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# The Use of Regional Geographic Information Systems by the Maricopa Association of Governments

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## Presentation to the MAG Telecommunications Advisory Group

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# Outline

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- Why do GIS at MAG
- Primary Data Collection
  - In conjunction with Census Bureau
  - In conjunction with Member Agencies
- Using GIS for Population Projections
- Using GIS for Analysis
- Using GIS for Strategic Planning
- Interactive Mapping on the MAG Web Site

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# What is Currently Being Done - and Why?

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# Metropolitan Planning Organization and Air Quality Planning Agency for the Region

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    graph TD
      LU((Land Use)) -- Trips --> T((Transportation))
      T -- Congestion --> AQ((Air Quality))
      AQ -- Emissions --> T
      AQ -- Health --> H((Health))
  
```

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# Executive Order 95-2

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- Requires official socioeconomic estimates and projections
- DES prepares state and county estimates and projections with input from the state Councils of Governments (COGs)
- COGs may prepare subcounty estimates and projections for their respective counties

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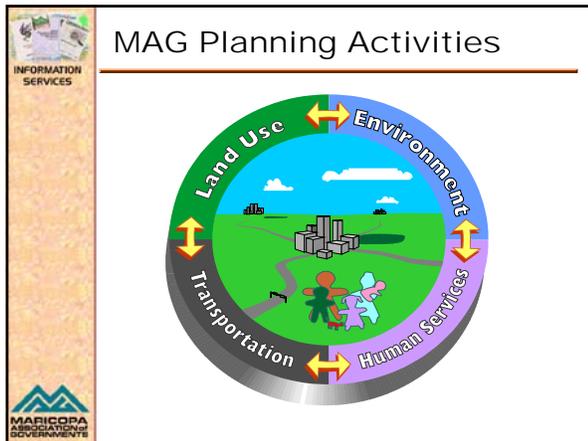
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# The MAG area has been growing dramatically

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Year	MAG Area (Millions)	Arizona (Millions)
1910	0.0	0.0
1920	0.0	0.1
1930	0.0	0.2
1940	0.0	0.3
1950	0.1	0.5
1960	0.2	0.8
1970	0.3	1.2
1980	0.4	1.8
1990	0.5	2.8
2000	3.1	5.1

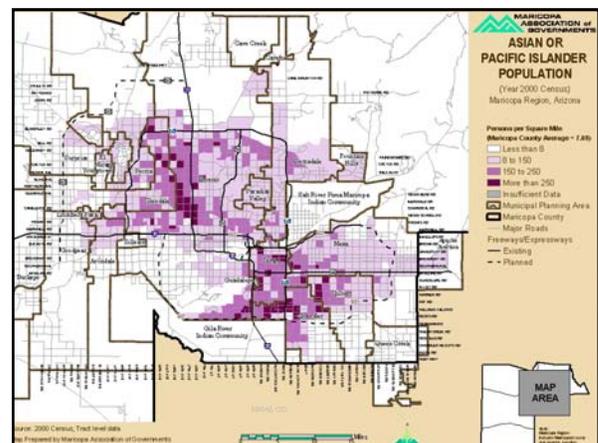
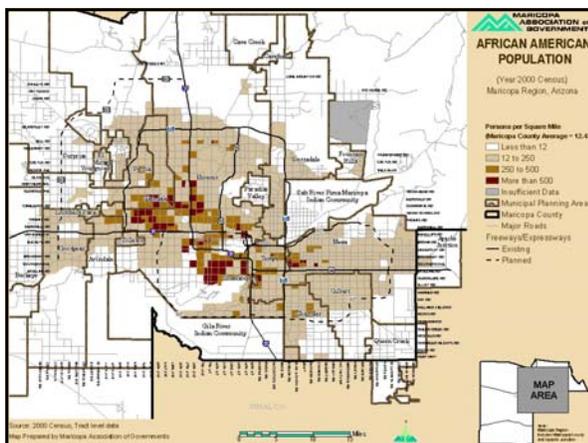
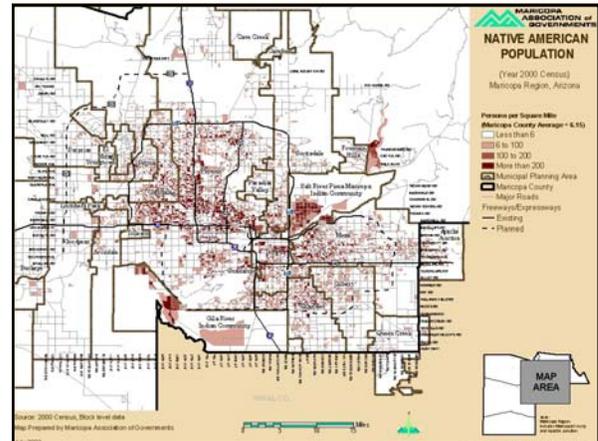
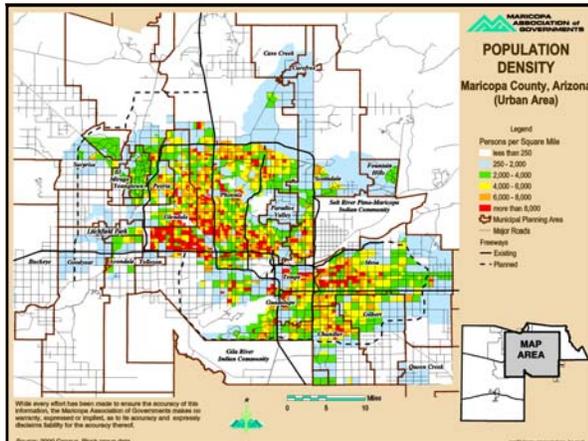
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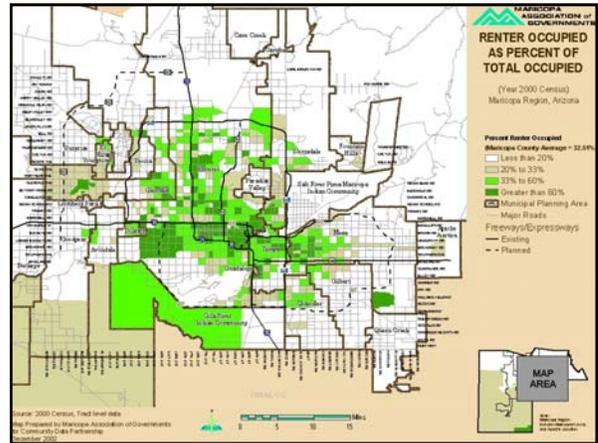
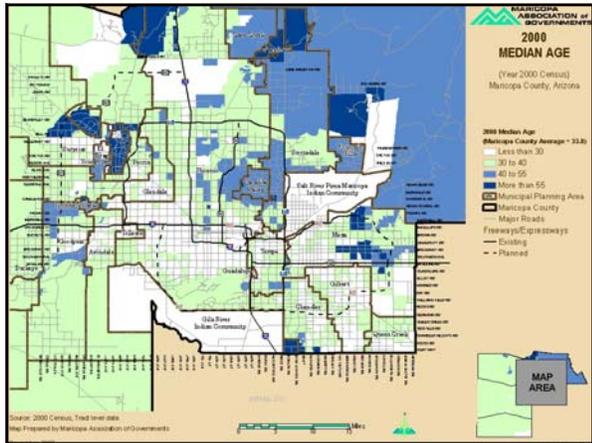
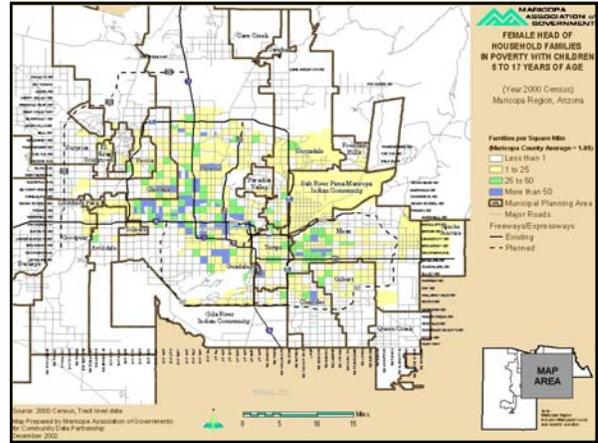
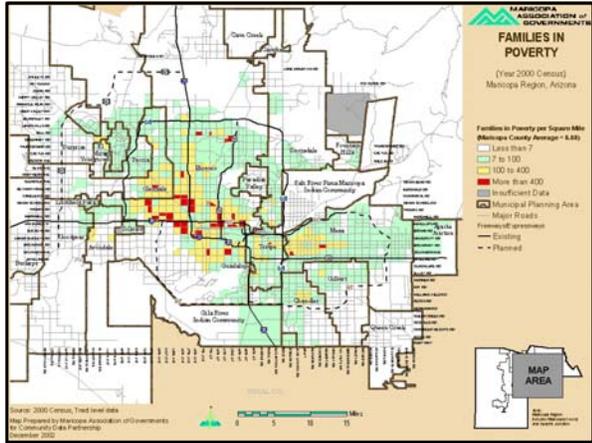
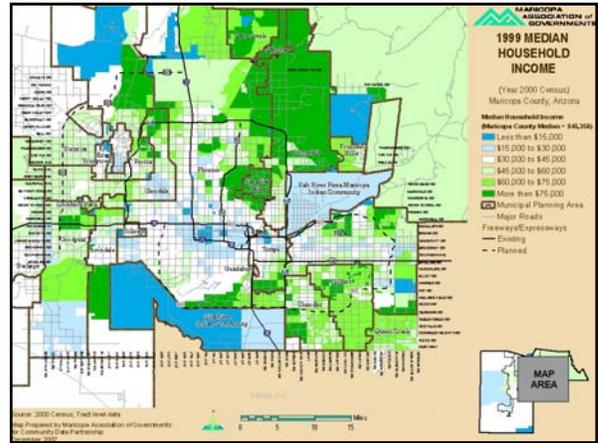
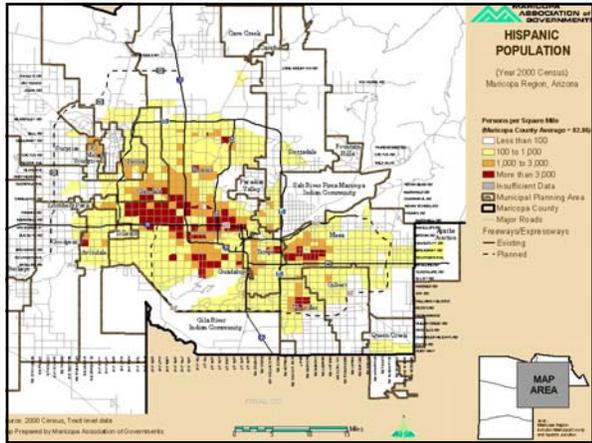


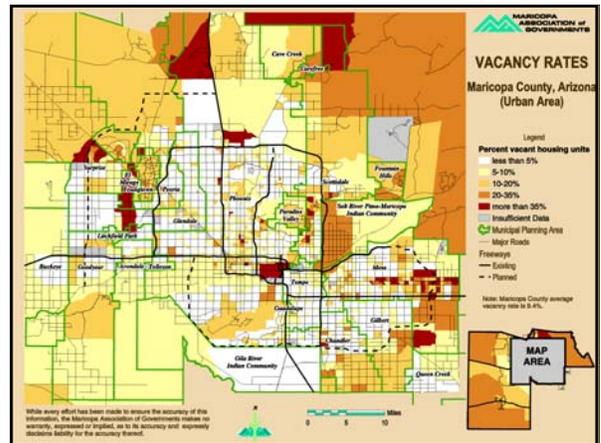
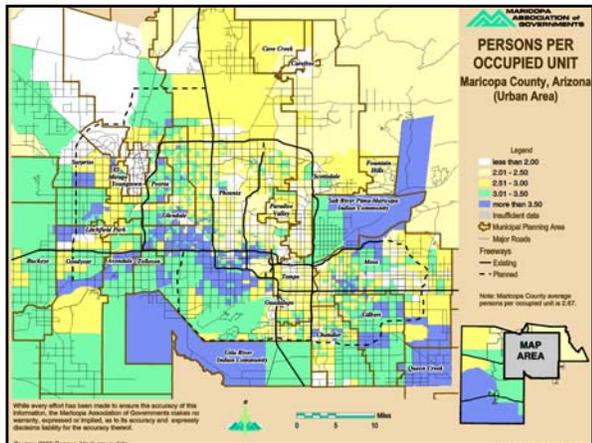
### Data Collection Activities in Conjunction with the Census Bureau

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## Primary Data Collection Activities in Conjunction with MAG Member Agencies

