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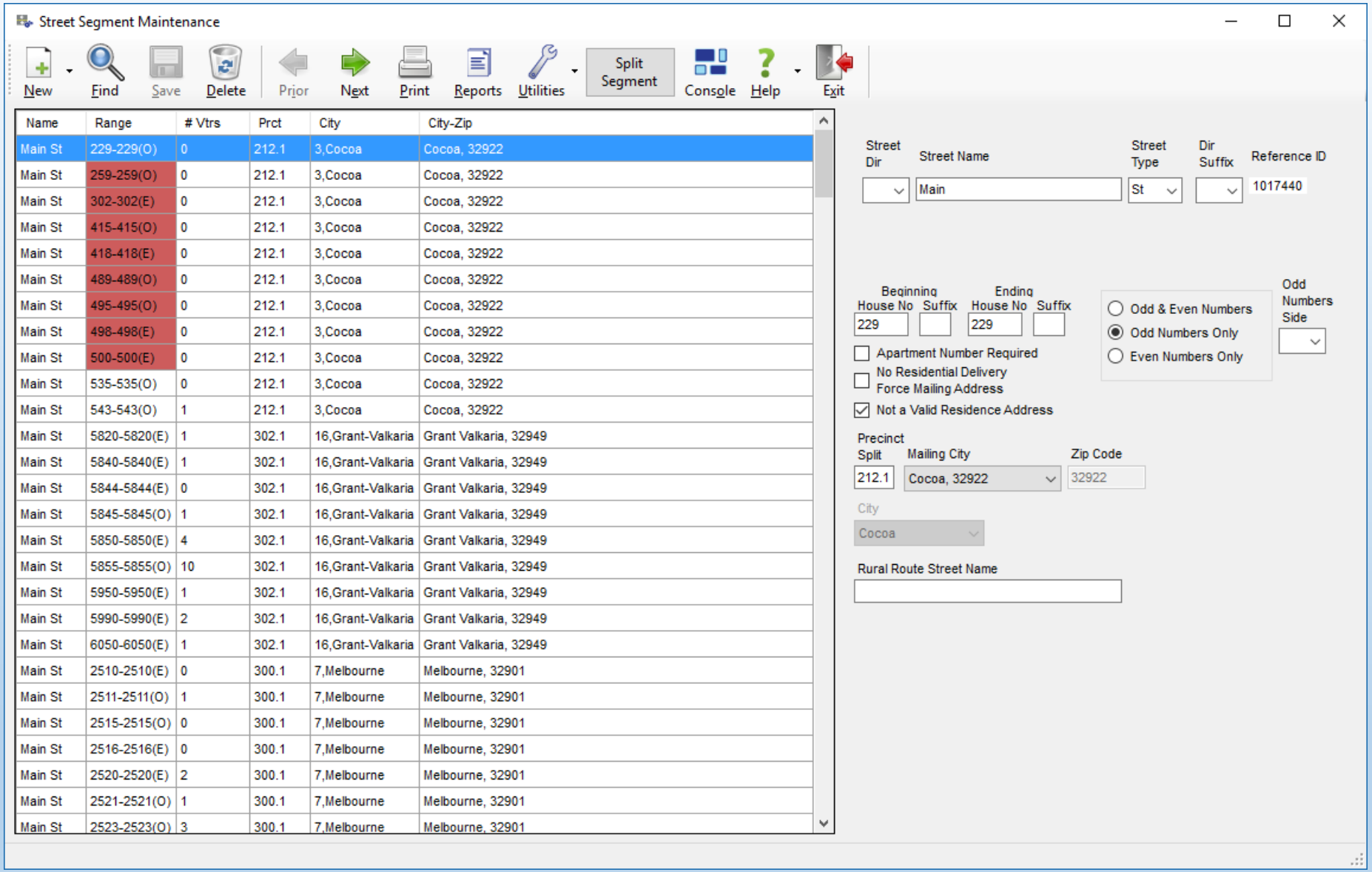
Supervisor of Elections
BREVARD COUNTY

Brevard County's GIS Street File Integration Process

ArcMap -> VR

- Brevard County's street file is currently over 280,000 records.
- Each street segment is exactly ONE ADDRESS long.
- In this example you could register to vote at 535 Main Street or 543 Main Street, but not at any address in between.



Name	Range	# Vtrs	Prct	City	City-Zip
Main St	229-229(O)	0	212.1	3,Cocoa	Cocoa, 32922
Main St	259-259(O)	0	212.1	3,Cocoa	Cocoa, 32922
Main St	302-302(E)	0	212.1	3,Cocoa	Cocoa, 32922
Main St	415-415(O)	0	212.1	3,Cocoa	Cocoa, 32922
Main St	418-418(E)	0	212.1	3,Cocoa	Cocoa, 32922
Main St	489-489(O)	0	212.1	3,Cocoa	Cocoa, 32922
Main St	495-495(O)	0	212.1	3,Cocoa	Cocoa, 32922
Main St	498-498(E)	0	212.1	3,Cocoa	Cocoa, 32922
Main St	500-500(E)	0	212.1	3,Cocoa	Cocoa, 32922
Main St	535-535(O)	0	212.1	3,Cocoa	Cocoa, 32922
Main St	543-543(O)	1	212.1	3,Cocoa	Cocoa, 32922
Main St	5820-5820(E)	1	302.1	16,Grant-Valkaria	Grant Valkaria, 32949
Main St	5840-5840(E)	1	302.1	16,Grant-Valkaria	Grant Valkaria, 32949
Main St	5844-5844(E)	0	302.1	16,Grant-Valkaria	Grant Valkaria, 32949
Main St	5845-5845(O)	1	302.1	16,Grant-Valkaria	Grant Valkaria, 32949
Main St	5850-5850(E)	4	302.1	16,Grant-Valkaria	Grant Valkaria, 32949
Main St	5855-5855(O)	10	302.1	16,Grant-Valkaria	Grant Valkaria, 32949
Main St	5950-5950(E)	1	302.1	16,Grant-Valkaria	Grant Valkaria, 32949
Main St	5990-5990(E)	2	302.1	16,Grant-Valkaria	Grant Valkaria, 32949
Main St	6050-6050(E)	1	302.1	16,Grant-Valkaria	Grant Valkaria, 32949
Main St	2510-2510(E)	0	300.1	7,Melbourne	Melbourne, 32901
Main St	2511-2511(O)	1	300.1	7,Melbourne	Melbourne, 32901
Main St	2515-2515(O)	0	300.1	7,Melbourne	Melbourne, 32901
Main St	2516-2516(E)	0	300.1	7,Melbourne	Melbourne, 32901
Main St	2520-2520(E)	2	300.1	7,Melbourne	Melbourne, 32901
Main St	2521-2521(O)	1	300.1	7,Melbourne	Melbourne, 32901
Main St	2523-2523(O)	3	300.1	7,Melbourne	Melbourne, 32901

