




Implementing ArcGIS 8.1 for Redistricting

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ESRI Implementation Services



Who, What, Why & When

Who: DynCorp I.S. & ESRI, for USDOJ Civil Rights

What: Migrate 1990's vintage workstation system to standard desktops with core technology

Why: Hardware at end of usable life; advances in off-the-shelf spatial analysis tools/databases

When: Needed by time 2000 Census data released

Redistricting Design Approach

- ◆ Start with user interface requirements: quite similar to the ESRI free extension
- ◆ Data model required to map the Census data to OMB mandates in Voting Rights.
Geographic model of Census Tract/Block
- ◆ Up front, commit to geodatabase design
- ◆ Base development on “core” ArcGIS 8.1

Design Development Phasing

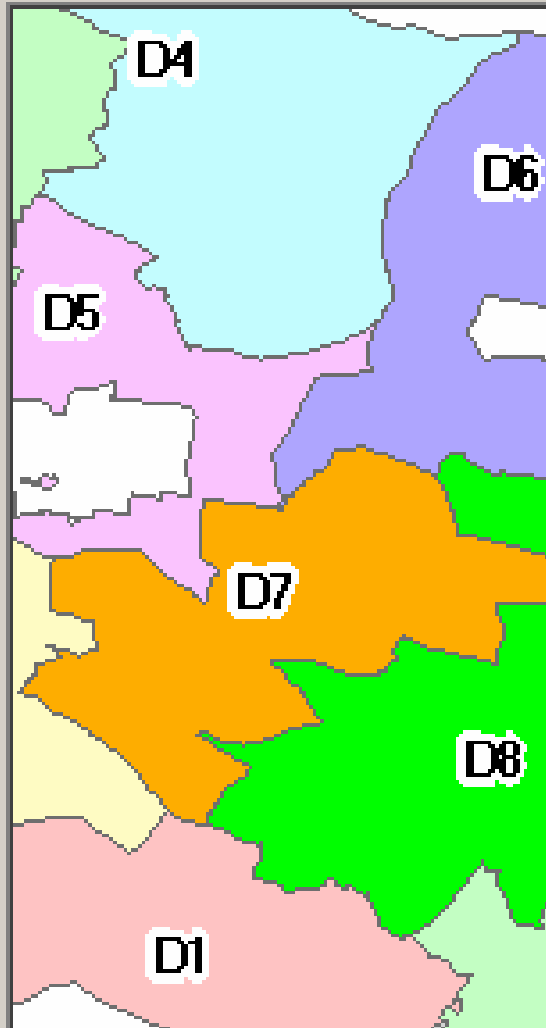
- ◆ Conceptual: Client-only, with key modules
- ◆ Detailed Matrix: Specified all functionality
- ◆ Data Model: Impacts relational database structures, performance & maintainability
- ◆ Client-Server: Integrate front and back end using separately developed / tested modules

Key Functional Capabilities

- ◆ Plan Creation
- ◆ (Plan Import)
- ◆ Plan Analysis
- ◆ Reports and Maps
- ◆ Plan Management

Example screen shots

Create Plan



What type of plan do you want to create or import?

-
-
-

What is the Plan Submission Number?
(e.g., 2000-1234)

-

Help

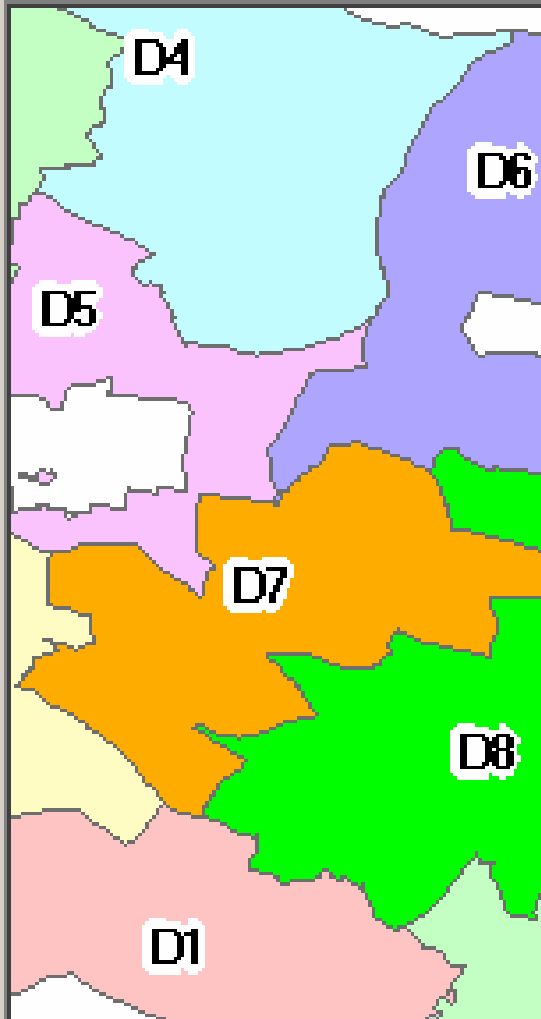
Cancel

< Back

Next >

Finish

Create Plan



What is the plan series?

-
-
-
-

What is the census year?

