

GIS Concepts Course

To Better Understand
Geographic Information Systems,
Their Use in Making Maps
and Their Capabilities for Spatial Analysis

Tucson and Pima County, Arizona

Updated July 2004

Part I - What Is GIS?

- An Organized Collection of:
- computer hardware
- computer software
- geographic data and
- trained personnel
- designed to . . .

What Is GIS?

- efficiently capture, store,
- update, manipulate,
- analyze and display
- all forms of geographically referenced information. (ESRI 1992)

What Is GIS?

An Organized Collection of computer hardware, computer software, geographic data and trained personnel

designed to efficiently capture, store, update, manipulate, analyze and display all forms of geographically referenced information. (ESRI 1992)

GIS In Tucson and Pima County

- 25 Year History
- Pima County / City of Tucson Intergovernmental Agreement
- Many Shared Resources Widely Available
- City GIS Cooperative Assists Users
- Good Desktop Software Now Available
- Lots of Experienced People Willing to Help

GIS In Tucson and Pima County

- City/County Workers Have Desktop Access
- To Over 600 Local Thematic Layers
- Including:

Parcels
Street Network
Jurisdictions
Parks
Schools
Neighborhoods

Washes
Bike Paths
Cemeteries
Hospitals
Post Offices
Fire Stations

Census Tracts
Rio Nuevo
Zoning
City Wards
ZIP Codes
Ortho Photos

Let's Make a Map

- Local Stories of GIS In Action
- How GIS Can Help You Do Better Work
- The Right Picture Really Is Worth 1000 Words

Example 1

Problem:

Find Crime Concentrations in Tucson

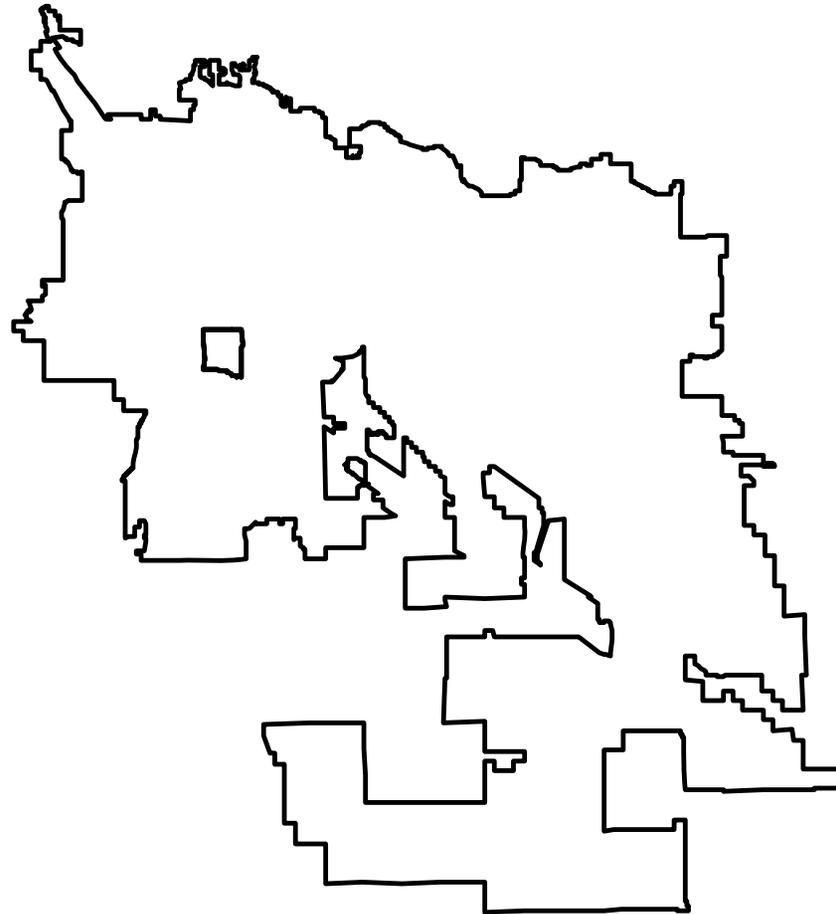
- Use Local Resources
- Prepare Data
- Use GIS Functions and Statistics
- Use Good Map Design Principles
- Finish Map for Screen or Print

What Do You Want on Your Map?

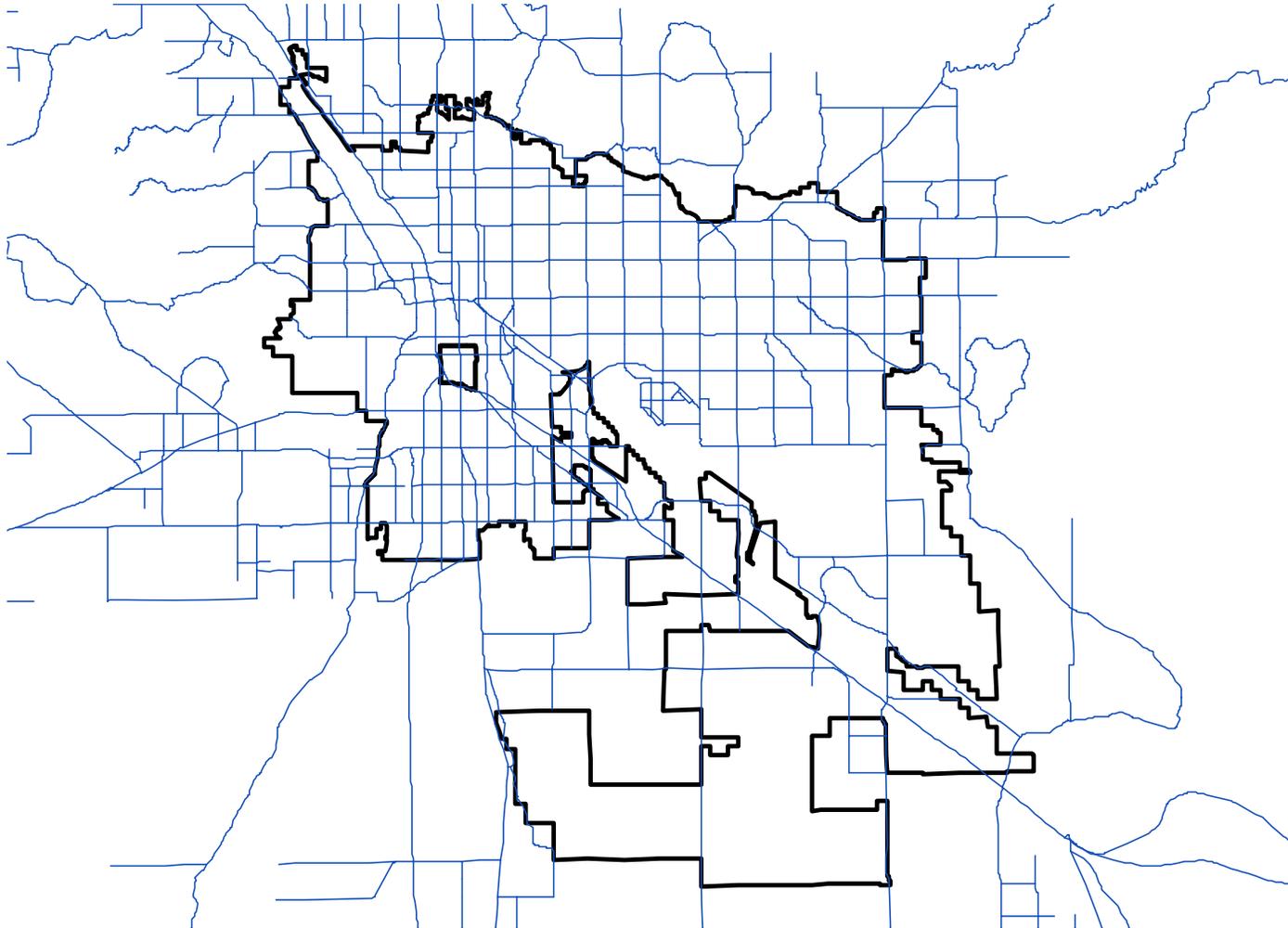
- City Outline - Local Resource
- Major Streets - Local Resource
- Parks - Local Resource
- Schools - Local Resource

