.300 | | | MIS | N | E | nonroad FM proj - 12/6/10 |
| 16 | 16900003 | 16 | 0.000 | 0.200 | | | MIS | N | E | bridge off road FM 11/9/2016 |
| END POLK | | | | | | | | | | |
| CNTY | SECTION | RDST | BGN | END | BM_LNGH | DIFF | ERR | IND | EXC | COMMENTS |
| 17 | 17900002 | 16 | 0.000 | 0.100 | | | MIS | N | E | Projected Construction 1/06/14 |
| END SARASOTA | | | | | | | | | | |
| CNTY | SECTION | RDST | BGN | END | BM_LNGH | DIFF | ERR | IND | EXC | COMMENTS |
| 91 | 91900001 | 16 | 0.000 | 2.772 | 1.424 | 1.348 | .10 | N | | FM proj - no map 2/7/11 |
| END OKEECHOBEE | | | | | | | | | | |
| CNTY | SECTION | RDST | BGN | END | BM_LNGH | DIFF | ERR | IND | EXC | COMMENTS |

Exclusion Status of Sections

Within the Detailed Listing Report, there is a column with a header of 'EXC', denoting 'excluded from the Summary Report.' If any roadway ID has an entry of 'E' in this column, it means that it is not included in the Summary Report for that County/District until such time that it is excluded status is rescinded. The result of being categorized as 'excluded' is that the District is not held accountable grade-wise for that roadway ID until the data in the 'COMMENTS' column are cleared up. Exclusions must be reapproved at least once every six months in order to maintain an excluded status. Attaining an 'excluded' status is based upon mutually agreed factors between the Districts and the RCI/LRS Coordinator. The most commonly used but not exclusive factors are:

- Unavailability of newer aerials
- Inability to field inventory due to construction
- Inability to research or gather GPS points
- Inability to resolve the factors causing the discrepancy by CO or District involved

Sections where the deviation is greater than 0.100 mile and less than 1.00% of RCI length will need to be re-evaluated within five years utilizing the latest available technology.

Global Positioning System (GPS) Data

The use of Global Positioning System (GPS) data for LRS maintenance is appropriate and recommended for relaying information on alignment and point location. Proper knowledge of the collection and transmittal of such data for LRS use is required, and the technical aspects are detailed below, including the minimum standards for GPS collection hardware and software. A recommended tutorial on GPS can be found on the Internet at www.trimble.com.

GPS is a satellite-based navigation system operated and maintained by the U.S. Department of Defense. It provides location coordinates (such as latitude/longitude) for positioning and navigation. A GPS receiver is simply a range measurement device; distances are measured between the receiver antenna and the satellites, and the position is determined by means of trilateration, a method of determining position based on the point of intersection of multiple time-coded pulses. Positional accuracy obtainable by GPS can range from 100 meters down to the sub-centimeter level. Accuracy is largely dependent on equipment, the number

and distribution of available satellites, and the settings of user defined operational and tracking parameters which constrain how positional data is logged into the system. Selection of a particular GPS operating and tracking mode depends on the user application and the desired accuracy level.

Recent advances in Distance Measuring Instruments (DMIs) allow for easier installation and additional information such as GPS coordinates. These vehicle mounted instruments, typically on the dashboard or windshield, use an external sensor input such as a Vehicle Speed Sensor (VSS) to determine distances traveled greater than a hundred feet. Newer models offer a USB interface and a 66-channel, 10-Hz update, super-sensitive GPS engine that requires no wiring -- besides power -- and achieve an accuracy of up to 0.5 feet per mile.

Delivered GPS Data File Format and Specifications

GPS data shall be collected so as to capture the center of the roadbed as defined by the outside edge of pavement to the outside edge of pavement of the through lanes. For some field situations, the GPS user may need to consider using an offset to capture the center of the road bed.

For the purpose of reference/inclusion in the FDOT RCI/LRS, collected data should be provided shapefile formats. GPS data must be provided in UTM 17 projection to be accepted. GPS data feature type can be either a streaming feature type (line) -- the preferred choice -- or a series of static points.

RCI/LRS PACKAGE PROCESS

Introduction to the RCI/LRS Package Process

The RCI/LRS Package Process was developed by the Transportation Statistics Office (TDA) to aid the Districts in recording all revisions, updates, and modifications to roads in RCI and the RCI/LRS. This process has been refined to facilitate the requirement that Districts send all such revisions to TDA in package format so that changes can be tracked and completed in a timely manner.

RCI changes that require an RCI/LRS Package include:

- Adding a new Roadway ID
- Deleting a Roadway ID
- Inactivating a Roadway ID
- Lengthening or shortening a Roadway ID
- Changing a Roadway ID overall status, overall description, or any other information field on the RCI View/Update/Delete (V/U/D) screen

When any GIS alignment or RCI data differences are found and the Districts are notified of them, e.g. via the **RCI/LRS Reconciliation Process**, the Districts are suggested to correct them within 15 days or as directed by Management.

Once an RCI/LRS Package is submitted, TDA processes it according to the following deadlines:

- RCI/LRS packages are logged into TDA database within 3 days of date received.
- RCI/LRS packages are coordinated and processed internally within 45 days of the date logged.
- RCI/LRS packages requiring additional work by the District may be suspended for up to 7 days by TDA.

NOTE: Additional work that cannot be completed during suspension may be returned to the District for re-submittal.

If any documents, maps, RCI V/U/D screens, or other follow-up material are missing, then processing of the RCI/LRS package may be suspended according to the following steps:

- 1 The District will be notified.
- 2 The RCI/LRS Package Coordinator will be notified to place the package under suspension.
- 3 The package will stay suspended for up to 7 calendar days, giving the District time to provide the required information.
- 4 After 7 calendar days, no further action will be taken on that particular roadway ID, although the remainder of the package will be processed.

RCI/LRS Correction Form

An RCI/LRS Correction Form was developed by TDA to assist in the submitting and processing of RCI/LRS Packages submitted by the Districts. This Form may be downloaded from the following link:

<http://fdotsp.dot.state.fl.us/sites/ISD-TRANSTAT/Divisions/GIS/SitePages/Home.aspx>

Use of this Form will help to minimize the chance of errors and will improve the quality of the entire process. Always keep a copy of the Form that has been sent to TDA.

The Form being submitted must be filled out correctly and reviewed by the District Office before any changes will be made in RCI and/or the RCI/LRS. The steps for correctly filling out the Form are listed below. It is highly recommended when submitting Roadway ID updates for both RCI and the RCI/LRS that they are simultaneously updated in the same package. In this way, discrepancies can be kept to a minimum in RCI, the RCI/LRS, and especially on the monthly reports.

RCI/LRS PACKAGE CORRECTION FORM

Date Sent to Transportation Data and Analytics Office: 03/08/2017



To: RCI/LRS Package Coordinator, Transportation Data and Analytics Office
M.S. 27 (850) 414-4739

From: D9 Coordinator (850) 555-1234, D9@dot.state.fl.us.
District Contact Name, Phone Number, Email

Re: RCI/LRS Correction Package Number [District's tracking number]

Enclosed is a package of updates/revisions for RCI and/or the Linear Referencing System (LRS)



| Item No. | Roadway ID | New Road | Local Road with FM Projects | SIS Facility | RCI Revision ¹ | LRS Revision ² | Feature 112 Revision |
|----------|------------|--------------------------|-----------------------------|--------------------------|-------------------------------------|---------------------------|--------------------------|
| | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
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| | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Acknowledgement of receipt of materials. **DO NOT ALTER THIS FORM FROM THE ORIGINAL**

Received by LRS Package Coordinator _____

Date: _____

¹Requires all data necessary to complete the RCI View/Update/Delete (V/U/D) Roadway ID Screen

²Requires accompanying maps, such as iView Screen print-outs, or aerials (Package cannot be processed without adequate alignment information).

Due Date: _____

RCI/LRS Correction Form Entries

Date

The date the package is being submitted should always be included. This aids in the tracking process.

From

It is very important to include the name of the person who actually prepared the package. If a consultant completed the package, please include their name and telephone number along with a District contact person. This assists TDA personnel in the event any questions arise concerning the data being submitted.

RCI/LRS Correction Package Number (#)

This number is used to identify packages containing the Roadway IDs that are being submitted to TDA for revisions of any type (updates, changes, corrections, etc.). Package numbers should be established using the initials of the person compiling the package contents and an associated number sequence. For example, DA-1 would be from District Administrator, package number one. We have found this process to be the most reliable and least confusing. Do not use a date or Roadway IDs as a package number.

It is the District's responsibility to keep up with the package numbering sequence. This may be easily done with a spreadsheet showing submitted and returned packages. Never use the same package number twice. If information or the status about a package is required, refer to the package number in question exactly as the package number was submitted.

Item Number

This column is provided for convenience when referring to a Roadway ID in question. There are 15 rows on each correction Form. Since multiple Forms can be used per package, please remember to number 1 through 15 on the first Form and 16 through 30 on the second Form. No more than 30 roadway ideas may be sent in a single package.

Roadway ID

This column is only for the Roadway ID(s) being submitted for revision.

New Road

A checked box in this column indicates that the Roadway in question is being added to RCI and/or the RCI/LRS.

Local Road with FM Projects

A checked box in this column indicates that the Roadway in question is a part of the On/Off System and requires a minimum of RCI and/or RCI/LRS work. The roadway idea must contain the number 9 in the third place holder.

SIS Facility Feature 147 Revisions

A checked box in this column indicates that the Roadway in question is designated as a Strategic Intermodal System alignment and is highest priority when considering assignments.

RCI/RCI/LRS/Feature 112 Revisions

This column indicates if an RCI, RCI/LRS and/or Feature 112 (Federal System) update is necessary.

Acknowledgement of receipt of Materials

Once the RCI/LRS Correction Form has been reviewed for completeness, the RCI/LRS Package Coordinator will date and sign the package. A copy of the Form will then be returned to the District to be kept with their records. The package is then logged into the tracking program, which starts the review process to RCI and/or the RCI/LRS. If the Correction Form has not been filled out correctly, the District will be notified and given three days to resubmit the corrected form.

RCI/LRS Correction Checklist

An RCI/LRS Correction Checklist has been assembled for District use to aid in putting together package requirements before final submittal to the TDA Office. This checklist ensures that each District sends packages with the essential information required by TDA to effectively make the necessary revisions for both RCI and the RCI/LRS.

It is important to send the required information from the checklist for each Roadway ID that needs updating, otherwise setbacks and delays can occur in the TDA package review process.

All of the requirements for a complete package submittal are listed in the RCI/LRS Correction Checklist which follows. It is highly recommended that a thorough review of the package contents be made to ensure correctness and that all District responsibilities have been recognized and completed before submittal to TDA. This RCI/LRS Correction Checklist was developed for customers in each District so they can become more familiar with the TDA process of updating RCI and the RCI/LRS.

RCI/LRS Correction Checklist

Check appropriate box for information included in package submittal.
(Do not send this checklist form to TDA – For District use only.)

PACKAGE # _____ SUBMITTED BY: _____
DISTRICT REVIEW BY: _____ DATE: _____

RCI/LRS ALIGNMENT

☐ Reviewed the RCI/LRS to verify the roadway alignment needs to be adjusted.

Always review the RCI/LRS first before submitting GIS roadway updates to TDA.

If you are requesting a roadway alignment adjustment/deletion/addition for the RCI/LRS, first review the latest version of the RCI/LRS.

View/Update/Delete Roadway ID Screen

☐ Include the latest printout of the View/Update/Delete Roadway ID Screen for each Roadway ID being submitted for updates to RCI and/or the RCI/LRS.

This is required so both the RCI/LRS and RCI coordinators can make a thorough review of the header information. Never send a View/Update/Delete Roadway ID Screen printout from a previous processed package; always include the latest View/Update/Delete Roadway ID Screen printout. Do not create and send in another “version” or copy of the V/U/D screen.

☐ All information is complete on the View/Update/Delete Roadway ID Screen printout to open a new Roadway ID in RCI.

When creating a new Roadway ID in RCI, it is extremely important to submit all the information necessary to complete the View/Update/Delete Roadway ID Screen. Otherwise the Roadway ID cannot be created.

☐ Reviewed all the information on the View/Update/Delete Roadway ID Screen printout and made corrections as necessary.

When updating/changing/correcting any information on the View/Update/Delete Roadway ID Screen printout, please strike through the old or wrong information and write in the new information. If lengthening or shortening the gross length of the roadway, cross out the old and write in the new length.

☐ Included additional instructions listed on the View/Update/Delete Roadway ID Screen printout.

Never assume or take for granted that TDA knows what you want; be very explicit when listing any additional instructions.

Feature 112

☐ Feature 112 has been reviewed and instructions have been included on each View/Update/Delete Roadway ID Screen printout that is submitted.

On each View/Update/Delete Roadway ID Screen printout that is submitted, always state if Feature 112 needs to be lengthened, shortened, deleted, created, or that Feature 112 is good as is. Do not state that “Feature 112 needs to be updated.” This does not indicate if Feature 112 has been reviewed by the District. The Functional Class Coordinator reviewing/updating Feature 112 has requested that all future updates to Feature 112 (especially when the Feature needs to be created in RCI) include the functional classification of the roadway on each View/Update/ Delete Roadway ID Screen printout as well as the reason for the request. If there is an exception for the Roadway ID, then please indicate the mileages that you would like entered into Feature 112.

RCI Updates

☐ All Features have been shortened in RCI before shortening gross length.

It is required that all Features be shortened in RCI before the gross length can be shortened. If necessary, run a Propose New Roadway Section Boundaries report to verify that all Features have been shortened before requesting a length change. Also, remember the net length is automatically adjusted in RCI once the gross length and Feature 140 have been corrected.

☐ A general location map showing roadway location is included for RCI/LRS Roadway ID updates.

It is required to include a general location map; this aids the RCI and GIS Sections in identifying where a roadway is located.

☐ Features 140 and 141 have been reviewed for exceptions on roadways for Roadway IDs to be updated in the RCI/LRS. Review Feature 138 for realignments.

It is required that Feature 140 be reviewed and that all exceptions to a roadway be updated in RCI before Roadway ID submittal to TDA.

☐ Sufficient alignment information is included for RCI/LRS updates.

In order for the GIS Section to adjust or create a roadway alignment in the RCI/LRS, adequate maps or aerials are needed showing the new alignment information and location. Global Positioning System (GPS) data is also an option for many needs in this area.

Features 326, 330 and 331

☐ District Maintenance and Central Safety Office have been notified of RCI data updates/ deletions.

Remember to advise Maintenance and Safety of data updates/deletions, so they can make their necessary data updates/deletions. Do this before package submittal to TDA.

☐ Check RCI Features 330, 331 and 326 for information before deleting Roadway ID in RCI. Contact Traffic Counts personnel in your District; they can explain how to remove this information.

If a Roadway ID needs to be deleted and there is information in Feature 330, 331 or 326, you should contact the Traffic Counts personnel in your District. They should be able to delete this Feature for you.

Strategic Intermodal System (SIS) Feature 147

☐ District Feature 147 Revision Process.

To request a milepoint revision to Feature 147 Strategic Intermodal System (SIS), the District will write on the package correction Form and on each of the individual View/Update/Delete Roadway ID Screen printouts a reference to updating the SIS milepoints. If you are unsure of the intended milepoints, call TDA's Package Coordinator. Like other RCI/LRS revisions, a general location map showing roadway location is required. It should be noted that this Feature needs to be shortened in RCI first before the total length can be shortened.

COMMENTS: _____

COUNTY SECTION NUMBER KEY SHEETS

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

County Section Number Key Sheet Requirements

The General Interest Roadway Data (GIRD) Procedure Topic No. 525-020-310, Section 3.1 states, “The Districts will maintain the accuracy of the RCI database, regeneration and timely distribution of SLDs and key sheets from the RCI database...” Section 3.1.1 states, “Within 120 Calendar Days of any SHS mileage changes – the Districts will regenerate and timely distribute the SLDs and key sheets from the RCI database to TDA and affected users reflecting the status of all roadways on the roadway network.” Section 3.1.2 states, “Within 120 Calendar Days of Notification of Project Completion – the Districts will regenerate and distribute the SLDs and key sheets from the RCI database to TDA and affected users reflecting the status of all roadways on the roadway network.” Section 3.1.3 states, “Within 120 Calendar Days from any MAP-21, SIS, or NHS Designation Changes – the Districts will regenerate from the RCI database and distribute SLDs and key sheets for all affected roadways.” Section 3.1.4 states, “Within 30 Calendar Days from the date of notification for events other than listed in Section 3.1, the Districts will take appropriate actions to update the data in the RCI database, regenerate and distribute any affected SLDs and key sheets from the RCI database...” Section 3.1.5 states, “RCI 5-Year Re-inventory Cycle – the Districts will... regenerate and distribute the SLDs and key sheets from the RCI database to reflect the status of the roadway network” and “Annually – the Districts will review, regenerate from the RCI database, and distribute SLDs and key sheets every year to accurately reflect any MAP-21, SIS, NHS, and SHS designations changes.”

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.