- 1990
- 2000

Help

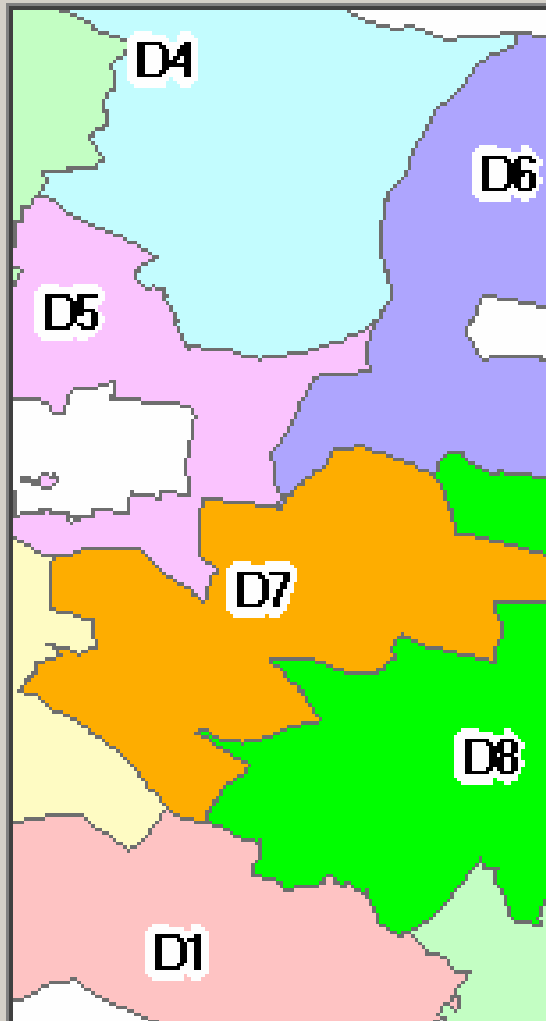
Cancel

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Next >

Finish

Create Plan



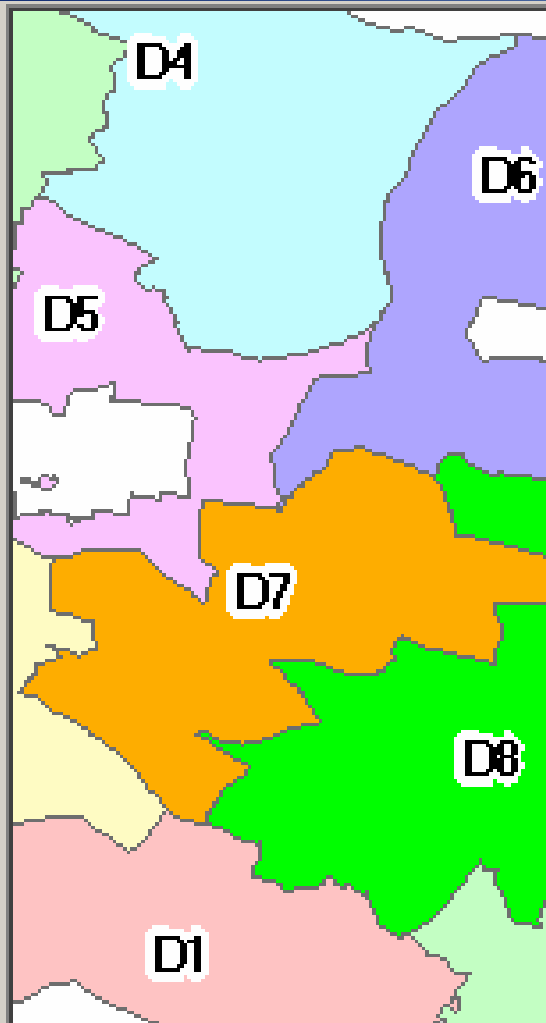
Enter the following information about the plan:

District caption:

Plan Description:

Comments:

Create Plan



What are plan geography type, state, census geography and attribute?

Geography type:

County

State:

Louisiana

Census Geography:

Acadia Parish

- Acadia Parish
- Allen Parish
- Ascension Parish
- Assumption Parish
- Avoyelles Parish
- Beauregard Parish
- Bienville Parish
- Bossier Parish

Help

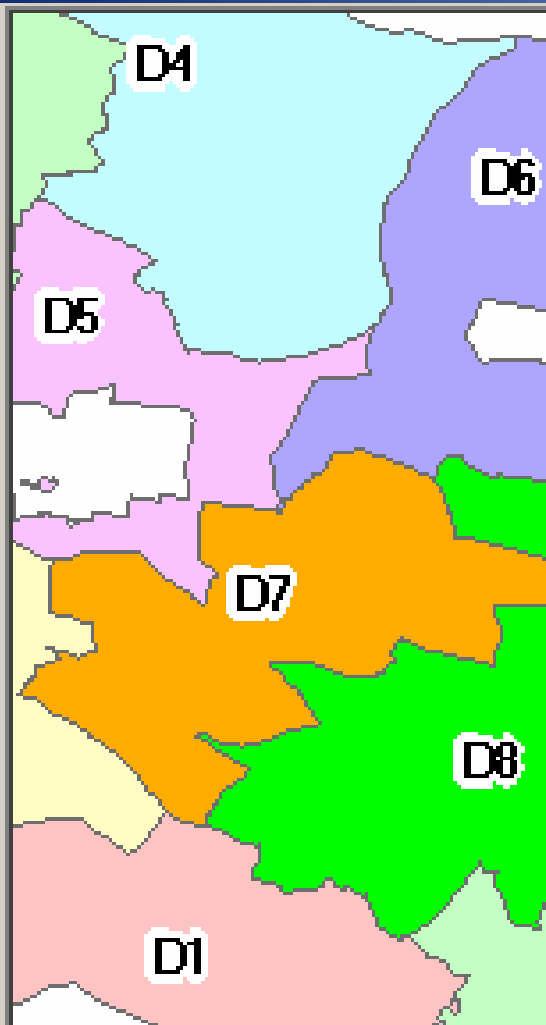
Cancel

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Next >

Finish

Create Plan



Which data fields and what statistics will be tracked for the plan?