- Crime Concentrations

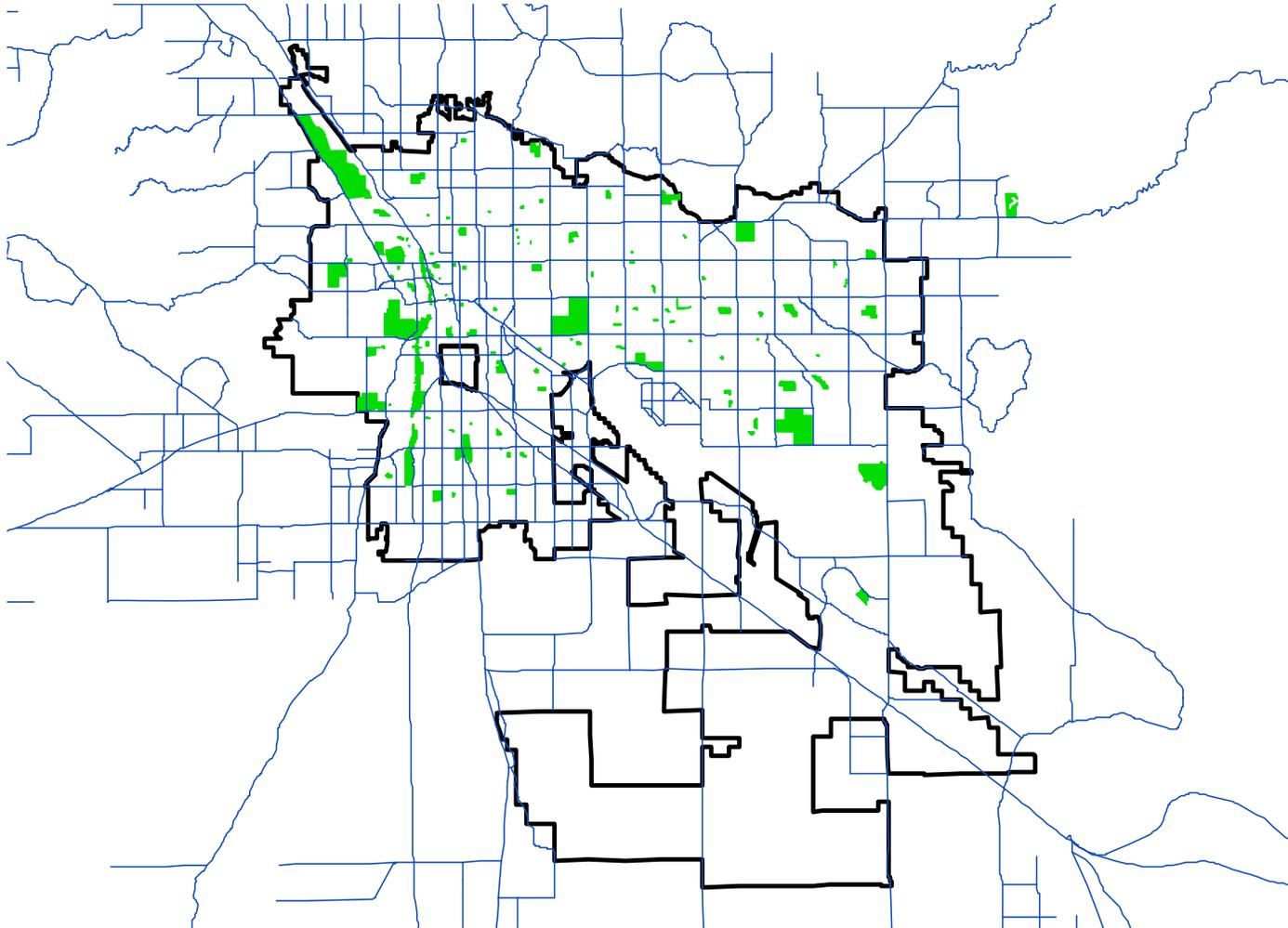
Local Resources - City Boundaries



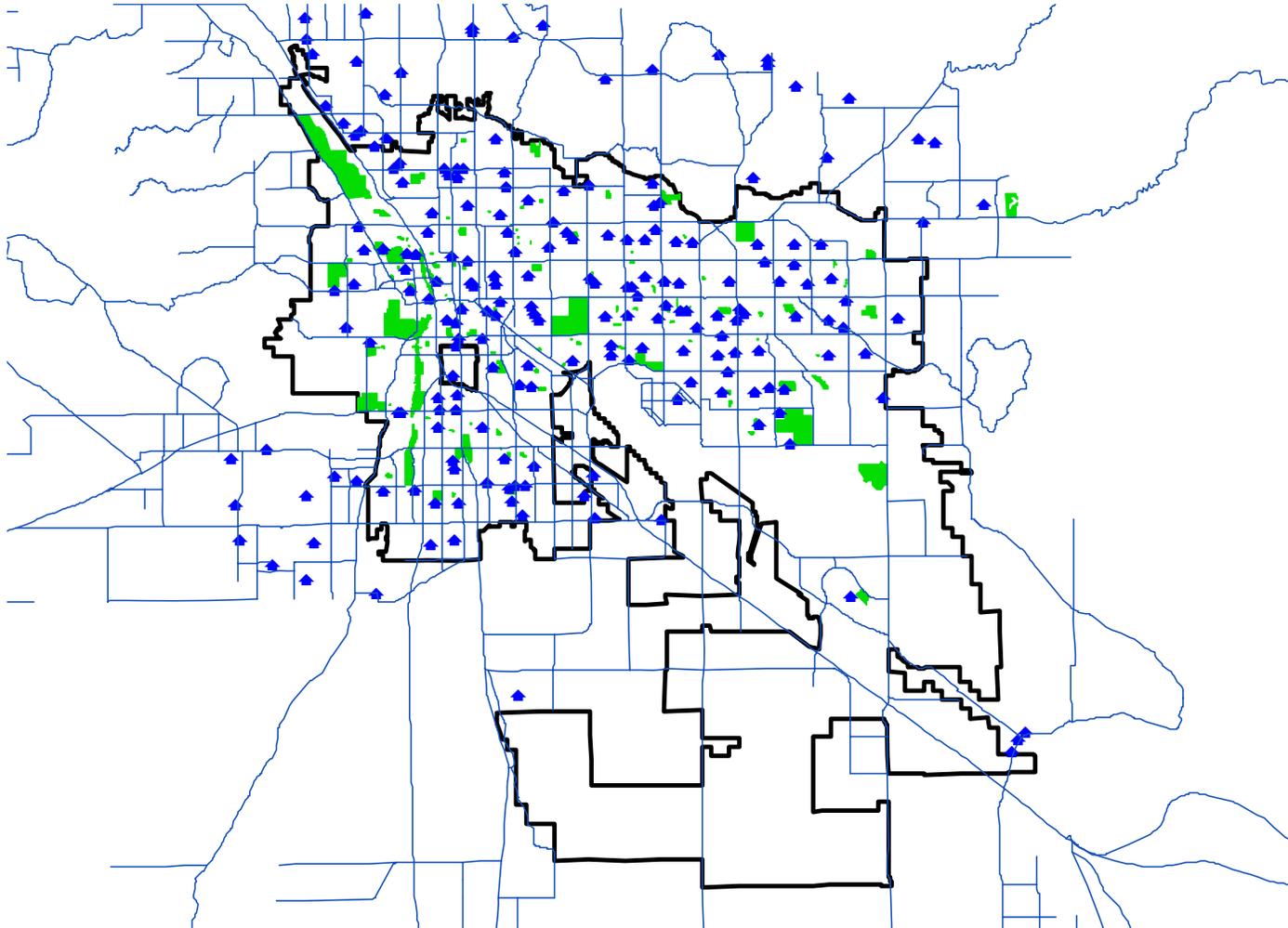
Local Resources - Major Streets



Local Resources - Parks



Local Resources - Schools



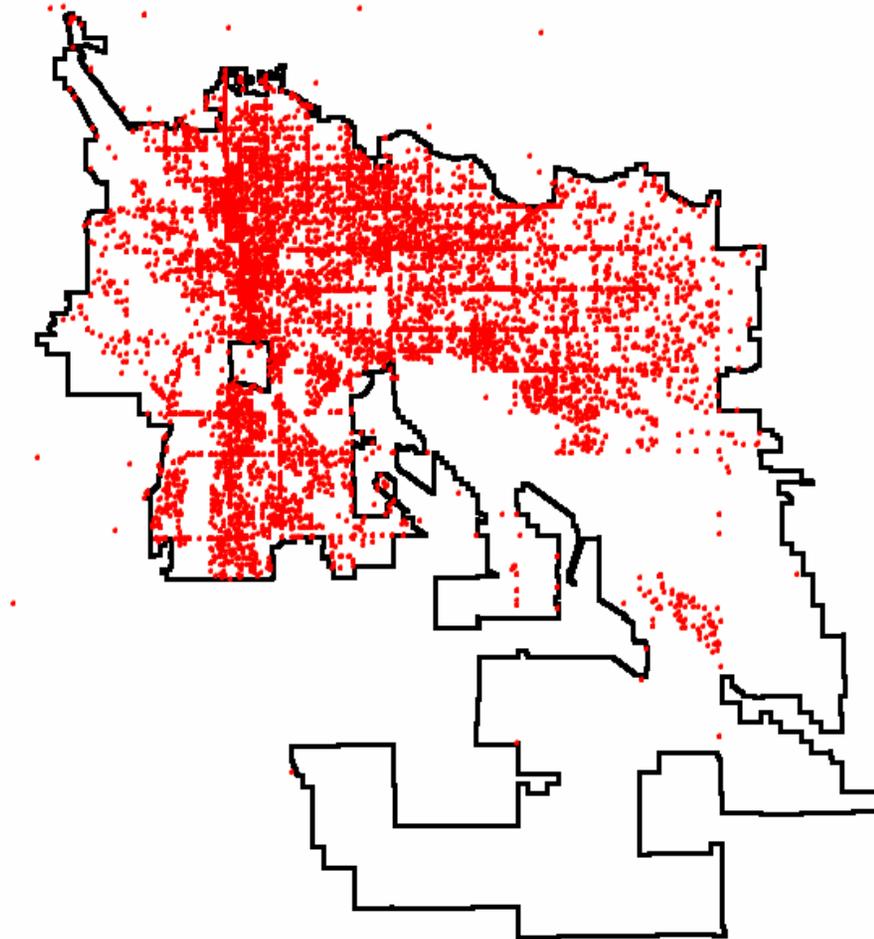
Crime Concentrations in Tucson

- Crime Data Is Not Part of Local Resources
 - Must Prepare Data For Mapping
 - How to Get X and Y Coordinates On Cases?
 - Geocoding / Address Matching

Geocoding / Address Matching

- Address Cleaning Is Needed
- Match Police Incident Addresses Against Master File with X and Y Coordinates
- Use Local Resource: **Street Network File**