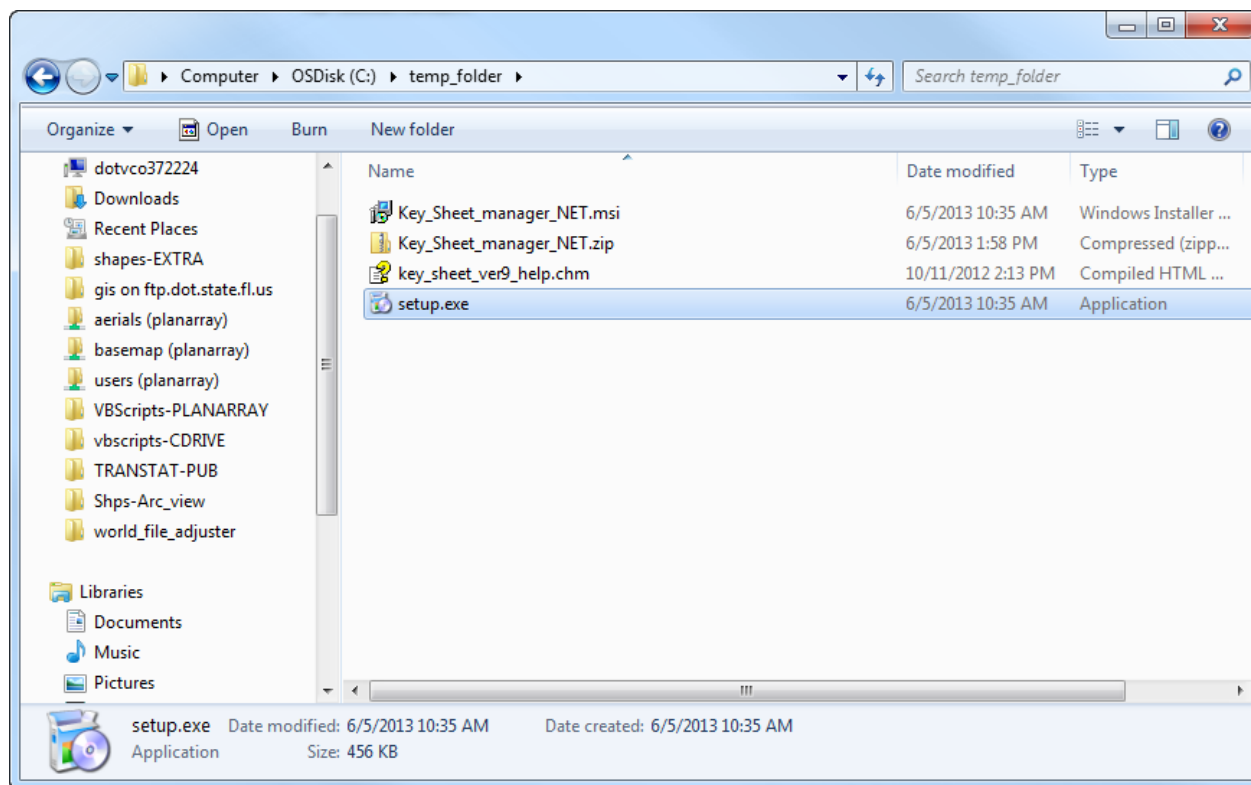
Installing the Extension

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.

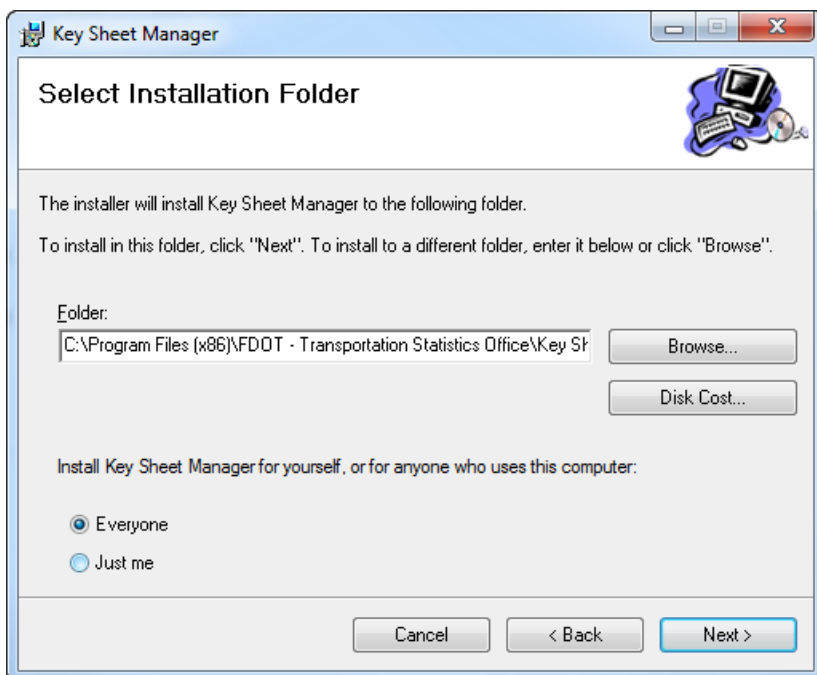
- The manager package is contained in the KEYSHEET_manager_NET.zip archive. Copy this archive to a folder on your computer and unpack all the contents.
- After unpacking the archive, double-click on the setup.exe file. This will install the Key Sheet Manager application on your computer.



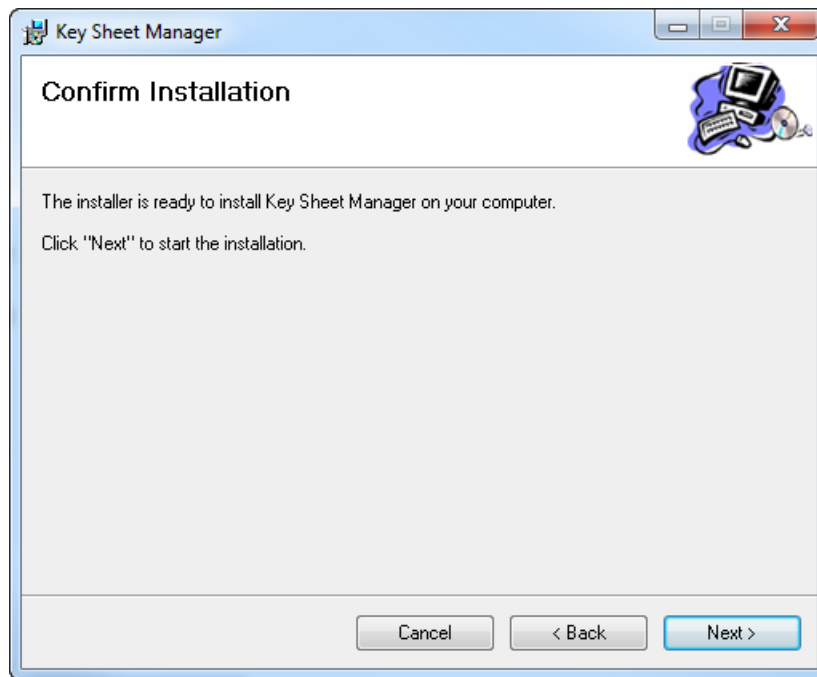
- Click “Next”



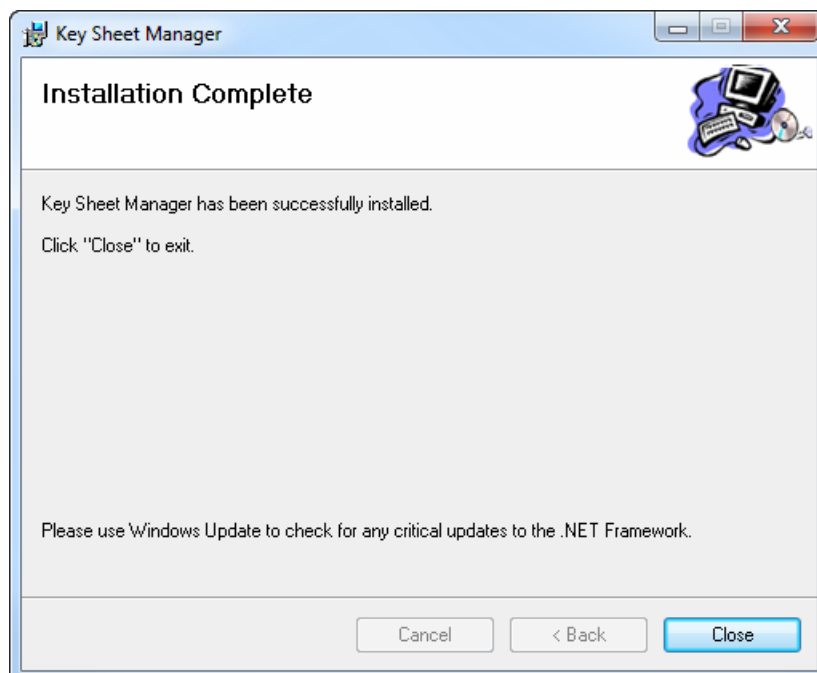
- Accept the default folder for installation, then click “Next”



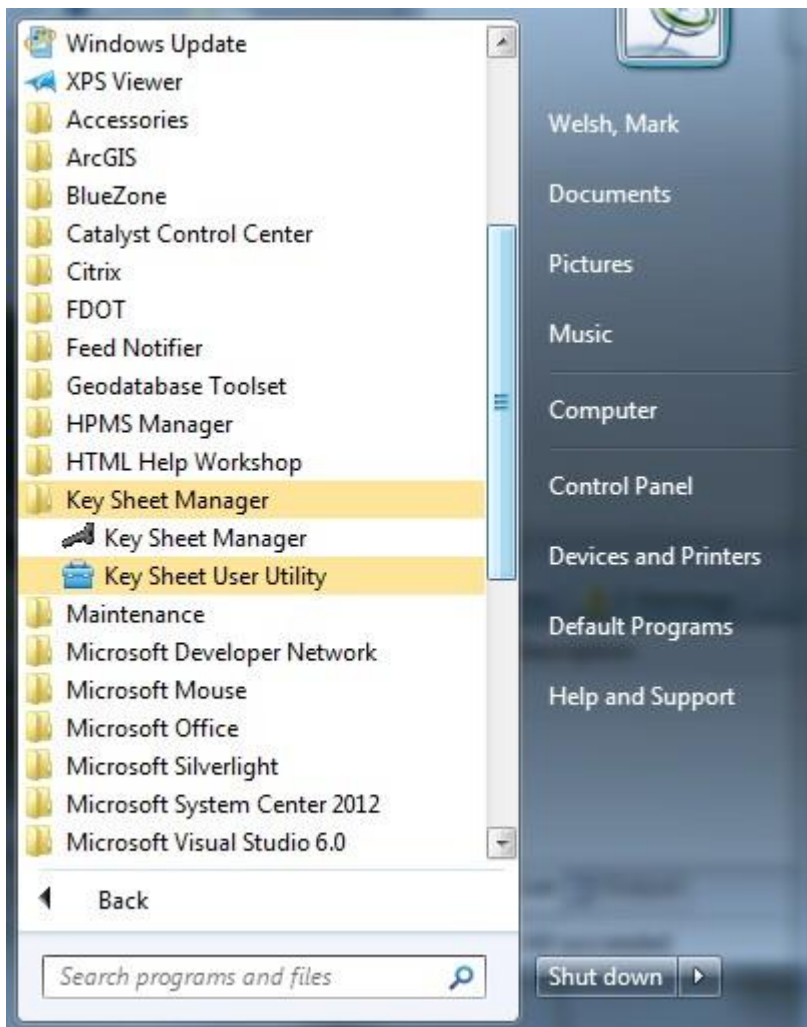
- Click on the “Next” to finish the installation:



- This indicates the manager was installed correctly:



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

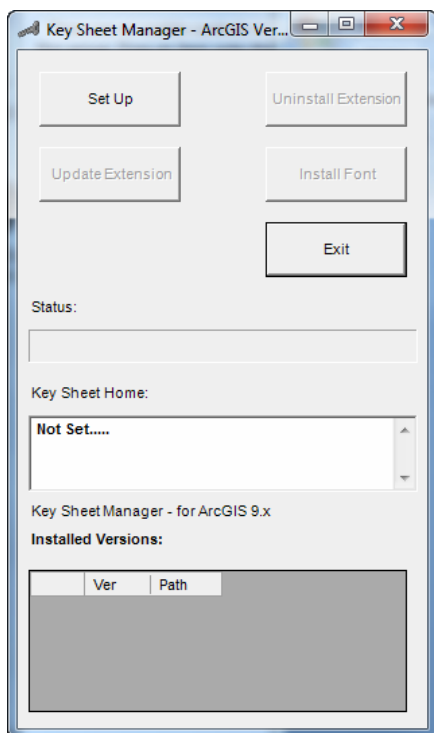


Note: If you did not successfully install the Key Sheet Manager, please contact your System Administration staff to assist. You may also call the Systems Support Section in TDA, Central Office (850-414-4848 or toll free 800-399-5503).

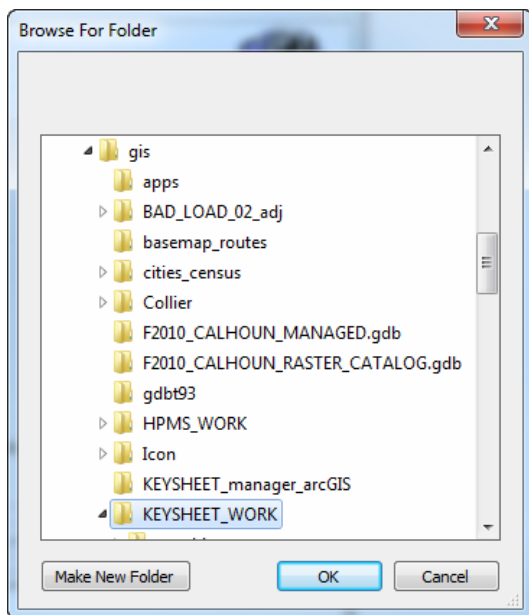
The Key Sheet manager is used to install the Key Sheet Extension into ArcGIS, setup the Key Sheet work area, and update the Key Sheet Extension when new versions are available. In addition to the Key Sheet Manager, there is an additional utility (Key Sheet User Utility) that allows any user to refresh 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.



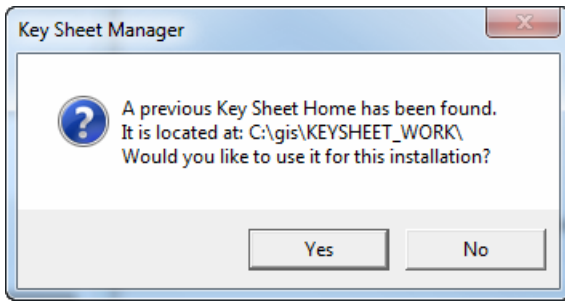
- Next, you will be prompted to specify your Key Sheet work home:



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:

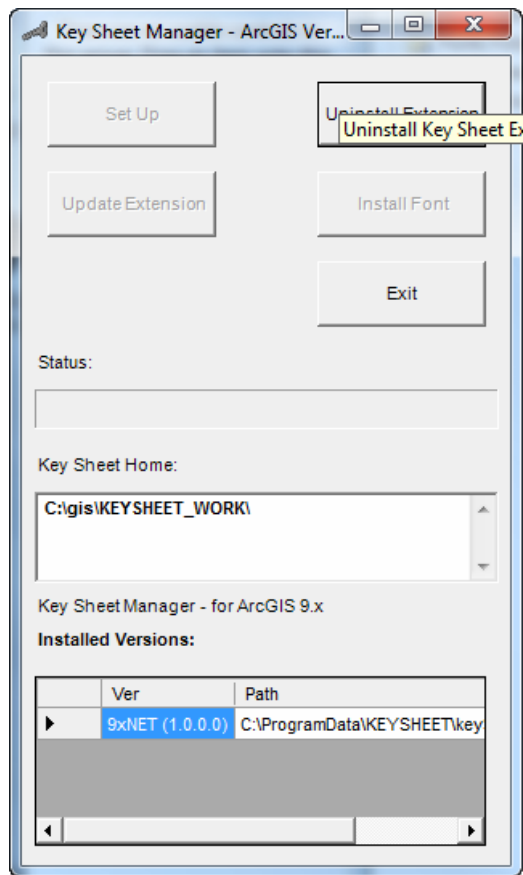


Note: You may see the following system warning. The Manager requires Internet connectivity, and your firewall may warn you. Please allow the Key Sheet Extension and Manager to have access to the internet. This is required to download the extension and necessary data.



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

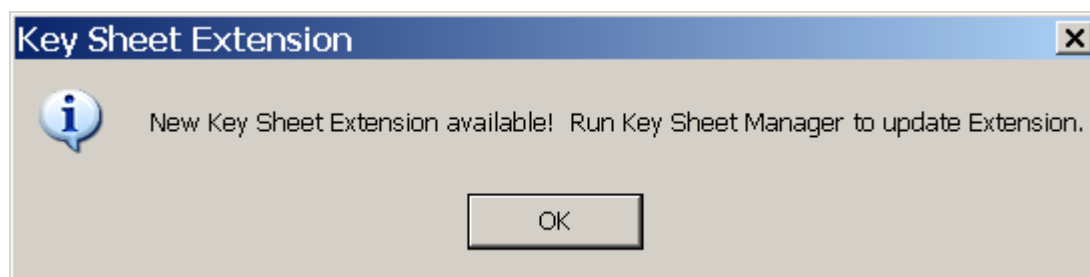
- The Key Sheet Extension will now be installed on your computer. Click the "Exit" button on the Manager. You are ready to proceed with using the Key Sheet Extension.