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## Acquire Aerial Photography

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## Define the Regional Area

MAG 2003 GEOGRAPHICAL BOUNDARIES

- MPA - Municipal Planning Areas
- TAZ - Traffic Analysis Zones
- RAZ - Regional Analysis Zones

Updated April, 2002

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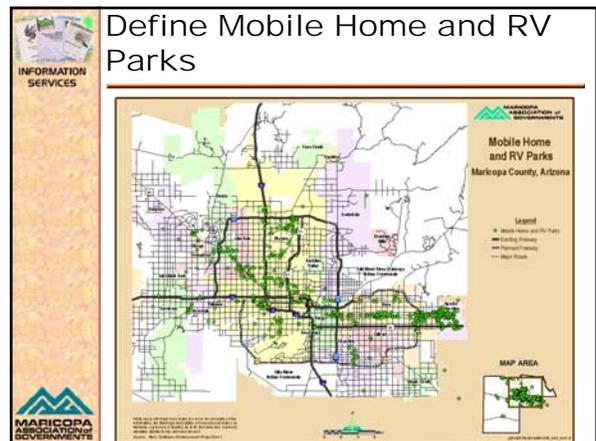
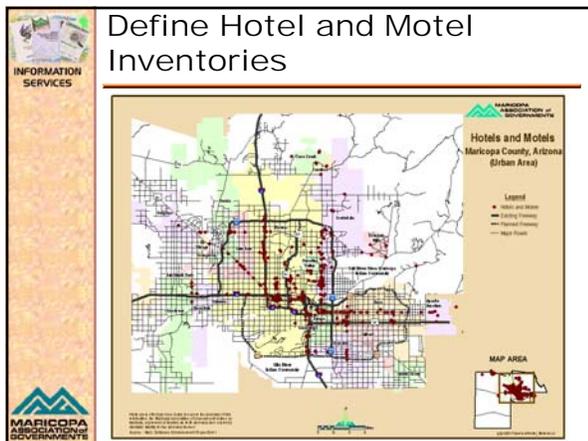
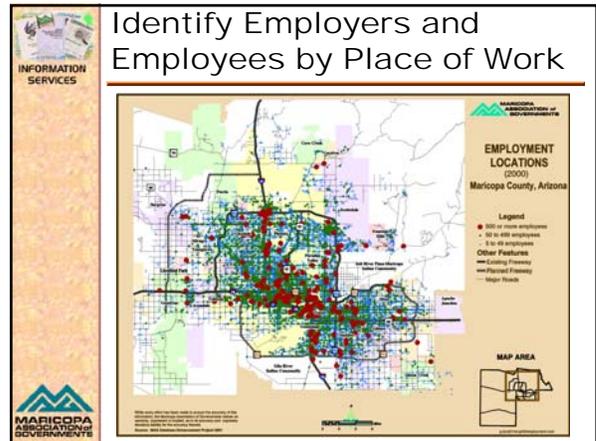
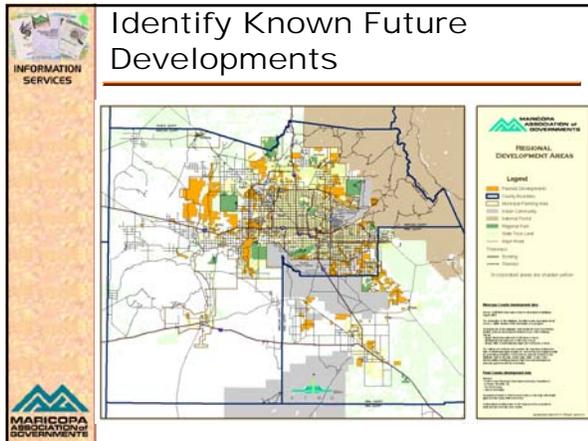
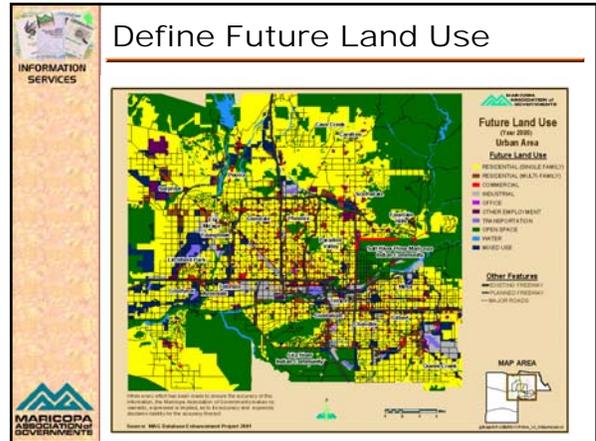
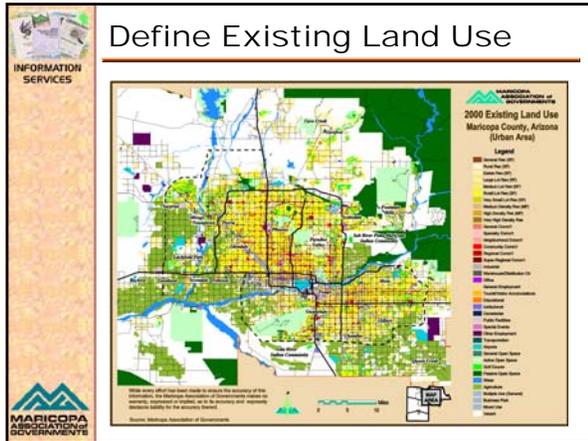
## Maintain MAGNet Street Centerline File

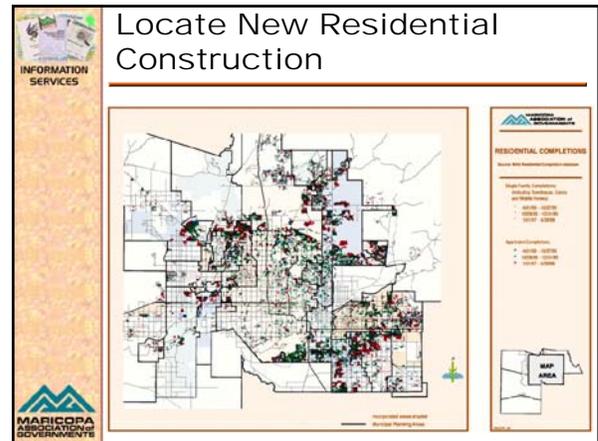
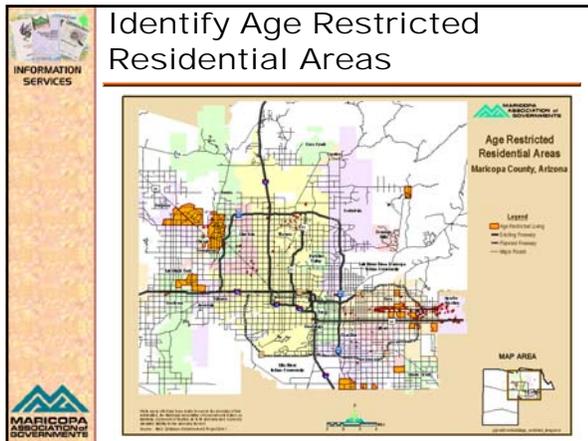
MAGNET STREET FILE

- Proposed
- Major Road
- Neighborhood Street
- Other Street

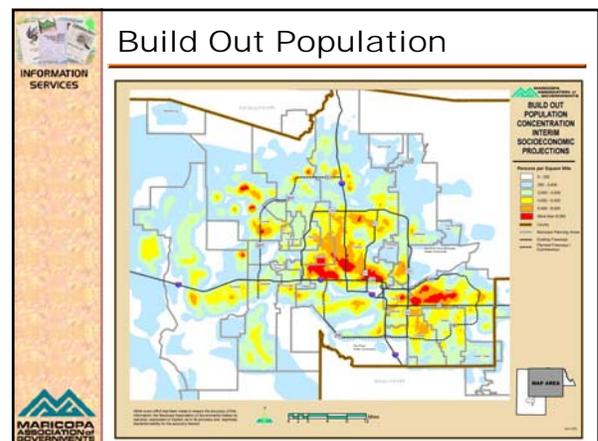
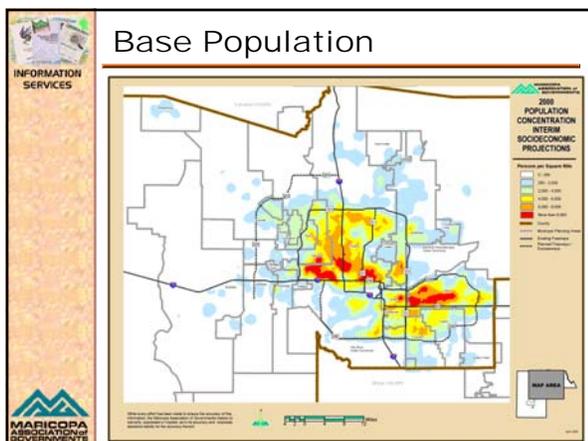
MAP AREA

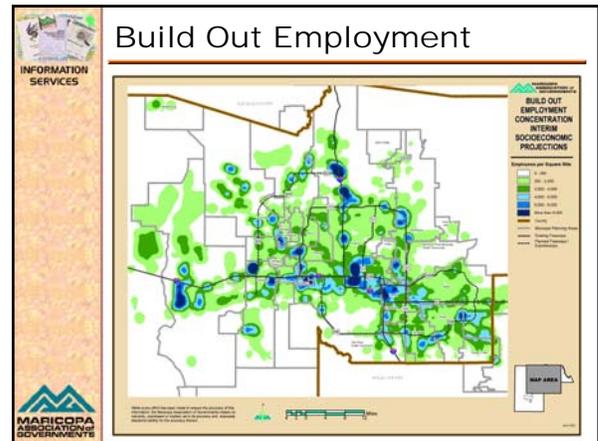
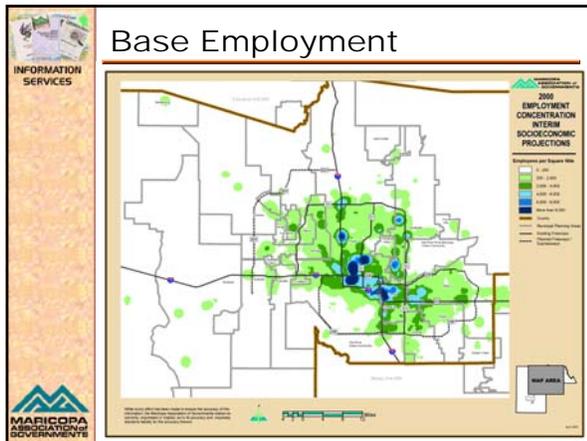
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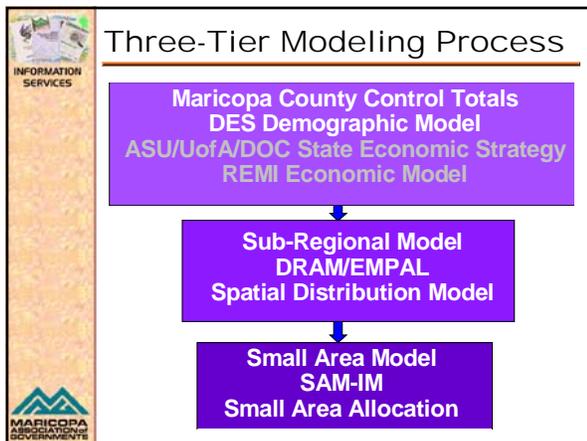
- ### MAG Member Agency Involvement
- Review of all data and GIS coverages on an ongoing basis
  - Review of Census data
  - Review of all surveys
  - Agency input on target densities, mixed use categories, persons per household and occupancy rates over time, etc.