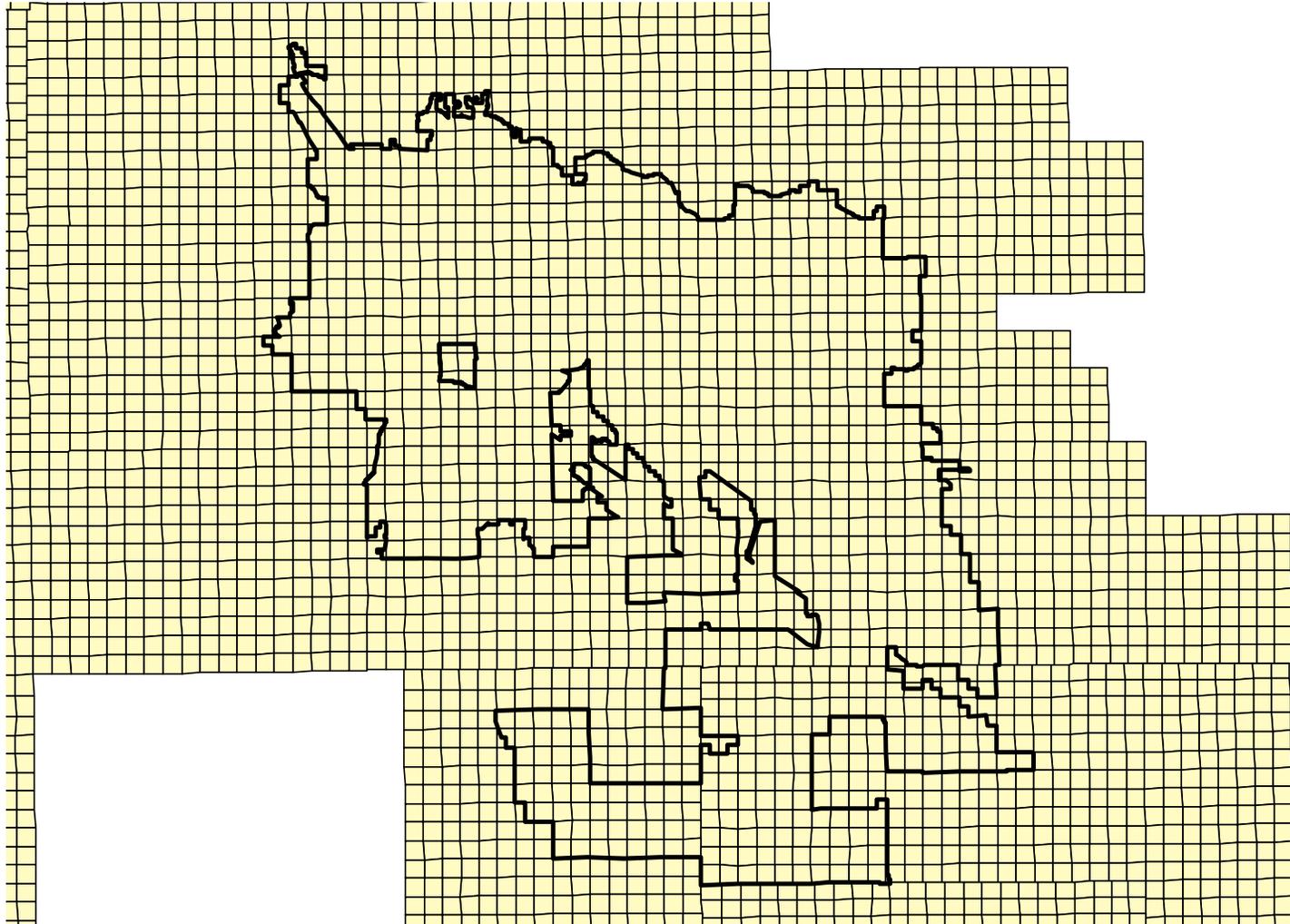
Crime Incidents are Points



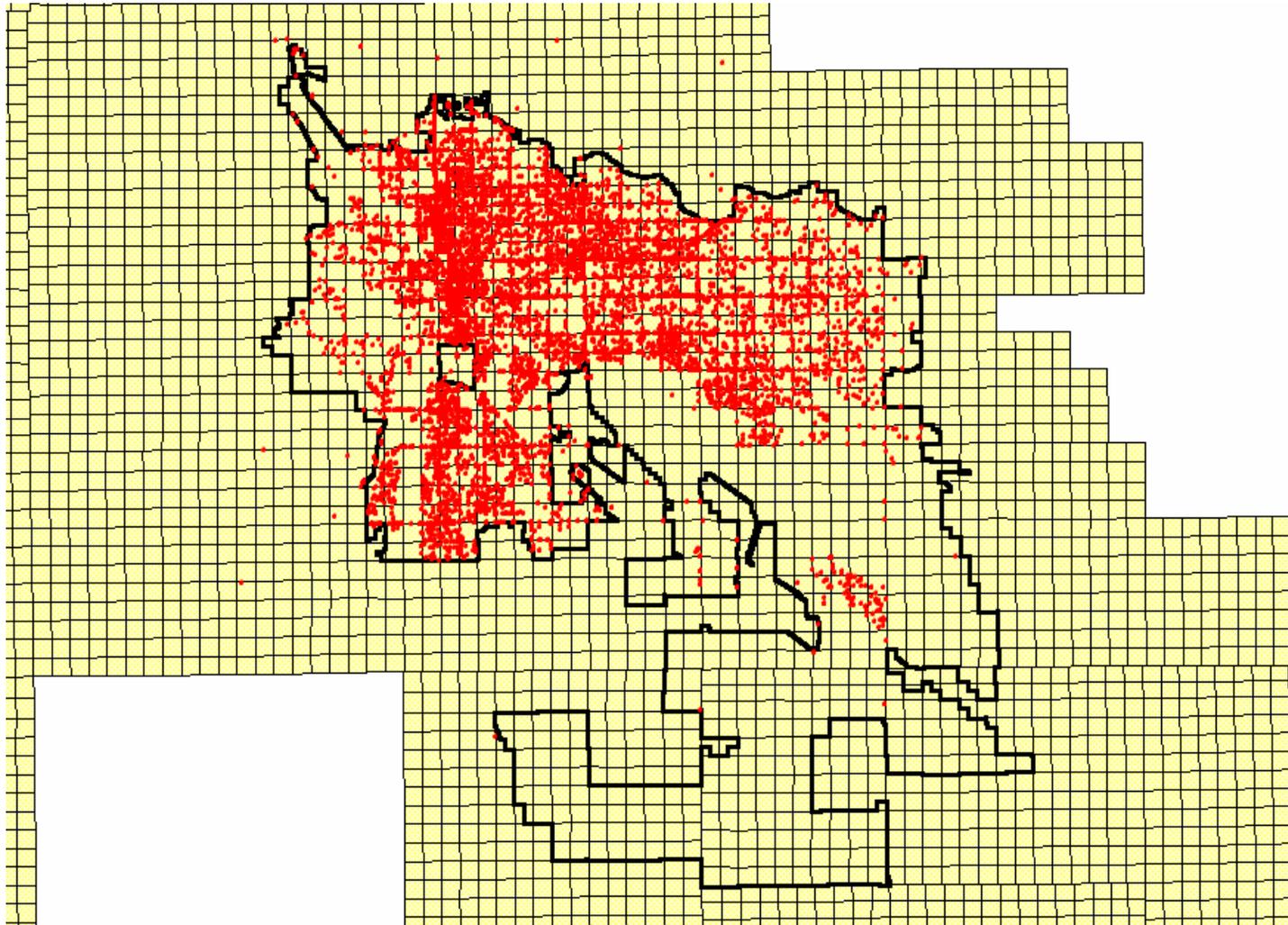
Crime Concentrations in Tucson

- What About Multiple Incidents at the Same Address?
- Use Small Areas of Same Size to Aggregate
- Local Resources - **Quarter Sections**

Use Small Areas of Same Size to Aggregate



Spatial Join: Point in Polygon



Step 1 - Highlight Shape Fields - Execute

ArcView GIS Version 3.1

File Edit Table Field Window Help

0 of 14951 selectec

Police Incidents

Shape	Casenum	Rpt_date	Rpt_date2	Rpt_time	Dispa	cr
Point	0105010092	20010501	TUE, MAY 01, 2001	0401	B	3 W IF
Point	0105010104	20010501	TUE, MAY 01, 2001	0456	B	0 4570
Point	0105010191	20010501	TUE, MAY 01, 2001	0919	B	07 175
Point	0105010105	20010501	TUE, MAY 01, 2001	1045	A	180 1
Point	0105010105	20010501	TUE, MAY 01, 2001	1025	A	0702
Point	0105010105	20010501	TUE, MAY 01, 2001	1135	A	0501
Point	0105010105	20010501	TUE, MAY 01, 2001	1204	A	0902 1
Point	0105010105	20010501	TUE, MAY 01, 2001	1309	C	3502 71
Point	0105010105	20010501	TUE, MAY 01, 2001	1459	A	0 459
Point	0105010105	20010501	TUE, MAY 01, 2001	0790	A	0 790
Point	0105010105	20010501	TUE, MAY 01, 2001	025145	A	02 5145
Point	0105010105	20010501	TUE, MAY 01, 2001	01E.22	A	01 E.22
Point	0105010105	20010501	TUE, MAY 01, 2001	015350	A	01 5350
Point	0105010105	20010501	TUE, MAY 01, 2001	022709	A	02 2709
Point	0105010105	20010501	TUE, MAY 01, 2001	044625	A	04 4625
Point	0105010105	20010501	TUE, MAY 01, 2001	037002	A	03 7002
Point	0105010001	20010501	TUE, MAY 01, 2001	0020	C	5301 1900
Point	0105010002	20010501	TUE, MAY 01, 2001	0002	J	5701 60 W
Point	0105010025	20010501	TUE, MAY 01, 2001	0049	Q	0603 1675
Point	0105010026	20010501	TUE, MAY 01, 2001	0051	J	6101 S. Cl
Point	0105010016	20010501	TUE, MAY 01, 2001	0033	J	5703 414 E
Point	0105018001	20010501	TUE, MAY 01, 2001	0056	C	2701 1300
Point	0105010013	20010501	TUE, MAY 01, 2001	0024	J	5303 W. C
Point	0105010044	20010501	TUE, MAY 01, 2001	0120	C	1803 E. Gl
Point	0105010022	20010501	TUE, MAY 01, 2001	0048	Q	0603 1841
Point	0105010021	20010501	TUE, MAY 01, 2001	0046	J	5603 E. Cl
Point	0105010010	20010501	TUE, MAY 01, 2001	0018	A	0609 6160
Point	0105010020	20010501	TUE, MAY 01, 2001	0041	J	5704 101 I
Point	0105010019	20010501	TUE, MAY 01, 2001	0036	J	5604 1602
Point	0105010017	20010501	TUE, MAY 01, 2001	0034	J	5402 3656
Point	0105010006	20010501	TUE, MAY 01, 2001	0009	J	5503 5240
Point	0105010008	20010501	TUE, MAY 01, 2001	0014	J	5303 S. St
Point	0105010037	20010501	TUE, MAY 01, 2001	0108	J	5704 1201
Point	0105010027	20010501	TUE, MAY 01, 2001	0052	J	5602 4811
Point	0105010007	20010501	TUE, MAY 01, 2001	0014	J	5403 1240
Point	0105010004	20010501	TUE, MAY 01, 2001	0007	C	2902 7777