Fields in the database:

- Universe
 - TOTAL
 - DEV
 - DEVP
 - TOTAL18
- Standard
 - TOTALHISP
 - TOTALHISPP
 - TOTALNH
 - TOTALNHP
 - WHITENH
 - WHITENHP

Help

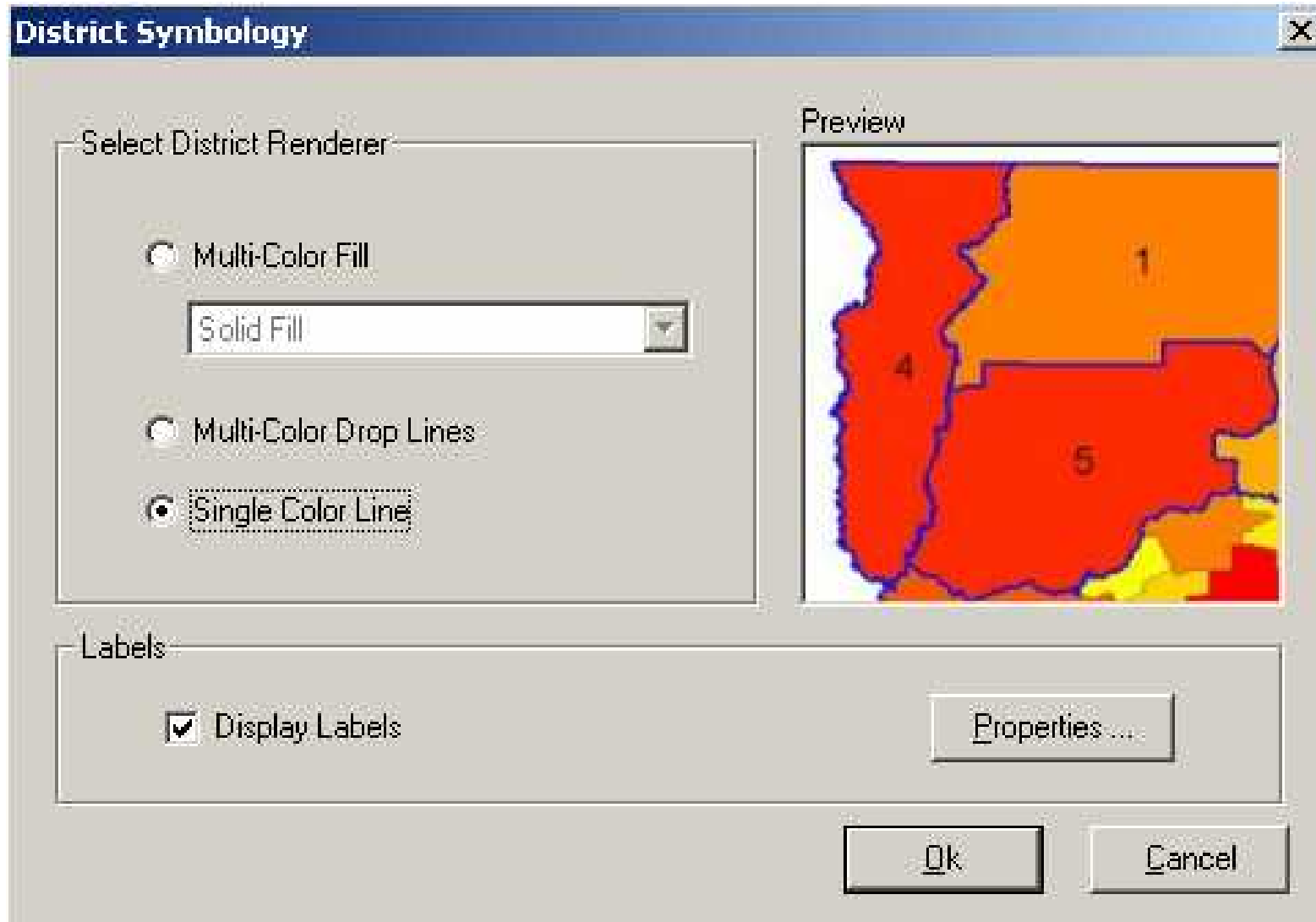
Cancel

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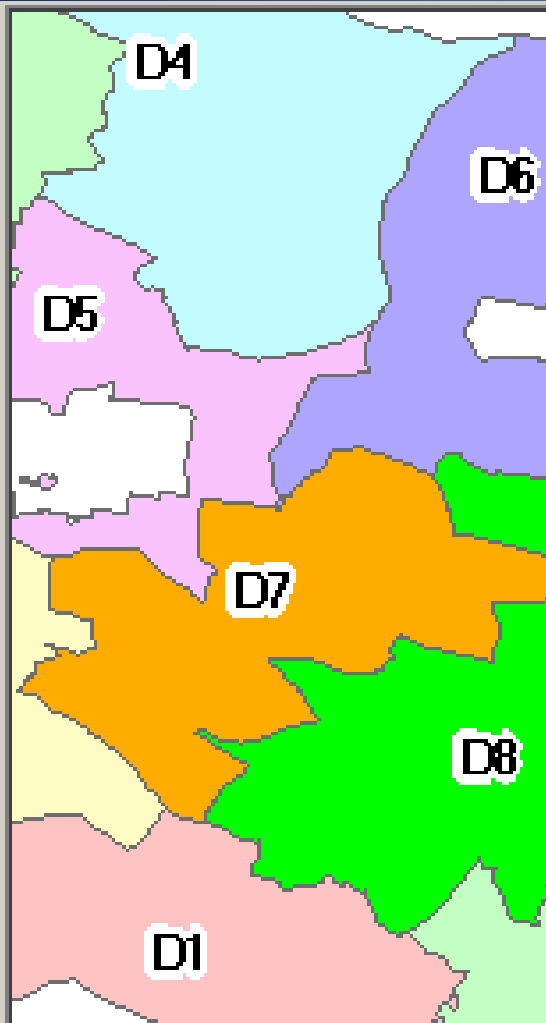
Next >

Finish

District Fill, Line, Label Options



Create Plan



Do you want to define new variables for statistics? If no, press the Next button.