We are currently using ESRI ArcMap 10.3.1 along with a little python code, and a custom application written in C# .NET to drive all street file editing.

ARCMap:

- Add new address
- Modify existing address
- Move precinct boundaries
- Define district assignments

Python:

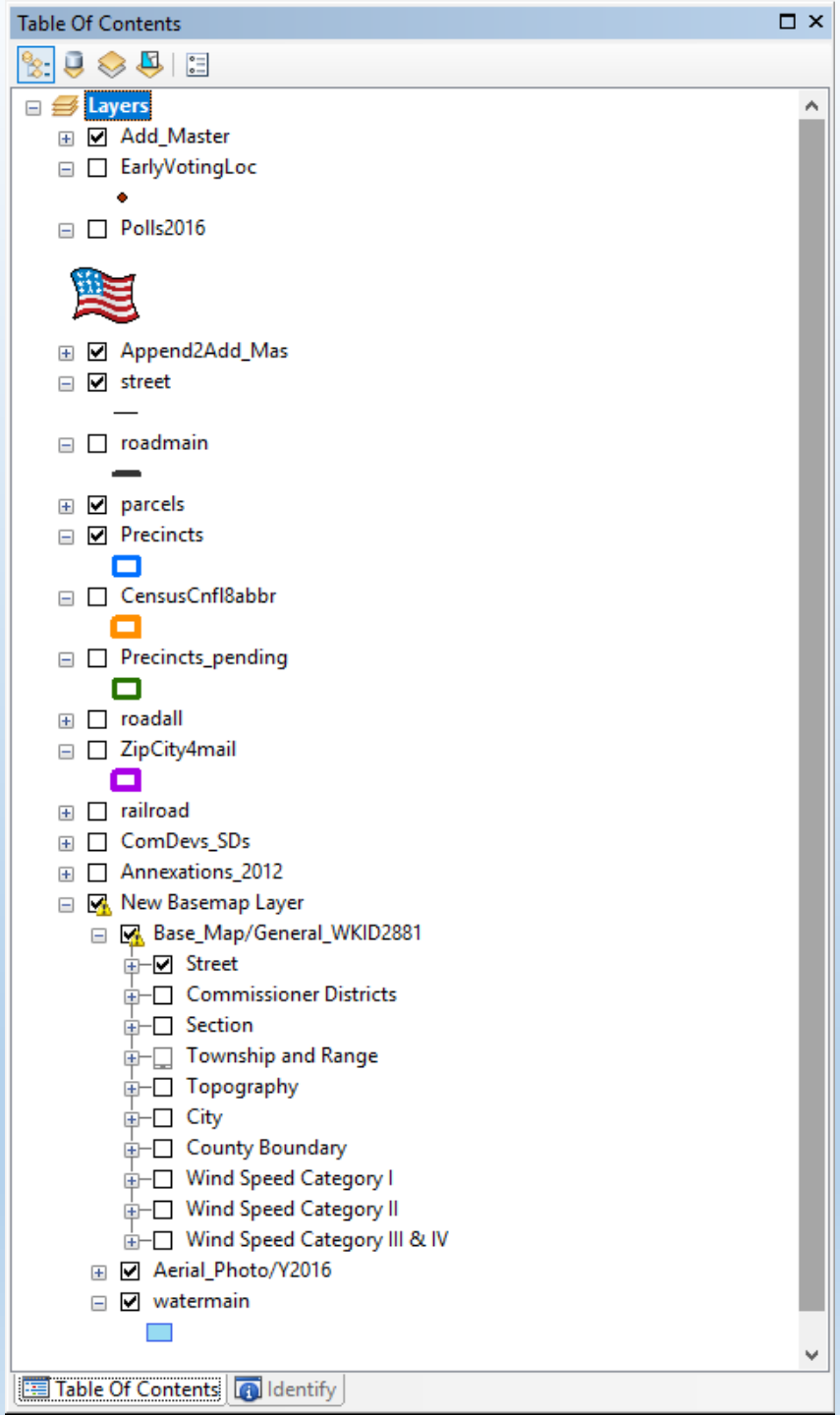
- Backup existing data store
- Perform spatial joins to assign precincts and zip codes.

C# .Net:

- Compare ArcMap points to VR Street file
- Create import file for Generic GIS Interface

VR:

- Takes input file and applies additions and changes to the street file.