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.

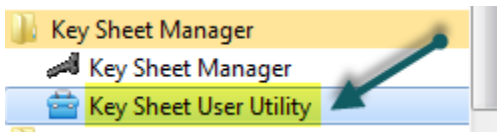
The manager also installs the latest extension version, should an update become available. If your computer has an internet connection, you may be alerted through ArcMap or the Key Sheet Manager that a new extension is available for download. This alert will happen right after you start an ArcMap session:



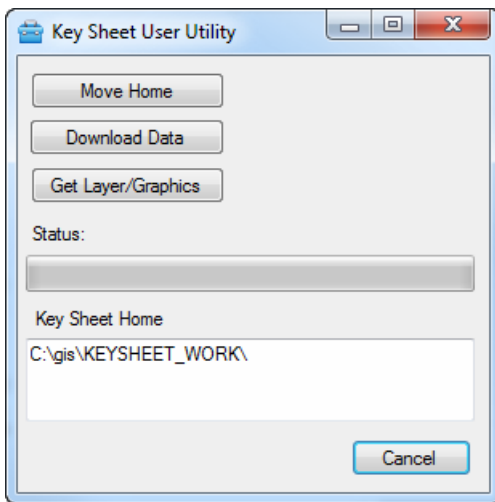
You can choose to ignore the update reminder and work with ArcMap as usual, or you can close ArcMap and run the Key Sheet manager to get the new extension. Start the manager and click on the “Update Extension” button to get the newest version.

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.

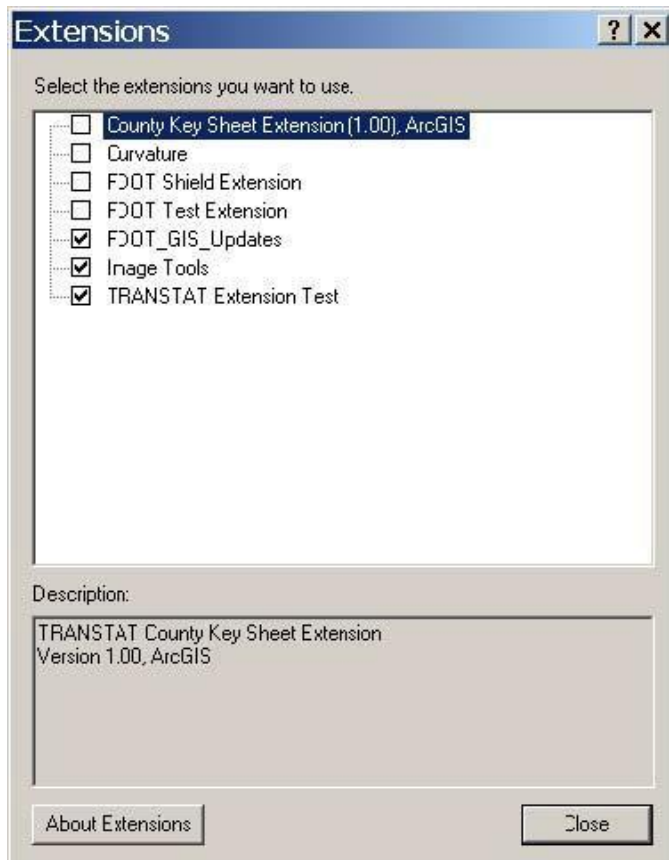
Finally, by clicking on the “Uninstall Extension” button, you can remove the Key Sheet Extension from the computer. **Note:** the Key Sheet home folder and any work and datasets stored in that folder will **NOT** be deleted.

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:



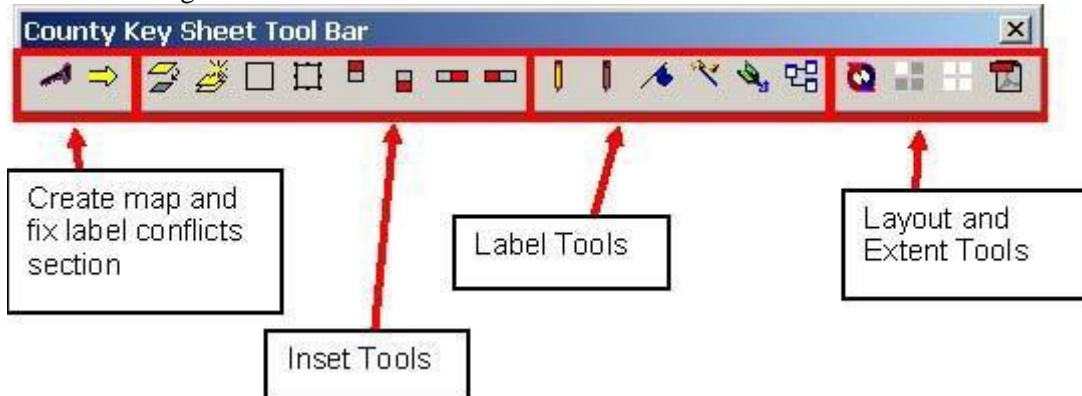
Check the box by the “County Key Sheet Extension...” This will make the toolbar visible. You can dock the toolbar anywhere on the ArcMap interface that you find convenient.

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.



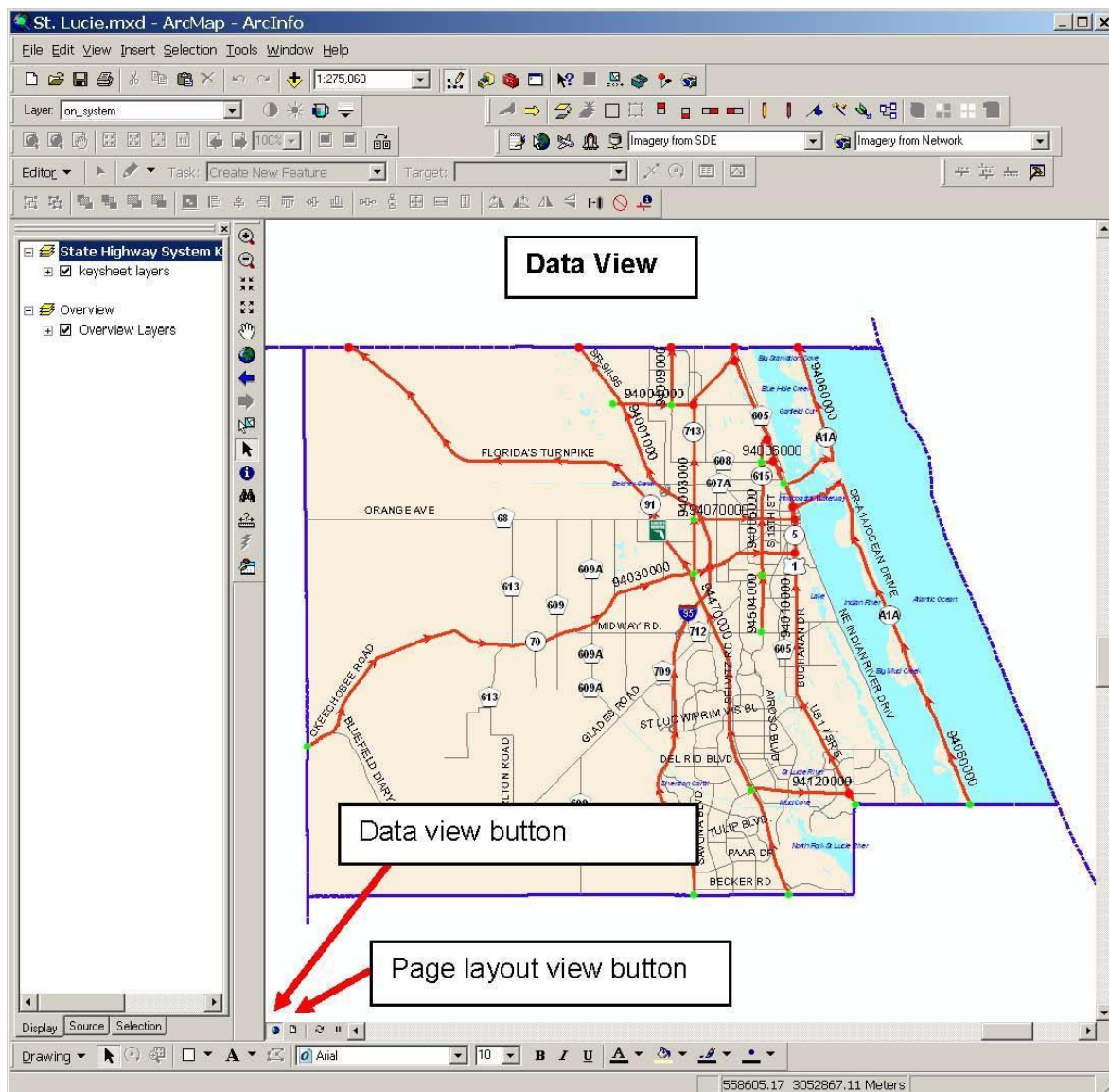
Select the county from the drop-down list.

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



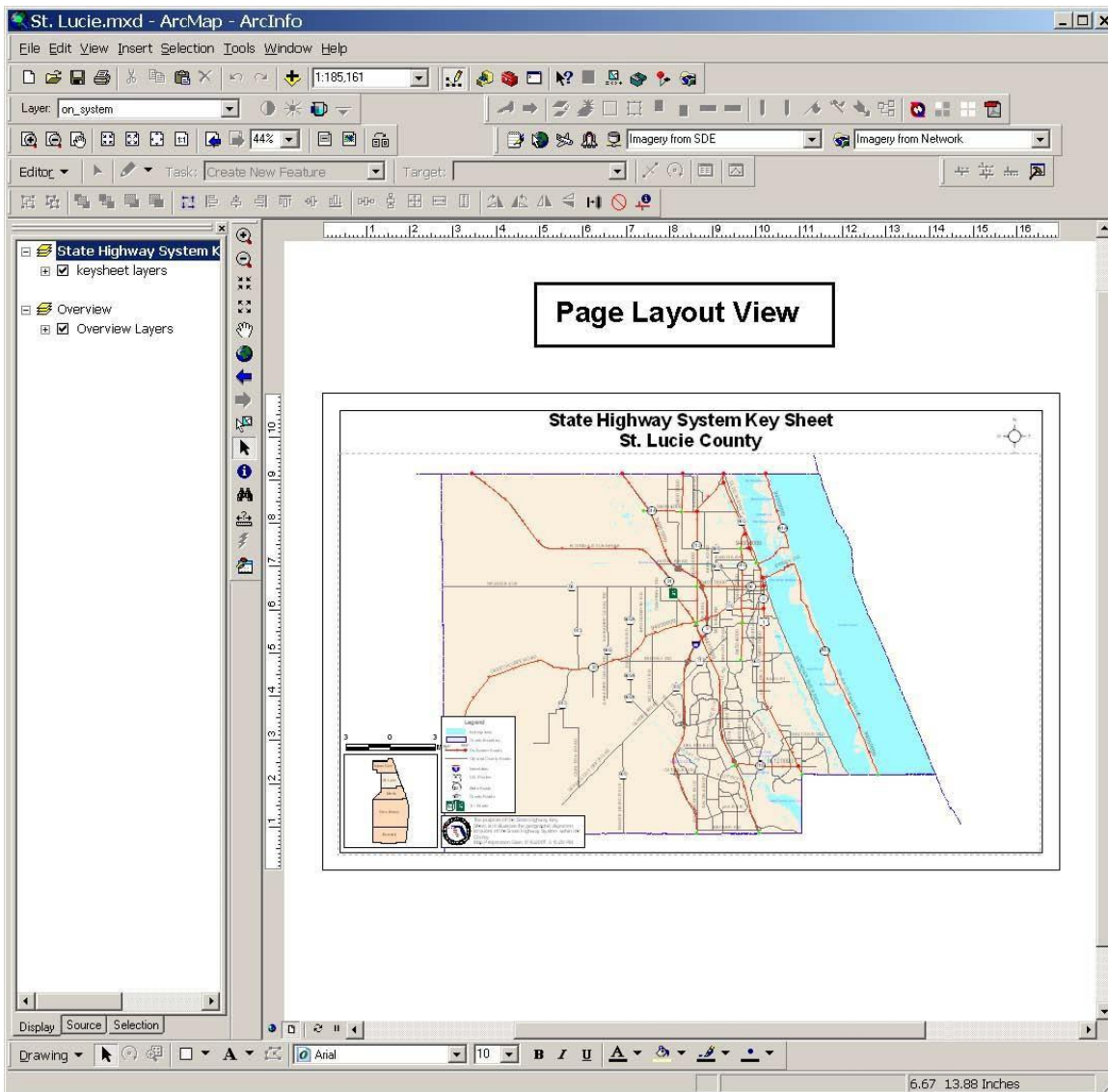
If the map document already exists, you will be prompted to overwrite the existing map document with the new version. If you click yes, the previous version will be deleted and replaced with the new version. If you click no, the previous version will be “archived” with a file name that indicates the 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

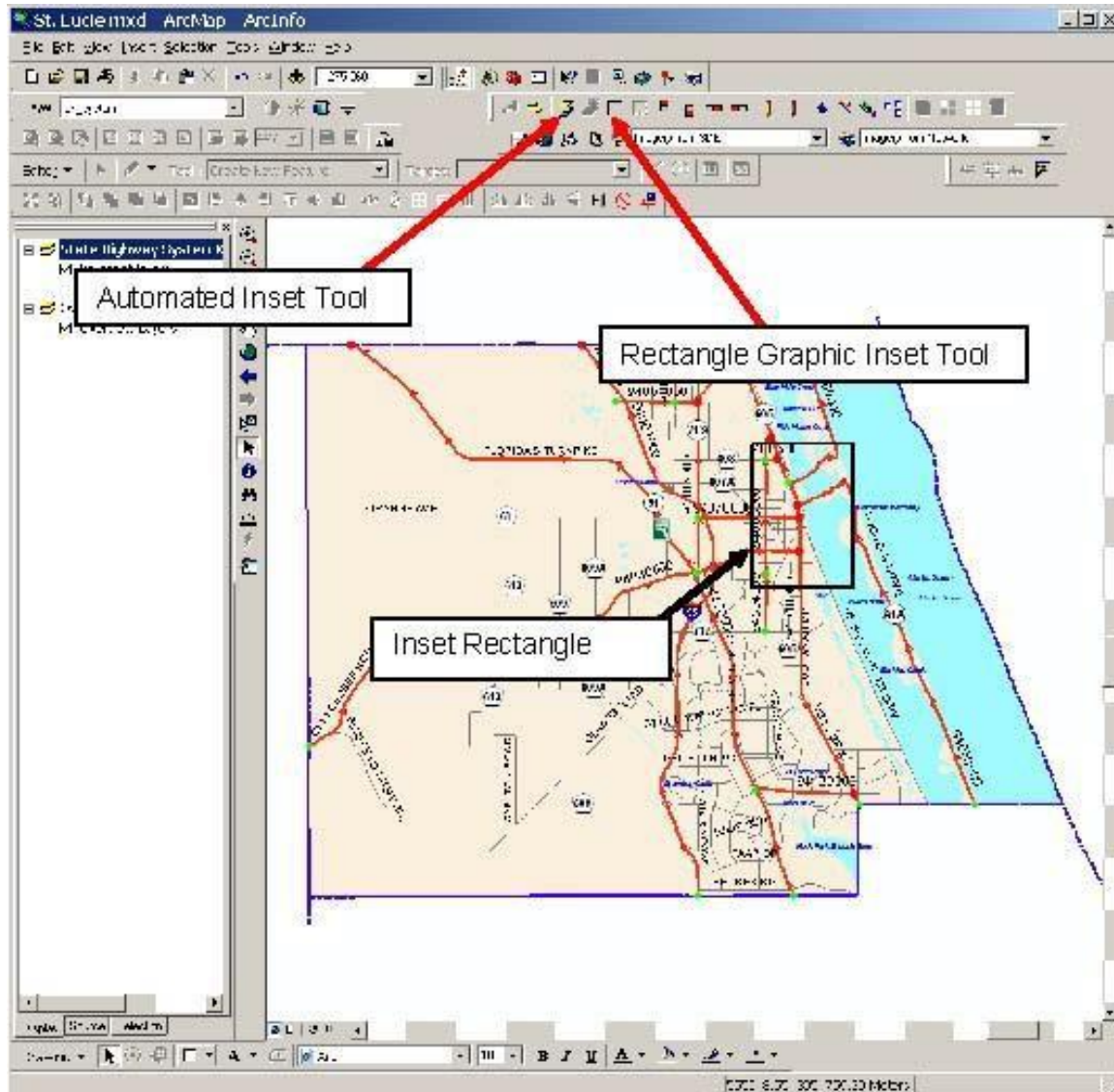
There are two ways to create insets manually. The first way is to use the automated inset tool and drag a rectangle around the area on the map you wish to make an inset. The inset gets made immediately and the inset database is updated. The second way is to use the inset rectangle graphic tool. This 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