User-defined Variables:

Create

Edit

Remove

Variable Definition:

Save

Load

Help

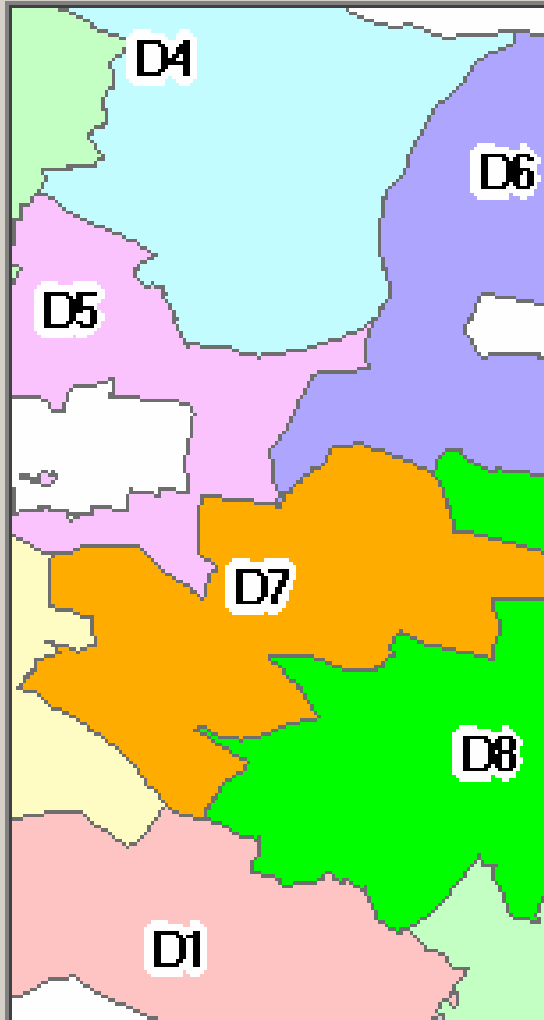
Cancel

< Back

Next >

Finish

Create Plan



Do you want to create or import a plan?

- Create a new plan
- Import an electronic submission

Help

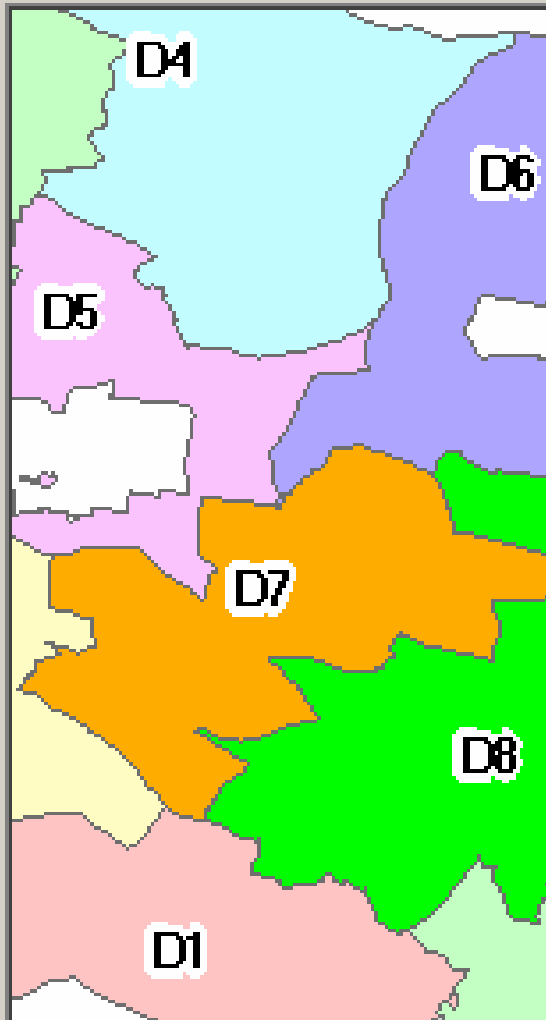
Cancel

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Next >

Finish

Create Plan



What is the number of districts?

The total and ideal population:

Total Population: 4468976

Calculated Ideal Population: 558622

Ideal Population:

Help

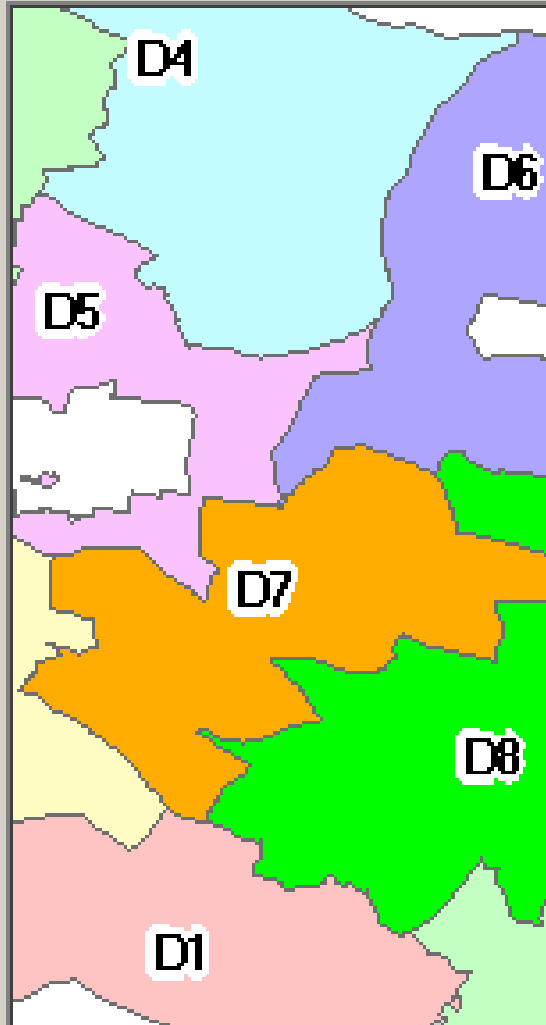
Cancel

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Finish

Import Electronic Submission



Submitter's Information:

Name:

Organization:

Date:

Address:

Phone:

Email:

Fax:

Help

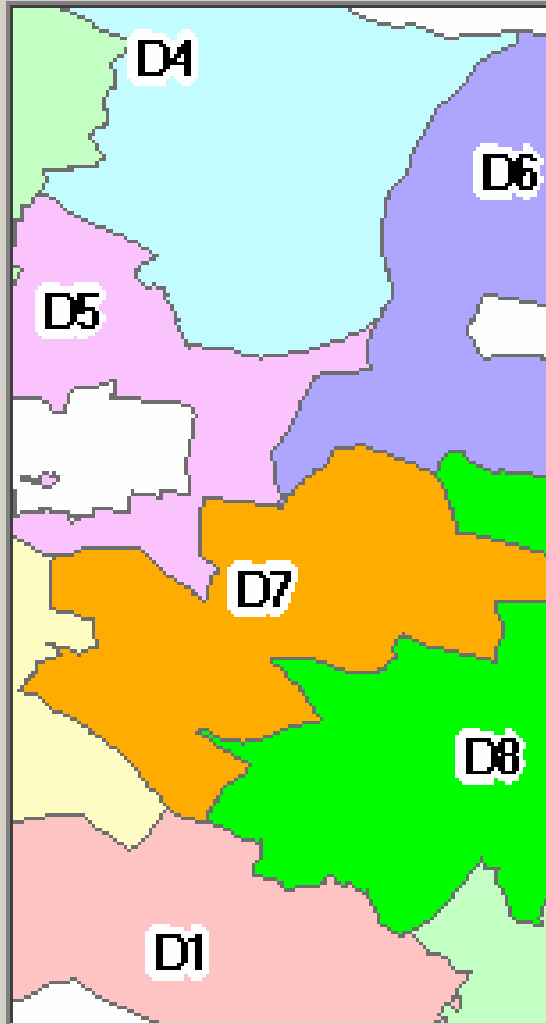
Cancel

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Next >

Finish

Import Electronic Submission



What is the electronic submission file format?

- ASCII (1990 Specification)
- ASCII (2000 Specification)
- DBF (dBASE IV)

Help

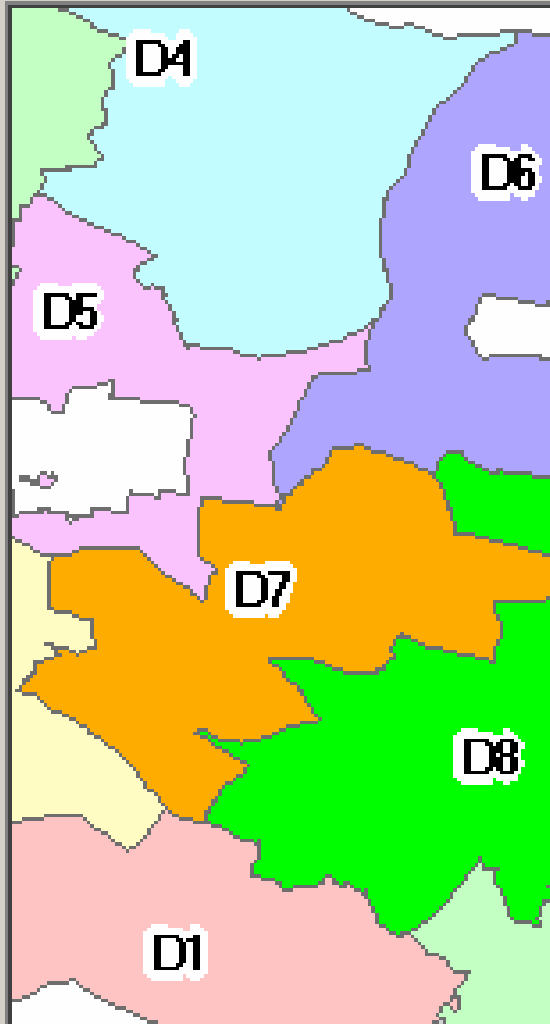
Cancel

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Finish

Import Electronic Submission



Where is your electronic submission file?



Help

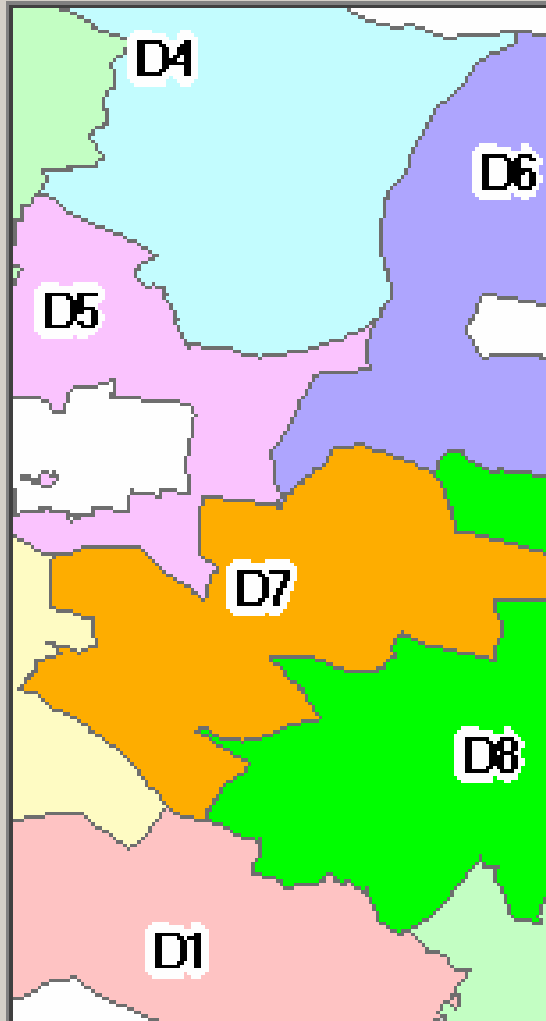
Cancel

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Next >

Finish

Import Electronic Submission



Which plan(s) do you want to import?