Quarter Sections

Shape	Area	Perimeter	Trs4	Trs4_id	Tile_name
Polygon	7317605.500	10825.570	2	1	E111402
Polygon	7319966.500	10825.190	3	2	E111401
Polygon	732331.500	10726.395	4	4	E111401
Polygon	732737.000	10838.737	5	3	E111402
Polygon	732750.000	10874.780	6	5	E111403
Polygon	732750.000	10859.403	7	6	E111403
Polygon	732750.000	10754.029	8	7	E111404
Polygon	732750.000	10713.659	9	8	E111404
Polygon	732750.000	10899.192	10	9	E111405
Polygon	7137924.000	10687.661	19	18	E111303
Polygon	7113870.000	10669.484	20	19	E111304
Polygon	7137810.500	10687.658	21	20	E111304
Polygon	7159198.000	10703.948	22	21	E111305
Polygon	714756.000	10730.900	23	22	E111305
Polygon	714756.000	10730.900	23	23	E111306
Polygon	714756.000	10730.900	23	24	E111306
Polygon	714756.000	10730.900	23	25	E111201
Polygon	714756.000	10730.900	23	26	E111201
Polygon	714756.000	10730.900	23	27	E111202
Polygon	714756.000	10730.900	23	28	E111202
Polygon	714756.000	10730.900	23	29	E111203
Polygon	714756.000	10730.900	23	30	E111203
Polygon	714756.000	10730.900	23	31	E111204
Polygon	714756.000	10730.900	23	32	E111204
Polygon	714756.000	10730.900	23	33	E111205
Polygon	714756.000	10730.900	23	34	E111205
Polygon	7092572.500	10654.435	36	35	E111206
Polygon	7197753.000	10780.399	37	36	E111401

2. Click Here On Point Field

1. Click Here On Polygon Field

3. And Finally, Click Here On Spatial Join

Step 2 - Result: Quarter Section Appended

ArcView GIS Version 3.1

File Edit Table Field Window Help

0 of 14951:selectec

Police Incidents

Mat status	Mat score	Area	Perimeter	Trs4	Trs4_id	Tile_name	Township	Range	Section	Qs	Qs_1/4	Qs_1/4	Mapid	Trsq
4	100	7054872.500	10624.558	3328	3327	E1413353	1403	1302	35	3	C	SW	SW35141	14S13E35SW
1	100	7007479.000	10588.910	3323	3322	E1414314	1403	1402	31	4	D	SE	SE31141	14S14E31SE
1	100	7064224.500	10635.693	3046	3045	E1415302	1403	1502	30	2	B	NW	NW30141	14S15E30NW
1	100	7097491.000	10656.725	3662	3661	E1414103	1503	1402	10	3	C	SW	SW10151	15S14E10SW
1	100	6928613.000	10528.927	2482	2481	E1413013	1403	1302	01	3	C	SW	SW01141	14S13E01SW
1	100	6983721.000	10570.760	2392	2391	E1414062	1403	1402	06	2	B	NW	NW06141	14S14E06NW
1	100	7034994.000	10609.442	2567	2566	E1414071	1403	1402	07	1	A	NE	NE07141	14S14E07NE
1	100	7002006.000	10584.581	2128	2127	E1414303	1303	1402	30	3	C	SW	SW30131	13S14E30SW
1	100	7115394.500	10670.096	1872	1871	E1413242	1303	1302	24	2	B	NW	NW24131	13S13E24NW
1	100	7291213.500	10807.463	4041	4040	E1414244	1503	1402	24	4	D	SE	SE24151	15S14E24SE
1	100	6951777.500	10547.747	2549	2548	E1414111	1403	1402	11	1	A	NE	NE11141	14S14E11NE
1	100	7008275.000	10589.306	2807	2806	E1414164	1403	1402	16	4	D	SE	SE16141	14S14E16SE
1	100	7074711.000	10639.816	2716	2715	E1414141	1403	1402	14	1	A	NE	NE14141	14S14E14NE
1	100	6866628.500	10481.905	2734	2733	E1413132	1403	1302	13	2	B	NW	NW13141	14S13E13NW
1	100	7025728.500	10602.980	2640	2639	E1414104	1403	1402	10	4	D	SE	SE10141	14S14E10SE
1	100	7040832.000	10613.887	3867	3866	E1413134	1503	1302	13	4	D	SE	SE13151	15S13E13SE
1	100	7088367.500	10649.943	3767	3766	E1414172	1503	1402	17	2	B	NW	NW17151	15S14E17NW
1	100	7030528.000	10606.153	1786	1785	E1413133	1303	1302	13	3	C	SW	SW13131	13S13E13SW
1	100	7272757.500	10787.979	2467	2466	E1414014	1403	1402	01	4	D	SE	SE01141	14S14E01SE
1	100	7003076.000	10585.424	2280	2279	E1414014	1403	1402	01	2	B	NW	NW25141	14S14E25NW
1	100	6973466.500	10563.313	2280	2279	E1413251	1303	1302	25	3	C	SW	SW25131	13S13E25SE
1	100	6865110.000	10480.713	2280	2279	E1414231	1403	1402	23	1	A	NW	NW23141	14S13E23NW
1	100	6918742.000	10521.413	2280	2279	E1414141	1403	1402	14	1	A	NW	NW14141	14S13E14NW
1	100	6938237.500	10536.413	2280	2279	E1414061	1403	1402	06	1	A	NE	NE06141	14S14E06NE
1	100	7054169.000	10624.013	2280	2279	E1414241	1403	1402	24	1	A	NW	NW24141	14S14E24NW
2	100	6973190.000	10566.013	2280	2279	E1414211	1403	1402	21	1	A	SE	SE12141	14S14E12SE
1	100	7272757.500	10787.913	2280	2279	E1414011	1403	1402	01	1	A	SE	SE01141	14S14E01SE
1	100	6986425.000	10573.813	2280	2279	E1414071	1403	1402	07	1	A	SE	SE07141	14S15E07SE
1	100	7015977.000	10595.213	2280	2279	E1414181	1403	1402	18	1	A	NE	NE18141	14S14E18NE
1	100	6980750.000	10568.413	2280	2279	E1414091	1403	1402	09	1	A	NE	NE09141	14S14E09NE
1	100	7120363.000	10673.613	2280	2279	E1414021	1403	1402	02	1	A	NE	NE02141	14S14E02NE
1	100	6943473.500	10541.113	2280	2279	E1414151	1403	1402	15	1	A	NE	NE15141	14S13E15NE
1	100	6991528.000	10576.702	2480	2479	E1414063	1403	1402	06	3	C	SW	SW06141	14S14E06SW
1	100	7030528.000	10606.153	1786	1785	E1313133	1303	1302	13	3	C	SW	SW13131	13S13E13SW
1	100	6928613.000	10528.927	2482	2481	E1413013	1403	1302	01	3	C	SW	SW01141	14S13E01SW
1	100	6956143.500	10549.920	2970	2969	E1415204	1403	1502	20	4	D	SE	SE20141	14S15E20SE

Quarter Section Name
Is Appended to
Police Incidents

Step 3 - Count Incidents by Quarter Section

2. Click Here - On Summarize

1. Click Here - On Quarter Section Identifier

3. And Produce a Summary Table of Incident Counts Per Quarter Section

Y	Leewa	Mat status	Mat scoo	Perimeter	Trs4	Trs4_id	Tile_name	Township	Range	Section	Qs	Qs #	Qs dia
424309.000	0	4		10624.558	3328	3327	E1413353	140					
426406.252	0	1		10588.910	3323	3322	E1414314	140					
	0			10635.693	3046		E1415302	140					
	0			10656.725	3662		E1514103	150					
	0			10528.927	2482		E1413013	140					
	0			10570.760	238		E1414062	140					
	0			10609.442			E1414071	140					
	0			10584.581			E1313354	140					
	0			10670.096			E1414091	130					
405077.143	0	1	100	10807			E1313242	130					
							E1413123	140					
							E1314334	140					
							E1414242	140					
							E1413013	140					
							E1313363	140					
							E1313254	140					
							E1313362	140					
							E141312	150					
							E1413	150					
							E131	130					
							E1	140					
435273.062	0	1	100	10588.403	3049	3049	E1414252	140					
463997.540	0	1	100	10563.325	2129	2128	E1313254	130					
437579.608	0	1	100	10480.723	2900	2899	E1413232	140					
444993.656	0	1	100	10521.430	2738	2737	E1413142	140					
456009.062	0	1	100	6938			E1414063	140					
437988.341	0	1	100	7054									
447318.187	0	2	100	6973									
451859.484	0	1	100	7272									
446192.726	0	1	100	6986									
445600.476	0	1	100	7015									
451050.235	0	1	100	6980									
455923.659	0	1	100	7120									
443200.250	0	1	100	6943									
451354.240	0	1	100	6991									
472861.439	0	1	100	7030									
451551.748	0	1	100	6928									
435308.227	0	1	100	6956									

