

Are Republicans Sprawlers and Democrats New Urbanists? – *Understanding the Spatial Analysis of the 2004 Presidential Vote*

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Abstract

After the 2004 Presidential Election, a perception with planners was that the voting pattern represented urban sprawl with little empirical research. The author used the 2004 Presidential Election results and 2000 Census data to examine the relationship between sprawl and the election winner by county. The study analyzed election results and compared it to the 83 metropolitan sprawling regions defined in the "Measuring Sprawl and Its Impact" study and the USDA urban/rural codes. The author provides a quantitative examination of how the population relates to political ties. The study evaluated whether the voting pattern of the Republican win had sprawl and exurban ties. The author used ArcGIS and its Spatial Statistics tools to assess the association of population density and metropolitan location to a county's political vote. The study found that election results were unrelated to the location of sprawl, but were significantly related to population density.

Keyword: GIS; Voting Demographics, Census; Sustainable Development Planning, Change Analysis

Introduction

With the beginning of the millennium, the American media has become obsessed with the colors red and blue. Before the 2000 election, we rarely heard the terms "blue state" and "red state." According Geoffrey Nunberg, as late as 2000, the terms only appeared about a dozen times in major newspapers. They always were associated with stories about the presidential election. The 2000 presidential election gave rise to the terms. Starting in late 2003, these terms have appeared over 2500 times. We continue to use them even with the 2004 election settled (Nunberg, 2005). The media has a fixation on isolating political and social differences. Are there real differences or a contrived assessment?

The media has used the terms to simply explain the culture wars and typecast our opinion based on where we live in this country. Are these terms becoming permanent fixtures of the American political lexicon alongside left and right or liberal and conservative? Has the media's analysis become oversimplified, particularly since we can generate good visuals using these terms?

The press tried to compartmentalize all voting decisions by polarizing the electorate into two culturally distinct groups. Respected journalists David Brooks of the New York Times and Ronald Brownstein of the Los Angeles Times used selective demographics to make their point about the election. They glossed over the different levels of political support throughout the country.

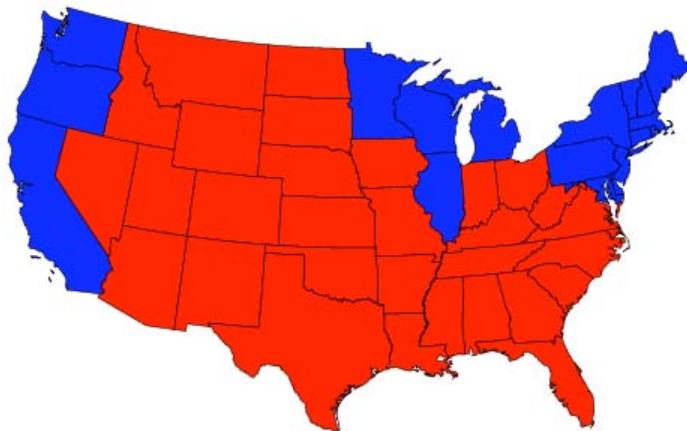
Many academics have the same stereotype. Web posts by planning academicians on the Planet List Serve stated that Democratic votes are concentrated in the urban areas, while the Republicans strength is just in exurbia or rural areas of the country. Where was the

largest concentration of votes for George Bush? Was it in Texas or the sprawling South? Is it surprising that it was Los Angeles County with 954,764 votes? His next largest area was Cook County (Chicago) with 583,774 votes. Houston was third giving Bush 580,553 votes. However, LA and Chicago each gave John Kerry over 700,000 more votes. In Houston, Kerry came within 100,000 votes of George Bush's total. Should Democrats be written off in the South and Republicans in the Northeast? Do we really have political segregation? If you used the typical vote graphics, you may assume we are segregated. GIS allows us to drill down and see different views. This paper discusses these presentation techniques and reviews how urban is the Democratic vote and suburban is the Republican vote.