Plan Index:

- 1
- 2
- 3

Description for plan 1:

Senate

Comments:

MyPlan1

Help

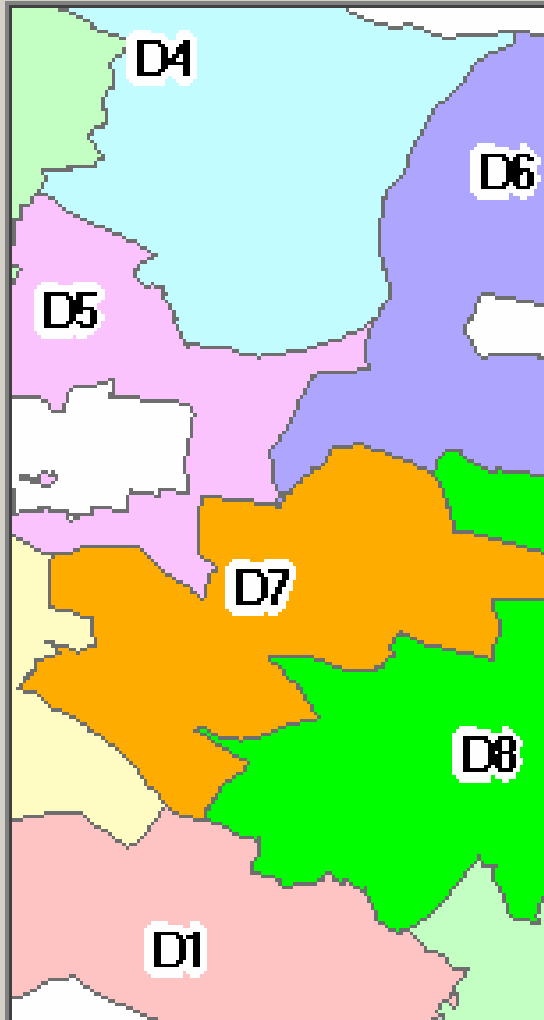
Cancel

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Next >

Finish

Create New Version



What are the plan series, description and comments:

Plan series



Plan Description:

My New Version

Comments:

My Version

Help

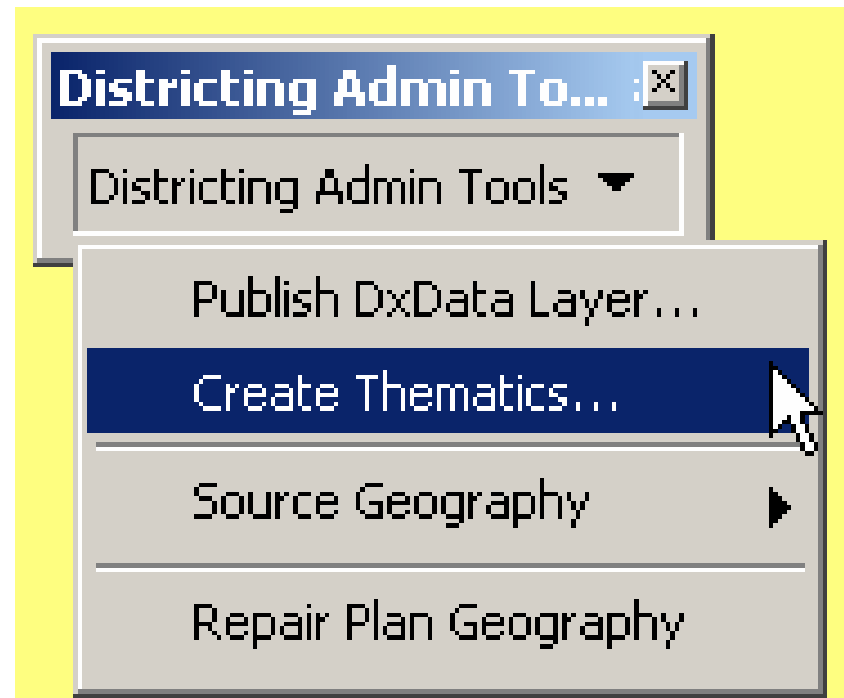
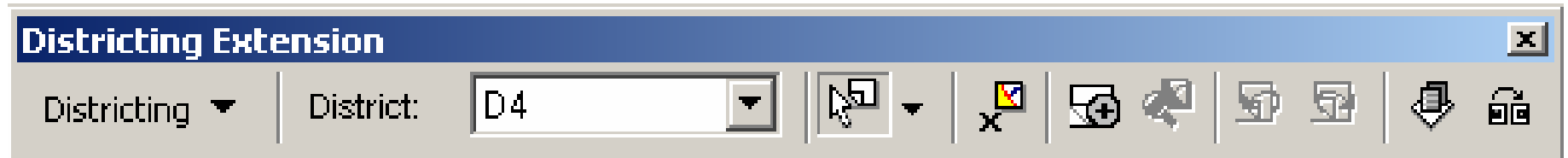
Cancel


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Next >

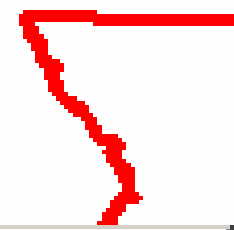
Finish

Districting Toolbars Available



Districting ▾ District: D4 ▾ 

- Start Editing
- Save Edits
- Stop Editing
- Plan Geography ▶**
 - Select by Attributes
 - Select by Location
 - Preview Statistics
 - Assign Selection
 -  Lock Selected Features
 -  Unlock Selected Districts
 - Explode Selection
 - UnExplode
 - Plan Comparison...
 - Create Shapefile...
- Plan Properties...
- Symbology ▶
- Locator Tool...
- Report and Layout Tools ▶
- Export...
-  Chart Window
-  Statistics Window
- Preferences...



Plan.mxd - ArcMap - ArcInfo

File Edit View Insert Selection Tools Window Help

1:286,949 Districting Admin Tools 68%

Layers

- Districsts
 - All Districsts
- East Baton Rouge Parish
 - LA.TRACT00_PL.BLACK18
 - 35 - 318
 - 319 - 865
 - 866 - 1487
 - 1488 - 2631
 - 2632 - 4769
- East Baton Rouge Parish
 - LA.COUNTY00_PL
 - BLACK
 - 403 - 11461
 - 11462 - 28627
 - 28628 - 49676
 - 49677 - 166141
 - 166142 - 326952
- Locator View
- Overview