Tile_name	Count
E1413124	241
E1413012	173
E1413134	172
E1313354	150
E1414091	134
E1413123	116
E1314334	110
E1414242	110
E1413013	109
E1313363	104
E1313254	102
E1313362	100
E141312	100
E1413	99
E131	97
E1	92
E1414252	91
E1313254	90
E1413232	88
E1413142	86

Step 4 - Join Incident Counts to Quarter Sections

0 of 6339:selectec

Quarter Sections

Shape	Area	Perimeter	Trs4_id	Tile_name	Count
Polygon	7317605.500	1085...	2	E1114021	241
Polygon	7318865.500	1085...	2	E1114012	173
Polygon	7318865.500	1085...	4	E1114011	172
Polygon	7318865.500	1085...	3	E1114022	150
Polygon	7318865.500	1085...	5	E1114031	134
Polygon	7318865.500	1085...	6	E1114032	116
Polygon	7318865.500	1085...		E1114041	110
Polygon	7318865.500	1085...		E1114042	110
Polygon	7318865.500	1085...		E1114051	110
Polygon	7318865.500	1085...		E1114052	109
Polygon	7318865.500	1085...		E1114061	
Polygon	7318865.500	1085...		E1114062	
Polygon	7318865.500	1085...		E1113011	
Polygon	7318865.500	1085...		E1113012	
Polygon	7318865.500	1085...		E1113021	
Polygon	7318865.500	1085...		E1113022	
Polygon	71966...	10753.685	16	E1112031	80
Polygon	71379...	10753.685	16	E1112032	79
Polygon	71138...	10758.812	17	E1112041	78
Polygon	71378...	10758.812	17	E1112042	77
Polygon	71591...	10466.882	30	E1112051	75
Polygon	71947...	10485.075	31	E1112052	74
Polygon	69256...	10481.603	32	E1112061	74
Polygon	67284...	10484.476	33	E1112062	74
Polygon	67821...	10492.831	34	E1112051	74
Polygon	67919...	10507.908	35	E1112052	74
Polygon	68431...	10654.435	36	E1112061	73
Polygon	68362...	10780.300	37	E1112061	72
Polygon	6846123.000	10466.882	30	E1112031	71
Polygon	6870171.000	10485.075	31	E1112032	
Polygon	6865770.000	10481.603	32	E1112041	
Polygon	6869617.000	10484.476	33	E1112042	
Polygon	6880896.000	10492.831	34	E1112051	
Polygon	6900830.000	10507.908	35	E1112052	
Polygon	7092572.500	10654.435	36	E1112061	
Polygon	7197753.000	10780.300	37	E1112061	

qscrm.dbf

Tile_name	Count
E141324	241
E141324	173
E141324	172
E131324	150
E141324	134
E141324	116
E131324	110
E141324	110
E141324	109
E131331	80
E1314311	79
E1313244	78
E1314283	77
E1513123	75
E1514074	74
E1414231	74
E1414221	74
E1414044	74
E1414222	73
E1413241	72
E1413232	71

3. And Finally, Click Here To Join Tables

2. Click Here On Original Quarter Section Field

1. Click Here On Summary Table Quarter Section Field

Step 5 - Result: Counts Appended to Q. Sections

ArcView GIS Version 3.1

File Edit Table Field Window Help

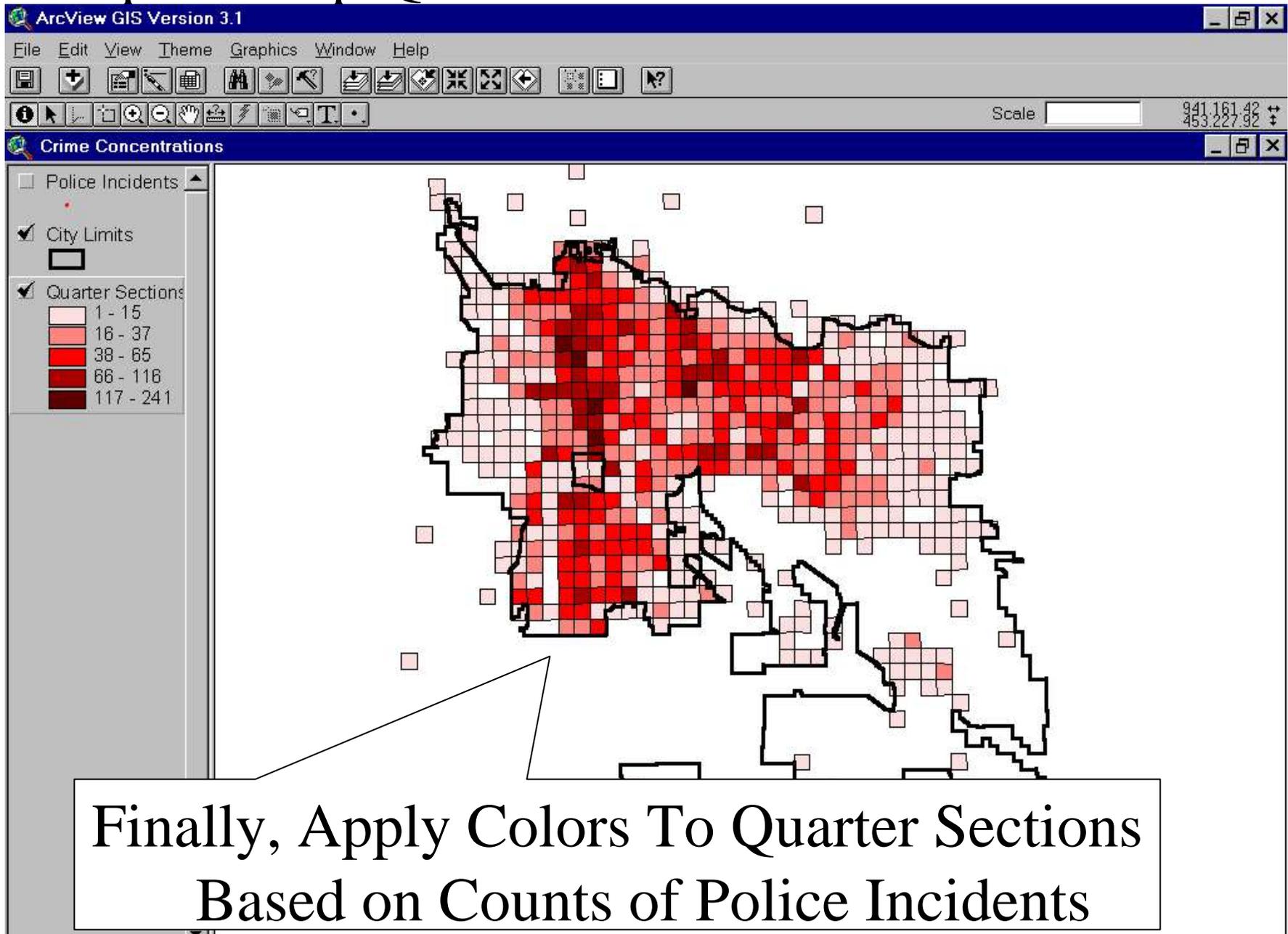
0 of 6339:selectec

Quarter Sections

Area	Perimeter	Trsq	Trsq_id	Tile name	Township	Range	Section	Qs	Qs Id	Qs dx	Mapid	Trsq	Count
6981577.000	10569.236	3136	3135	E1414253	1403	1402	25	3	C	SW	SW25141	14S14E25SW	1
7042465.000	10615.316	3132	3131	E1414254	1403	1402	25	4	D	SE	SE25141	14S14E25SE	
7064174.500	10632.204	3056	3055	E1414261	1403	1402	26	1	A	NE	NE26141	14S14E26NE	
7094606.500	10655.350	3057	3056	E1414262	1403	1402	26	2	B	NW	NW26141	14S14E26NW	
7062760.500	10630.955	3142	3141	E1414263	1403	1402	26	3	C	SW	SW26141	14S14E26SW	
7032328.000	10607.807	3139	3138	E1414264	1403	1402	26	4	D	SE	SE26141	14S14E26SE	
6949679.000	10546.568	3058	3057	E1414271	1403	1402	27	1	A	NE	NE27141	14S14E27NE	
6937252.500	10537.309	3059	3058	E1414272	1403	1402	27	2	B	NW	NW27141	14S14E27NW	12
6923768.000	10527.379	3145	3144	E1414273	1403	1402	27	3	C	SW	SW27141	14S14E27SW	
6936159.000	10536.613	3144	3143	E1414274	1403	1402	27	4	D	SE	SE27141	14S14E27SE	
7067707.000	10634.426	3060	3059	E1414281	1403	1402	28	1	A	NE	NE28141	14S14E28NE	
7058598.500	10627.405	3062	3061	E1414282	1403	1402	28	2	B	NW	NW28141	14S14E28NW	8
7099514.000	10658.395	3148	3147	E1414283	1403	1402	28	3	C	SW	SW28141	14S14E28SW	1
7109165.500	10665.823	3146	3145	E1414284	1403	1402	28	4	D	SE	SE28141	14S14E28SE	
6943236.000	10540.057	3063	3062	E1414291	1403	1402	29	1	A	NE	NE29141	14S14E29NE	34
6944020.500	10540.646	3064	3063	E1414292	1403	1402	29	2	B	NW	NW29141	14S14E29NW	60
6949155.500	10											14S14E29SW	25
6948456.500	10											14S14E29SE	5
6974677.000	10											14S14E30NE	4
6993211.000	10											14S14E30NW	10
6988911.500	10											14S14E30SW	61
6970255.500	10											14S14E30SE	2
7004052.500	10											14S14E31NE	34
6987428.500	10											14S14E31NW	26
6990812.500	10											14S14E31SW	38
7007479.000	10											14S14E31SE	58
7043459.500	10											14S14E32NE	23
7017908.500	10											14S14E32NW	
7018699.000	10											14S14E32SW	43
7044120.500	10616.839	3321	3320	E1414324	1403	1402	32	4	D	SE	SE32141	14S14E32SE	10
7256256.500	10775.264	3230	3229	E1414331	1403	1402	33	1	A	NE	NE33141	14S14E33NE	1
7214958.000	10744.342	3234	3233	E1414332	1403	1402	33	2	B	NW	NW33141	14S14E33NW	3
7157343.500	10701.602	3320	3319	E1414333	1403	1402	33	3	C	SW	SW33141	14S14E33SW	4
7198305.000	10732.273	3317	3316	E1414334	1403	1402	33	4	D	SE	SE33141	14S14E33SE	2
7120624.000	10676.028	3232	3231	E1414341	1403	1402	34	1	A	NE	NE34141	14S14E34NE	
7116623.500	10672.449	3231	3230	E1414342	1403	1402	34	2	B	NW	NW34141	14S14E34NW	