The Sea of Red and Cartographic Representations

A typical election choropleth map (see Figure1) was shown on TV stations during election night. November 2, 2004 was joy to Republicans. Unfortunately, mapping totals or absolute values per enumeration unit (e.g., individual votes by state) has been perplexing to nearly half of the electorate. Their concern was the overemphasis of red land mass versus actual votes. If the goal is to show thematically relevant information in an easily interpretive manner, this graphic does not work.

Figure 1: 2004 Presidential Election by States



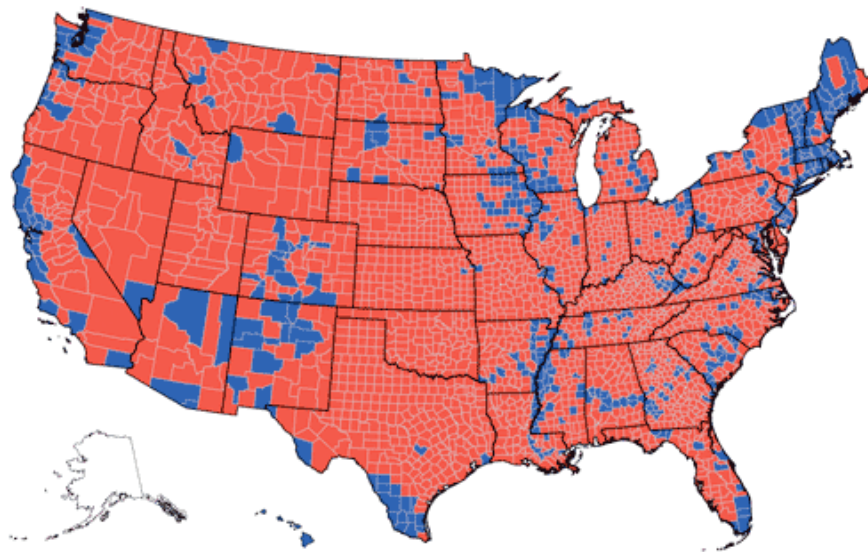
Source: www.cscs.umich.edu/~crshalizi/election/

The states are unequal in area giving the reader a false impression of the mapped data distribution. People, not familiar with the U.S. voting system, might assume that President. George W. Bush won nearly two thirds of the U.S votes. However, the race was much closer. Bush did win 31 of the 51 states (which includes the District of Columbia), but only 286 of the 538 electoral votes (59,834,866 votes, or 51% of the popular vote). Senator John Kerry on the other hand triumphed only in 20 states, but he still received 252 of the electoral votes (56,373,514 votes, or 48% of the popular vote} (USA Today, 2004).

While the state map bothered Democrats, the counties map of the vote appearing in USA Today and other newspapers was even worse. It emphasized the islands of blue in the sea

of red (see Figure 2). However, as pointed out by many others, this is misleading because it fails to take into account the fact that many of the red states have small populations, whereas most of the blue states have large populations but small land mass. The blue islands are small in area, but they are large in terms of votes, which is what matters in an election. By counties, the President's voting land mass was 81%, but it represented only 55% of the US population. On the internet, some creative cartography was created to show the truer vote distribution.

Figure 2: 2004 Presidential Election by Counties



Square miles of counties won		Population (2003) of counties won		Counties won by less than 5 percentage points	
Bush	2.54 million	Bush	159.2 million	Bush	164
Kerry	592,000	Kerry	130.9 million	Kerry	146

Note: County election data is not reported for Alaska,
 Source: the Associated Press, ESRI Inc. USATODAY analysis by Paul Overberg.

Robert J. Vanderbei of Princeton University produced a map depicting the results by voting percentage (see Figure 3). The blue is for the Democrats, red is for the Republicans, and green is for all other. Each county's color is a mix of these three-color components (RGB) in proportion to the results for that county. The (48 contiguous) states of the country are colored red to purple or blue to purple indicating the voting percentage for George W. Bush and John F. Kerry respectively. It is difficult to discern the voting pattern and showing the actual population weight.