Districting Extension

Districting District: D10

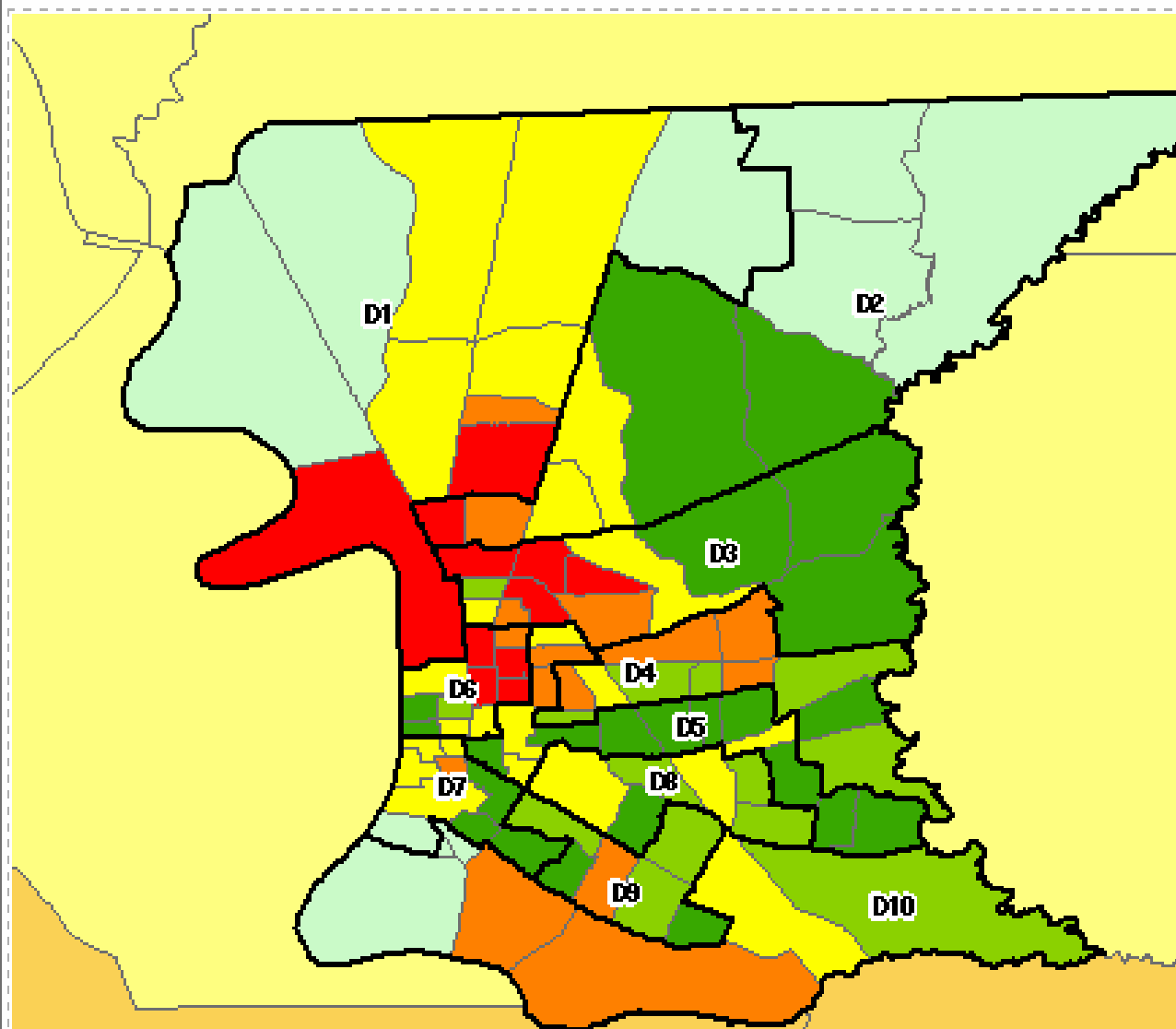
- Start Editing
- Save Edits
- Stop Editing
- Plan Geography
- Plan Properties...
- Symbology
- Locator Tool...
- Report and Layout Tools
- Export...
- Chart Window
- Statistics Window
- Preferences...

Current Statistics

DISTRICT	TOTAL	DEV	DEVP	TOTALHISP	TOTALHISP%
1	44086	2801	6.78	375	0.8
2	30219	-11066	-26.8	220	0.7
3	55141	13856	33.56	551	1.0
4	50677	9392	22.75	1176	2.3
5	60745	19460	47.14	948	1.5
6	33124	-8161	-19.77	218	0.6

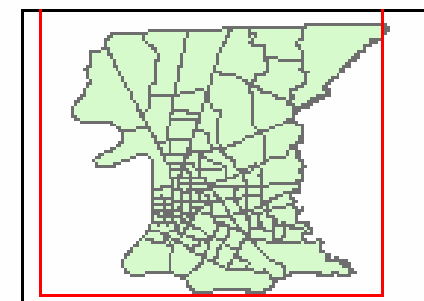
91°22'36.34"W 30°34'35.03"N

Sample Map



Plan Name:

- Districts
- All Districts
- LA.TRACT00_PL.BLACK 12
- 25 - 913
 - 913 - 205
 - 205 - 143 F
 - 1430 - 2091
 - 2092 - 4100
 - Carl Balon Rouge Parish
- BLACK
- 400 - 11401
 - 11402 - 2000 F
 - 20000 - 400 F 0
 - 400 F - 1 001 41
 - 1001 42 - 200000



Metadata View: Plan Geography



Metadata View: Plan Statistics

Contents | Preview | Metadata

My New Plan

Properties | **Statistics** | Geography

Click to see a description of the plan statistics

Current Population By Unit:

Universe							
District	TOTAL	DEV	DEVP	TOTALHISP	TOTALHISPP	TOTALNH	TOTAL
	44086	2801	6.78				
1	30219	-	-26.8	375	0.85	43711	99.15
2	55141	11066	33.56	220	0.73	29999	99.25
3	50677	9392	22.75	551	1	54590	99.15
4	60745	19460	47.14	1176	2.32	49501	97.65
5	33124	-8161	-19.77	948	1.56	59797	98.45
6	32710	-8575	-20.77	218	0.66	32906	99.35
7	36168	-5117	-12.39	924	2.82	31786	97.15
8	30917	-	-25.11	861	2.38	35307	97.65
9	39065	-2220	-5.38	690	2.23	30227	97.75
10				1400	3.58	37665	96.45

Total Population: 412852
Ideal Population: 41285

Plan Properties

Ability to modify statistics tracked

Or create custom variables: these typically will be combinations of available stats.