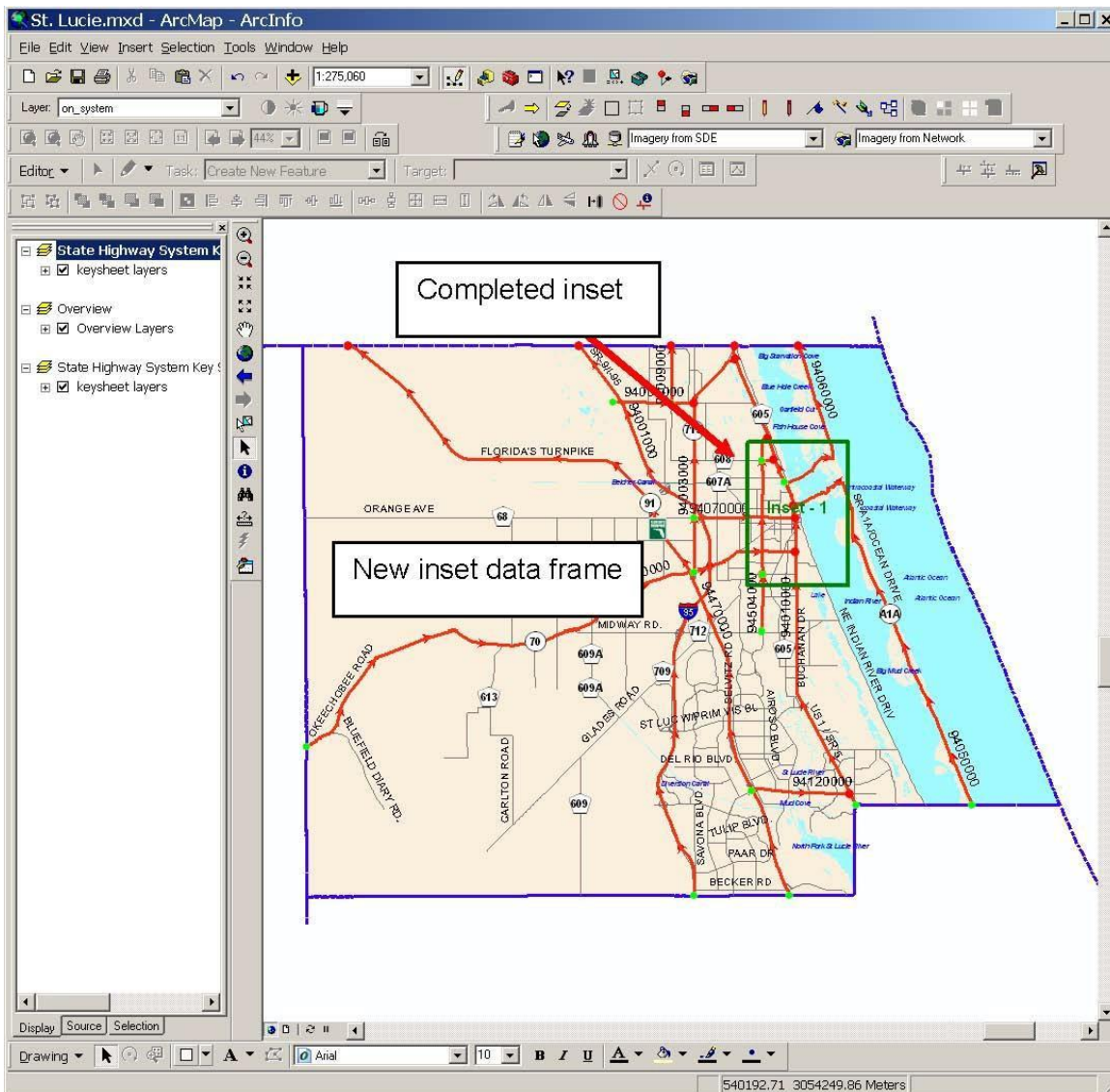


Select this tool. The cursor will display a pronounced crosshair symbol.

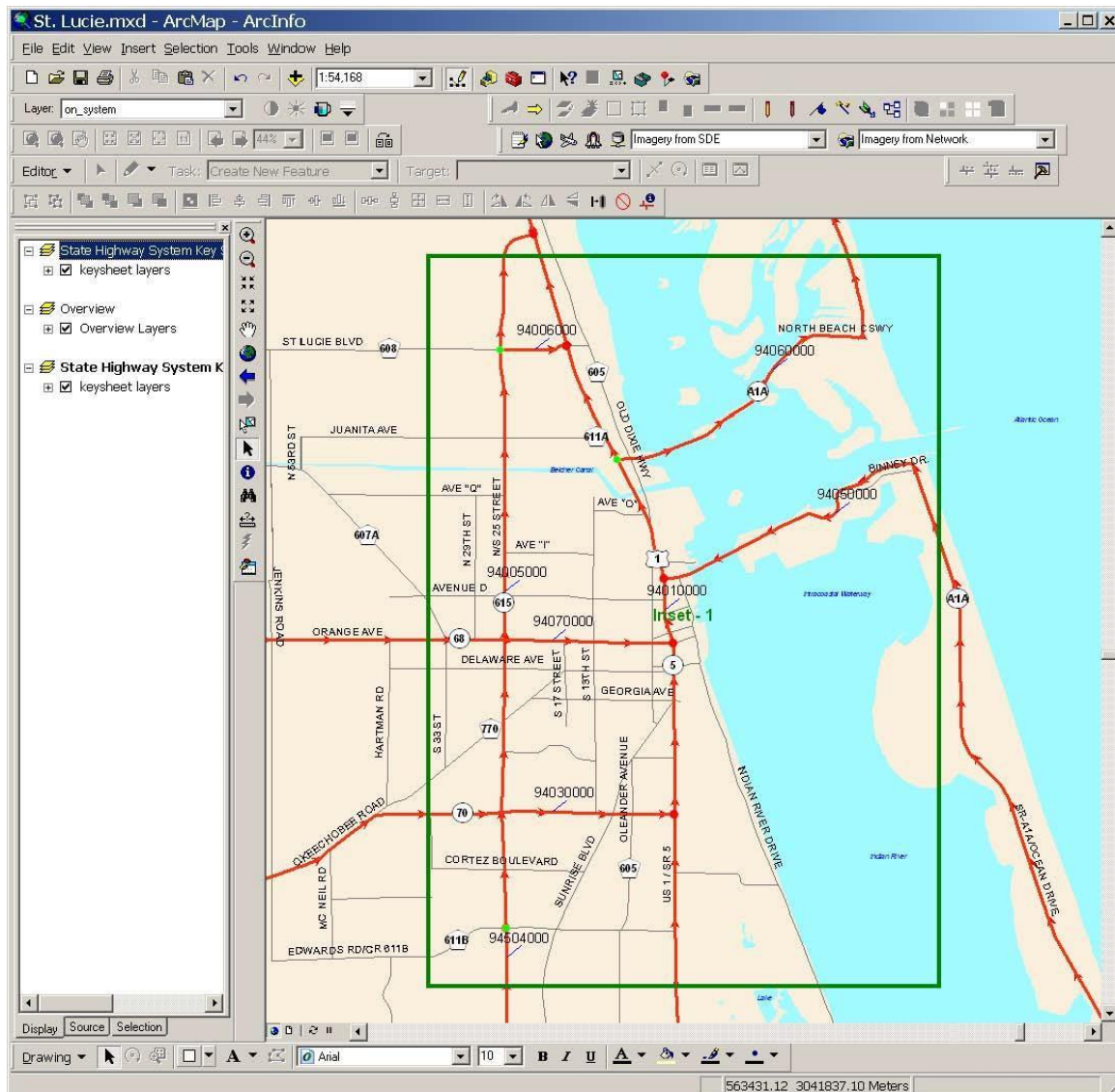
Drag a rectangle around the area of interest.



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:

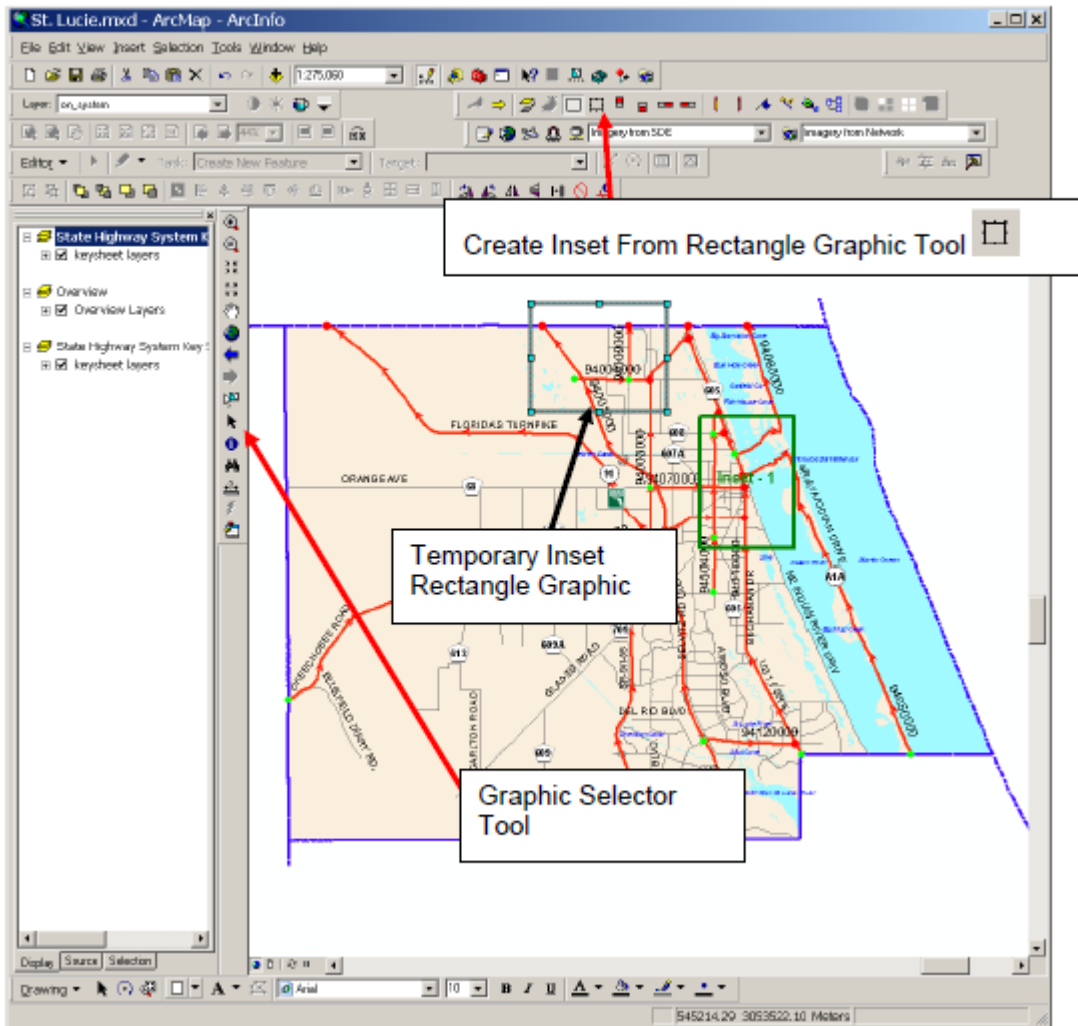


Activate the main county map to switch back to the original view.

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

Drag a rectangle around an area that requires an inset:

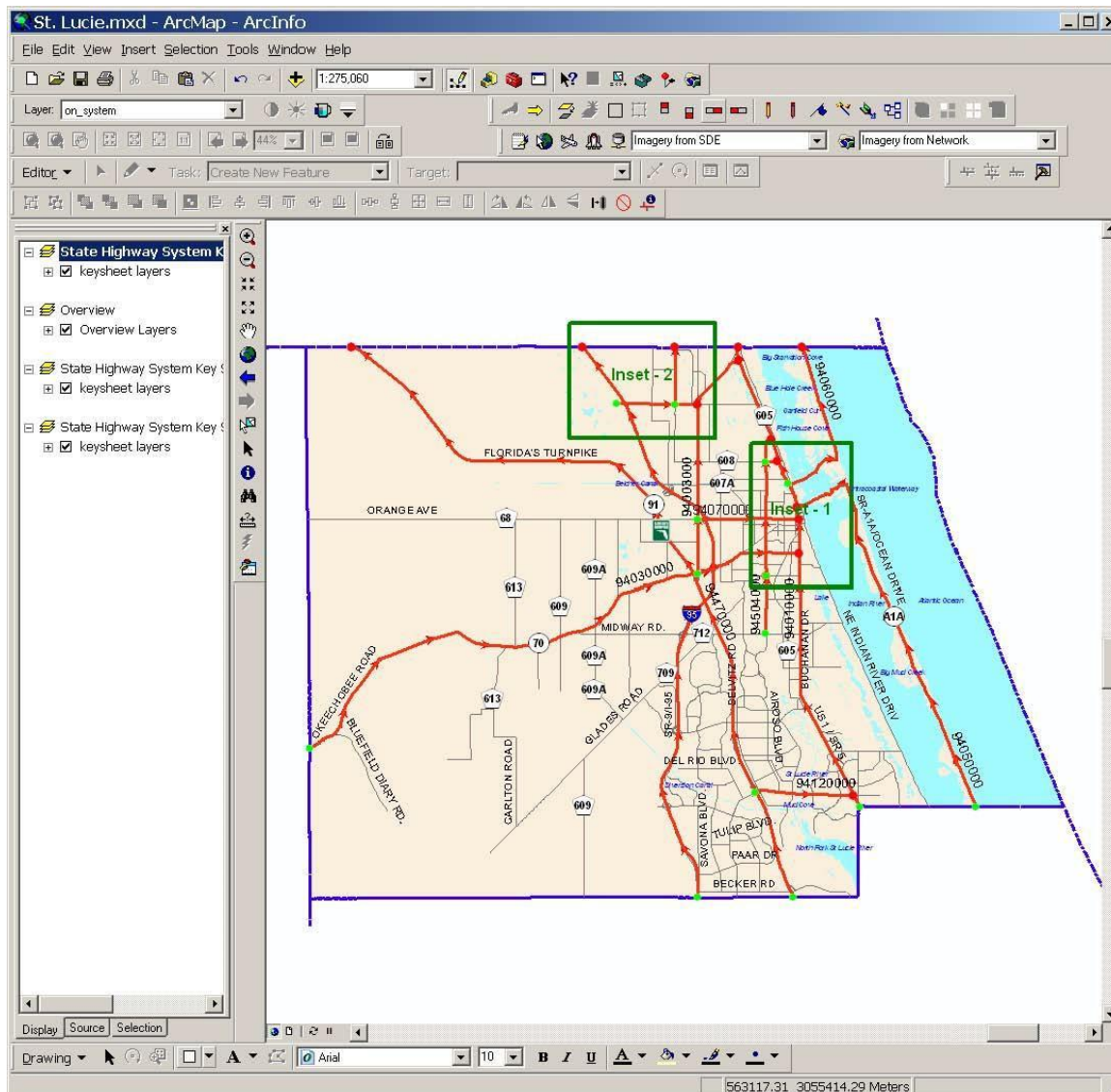
Note: In this case, all that happens is a gray rectangle graphic is created, but nothing is added to the map document. The inset database only has the one inset recorded that was made previously:



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:

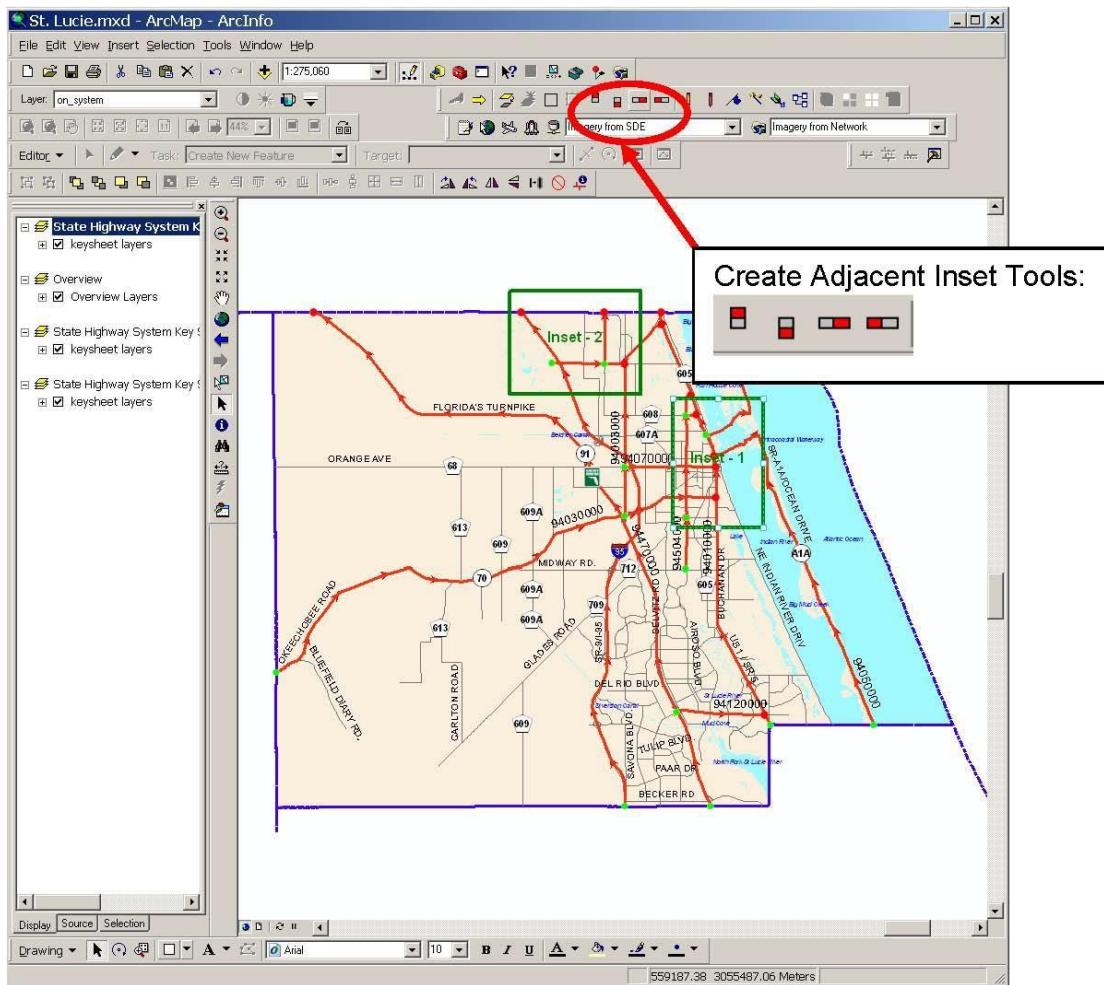


You now have two inset maps in your map document. Be sure to save your map document frequently to preserve the work you have done so far. You may proceed to make insets in similar fashion, or opt for using the create adjacent inset tools instead.