Figure 3: 2000 Presidential Election by Voting Percentage



Source Robert Vanderbi, Princeton University
<http://www.princeton.edu/~rvdb/JAVA/election2004/>

At the University of Michigan, Michael Gastner, Cosma Shalizi, and Mark Newman tried to correct the voting proportion by making use of a cartogram, a map in which the sizes of counties have been rescaled according to their population. That is, counties are drawn with a size proportional to the number of their inhabitants not its acreage. Counties with more people appear larger than counties with fewer people. Thus, on the cartogram map (see Figure 4), New York County (Manhattan) with over 1.5 million inhabitants, appears about 42 times the size of Nye, Nevada, which has approximately 35,000 residents, even though it has 793 times the acreage of New York County. The cartogram reveals what we know already from the news: that the country was nearly evenly divided by the vote, rather than being dominated by one side or the other. While this type of graphic has generated a lot of talk, its usefulness is questionable. Locating areas and discerning a pattern are difficult.

Figure 4: Cartogram of Voting Percentage



Source: www.cscs.umich.edu/~crshalizi/election/

Finally, ESRI made a 3D version of the county vote map for CBS News (see Figure 5). The column height represents the total number of voters. While the map helps to show the concentration of votes, it has a flaw: because the heights are proportional to total votes rather than votes per area or population density. This display approach makes it look like there are more people on the west coast than on the east coast, which is not the case.