Incident Counts Are Appended to Quarter Sections

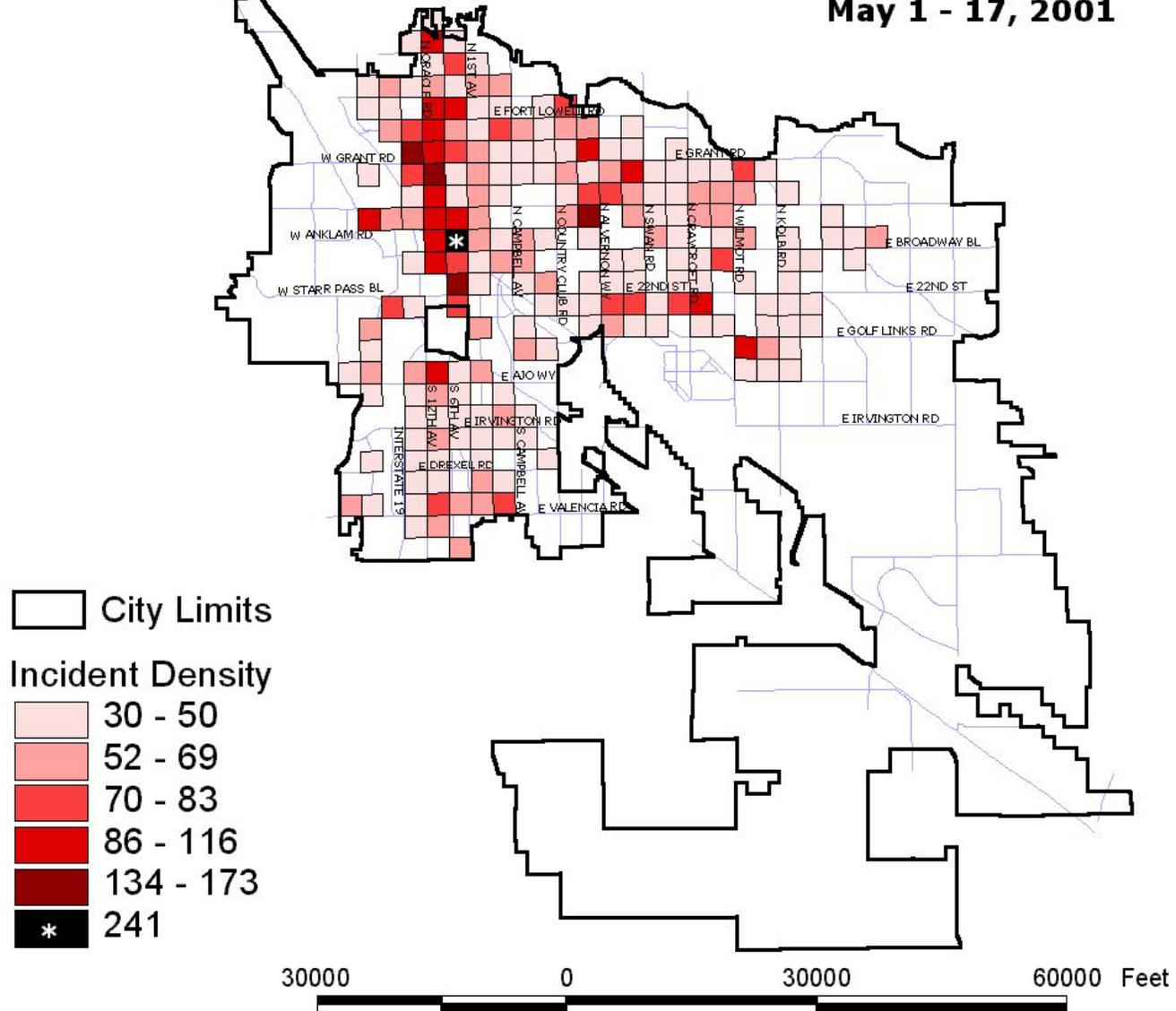
Step 6 - Map Q. Sections with Graduated Colors



Finish Map for Screen or Print

- Adjust Class Breaks for Color Gradients
- Delete Lowest Class to Accent Concentrations
- Put Map on Layout and Add Titles, Labels, Scale & Legend

City of Tucson, Arizona Areas of High Density Police Activity May 1 - 17, 2001



Example 2

Make a Neighborhood Association Map

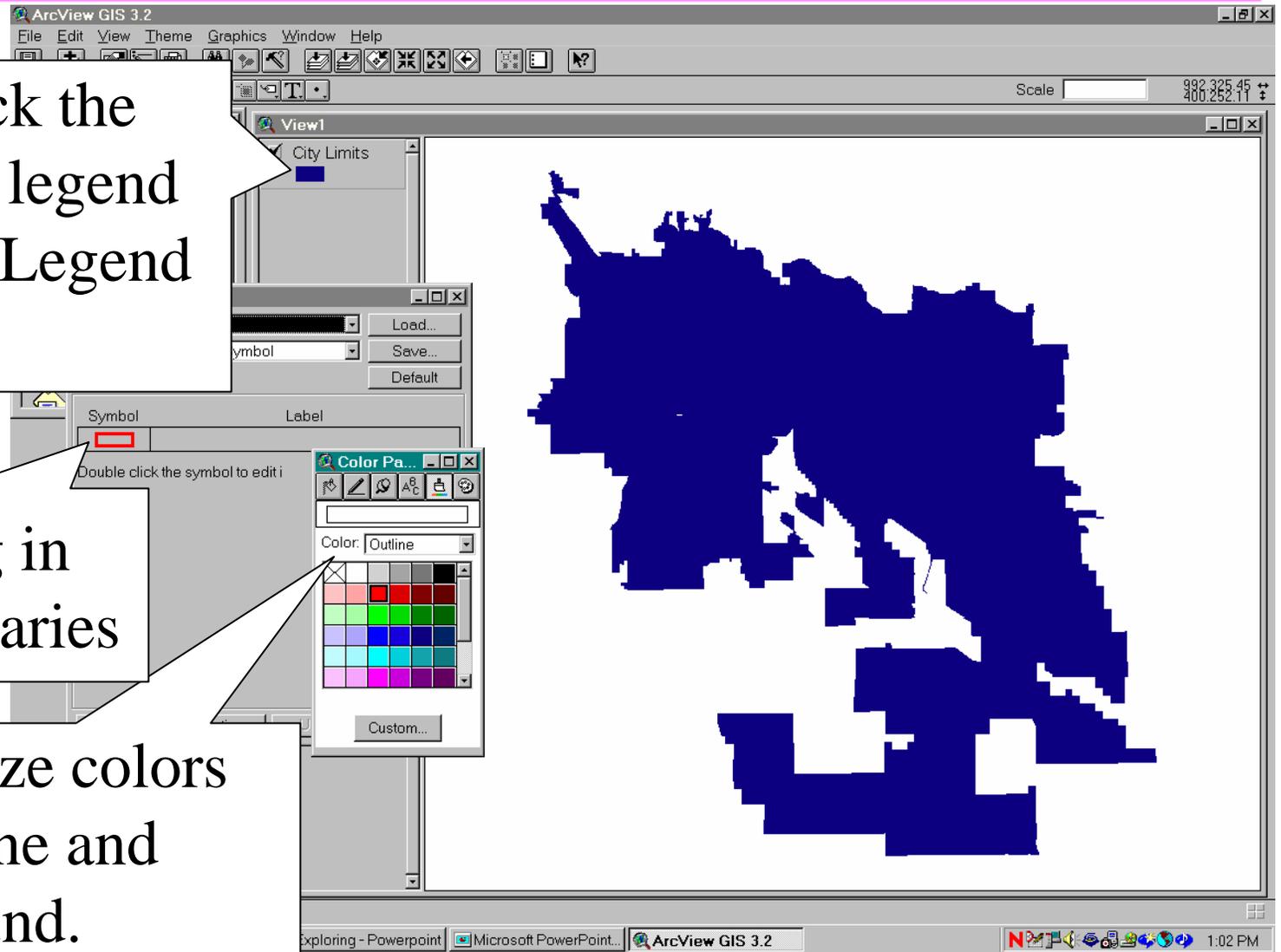
- Map Layers from local resource:
 - Registered Neighborhood Associations
 - Ward Boundaries
 - City Boundary
 - Major Streets
- Uses for Map:
 - Website, Print, and Display
 - Neighborhood Contact Notifications

Add City Limit Theme to View

Double Click the City Limits legend to open the Legend Editor.

Resulting in Red Boundaries

Customize colors for outline and foreground.