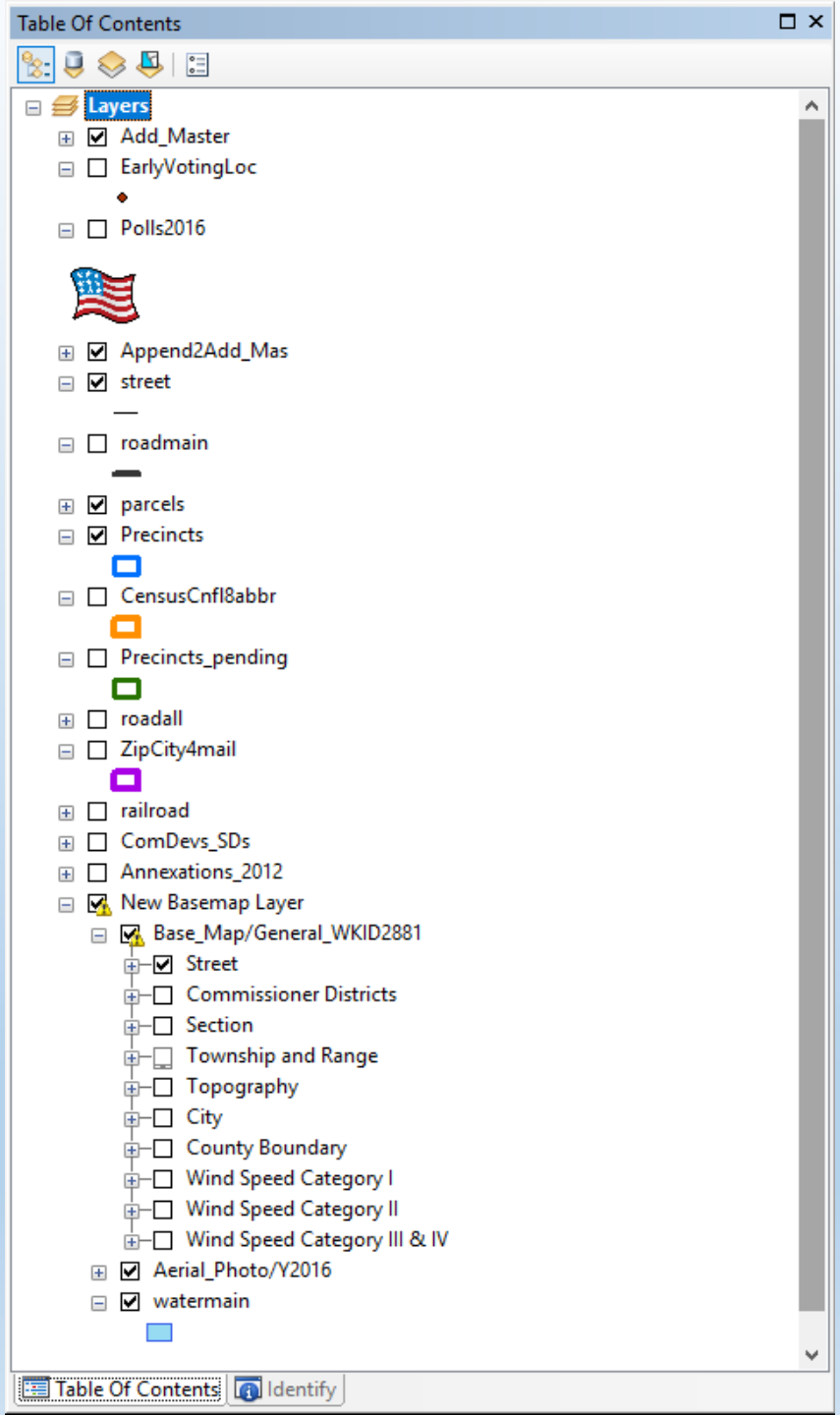
We have a few custom layers which are required for our integration routine to work:

Add_Master: This contains every address point in the system, with all of its associated information (precinct and district assignments, residential/commercial flag, comments, etc.). The information in this layer is compared to StreetM in Voter Focus to determine changes, or to overwrite it completely (redistricting).

Append2Add_Mas: Address point information that is waiting to be written to the main point file. Only contains address, residential/commercial flag, and comments.

Precincts: The precinct boundary polygon layer. The boundaries are locked together so that if we change one boundary the adjoining one moves as well. The precinct to district assignments are made here.

ZipCity4Mail: Zip code boundary polygon. Again the boundaries are locked. This is used to assign the proper mail zip code to each address.



We use a few other layers that are supplied by our county's GIS department:

Parcels: A polygon layer provided by the Property Appraiser. Much of our new address information comes from 911 dispatch, and the address is linked to a parcel ID. This layer helps us locate precisely where to drop a new point on the map.

Street: A line layer with the street names for visual reference and maps.

Railroad: Another line layer. Used mostly in redistricting.

Watermain: A polygon layer representing water sources.