  - POPTAC approval of all assumptions and their related methodologies





## Socioeconomic Projections Modeling

- ### MAG Geography (2003)
- In Maricopa County MPAs:
    - Municipal Planning Area (MPA) 27
    - Regional Analysis Zone (RAZ) 147
    - Traffic Analysis Zone (TAZ) 1868
  - In Pinal County MPAs:
    - MPAs 7
    - RAZs 22
    - TAZs 133
- 



- ### Subarea Allocation Model – Information Manager (SAM-IM)
- DRAM/EMPAL RAZ population and employment used as control totals
  - Uses Geographic Information System (GIS) and coverages of land uses
  - Each land use dealt with separately and in any order
  - Different factors influence growth of each land use
  - GIS coverages updated each time period

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### All Calculations for SAM-IM are at the 1-acre Grid Level

The diagram illustrates the integration of various planning factors into a 1-acre grid. It shows 'Highway' (red dots on a grid), 'Site Suitability' (green grid), and 'General Plan' (text) being processed to create a '1-Acre Grid'. This grid is then used to calculate 'Land Use Capacity' (yellow grid).

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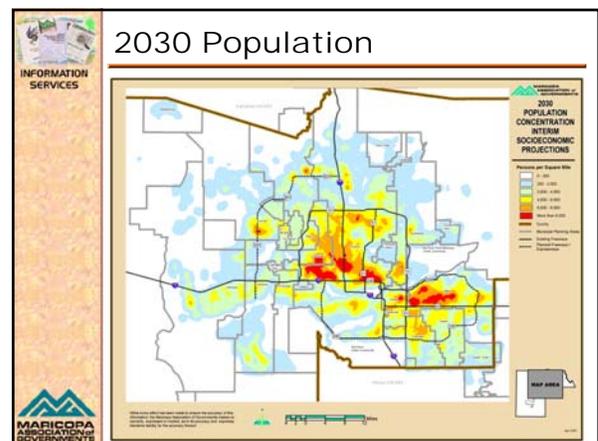
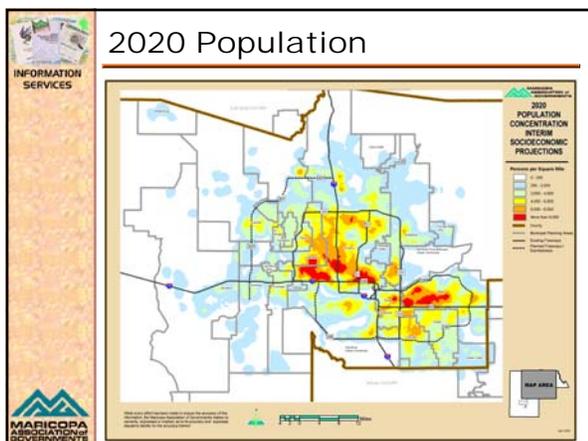
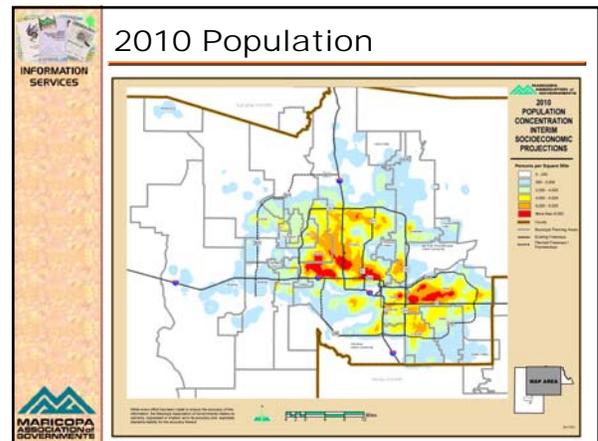
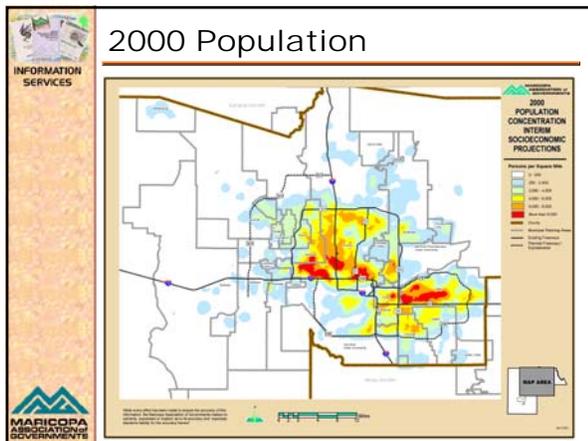