Figure 5: 3D Version of the 2004 Presidential Election by Counties

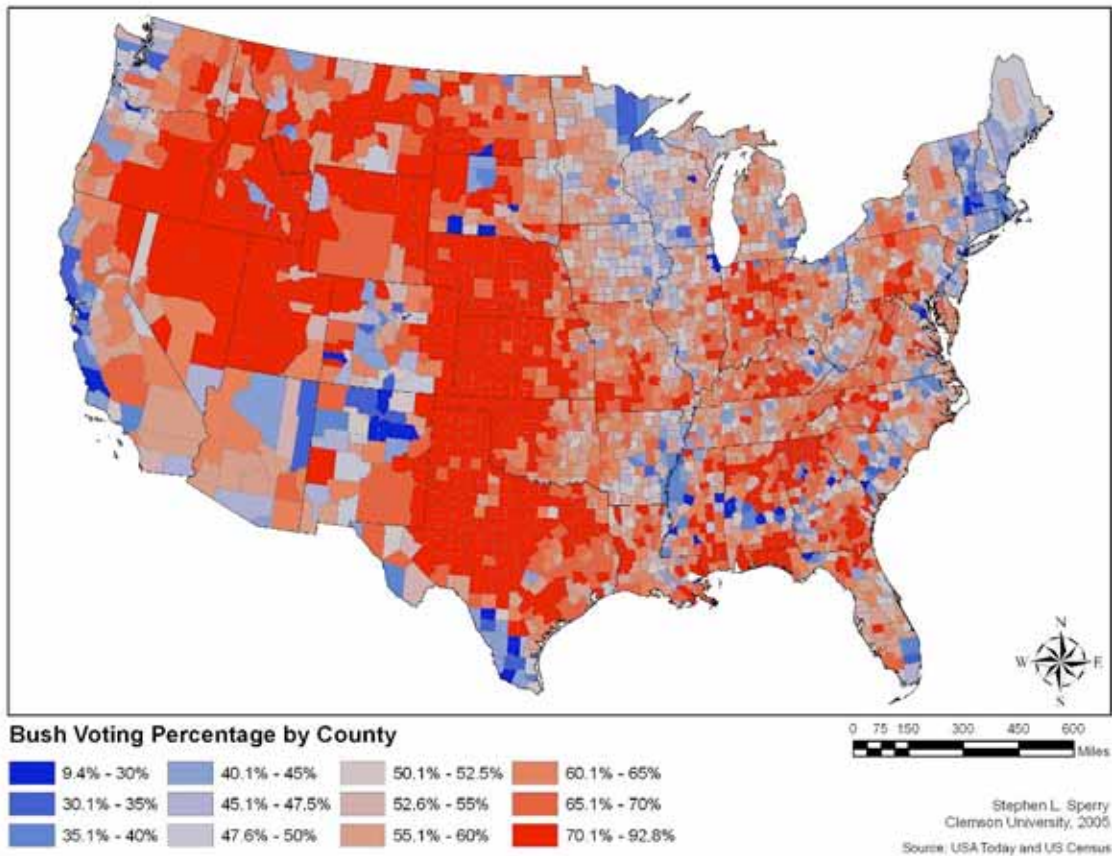


Source: http://www.esri.com/industries/elections/graphics/results2004_lg.jpg

By devising with a more descriptive color ramp display at the county-level, an election map can go further describing the vote results. This image is more striking (see Figure 6). The map of the continental US counties has an RGB color ramp of red to warm gray for the Republican vote and blue to cool gray to indicate the Democratic vote. This map uses a color scale that ranges the shades of red for 70% Republican vote or shades of blue for 70% Democrat vote. Solid colors are used beyond this range. This color range makes it easier to understand the vote range and spatial pattern. It helps in showing the vote was not segregated as many in the media and academia assumed. This type of map address the sea of red issue but still needs another display for population density. So, we are not purple states but shades of gray.

The final county totals were difficult to map in the Northeast. The vote total came from USA Today's website. Extensive data manipulation had to be done in the New England states, because many vote totals were reported at the municipal level not the county level.

Figure 6: 2004 The Presidential Election by Voting Percentage.



Population and Votes

On the web, many people asked to see maps more reflective of the actual location of the population. For example, Clark County, Nevada is one of the fastest growing counties in the US. It is very large in land mass. Actually most residents are located within proximity of Las Vegas, which at a national scale is just a large dot. The method required merging the county vote results (see Figure 6) with population density (see Figure 7). Using census tract boundaries, the tract's population figures were multiplied by the candidates' county vote percentages and divided by the tract land area to generate density figures. These densities were mapped to reflect the voting densities. This map still shows the county winners but now focuses on specifically where the county population is located. The color ramp reflects both the winning vote and where concentrations of voters actually occur (see Figure 8). The classification centers on a base data of less than two people per square mile. It shows dramatically, where most people live. The resulting map balances between accurate density equalization and readability.

A brief analysis reveals the Republican voters dominate much more than a half of the country. This is a misleading finding, because the US population is not uniform. Much of the Republicans' dominance is in the large but relatively unpopulated states in the

Midwest, Plain and Mountain States. On the other hand, the Democrats carried the more populous areas in the Northeast, the Great Lakes, and the West Coast.

Applying the analysis to the Interstate 85 corridor between Atlanta and Charlotte (see Figure 9), the red intensity of Republican county wins is significant. It shows much of the land mass with over a 60 percent vote for George Bush. When population density is added to the mix, the red intensity is diluted to reflect the concentration of the population. Using the third image, the 2008 challenge is essentially around the metropolitan areas of Atlanta, Greenville and Charlotte. Several rural counties that went for Gore in 2000 may become available with the right candidate for the Democrats, or they may become even more of a Republican strong hold. The final analysis shows the new Republican South may offer the Democrats opportunities in 2008 that Kerry did not capture in 2004. Other looking at the analysis may conclude this area will continue the trend of expanding the Republican strong hold in the fast growing exurban areas. Either way the battle will be in the metropolitan areas.