And of course…

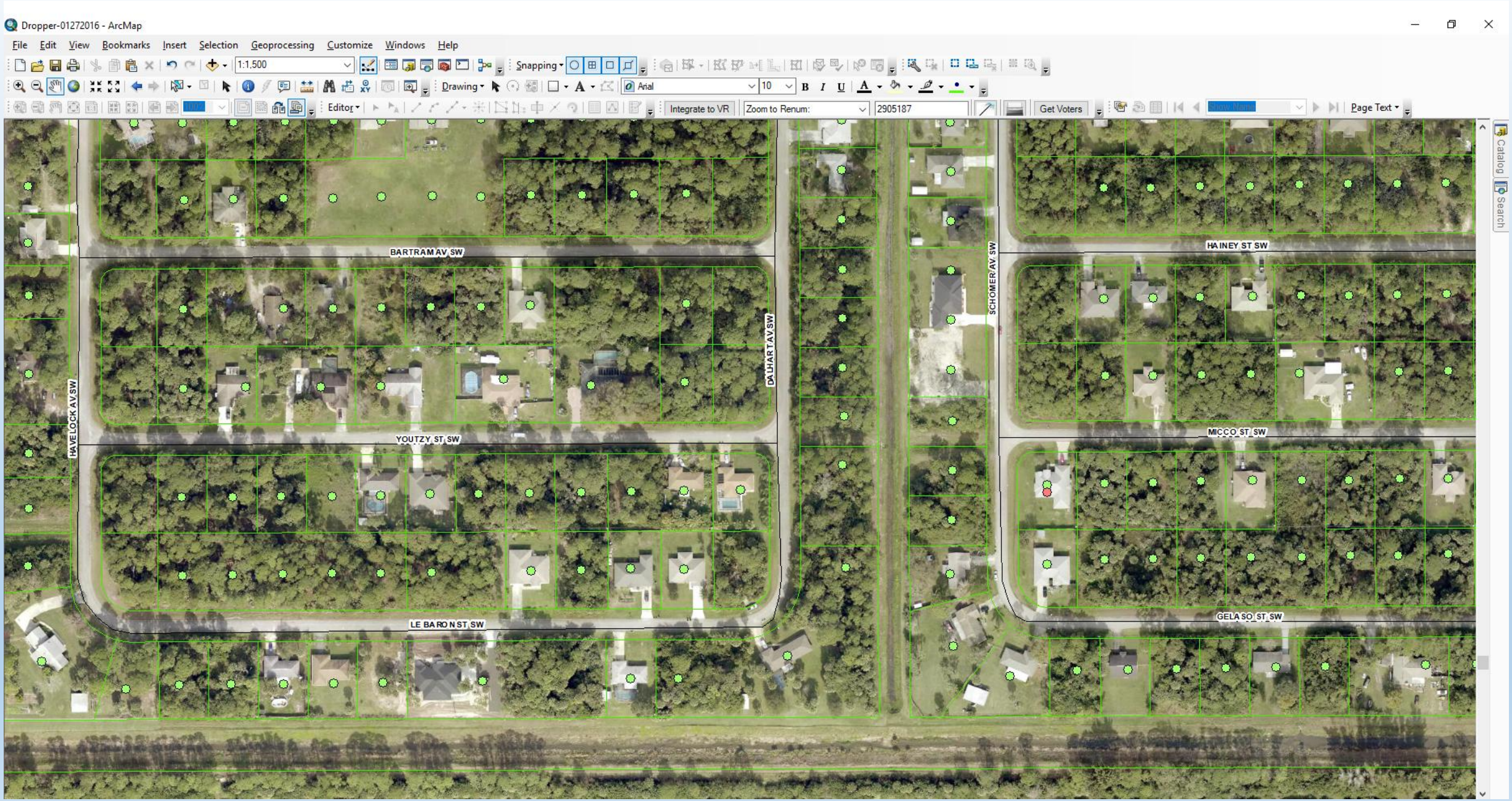
AERIALS!

The application also requires a connection to the VR6 database, so that StreetM and VotrM can be queried in real time.

We also use a few custom tables, mostly for report generation and audit logging. They are named with the prefix “Brev_”, so as to not interfere with VR’s normal operation.

Since we bypass VRs normal data entry procedures, the application maintains an audit log of every street transaction.

Here is a screenshot of our ArcMap interface:

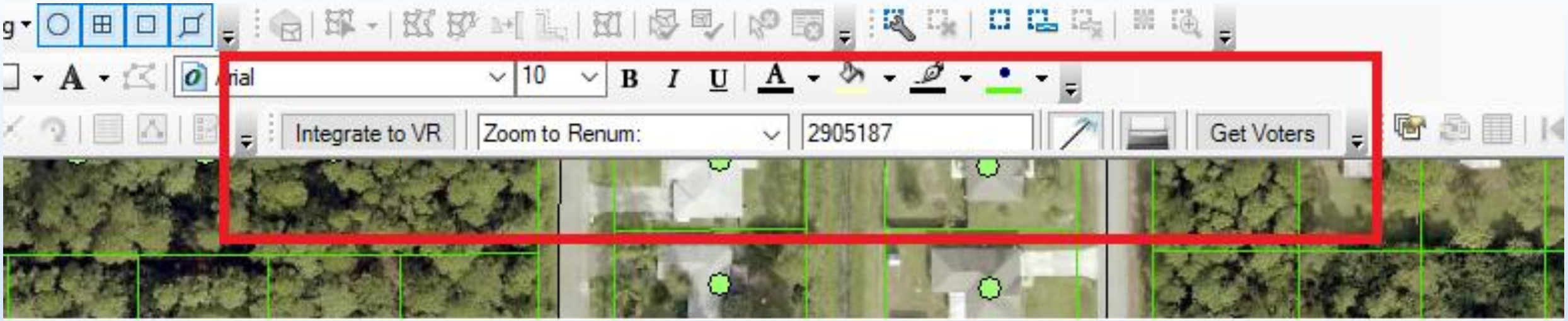


A GREEN dot represents a residential address.

A RED dot represents a commercial (or other non-residential) address.

In this example, this is a corner lot and the red dot represents an address on the street opposite the driveway.

We can remove this address by simply deleting this point, and ALSO deleting the street record in VR. (make sure there are no registered voters there)



Here is our GIS toolbar. This is where we control much of the application.

Get Voters button: Prepares a report of all the registered voters at any selected point(s) on the map.

Printer Icon: Brings up a dialog to select assorted reports.

Palm tree icon: Indicates the number that will be assigned to the next street record in VR. Mostly obsolete.

Zoom to Renum/Address/Polling place: Enter a parcel number or full or partial street address and ArcMap will zoom to that location on the map. Very helpful.