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### The 1-acre Grids Can be Summed to Any Geography

This diagram shows how individual 1-acre grids are summed to create a 'TAZ Boundary' (colored grid). Below this, a 'TAZ Table' is shown, which is a spreadsheet summarizing the data for each TAZ.

Analysis By Group										PROJECT
TAZ	2000	2010	2020	2030	2040	2050	2060	2070	2080	2090
1	100	100	100	100	100	100	100	100	100	100
2	200	200	200	200	200	200	200	200	200	200
3	300	300	300	300	300	300	300	300	300	300
4	400	400	400	400	400	400	400	400	400	400
5	500	500	500	500	500	500	500	500	500	500
6	600	600	600	600	600	600	600	600	600	600
7	700	700	700	700	700	700	700	700	700	700
8	800	800	800	800	800	800	800	800	800	800
9	900	900	900	900	900	900	900	900	900	900
10	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

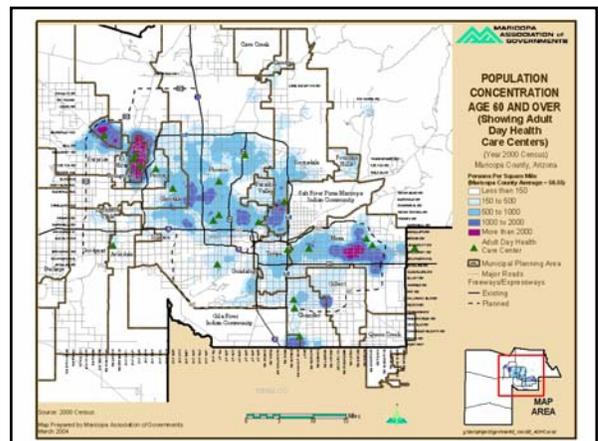
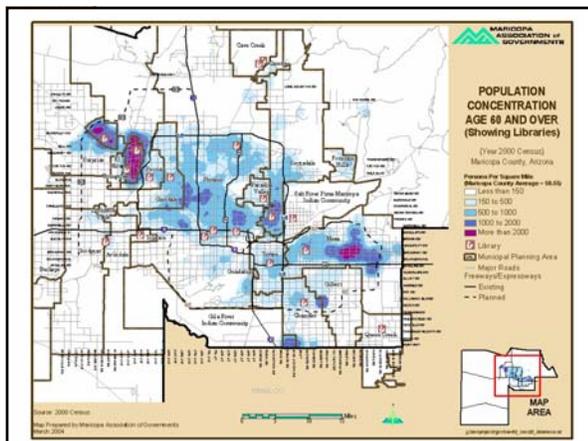
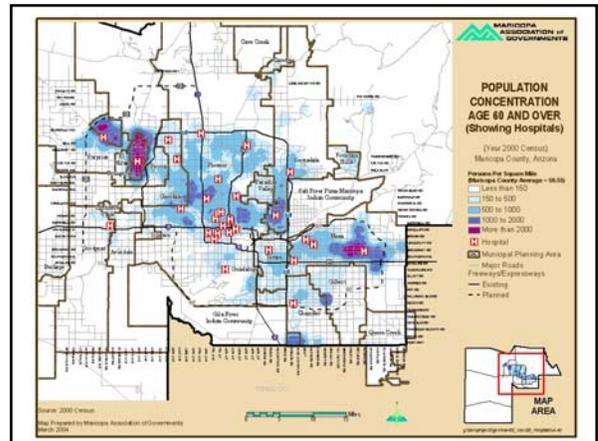
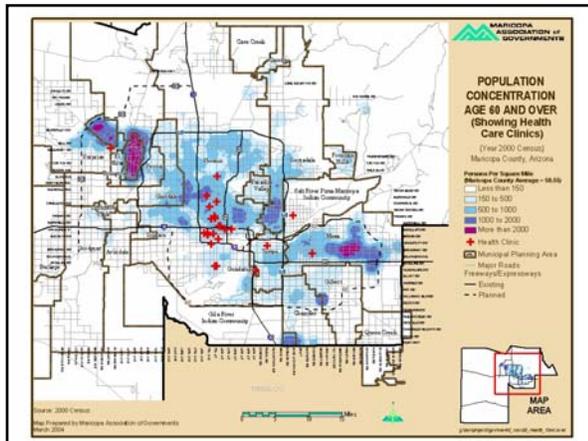
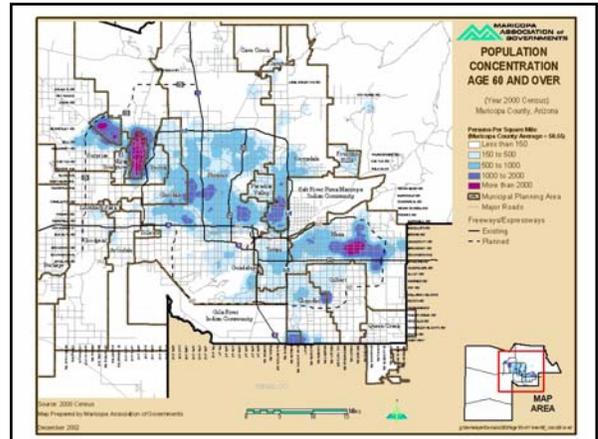
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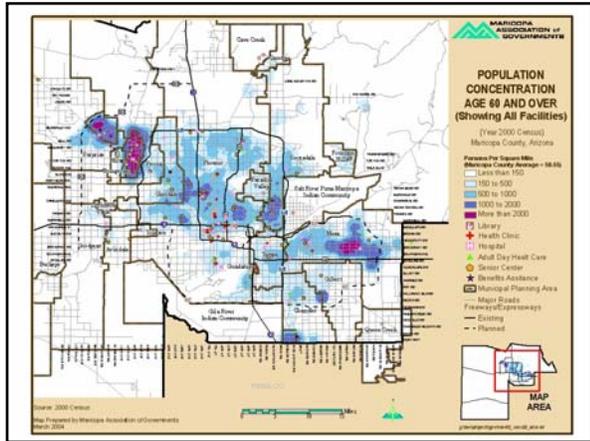
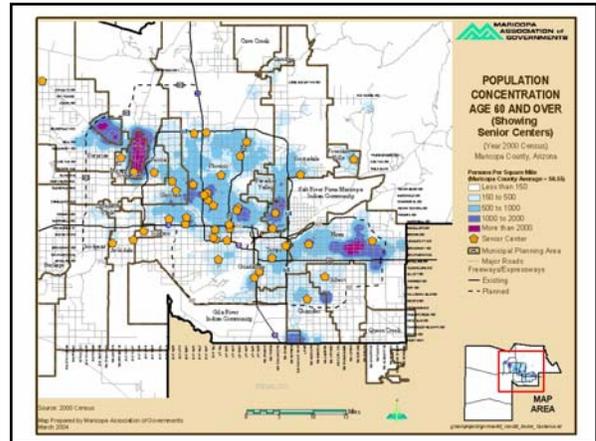
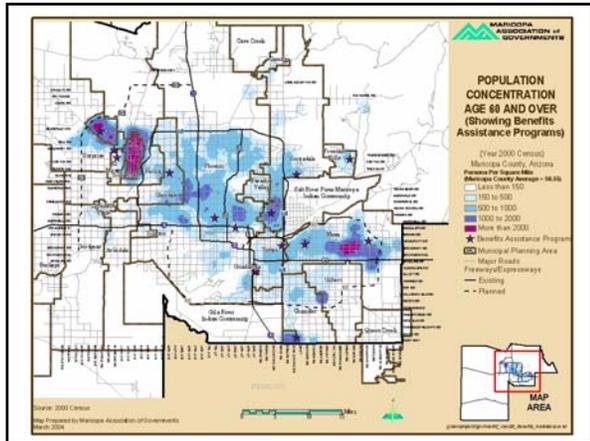


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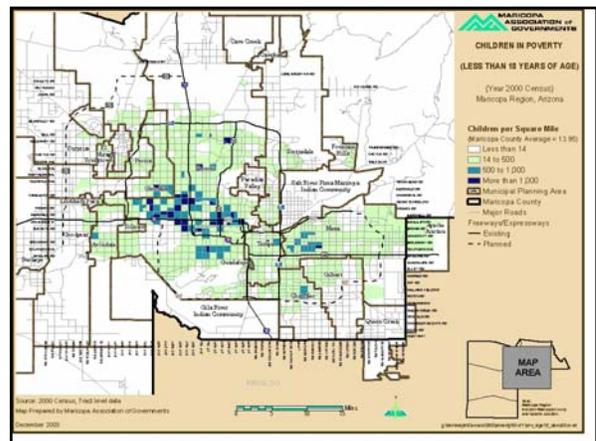
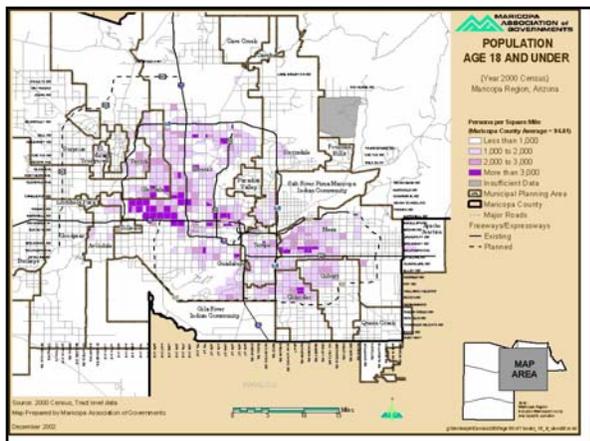
# Using GIS for Analysis

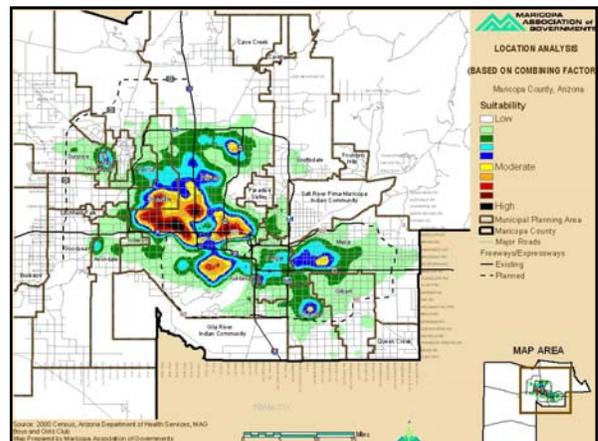
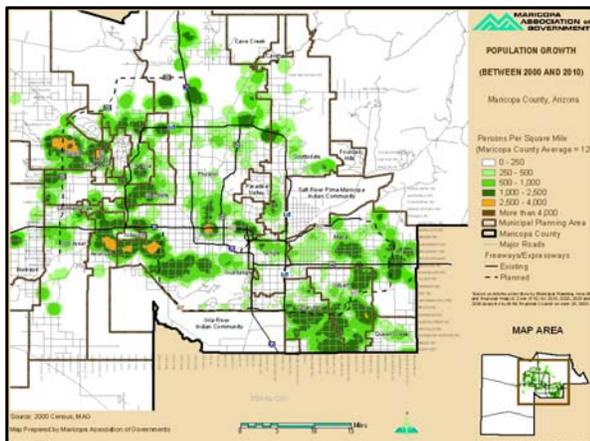