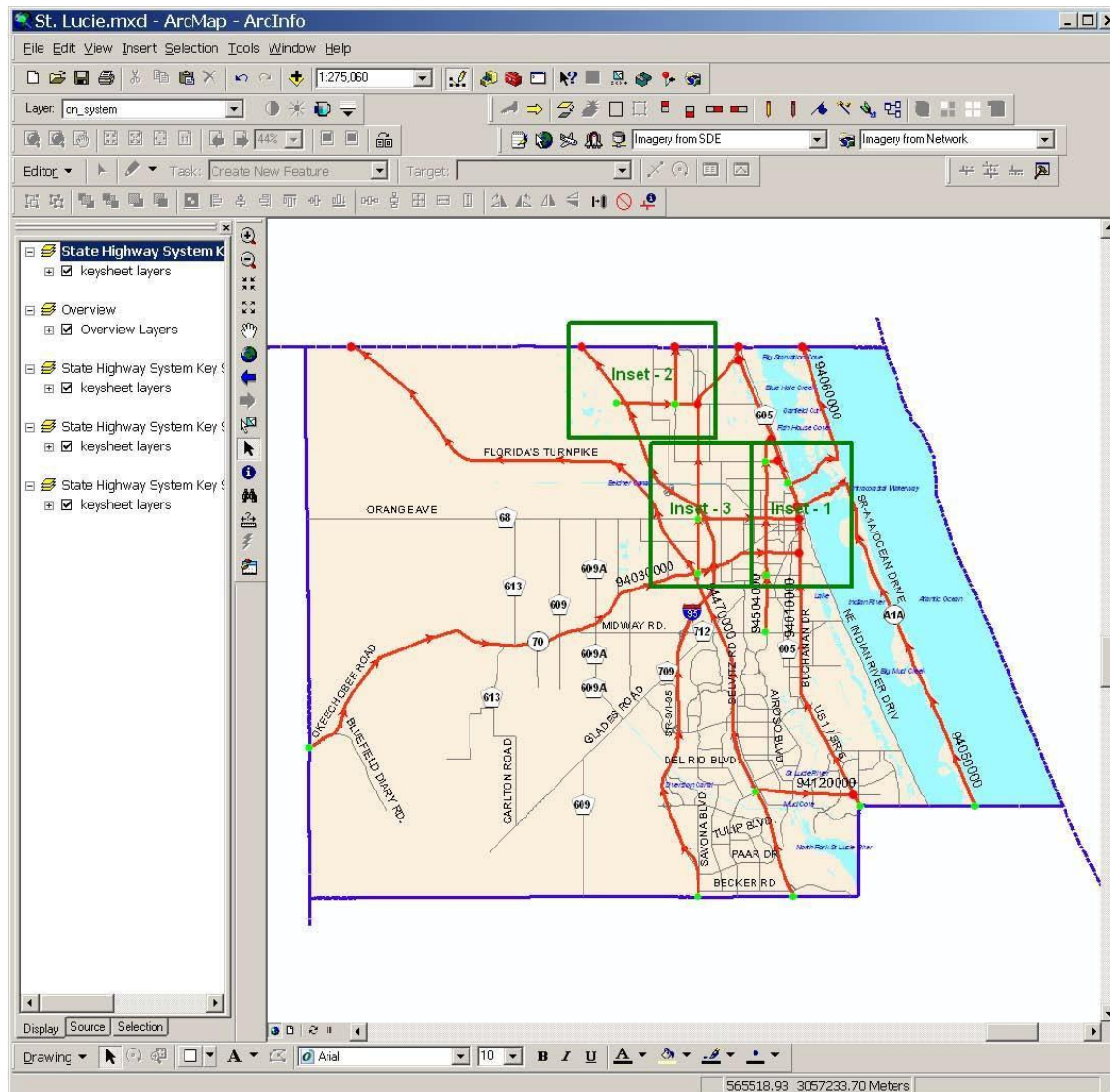
Create Adjacent Insets

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.

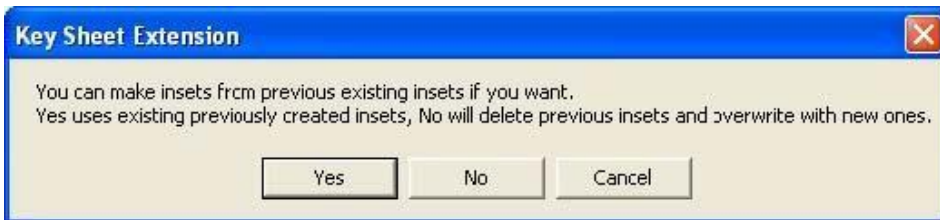
Note: It is imperative that you not change the insets after they are created. If you delete or move the insets, the inset database will be out of synch with your current map document. Do not remove or rename any Key Sheet data frame. If you make a mistake on insets at this point, simply recreate the 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:

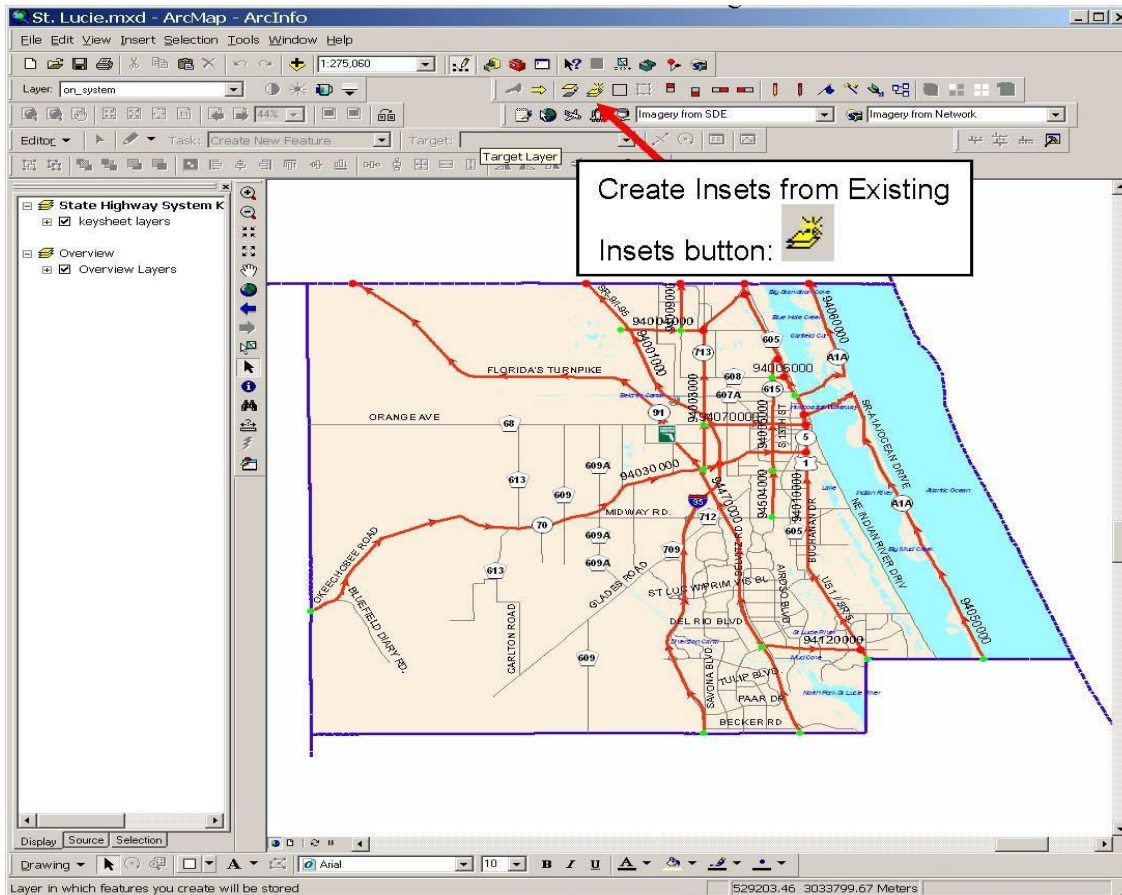
Create a new Key Sheet Map Document (as outlined previously).

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:

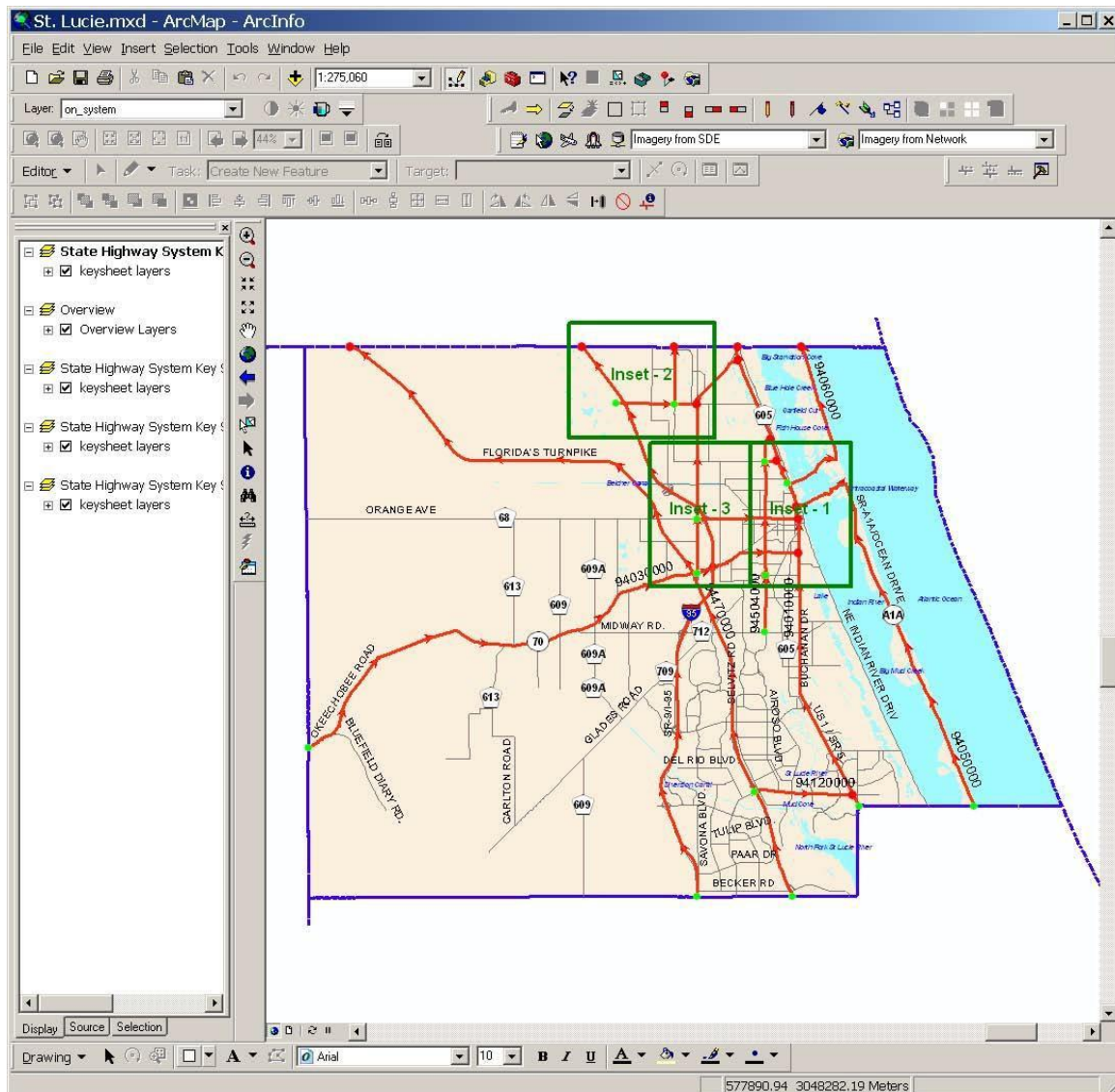


Or, you can use the Create Insets from Existing Insets tool:

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.

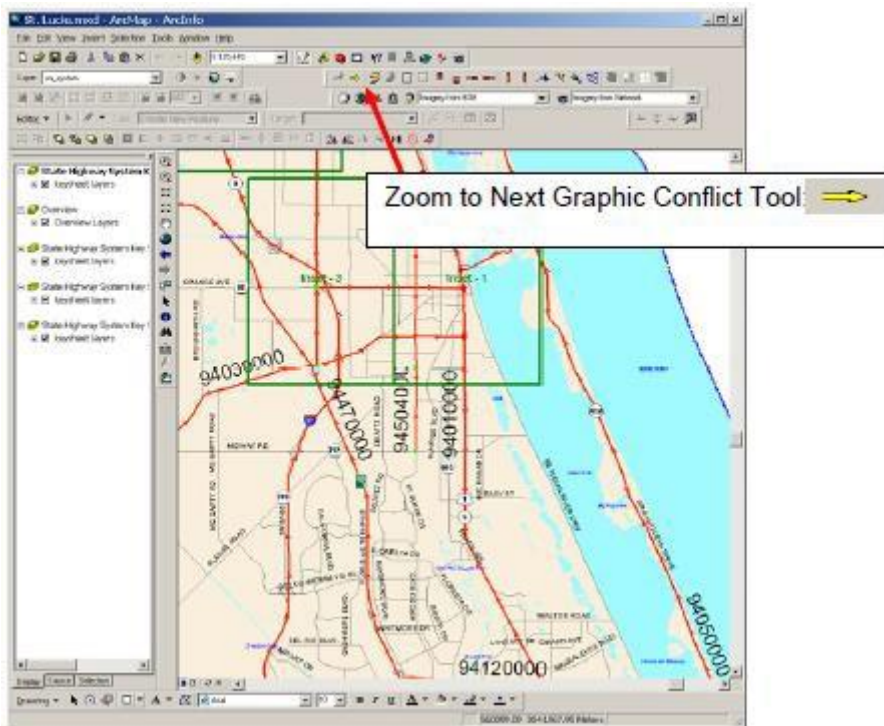
If your insets for a map document have sequence problems, the error message that appears will suggest ways to solve the problem. In some instances, if the inset database is corrupt, the Key Sheet Extension will suggest deleting these and the sequencing problem will be solved. In other cases, it may require 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.