Figure 7: 2000 Population Density

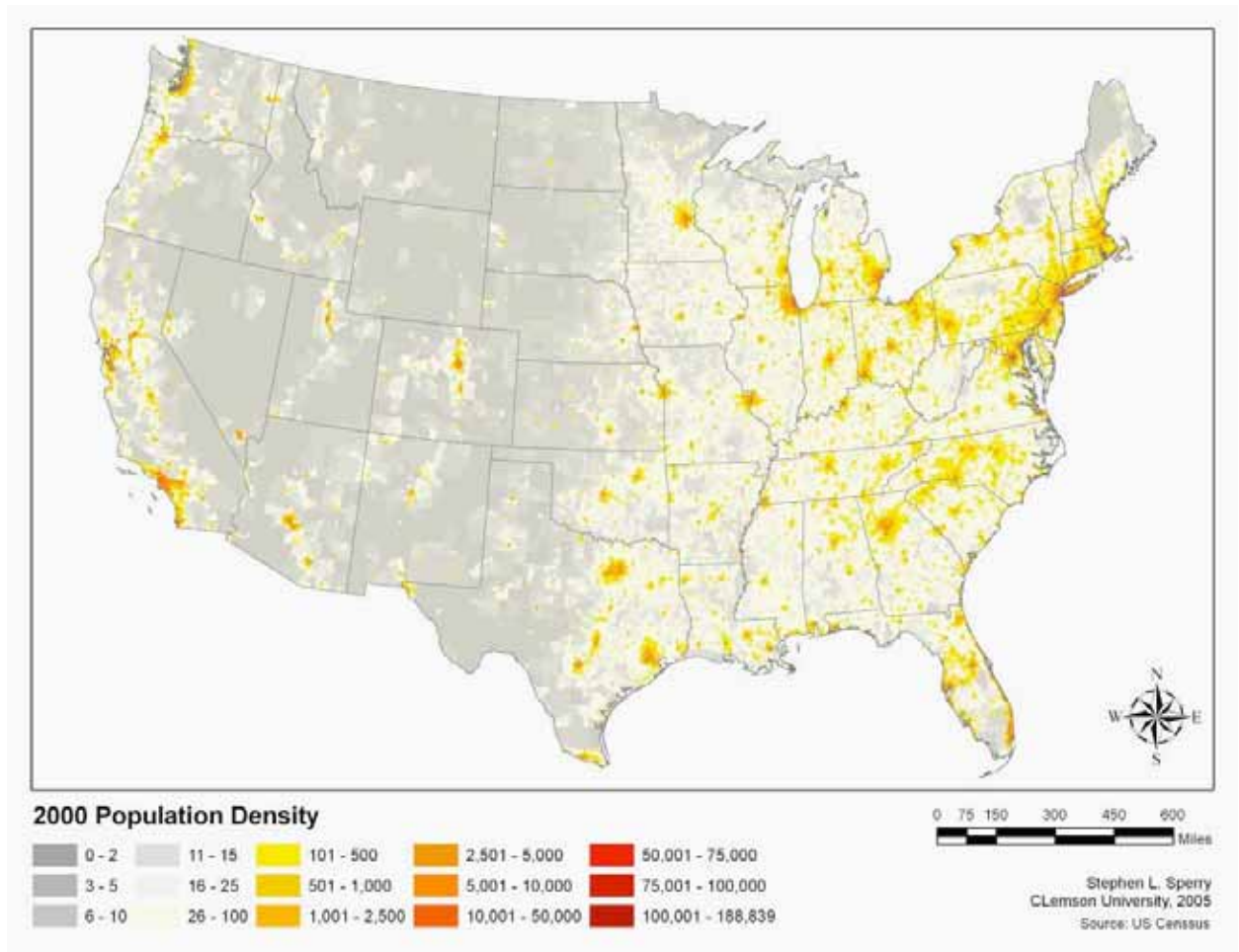


Figure 8: 2004 Election by Population Density and Voting Percentage.