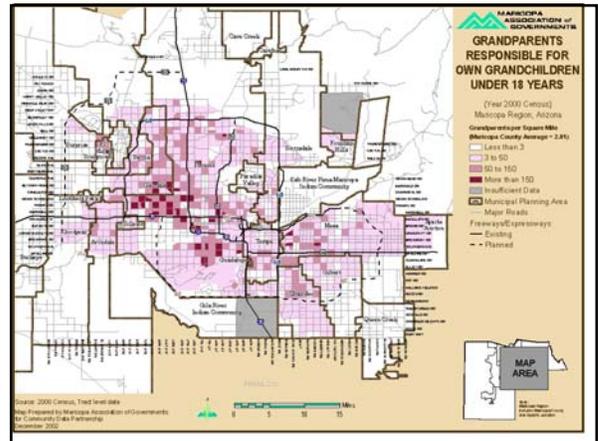
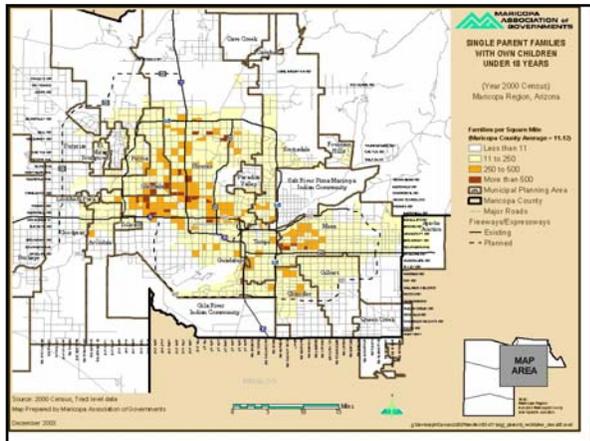
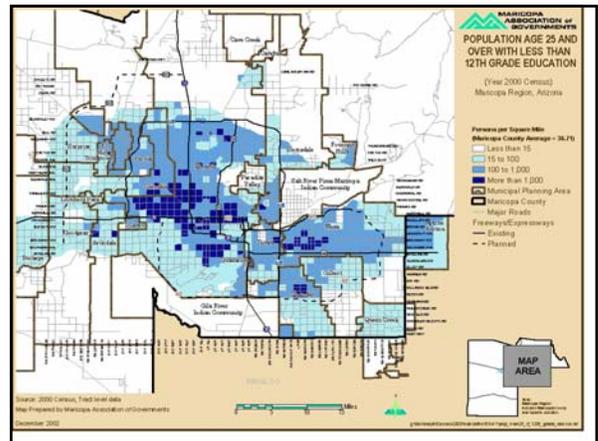
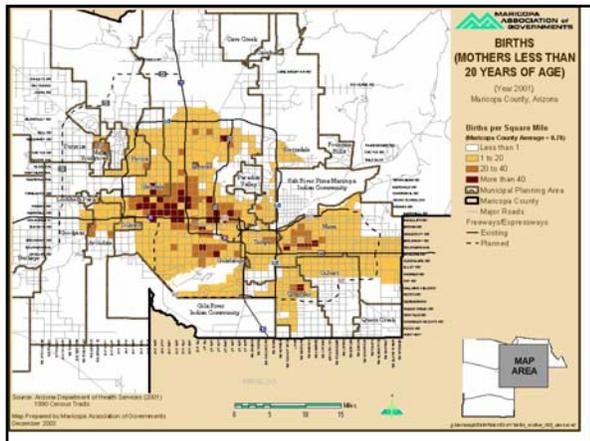


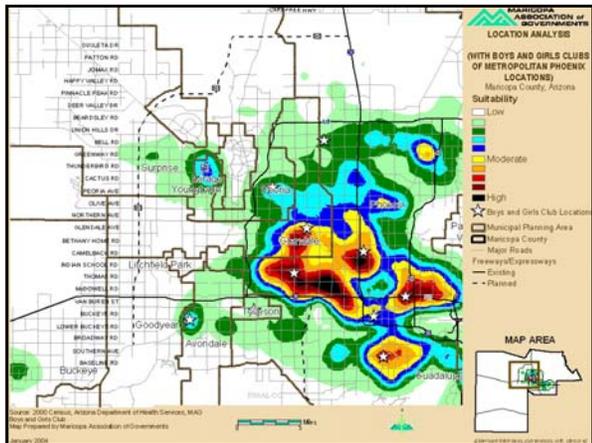


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## Using GIS for Strategic Planning





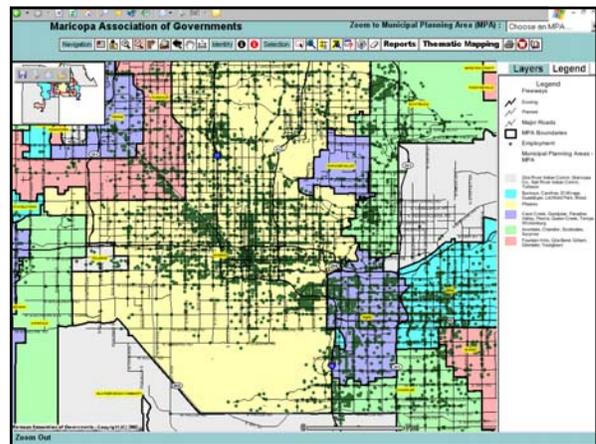
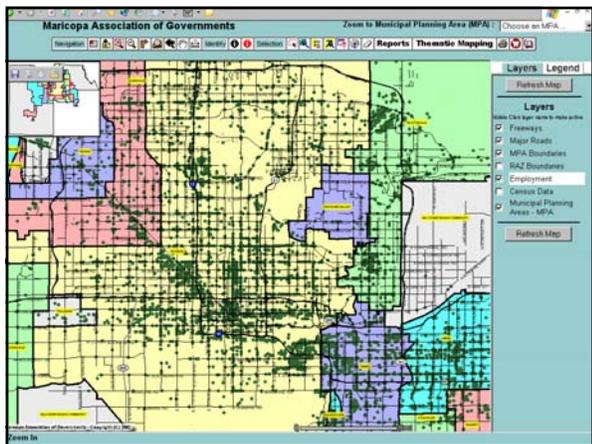
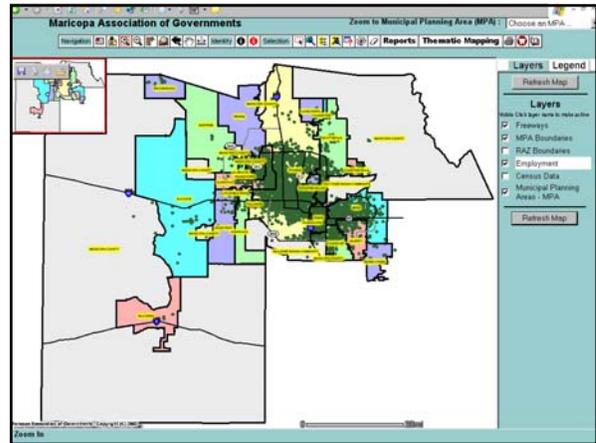
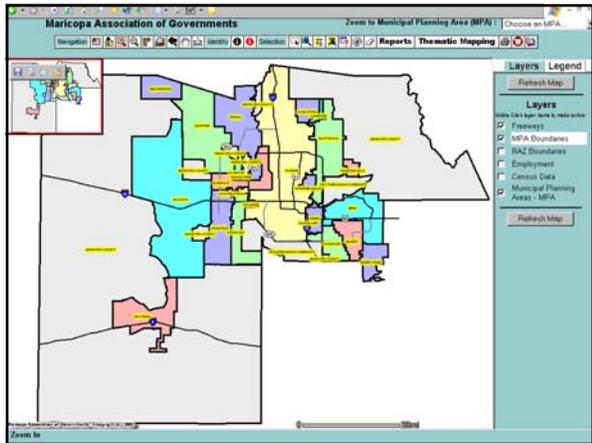


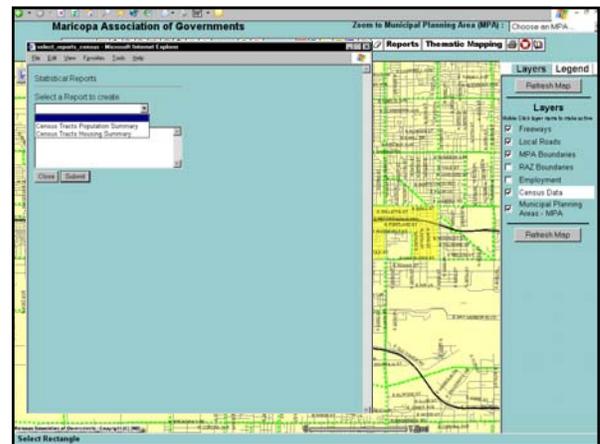
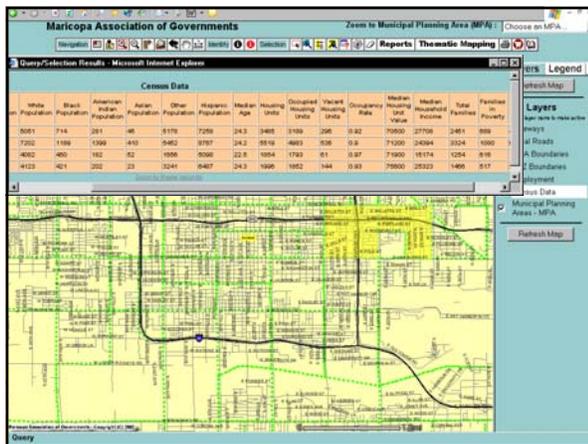
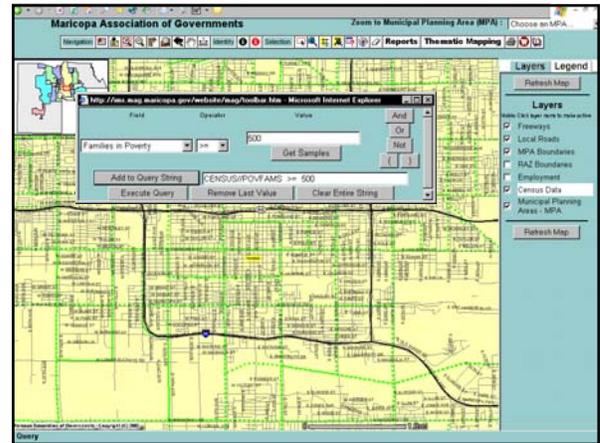
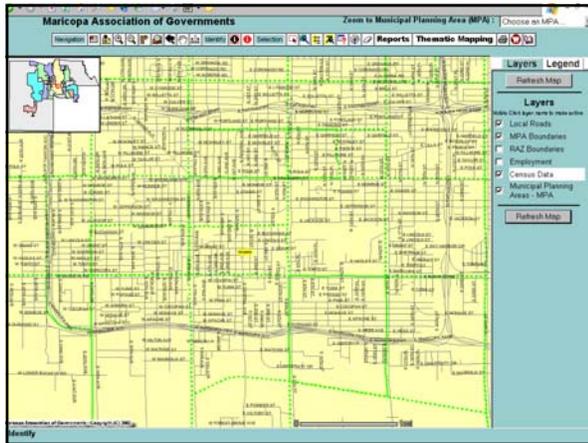
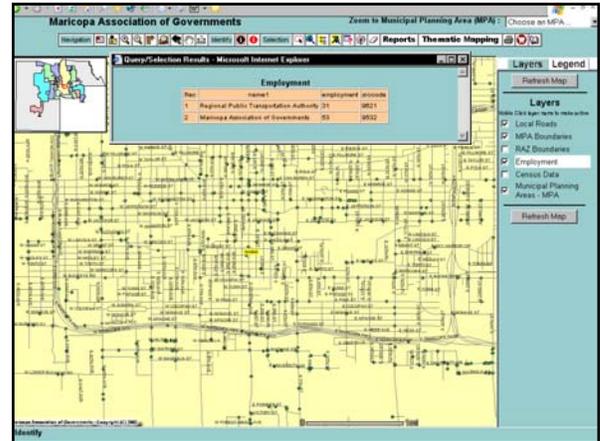
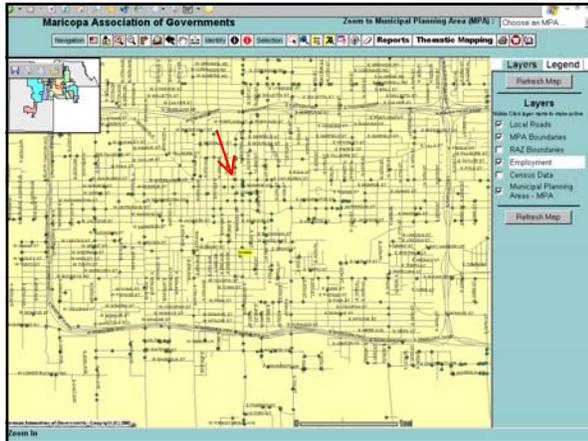
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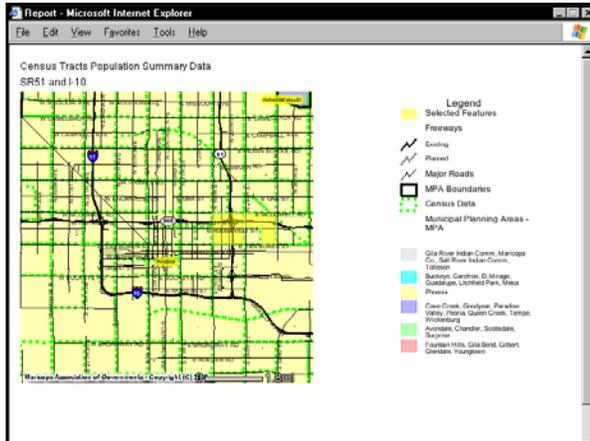
## Interactive Mapping on the MAG Web Site

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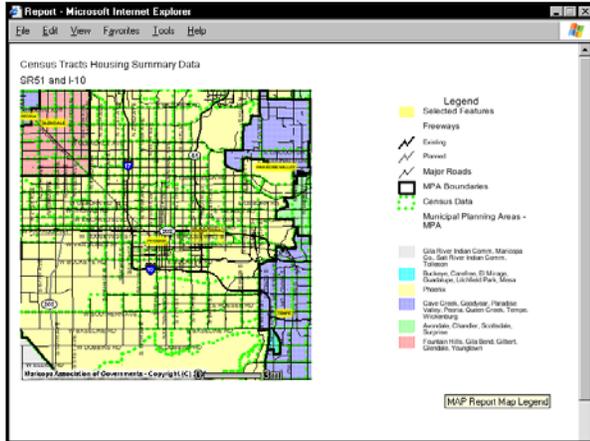
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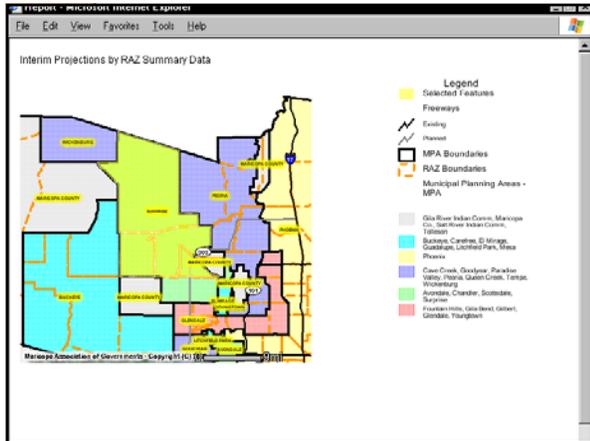




Population Summary	Selected Area		Maricopa County	
	#	%	#	%
Total Population	14,432		3,072,149	
White Population	8,205	56.85%	2,376,359	77.35%
African American Population	871	6.04%	114,551	3.73%
American Indian and Alaska Native Population	384	2.66%	56,700	1.85%
Asian Population	75	0.52%	66,445	2.16%
Other Race Population	4,897	33.93%	458,088	14.91%