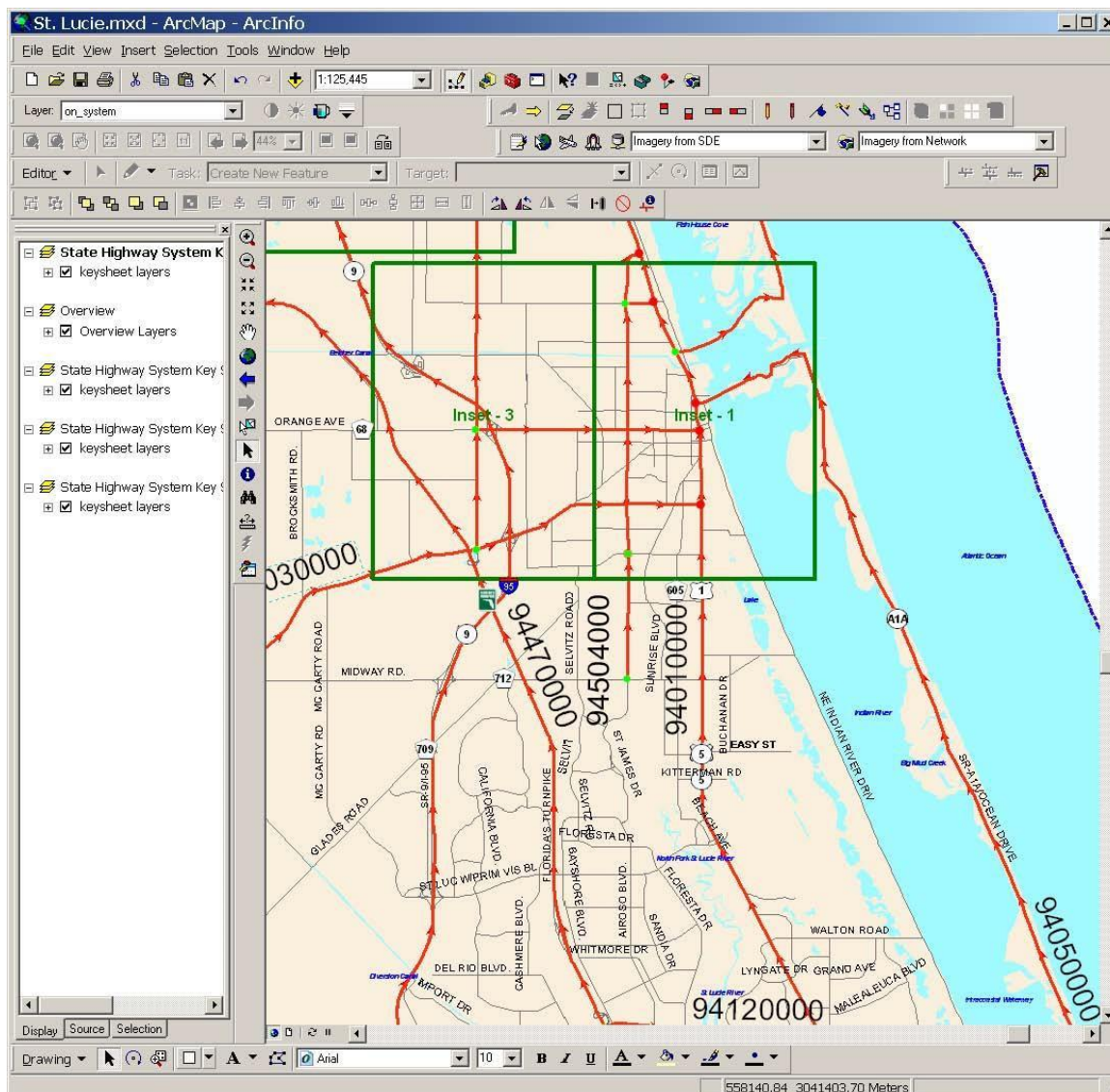
Graphic Conflict Cleanup and Labeling

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.

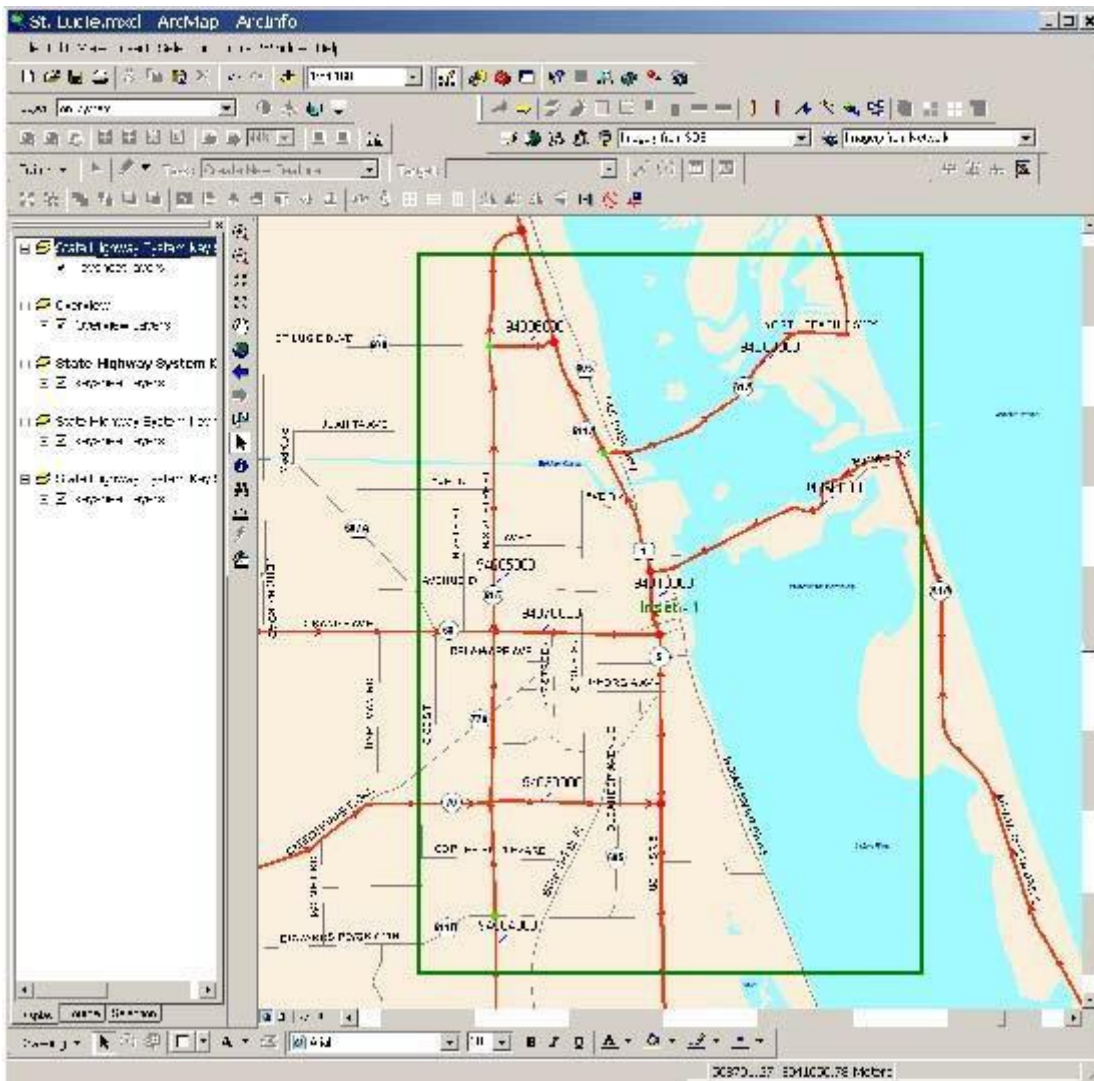
Once you are finished in an area, click on the Zoom to Next Graphic Conflict .

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



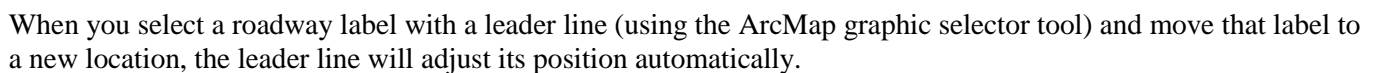
This indicates that this particular map (in this example, the main county map for St. Lucie County) has no overlapping graphics issues. You can proceed to dealing with any inset map data frames you have in your map.

Activate an inset data frame:



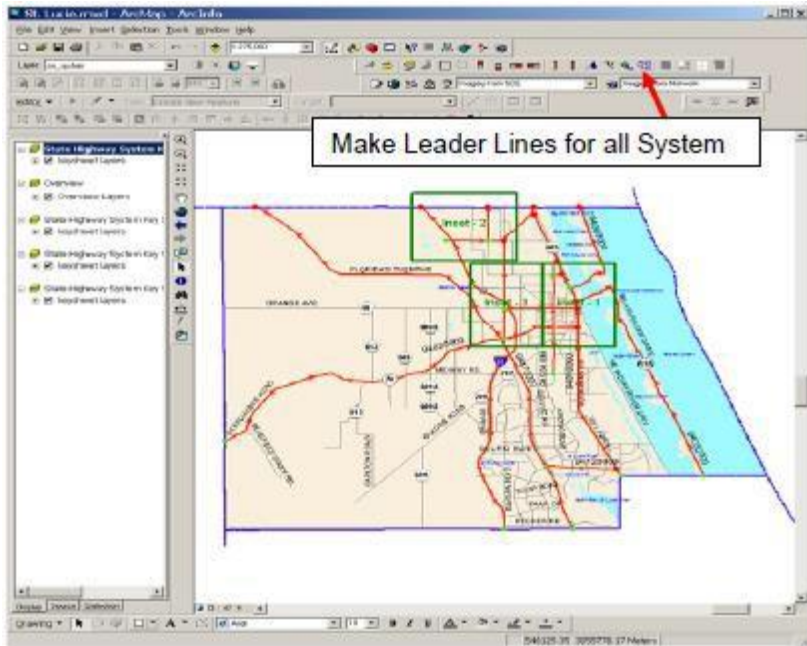
Because an inset is more compact in area, the graphic label conflicts are easier to fix. In this example, you could probably fix the conflicts by simply moving the labels to suitable locations if they overlap an adjacent roadway label. However, if you use the Zoom to Next Graphic Conflict tool, the procedure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


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.

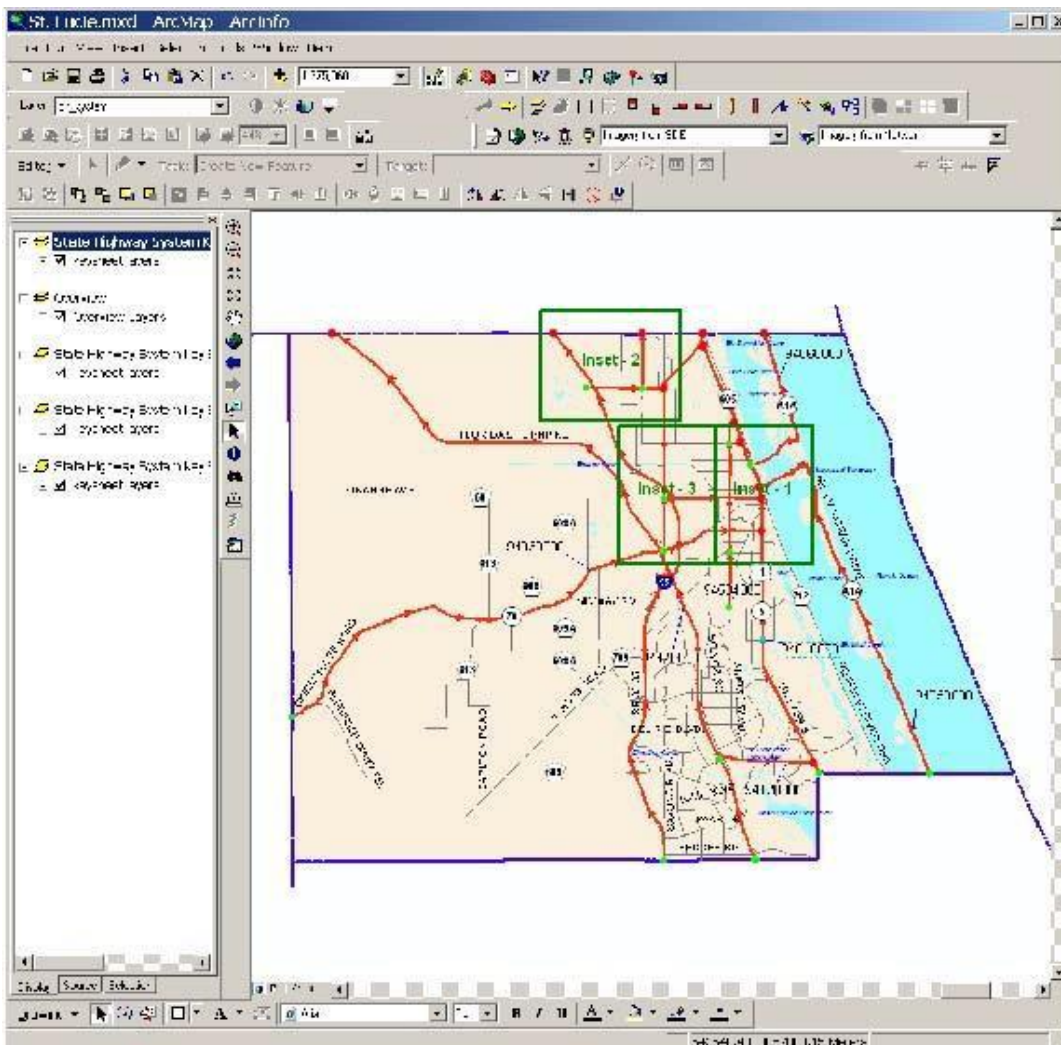


You may also move the leader line anchor point (the point on the leader line that touches the road segment) to an alternate location if you want.

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):



Click on the Make Leader Lines for all System Labels Tool :



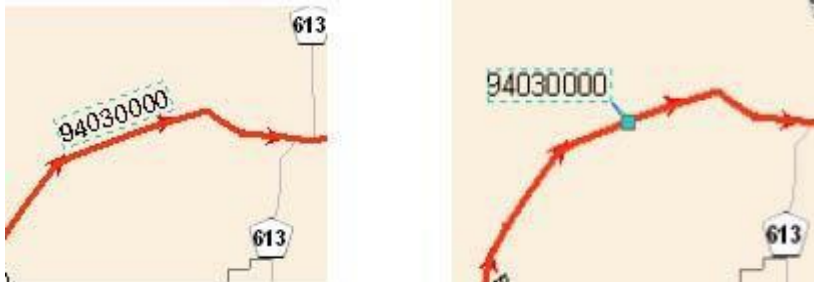
All the roadway labels have leader lines now and the labels have a horizontal orientation. **Note:** this operation cannot be undone. You may need to reposition the labels by using the Zoom to Graphic Conflict tool again (see page 34).

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:

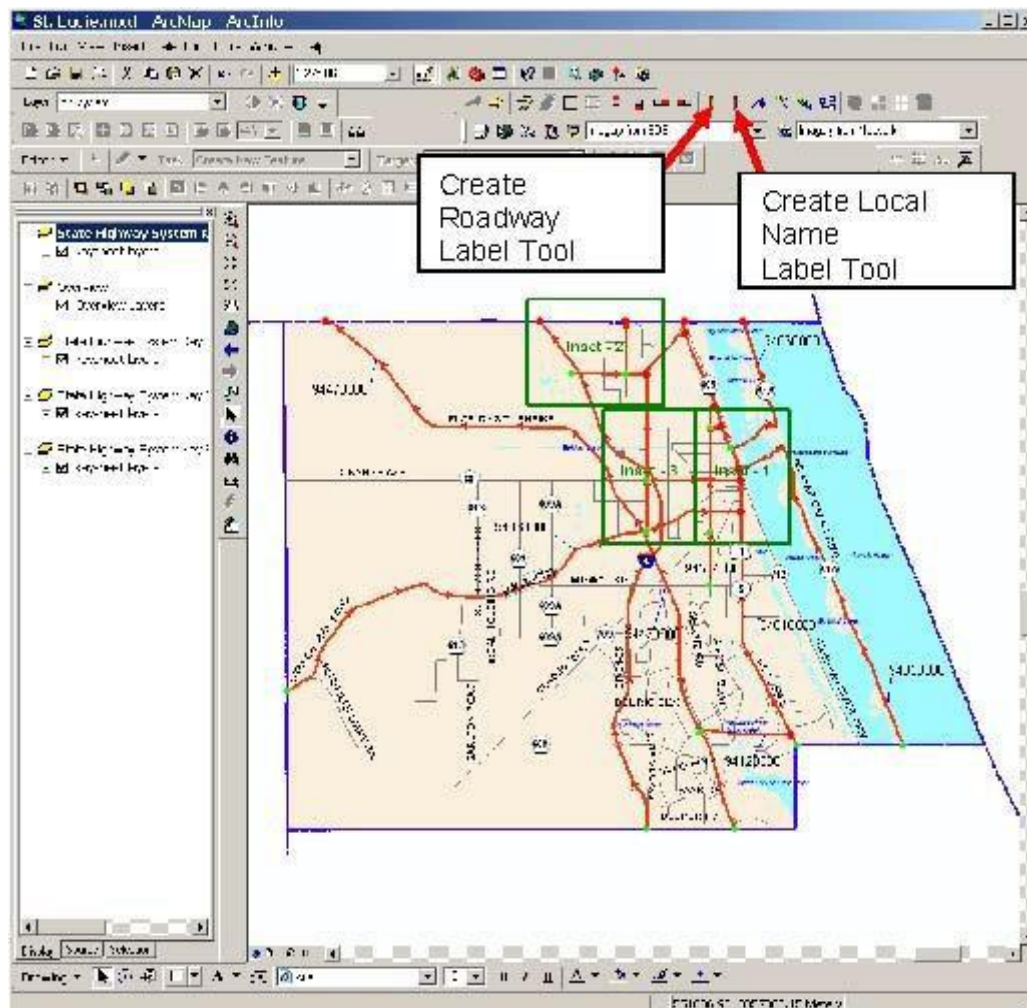
The roadway label now has a leader line.



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.