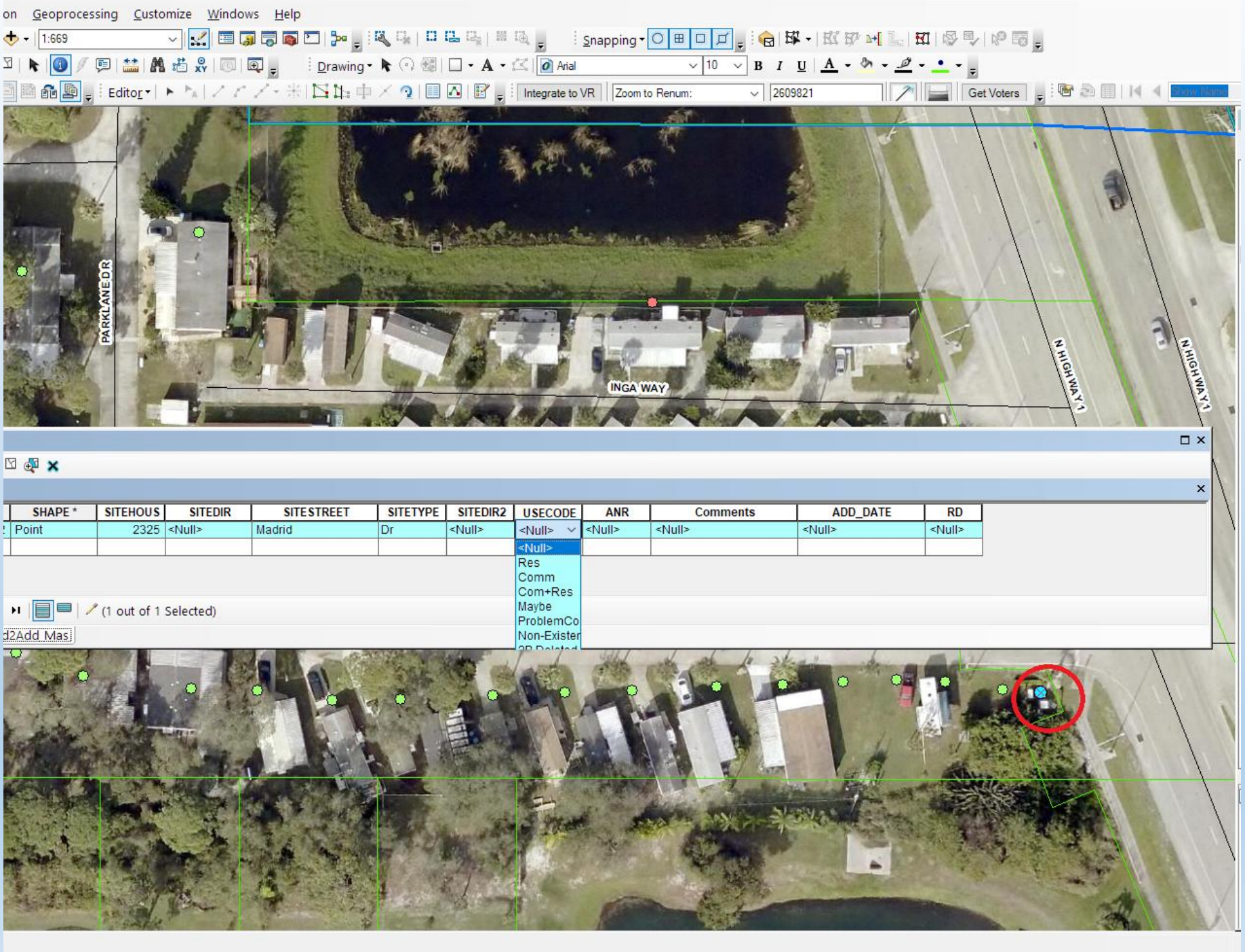
Integrate to VR button: We will cover the integration routine next.

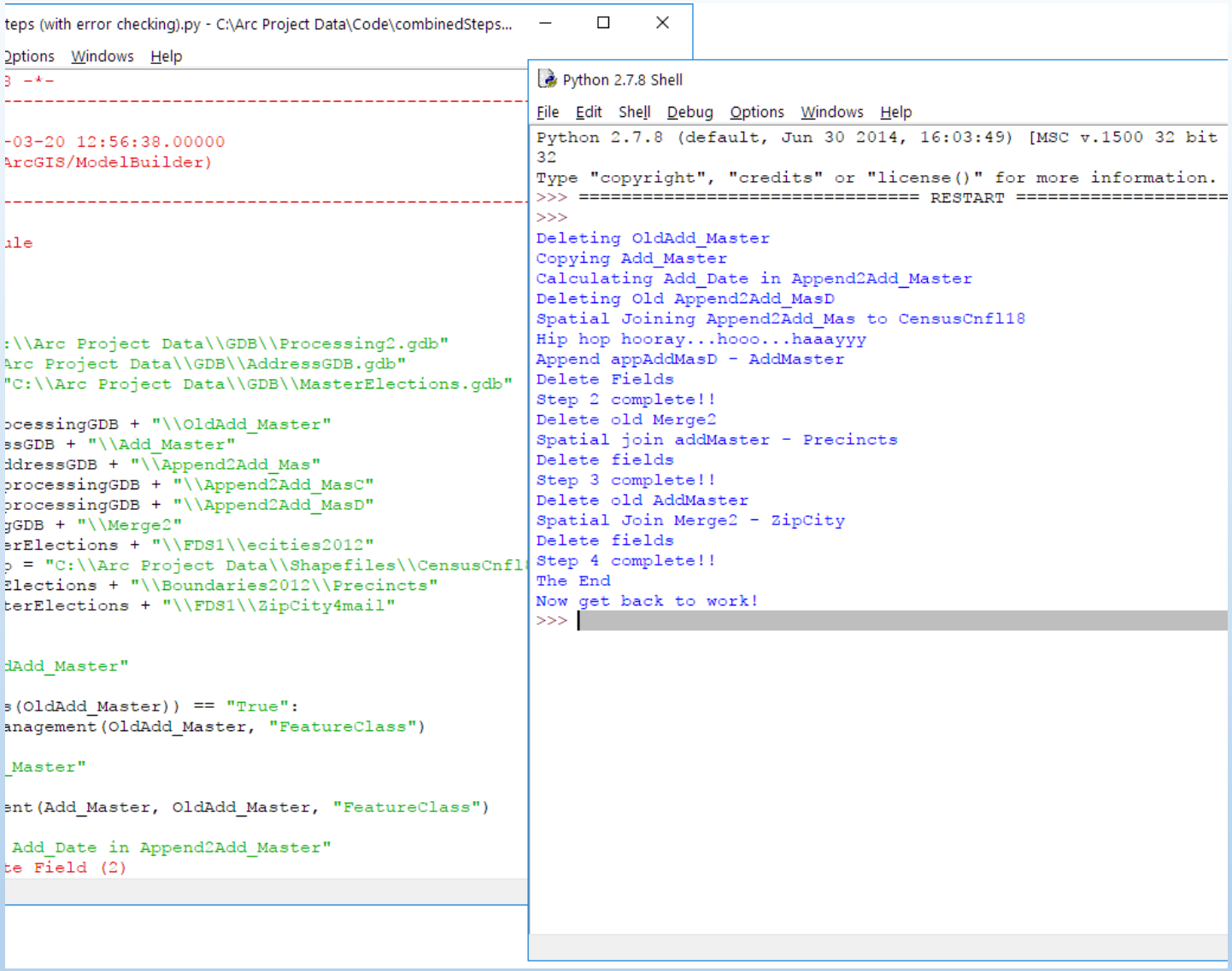
We begin the routine by adding one point to the Append2Add_Mas layer.