Hispanic Population	11,505	80.27%	763,341	24.85%
<b>Population by Age Groups:</b>				
Under 5	1,862	12.8%	241,974	7.88%
5 to 9	1,895	11.75%	238,222	7.75%
10 to 14	1,297	8.99%	222,050	7.23%
15 to 17	762	5.28%	125,751	4.09%
18 to 20	852	5.9%	133,989	4.36%
21 to 44	5,708	39.55%	1,143,612	37.23%
45 to 64	1,579	10.94%	607,566	19.78%
65 to 74	412	2.86%	160,816	5.21%
75 to 84	185	1.28%	130,036	4.23%
85 and Over	80	0.55%	40,127	1.31%
Median Age	23.5		33.0	
<b>Families</b>				
Total Families	2,720		768,800	
Families in Poverty	1,133	41.65%	61,519	8.0%

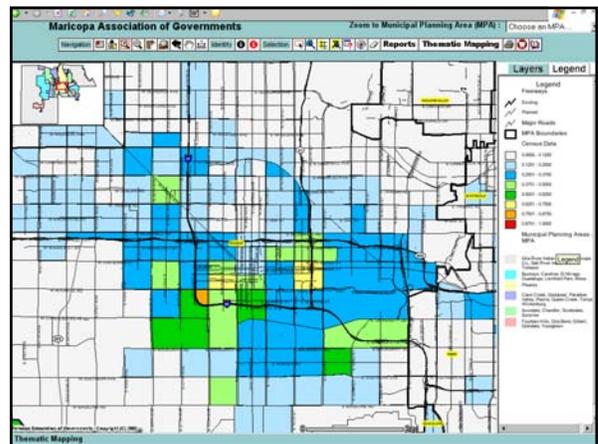
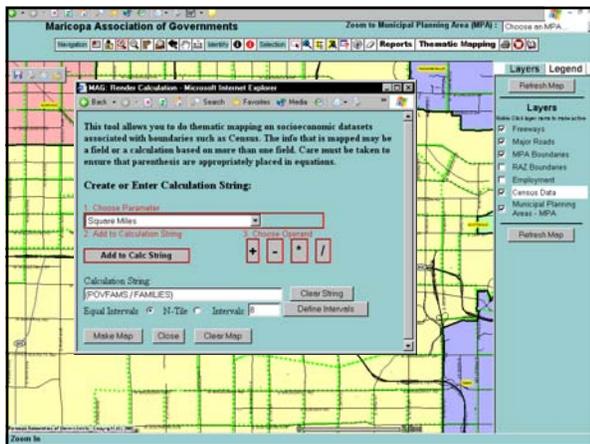
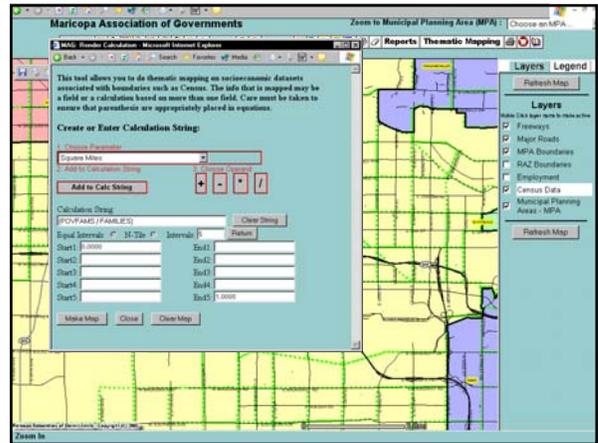
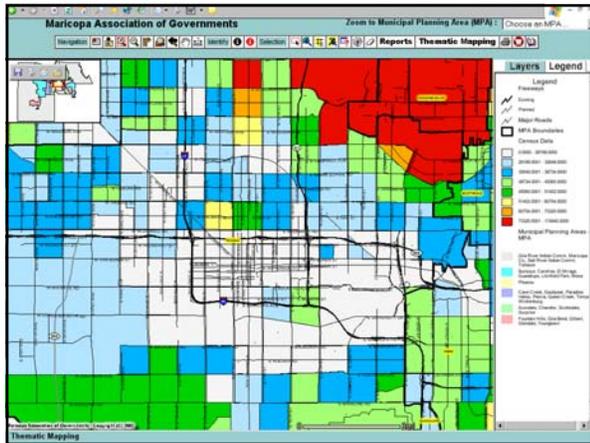
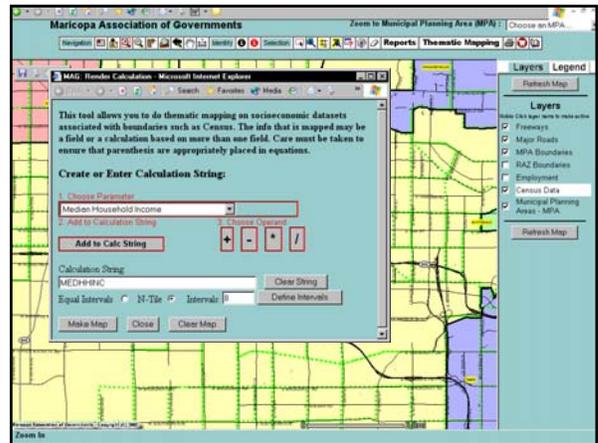
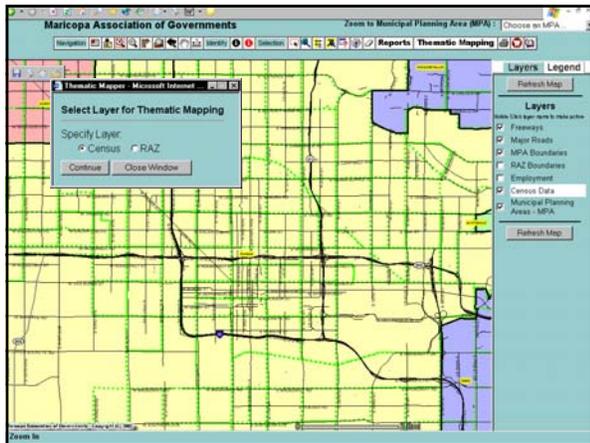


Housing Summary	Selected Area		Maricopa County	
	#	%	#	%
Total Housing Units	3,850		1,250,231	
Occupied Housing Units(Households)	3,645	94.68%	1,132,886	90.81%
Vacant Housing Units	205	5.33%	117,345	9.39%
<b>Housing Units by Unit Type</b>				
Single Family	1,474	38.29%	621,198	65.68%
Multi Family	2,241	58.21%	332,061	26.55%
Mobile Home Housing Units	114	2.96%	90,494	7.24%
Other Housing Units		0.0%	6,478	0.52%
<b>Occupied Housing Units by Tenure</b>				
Owner Occupied	1,070	29.38%	764,563	67.49%
Renter Occupied	2,559	70.21%	360,323	32.51%
<b>Household Income</b>				
Median Household Income	\$ 20,331		\$ 45,358	