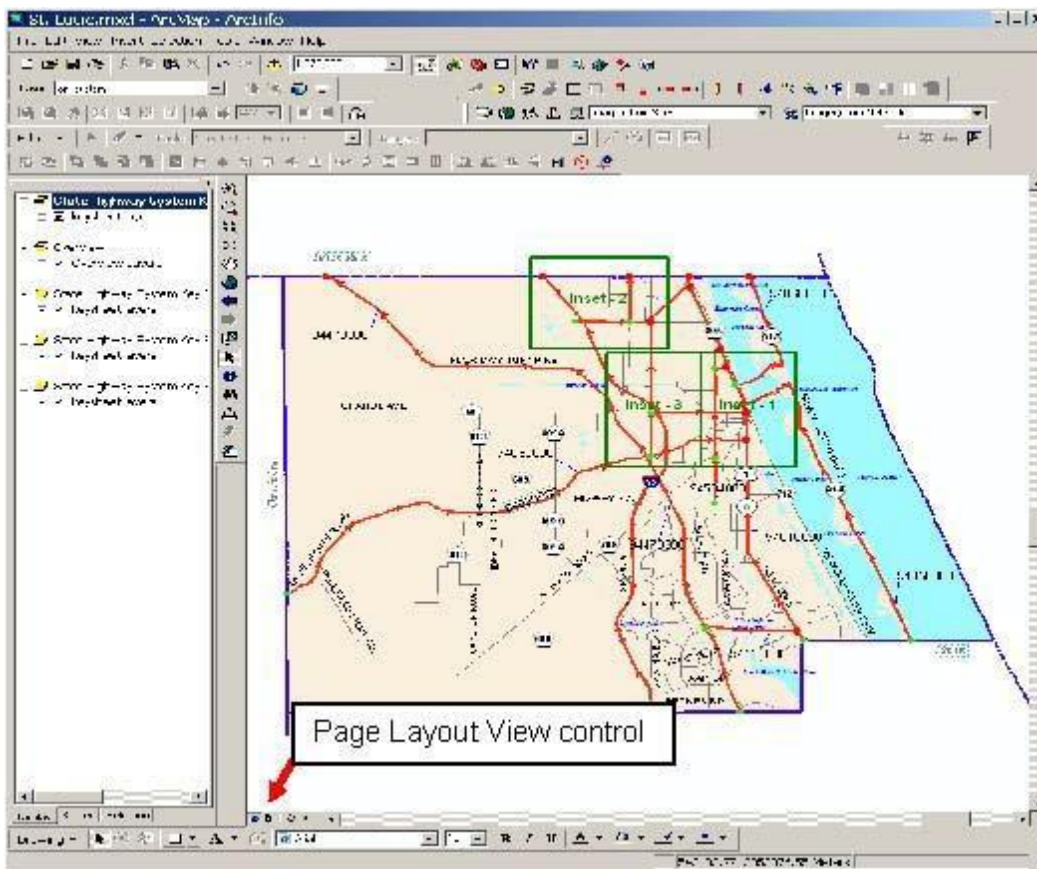
To add a local name label tool, click on the Create Local Name Label .

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 .

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.

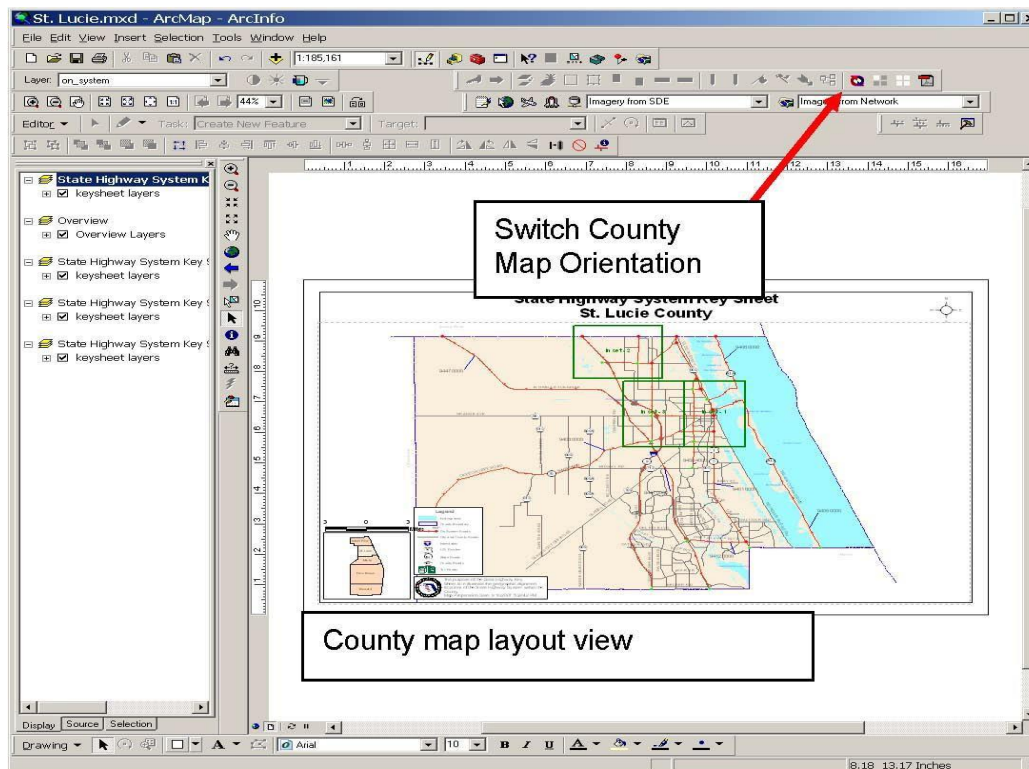
This is done using the Highway Shield .

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:

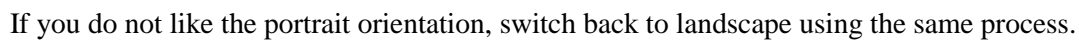


Change County Map Orientation

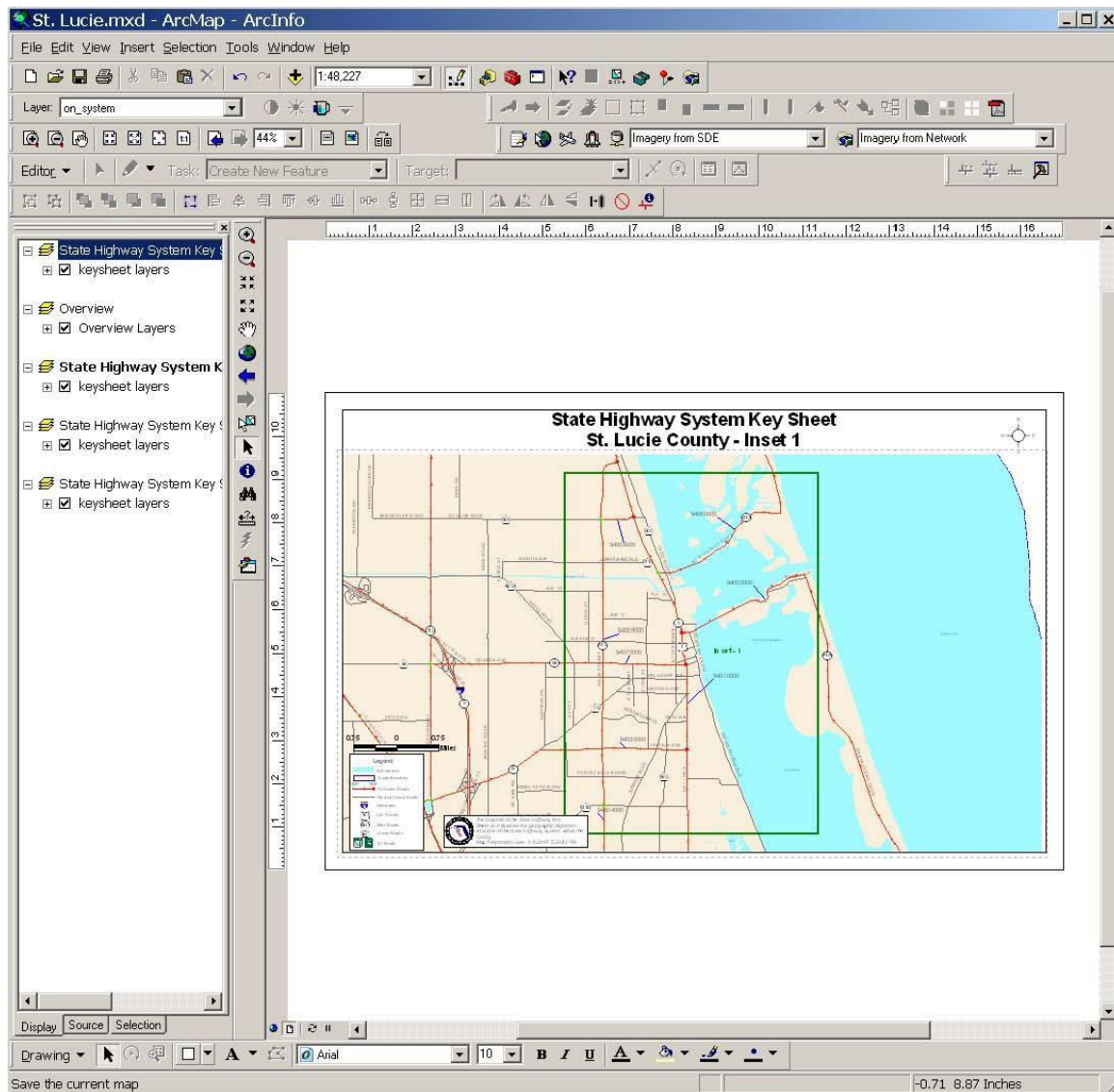
Sometimes, a county has a greater north-south extent, than it does east-west. In these cases, you might decide to change your page layout orientation to portrait rather than landscape. Click the Switch County Map Orientation button



The page layout orientation changes to portrait:



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:



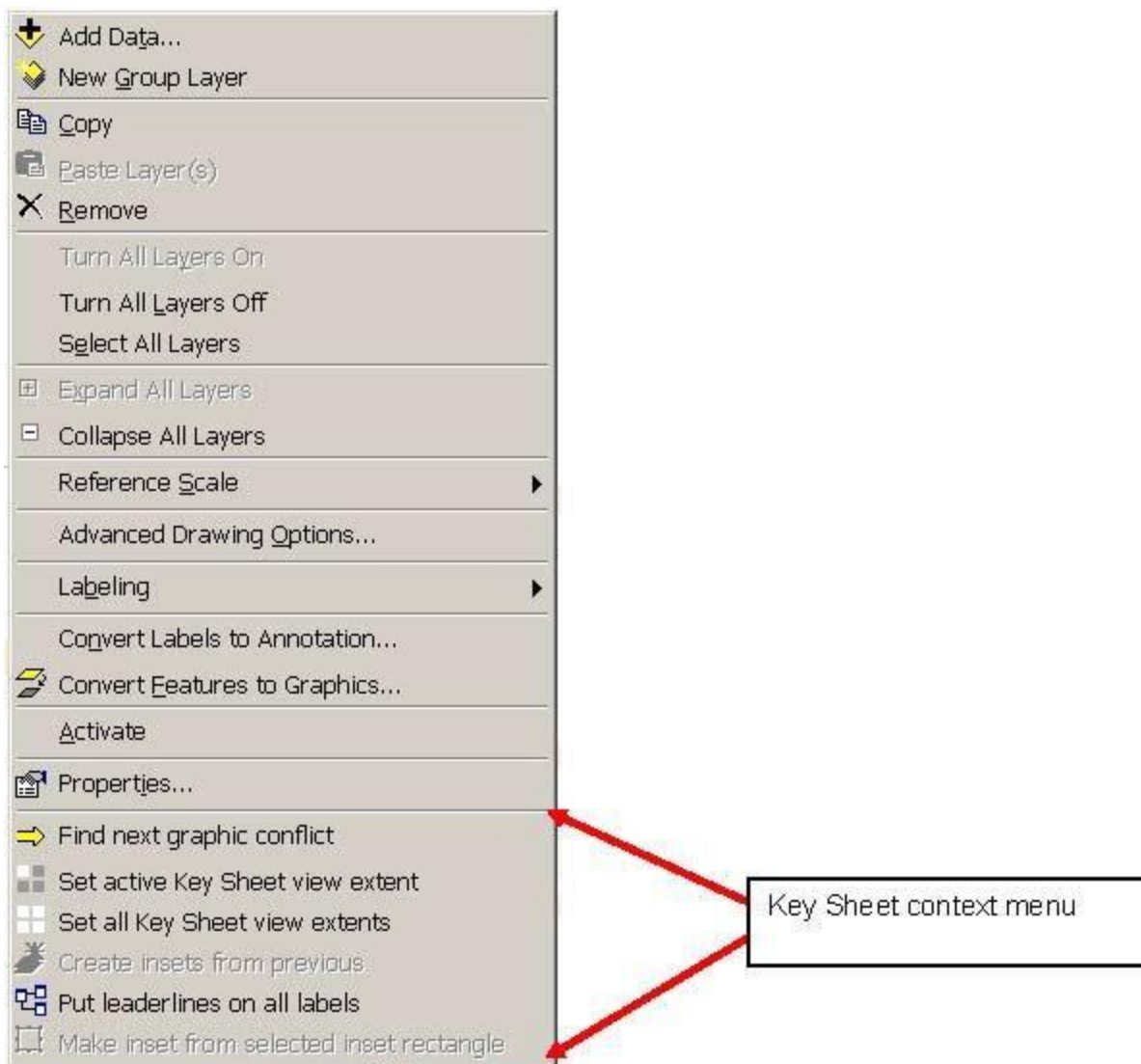
The PDF process may take a few moments to complete, depending on the complexity of the map. Please wait until you receive the PDF process completed message box:



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:



48 OTHER DATA RESOURCES AND TOOLS

A number of other programs and associated products are used with RCI. These programs add functionality to the use of RCI and its output. Guidance for the use of these programs is presented in detail in various user guides and instruction manuals, but they are described briefly in this Chapter. The programs and products are as follows:

- Transportation Data and Analytics GIS Application Manager
- LRS Distance Tool for ArcMap
- Compass Direction Extension for ArcMap
- Curvature Extension for ArcMap
- Data Download Tool
- Data Library Tool for ArcMap
- Florida Traffic Online
- Florida Transportation Information DVD
- Intersection Direction Tools
- IView

Transportation Data and Analytics Application Manager

The Transportation Data and Analytics GIS Application Manager is used to easily install, uninstall, and update the various LRS customizations provided by the Transportation Data and Analytics Office (TDA). It consists of a desktop application used for the installation of the GIS customizations, as well as an ArcGIS extension used to alert users about new or updated applications.

All of the extensions and tools for ArcGIS that are described in this Handbook, as well as others, are provided via the [GIS Application Manager](#).

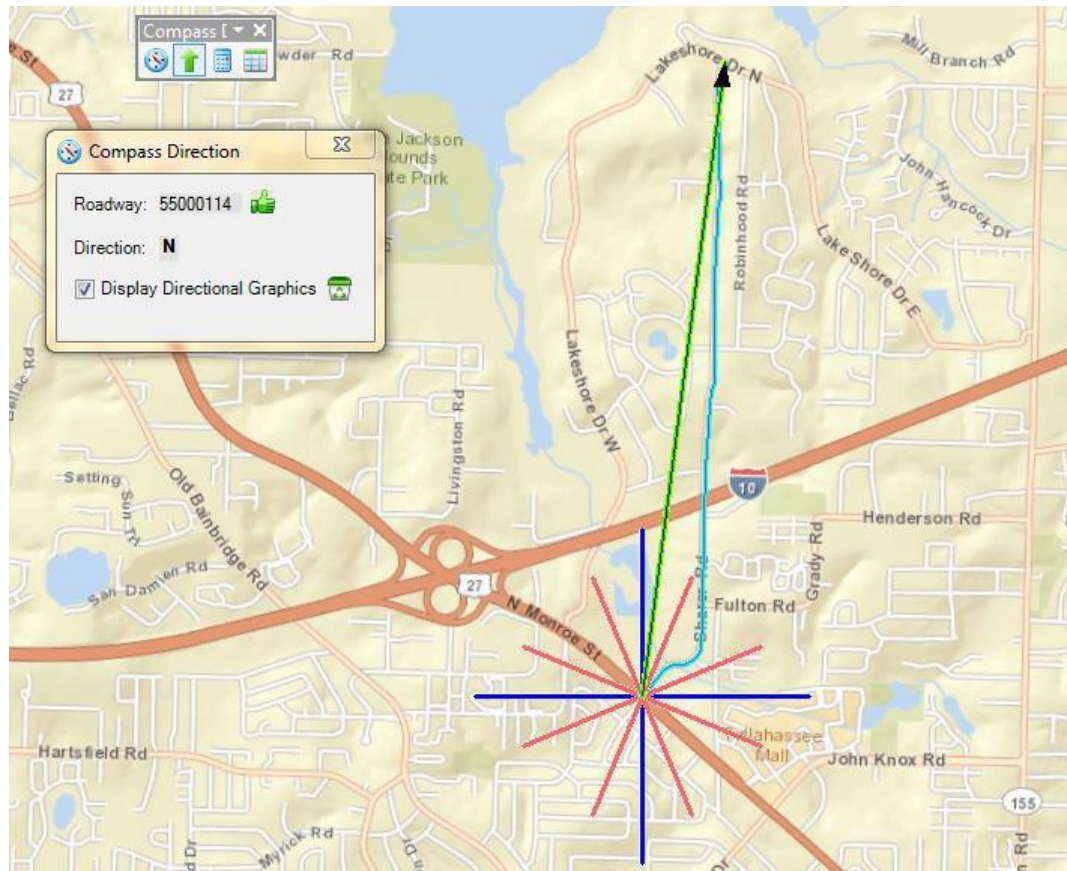
For more information, including how to request the GIS Application Manager, please visit the [GIS Application Manager](#) web site.

LRS Distance Tool for ArcMap

The LRS Distance Tool allows the user to derive the digitized distance, along with the RCI milepoint, at any point along a LRS route.