The screenshot shows the PlanProperties dialog box with the following sections:

- Tracked Statistics Fields:** A tree view showing 'Universe' (TOTAL, DEV, DEVP) and 'Standard' (TOTALHISP, TOTALHISP, TOTALNH, TOTALNHP, WHITENH, WHITENHP, BLACKNH, BLACKNHP, AIANNH, AIANNHP, ASIANNH).
- Population Data:** Total Population: 412852, Ideal Population: 41285.
- Custom Variables:** Fields for Names, Definition, and buttons for Create, Edit, Remove, Save, and Load.

Buttons at the bottom include 'Modify Tracked Statistics Fields', 'OK', 'Cancel', and 'Apply'.

DISTRIC	TOTAL	DEV	DEVP	TOTALHISP	TOTALHISP
1	44086	2801	6.78	375	
2	30219	-11066	-26.8	220	
3	55141	13856	33.56	551	
4	50677	9392	22.75	1176	
5	60745	19460	47.14	948	
6	33124	-8161	-19.77	218	

Example Report: Population

R2-Population Summary Report

User: just2585 Date and Time: 5/30/2001 5:12:49 PM
 Room: Report: PopSum.rpt
 Plan: 1234-4512_101

R2-Population Summary Report

District	TOTAL	DEV	DEV%	WHITENHP	TOTALHISPP	BLACKNHP	ASIANNHP	HPINHP	OTHERNHP	MLTMNNHP	TOTALNH	WHITENH	BLACKNH
1	44,086	2,801	6.78	43.75	0.85	54.47	0.33	0.02	0.11	0.16	43,711	19,286	24,014
2	30,219	-11,066	-26.80	59.67	0.73	38.55	0.27	0.03	0.27	0.11	29,999	18,032	11,648
3	55,141	13,856	33.56	34.42	1.00	63.16	0.71	0.01	0.11	0.31	54,590	18,977	34,829
4	50,677	9,392	22.75	50.77	2.32	42.12	3.94	0.05	0.21	0.19	49,501	25,728	21,345
5	60,745	19,460	47.14	71.39	1.56	24.39	1.89	0.04	0.20	0.20	59,797	43,366	14,813
6	33,124	-8,161	-19.77	12.88	0.66	85.40	0.38	0.01	0.08	0.42	32,906	4,266	28,288
7	32,710	-8,575	-20.77	59.32	2.82	30.11	6.23	0.05	0.59	0.45	31,786	19,402	9,849
8	36,168	-5,117	-12.39	80.40	2.38	13.46	2.96	0.04	0.29	0.15	35,307	29,080	4,868
9	30,917	-10,368	-25.11	75.65	2.23	18.54	2.78	0.03	0.35	0.16	30,227	23,388	5,733
10	39,065	-2,220	-5.38	66.35	3.58	25.72	3.10	0.09	0.50	0.28	37,665	25,920	10,048

Total Population:	412,852
Ideal Population:	41285
Mean Deviation:	0
Mean Percent Deviation:	0
Largest Positive Deviation:	19,460
Largest Negative Deviation:	-11,066
Overall Range in Deviation:	30,526
Overall Range in Deviation Percentage:	73.94

Plan Compare: Show Difference

The screenshot shows the ArcMap interface with the following components:

- Menu Bar:** File, Edit, View, Insert, Selection, Tools, Window, Help
- Toolbars:** Standard ArcGIS toolbars and a Districting Admin Tools toolbar.
- Layers Panel:**
 - Plan Comparison - 1965-0709_301 (checked)
 - Plan Comparison - Difference (checked, red outline)
 - 1965-0709_401 (checked)
 - Districts
 - All Districts (checked)
 - Acadia Parish (checked)
 - County (checked)
 - Tract (checked)
 - Block Group (checked)
 - Block (checked)
 - Locator View (checked)
 - Overview (checked)
- Map:** Shows four districts (D1, D2, D3, D4) with a red outline indicating the difference between the two plans.
- Statistics Window:**

DISTRIC	TOTAL	DEV	DEVP	TOTALHISP	TOTALHISPF	TOTALNH	TOTALNHP	WHITENH	WHITENHP	BLACKNH	BLACKNHP	AIANN
1	8205	-6510	-44.24	50	0.61	8155	99.39	7824	95.36	291	3.55	
2	16769	2054	13.96	197	1.17	16572	98.83	13620	81.22	2845	16.97	
3	8109	-6606	-44.89	48	0.59	8061	99.41	5639	69.54	2388	29.45	
4	25778	11063	75.18	243	0.94	25535	99.06	20067	77.85	5241	20.33	
- Status Bar:** 92°39'17.34"W 30°2'4.38"N

Plan Management

- ◆ Based on core ArcCatalog
- ◆ Plans created as MXD file, and stored on Unix server
- ◆ Identify plans in progress
- ◆ Metadata summary views of geography and statistics
- ◆ Summary info. on Intranet

Credits

Voting Rights: Bob Berman and Bob Kengle

Administration: Doug Crain and Nancy Sweesy

Onsite GIS: Mario Lopez-Gomez with Jonathan Brooks,
Lew Summers, Sharon Thomas

ESRI Account Manager: Todd Rogers, now Civilian
Federal Manager (& DOJ Account Rep).

Development: Larry Boden with Ryan Bae, Justin Fan,
Craig Ferris, Kevin Kelly, Mike Redpath

Support: Steve Ciampichini, Fatima Awad, Josh Blue,
Jim Anderson, Jim Correll, Spencer Crim, Sean Cononie

DynCorp Information Systems: Doug Cheek with
Kevin Bell, Soo-Ung Kim, Bill Pratt, Lucian Russell

Demo Today at 6 p.m.

Larry Boden and Kevin Kelly from ESRI will demo extensions for ArcView and ArcGIS in Demo Theater 1, located in ESRI Showcase

Follow-up Contact

Bob Andrew (703) 934-3446