<b>Households by Number of Vehicles Available</b>				
No Vehicles	1,061	29.11%	78,768	8.95%
One Vehicle	1,518	41.59%	439,513	38.71%
Two Vehicles	877	18.57%	454,034	40.09%
Three Vehicles	252	6.91%	122,182	10.78%
Four Vehicles	93	2.55%	29,142	2.57%
Five or More Vehicles	30	0.82%	10,277	0.91%



Summary	2000	2010	2020	2030
Area (square miles)	246.04	246.04	246.04	246.04
<b>Population and Housing</b>				
Total Resident Population	21,797	44,641	81,942	237,198
in Households	21,797	44,635	81,927	237,173
in Group Quarters	0	6	15	25
Housing Units	12,682	23,229	42,541	95,425
Households (occupied housing units)	9,681	18,961	36,452	85,001
<b>Employment</b>				
Total Employment	5,359	10,409	26,503	68,857
Retail Employment	2,056	5,023	8,680	15,237
Office Employment	309	654	3,972	25,661
Industrial Employment	481	965	4,213	8,483
Public Employment	359	494	963	2,993
Other Employment	2,144	3,253	8,767	16,493
<b>Analysis</b>				
Population Density (persons per square mile)	88.30	180.85	372.47	960.93
Housing Unit Density (units per square mile)	51.38	94.10	172.34	386.58
Employment Density (employees per square mile)	21.71	42.49	107.37	278.95
Persons per Household	2.25	2.35	2.52	2.79
Job/Housing Balance	0.55	0.55	0.73	0.81

4 matching records.  
July 2003 Interim Projections by Regional Analysis Zone





## For More Information Contact:

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