We also need to assign the street address fields and whether this is a residential or commercial address.

We can also add additional comments which will eventually be added to VR as well.

There are spots for no residential delivery and apartment number required, but we no longer use them.





Next we close ArcMap and run a custom python script, which performs a number of functions:

- Adds the entry date.
- Adds the new point(s) to the Add_Master layer.
- Performs spatial joins to assign the precinct, districts, zip code and GEOID to **EVERY** record in Add_Master. (This permits precinct or zip code boundary changes)

Takes 1-2 minutes to run.

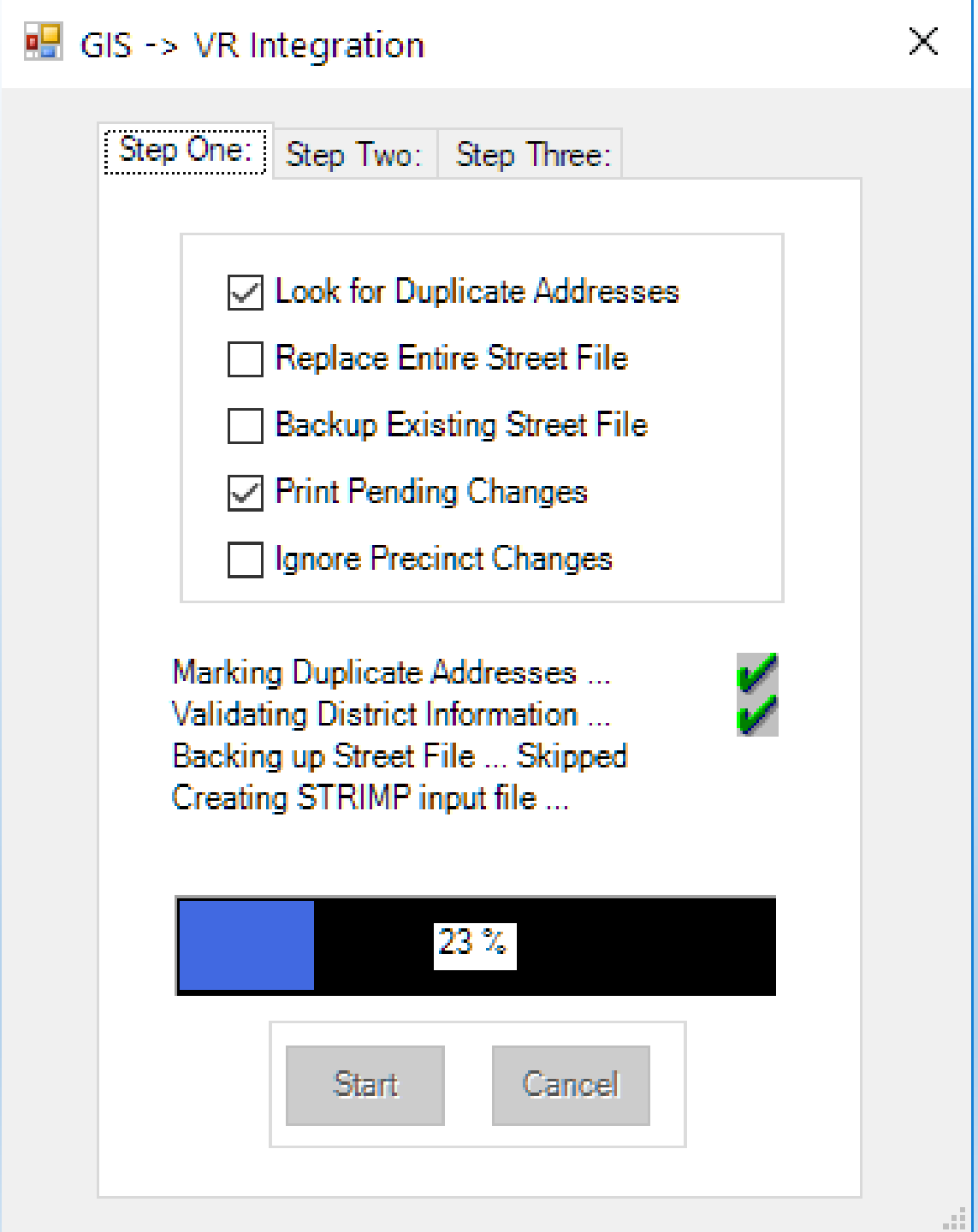
Then we reopen ArcMap and press the Integrate to VR Button:

The process looks for duplicate records, validates and reports any district changes (in case a line was moved inadvertently), and optionally backs up the street file.

Then each address point is compared to the corresponding record in StreetM, and all differences are noted.