Compass Direction Extension for ArcGIS

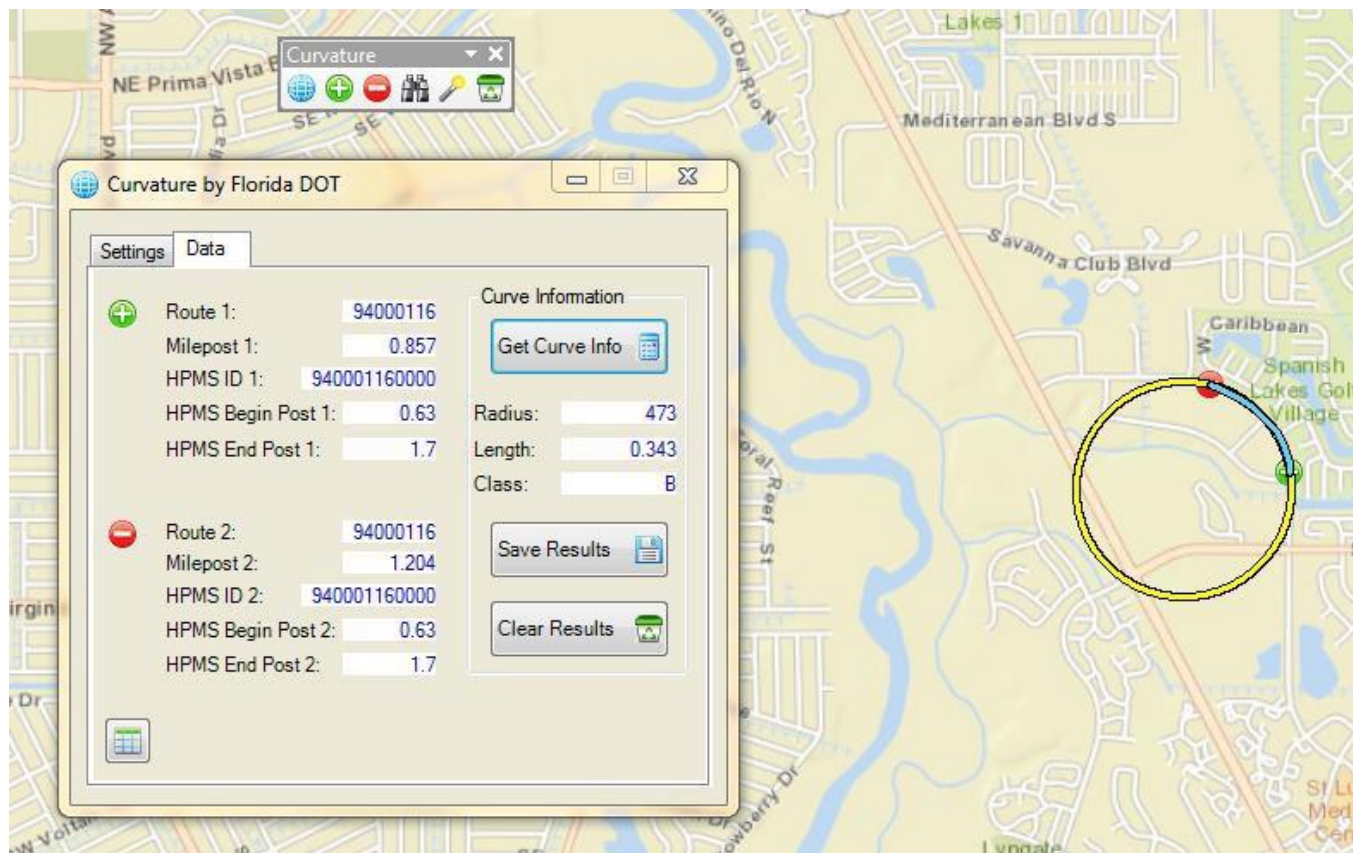
The Compass Direction Extension can be used to quickly and easily derive the compass direction for any roadway ID in the TDA LRS (LRS_route_road.shp). It can also be used to derive compass directions for an entire county or District.



Curvature Extension for ArcMap

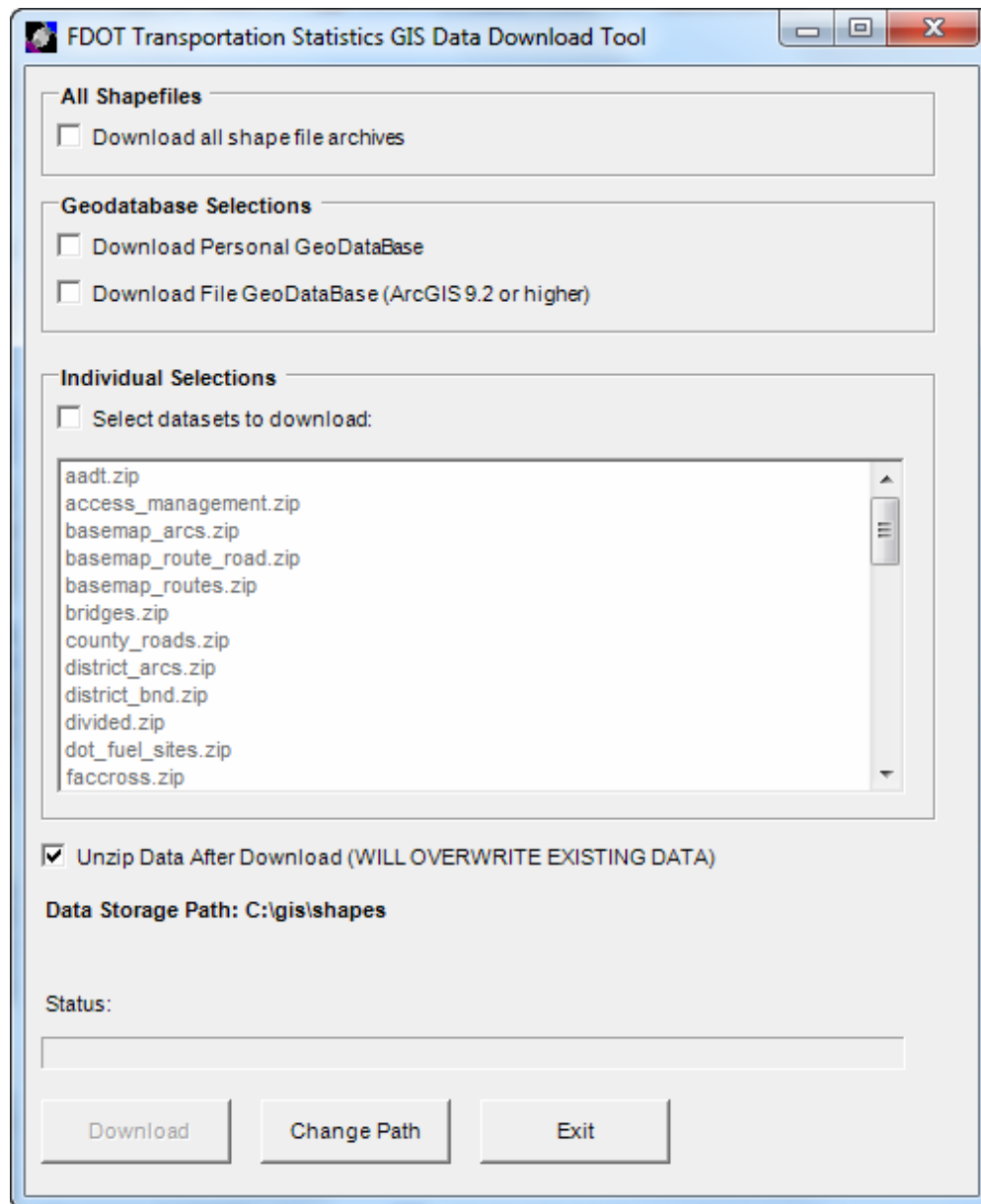
The Curvature Extension for ArcMap provides custom functionality to measure and classify curves within a GIS-based route system (e.g. feature class/shape file with or without measures). Curves are measured based on user input of the start and end points of the curve. The classification of the curve (A - F) is derived automatically by the application, eliminating any guesswork as to which classification a curve belongs to. The Curvature Extension was originally intended to be used to measure and classify curves along HPMS samples, and it will definitely accomplish this. However, it can also be useful for classifying curves outside of the world of HPMS, and has been written with this in mind.

For more information, please see the [Curvature Help](#).



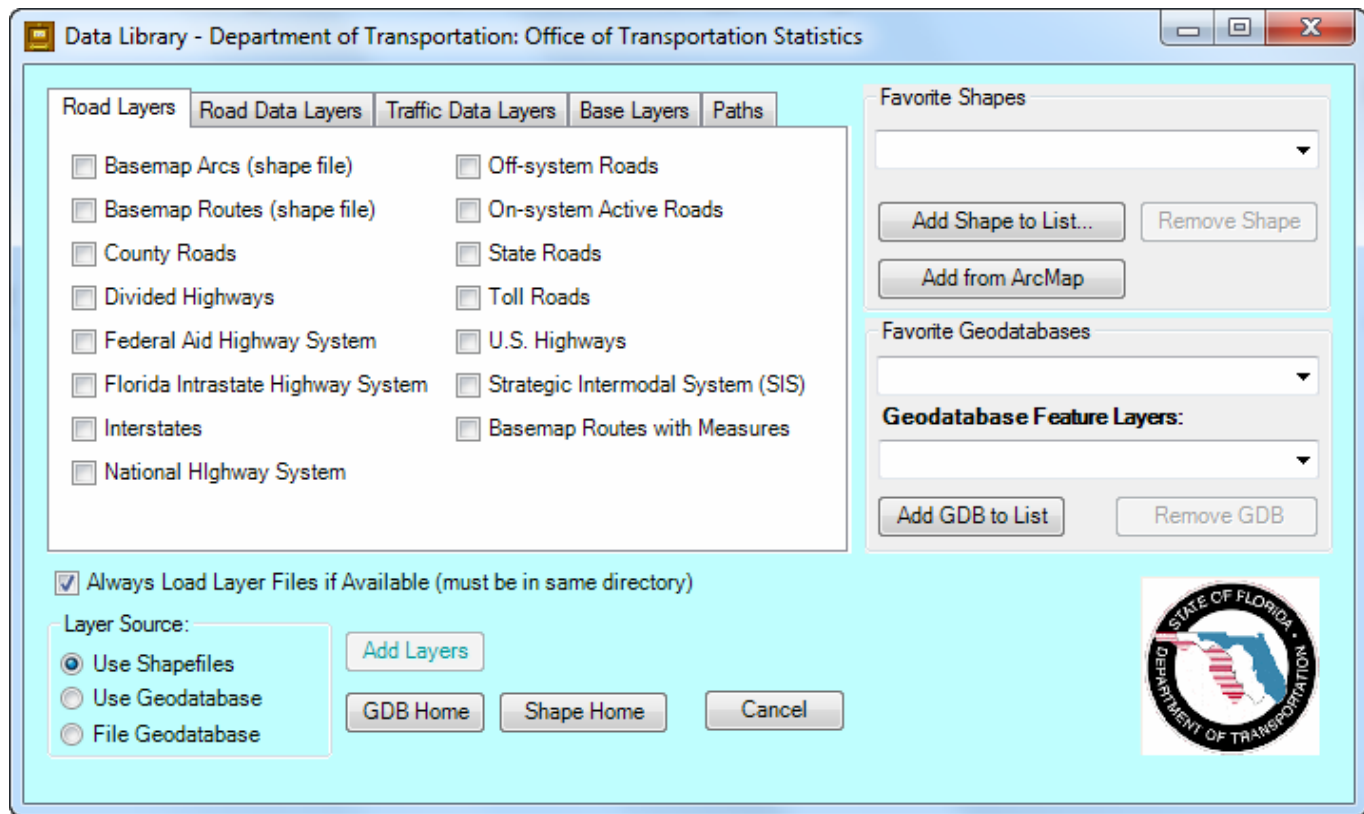
Data Download Tool

The Data Download Tool is used to automate the acquisition of TDA GIS datasets. It will automatically download and unzip the TDA GIS data to a local or network folder. The Data Library Tool can also be pointed to this location, ensuring that the most recent GIS datasets are used in all map documents.



Data Library Tool for ArcGIS

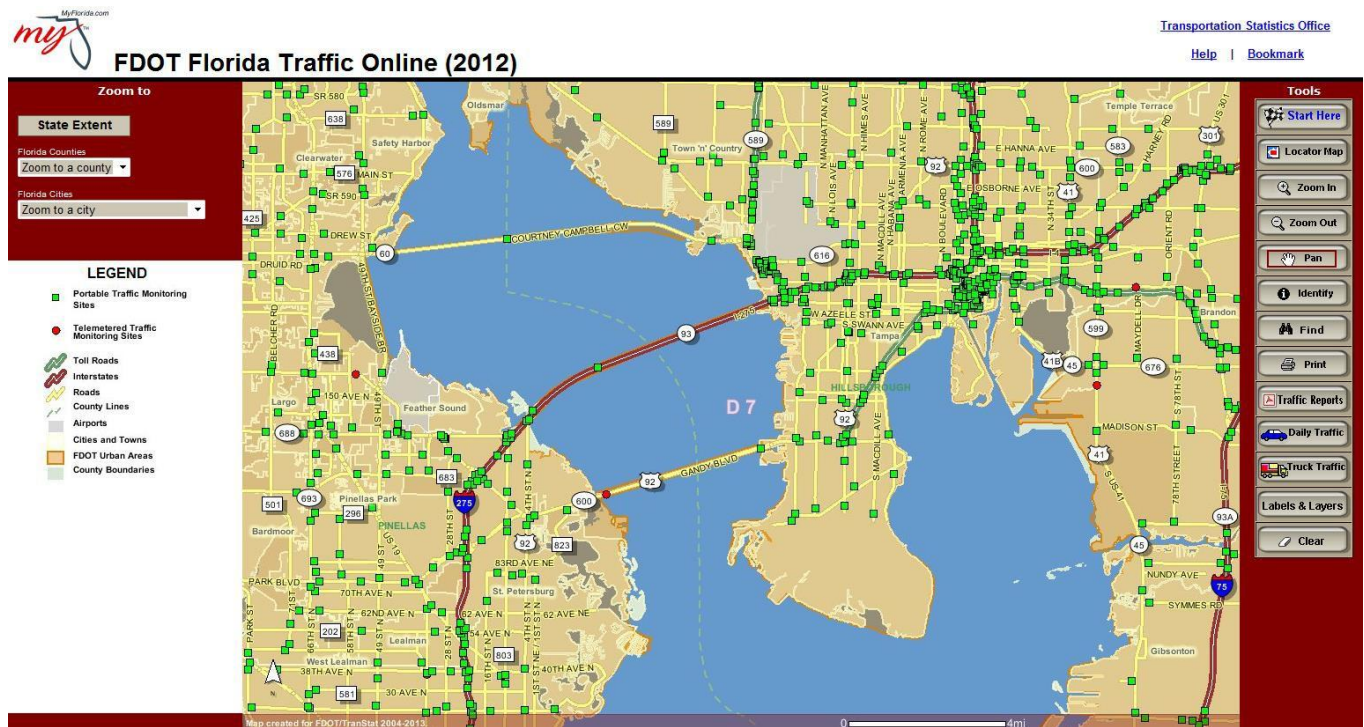
The Data Library Tool for ArcMap is reached through a button on the ArcMap interface that opens a form listing many of the available GIS vector layers. This makes it very easy to access and add data to an ArcMap document.



Florida Traffic Online

The Florida Traffic Online site is used to access Florida traffic information over the internet. Traffic information accessed through the site is released annually while other transportation data, such as the road networks displayed on the site, are updated monthly. The following traffic information is provided by the site:

- Annual Average Daily Traffic (AADT) - the total volume of traffic on a highway segment for one year, divided by the number of days in the year.
- Truck Volume - The total volume of truck traffic on a highway segment for one year. This number is determined as a percentage of AADT.
- Portable Traffic Monitoring Sites (PTMS) - A traffic monitoring site that has loops and/or axle sensors in the roadway with leads running back into a cabinet located on the shoulder.
- Telemetered Traffic Monitoring Sites (TTMS) - A continuous traffic monitoring site that transmits traffic data to the TDA Office via telephone or wireless communications.



Florida Transportation Information DVD

The Florida Transportation Information (FTI) DVD contains a graphical interface to access highway and traffic data collected for the State Highway System and for selected off-system roads.

For more information, please visit the [Florida Transportation Information \(FTI\) DVD](#) web site.

Intersection Direction Tools

For any given roadway, the Intersection Direction Tools derive the angle of an intersecting roadway and identify the corresponding intersection code. This code is based on the angle and the side of the roadway that the intersecting road comes from. The milepoint of the intersection is also derived.

This information is used in support of Intersections - Feature 251, characteristic INTSDIRx (with "x" being the intersection code) in RCI.

IView

The IView image viewer is an ArcIMS intranet Web site built and maintained by TDA. IView is used to serve TDA's aerial photography to the Department's users. The aerial photography is comprised of two types: a statewide set of USGS Digital Ortho Quarter Quads and a second set of County-based high resolution images. This image resource library is continually growing, and IView helps make this resource available to a broad user base. Along with the photography, IView also has numerous GIS layers that can be used for display, querying, and labeling. IView also has a simple map printing function, along with standard GIS tools like distance measure, identify, pan, and zoom. The Web site can be reached from within the Department's firewall at: <http://dcs-dot-ws10/iview/>