Add Neighborhood Theme

Open the Legend Editor and choose “Unique Value” under legend type

The screenshot shows the ArcView GIS 3.2 interface. A map of neighborhood associations is displayed, with various colored polygons representing different neighborhoods. The Legend Editor dialog box is open, showing the following settings:

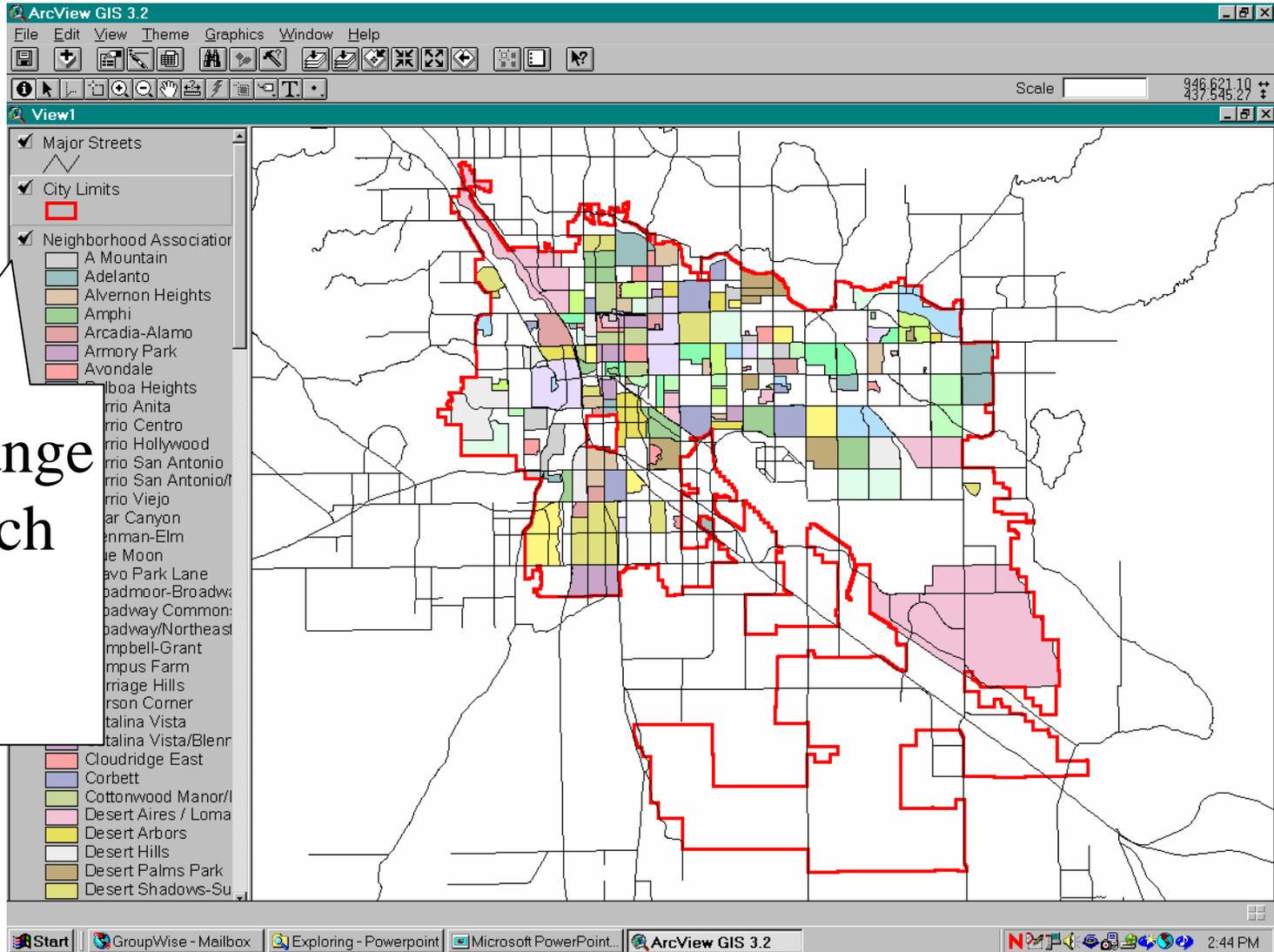
- Theme: Neighborhood Associations
- Legend Type: Unique Value
- Values Field: No_Name
- Color Schemes: Pastels

Symbol	Value	Label	Count
[Light Blue]	A Mountain 69	A Mountain 69	
[Light Green]	Adelanto 1	Adelanto 1	
[Light Yellow]	Alvernon Heights	Alvernon Heights	
[Light Purple]	Amphi 95	Amphi 95	
[Light Red]	Arcadia-Alamo 6	Arcadia-Alamo 6	
[Light Orange]	Armory Park 3	Armory Park 3	
[Light Pink]	Avondale 119	Avondale 119	

Buttons at the bottom of the dialog include: Advanced..., Statistics..., Undo, and Apply.

Choose a values field, and color scheme, then apply.

Add Major Streets Theme



You can change order in which layers are displayed.

Add Neighborhood Labels

The screenshot displays the ArcView GIS 3.2 interface. The main window shows a map with neighborhood boundaries outlined in red and various colored areas representing different neighborhoods. A dialog box titled "Auto-label: Neighborhood Associ..." is open, showing the "Label field" set to "Cot_map_no". The dialog includes options for "Use Theme's Text Label Placement Property", "Find Best Label Placement", "Allow Overlapping Labels", "Remove Duplicates", "Line Label Position Options" (Above, Below, On), and "Scale Labels". The "OK" and "Cancel" buttons are visible at the bottom of the dialog.

View1

- ✓ Std. maj.shp
- ✓ City Limits
- ✓ Neighborhood Association
- A Mountain 89

Auto-label: Neighborhood Associ...

Label field: Cot_map_no

Use Theme's Text Label Placement Property

Find Best Label Placement

Allow Overlapping Labels

Remove Duplicates

Line Label Position Options

Above Below On

Scale Labels

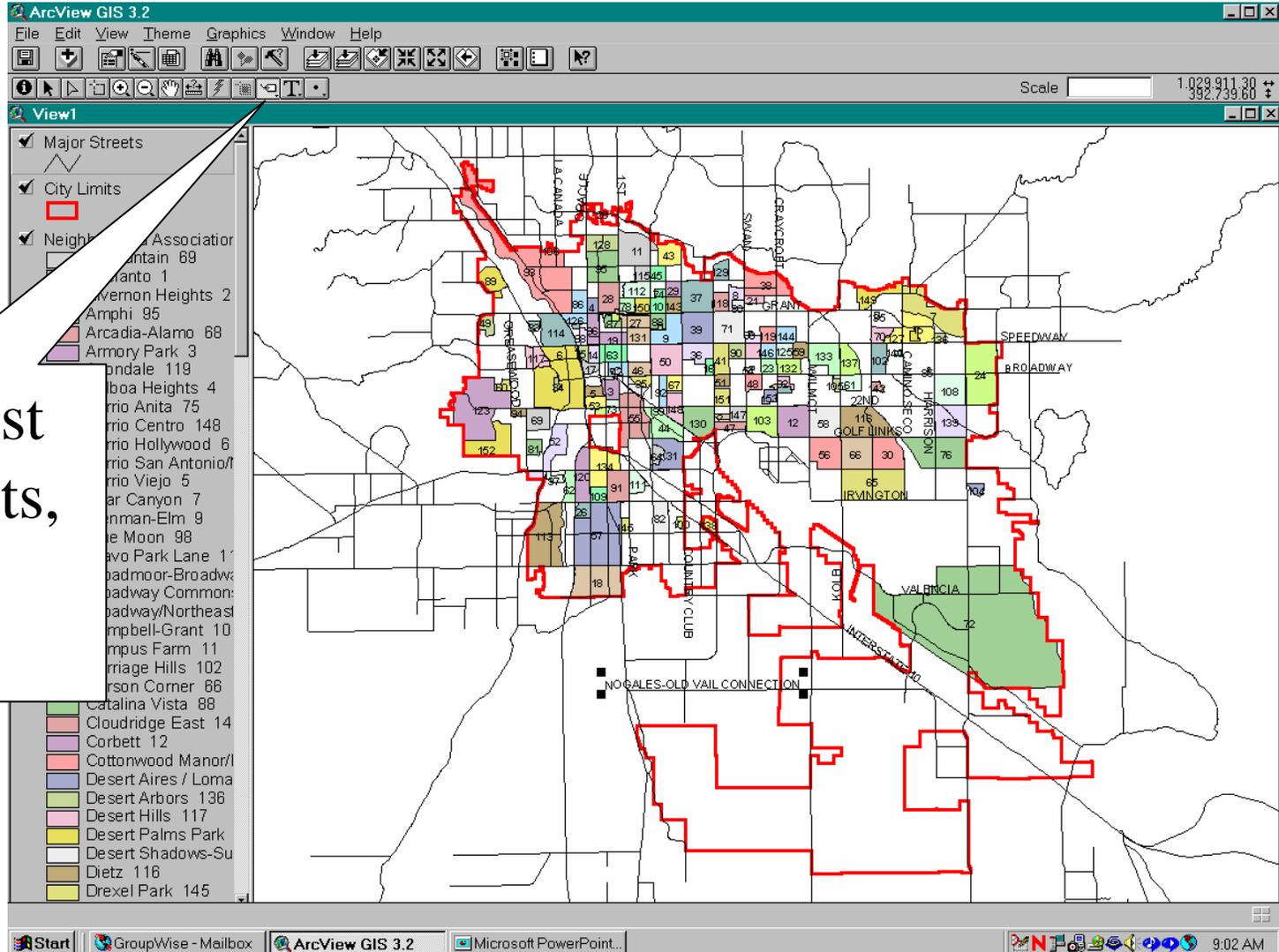
Label Only Features in View Extent

OK Cancel

Choose the field to use for autolabels and apply.

Add Street Labels

To label just a few streets, choose the label tool.