The input file for the Generic GIS interface is also created at this time.

This process takes less than one minute.



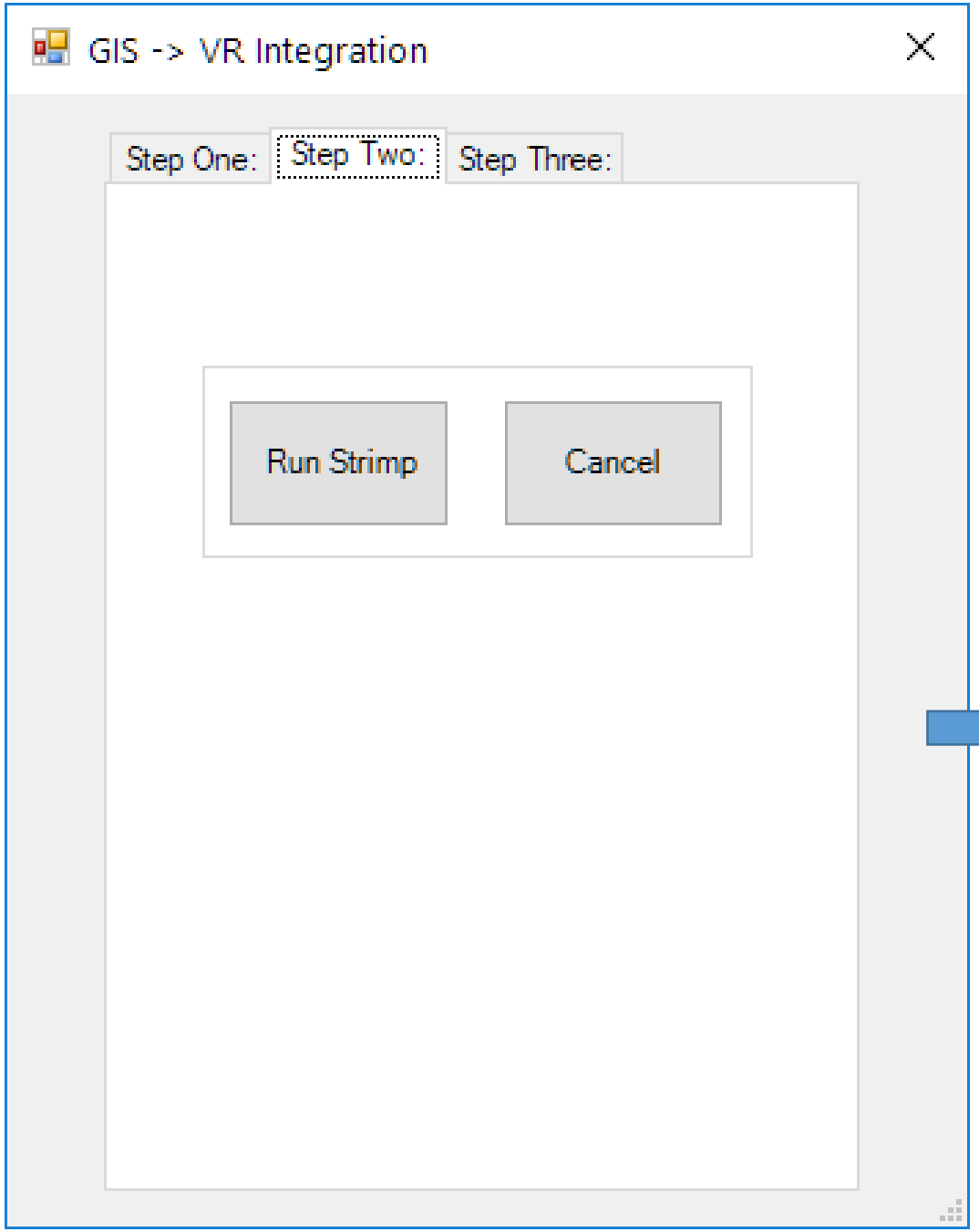
A report is generated indicating what changes are about to be made to the database.

This allows you to back out if some unintended edits were done in ArcMap.

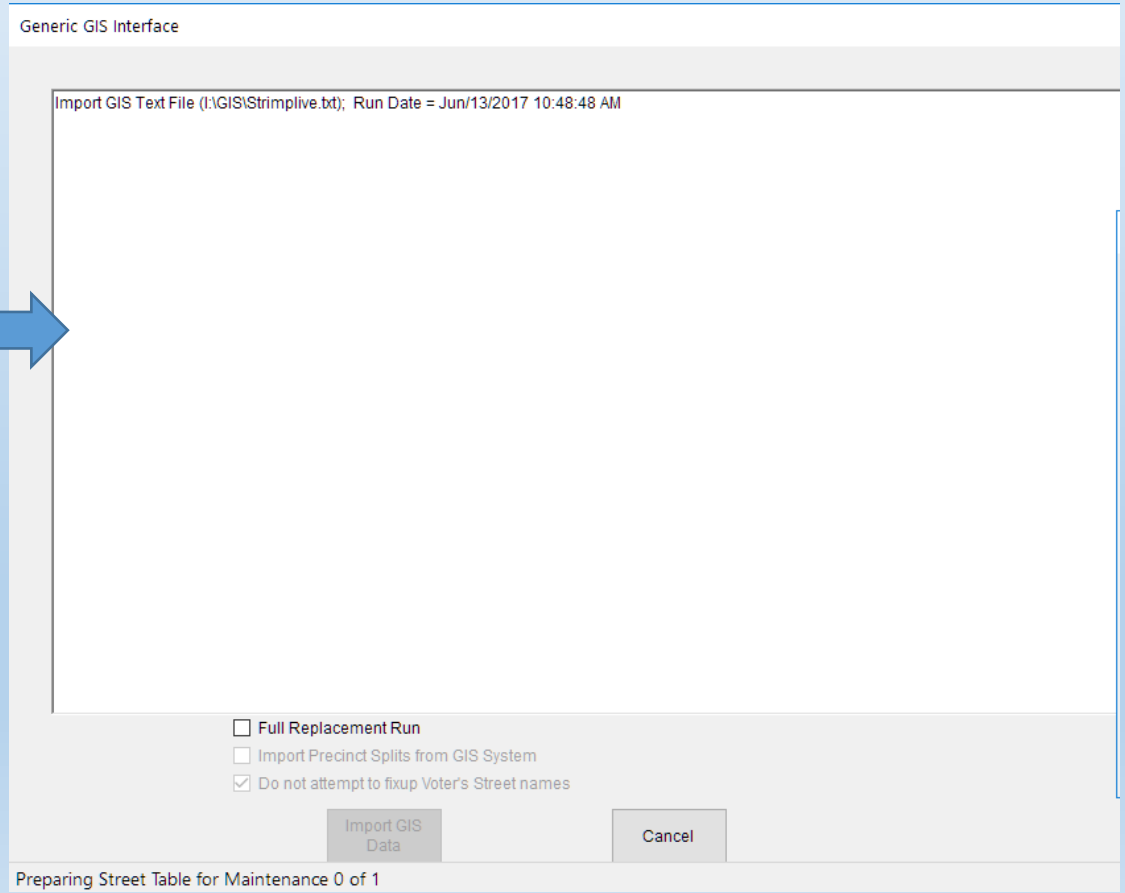
Pending Changes to StreetFile

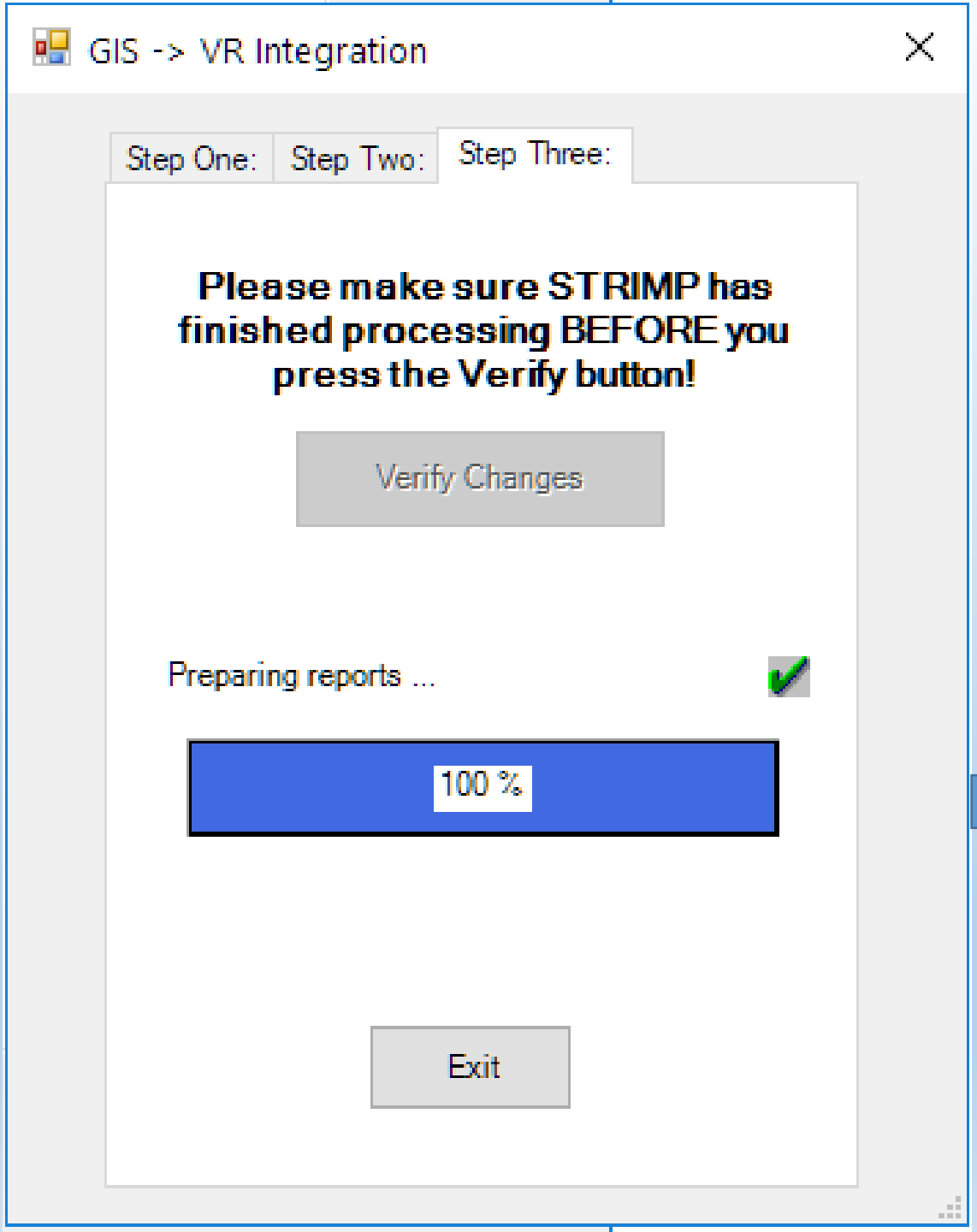
Street #	*Address*	*Pct*	*New Rec*	*Add #*	*Street Name*	*Zip Code*	*Pct*	*Mail City*	*Valid Flag*	*Com ments*	*No Res Deliv*	*Apt # Reqd*	*Geoid*	*City Ward*
2847790	2325 Madrid Dr 32940	410.1	✓											

Total number of Pending Changes : 1



After the report has been proofed, it is only necessary to press Run Strimp, which executes the VR integration routine.





The last step verifies that all the changes were made successfully, and performs some global error checking.