Create a Layout and Add Map Features

The screenshot displays the ArcView GIS 3.2 interface with a map layout titled "Layout1". The map shows "City of Tucson Registered Neighborhood Associations" with various colored areas and street names like "LA CARRON", "SPEEDWAY", and "VALENCIA". A legend on the right lists neighborhood names and their corresponding colors. A scale bar at the bottom right indicates 0, 1, and 2 miles. A north arrow is located in the bottom left of the map area. The software's menu bar (File, Edit, Layout, Graphics, Window, Help) and toolbar are visible at the top. A "demo.apr" project window is open on the left, showing a "Views" pane with a "View1" button.

8.79 in

City of Tucson
Registered Neighborhood Associations

LEGEND

0 1 2 Miles

Creates a scale bar frame on the display

Start ArcView GIS 3.2 Window

File Edit Layout Graphics Window Help

demo.apr

New Open Print

Views

View1

Layout1

8.79 in

0 1 2 Miles

Creates a scale bar frame on the display

Start ArcView GIS 3.2 Window

File Edit Layout Graphics Window Help

demo.apr

New Open Print

Views

View1

Layout1

8.79 in

0 1 2 Miles

Creates a scale bar frame on the display

Start ArcView GIS 3.2 Window

Add a title,

Add the map view
and a neatline
to frame the map.

a north arrow,

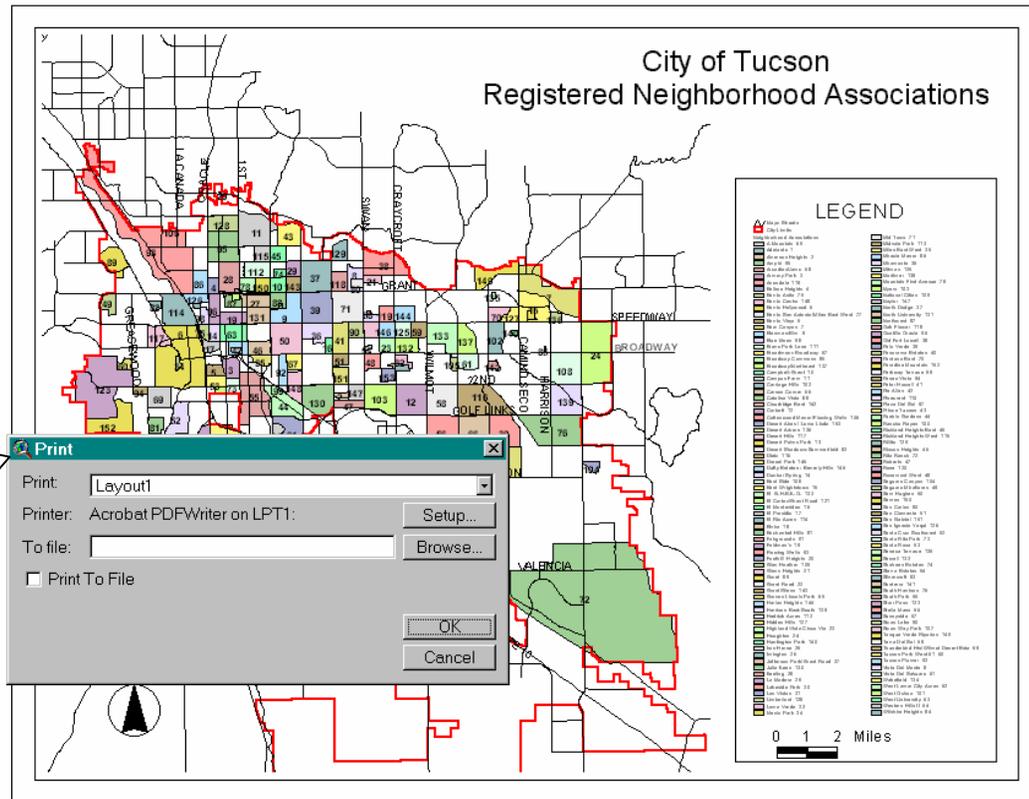
a legend,

and a scale.

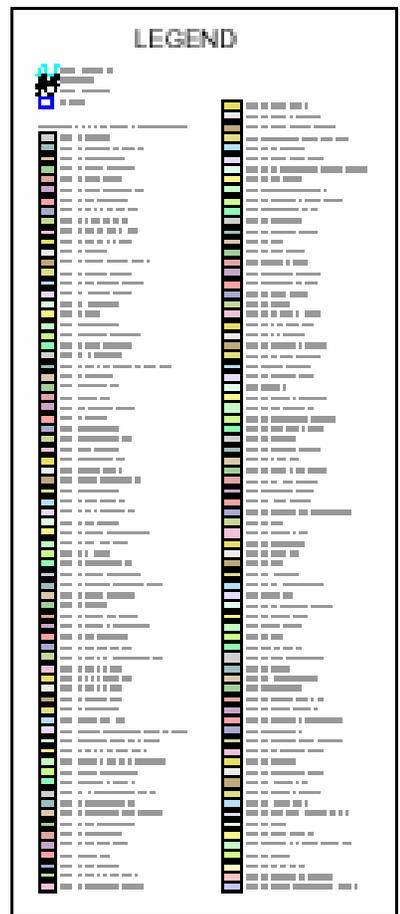
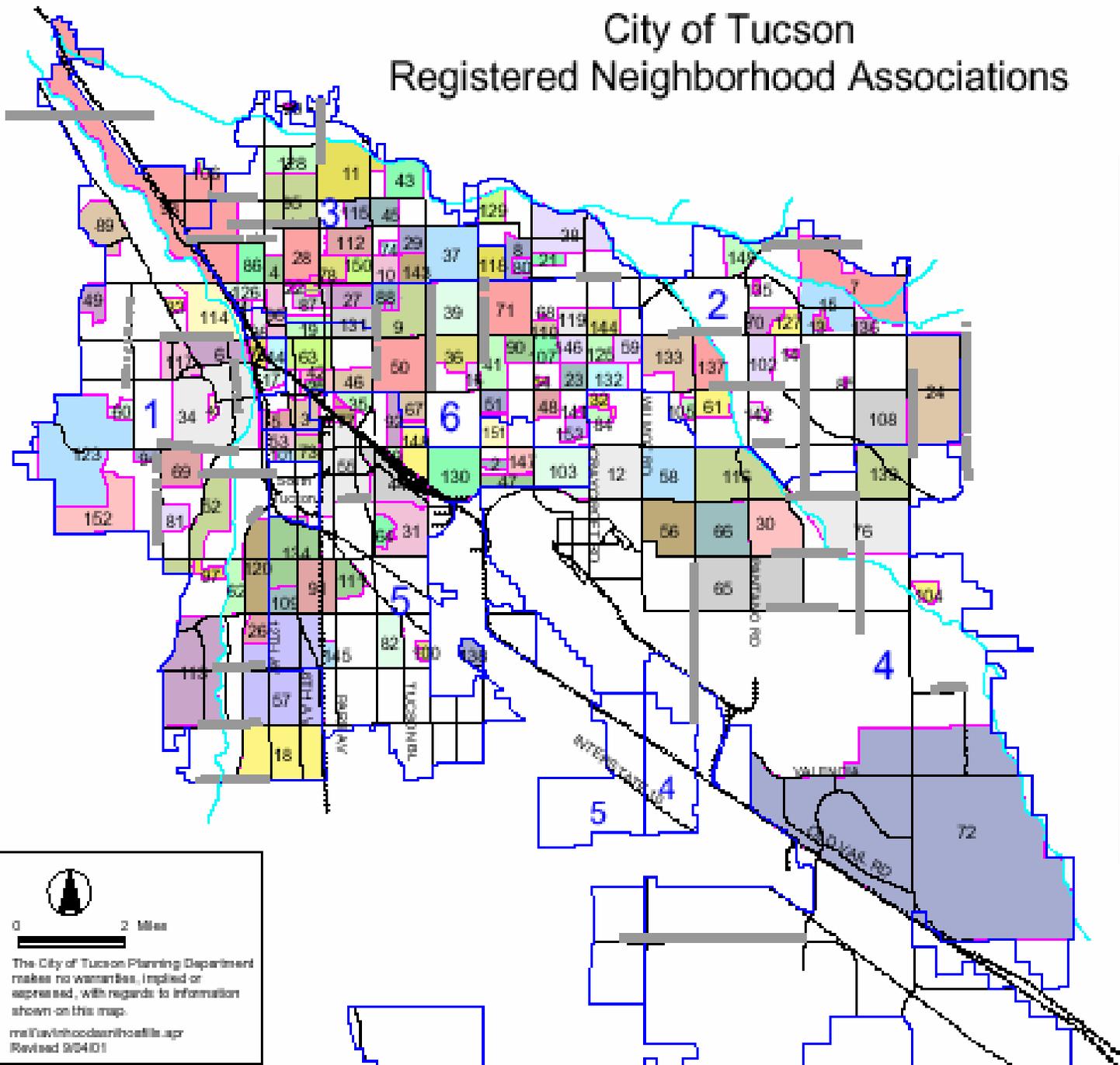
Print or Export Map



Prepare to print your map, or export it to a graphics or PDF file for web use.



City of Tucson Registered Neighborhood Associations




 0 2 Miles
 The City of Tucson Planning Department makes no warranties, implied or expressed, with regards to information shown on this map.
planning@cityoftucson.gov
 Revised 9/24/01



Map Production

- Good Map Design
- Careful Color Representation
- Pleasing Graphic Layout and Use of Fonts
- Good Understanding of Output Device or File Format

GIS Does The Following

- Organizes geographic data into layers.
- Links spatial data with tabular attribute data.
- Provides a common georeferencing system.
- Performs spatial analysis.
- Provides for display of geographic information.

GIS Concepts Course

To Better Understand
Geographic Information Systems,
Their Use in Making Maps
and Their Capabilities for Spatial Analysis

Tucson and Pima County, Arizona

Updated July 2004