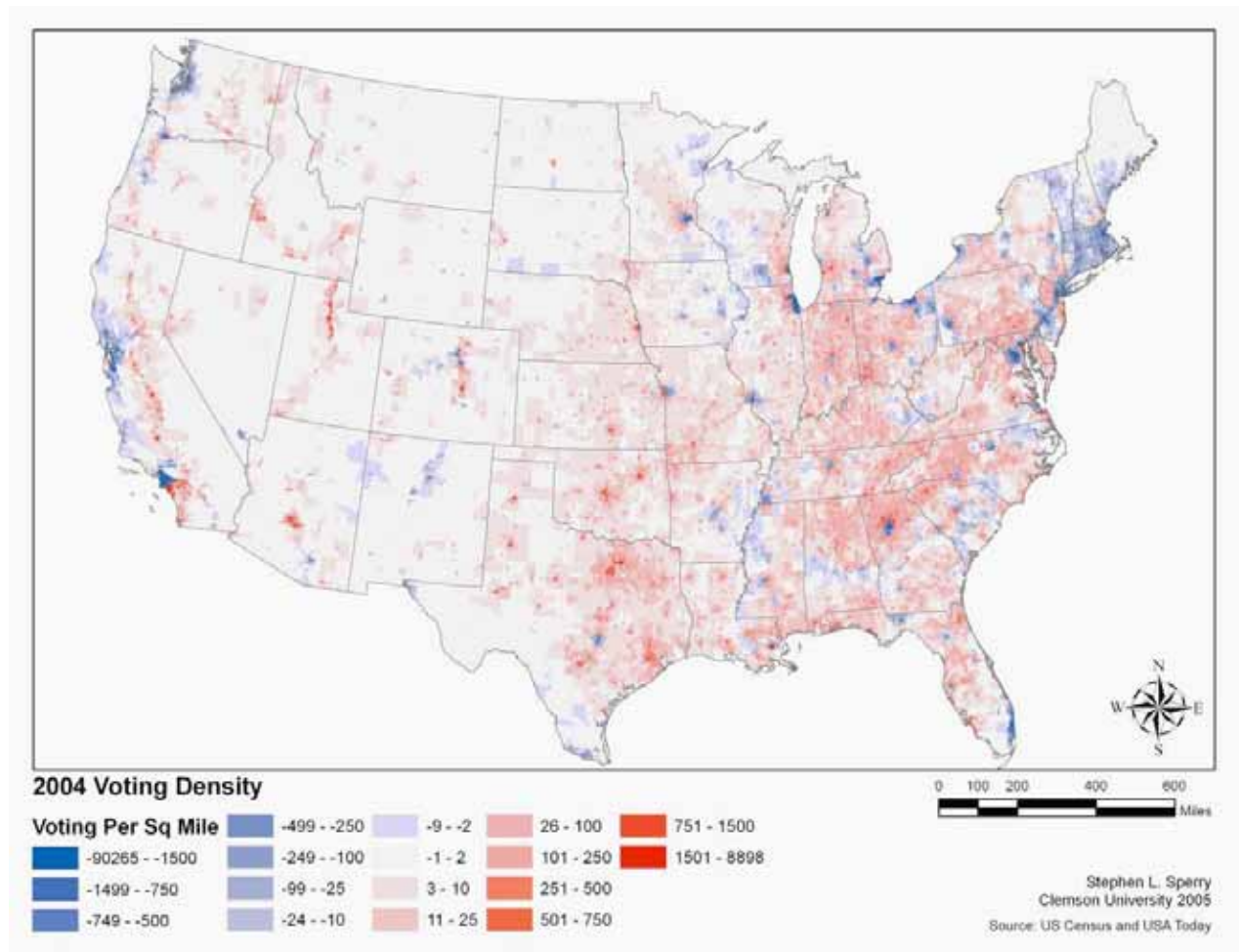
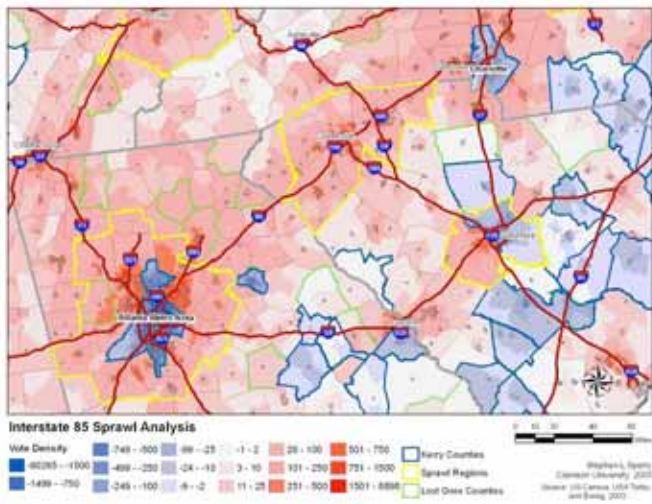
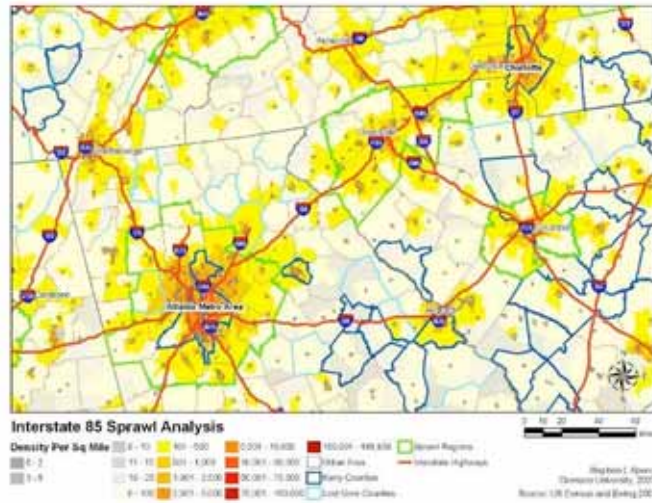
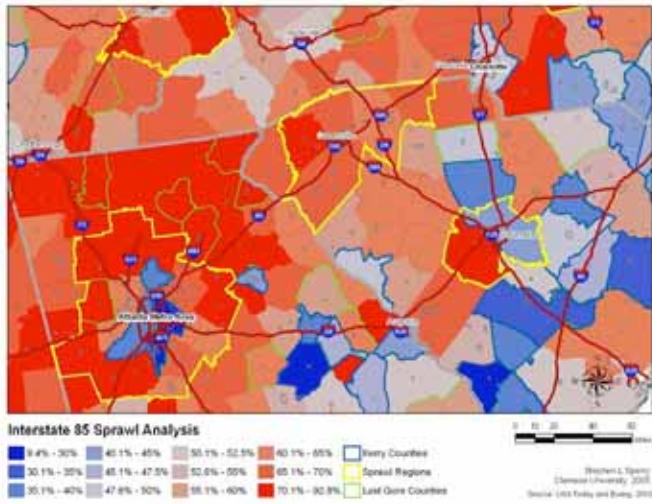


Figure 9: Interstate 85 Corridor Vote Analysis



As a final analysis, each party's density was mapped separately (see Figures 10 and 11). The seven vote density classes were based on quantile breaks of the Republican vote and were rounded up. The Democratic vote used the same class breaks. The difference is that the density range is higher in the last Democratic class, 139,552 verses 49,287. In comparing the maps, the vote concentrations are similar between the parties but more spread out from the urban cores for the Republicans. The exception is the southern concentration of votes centering on the Appalachian Mountain region with its small cities and expanding to the more metropolitan areas of North Carolina, Tennessee, South Carolina, Georgia and Alabama. The urban centers did generate greater Democratic votes while the urban fringe appears to be Republican territory. While there is a difference in the concentrations for either party's supporters when looking at vote distribution they are similar.

Figure 10: Republican Vote Density

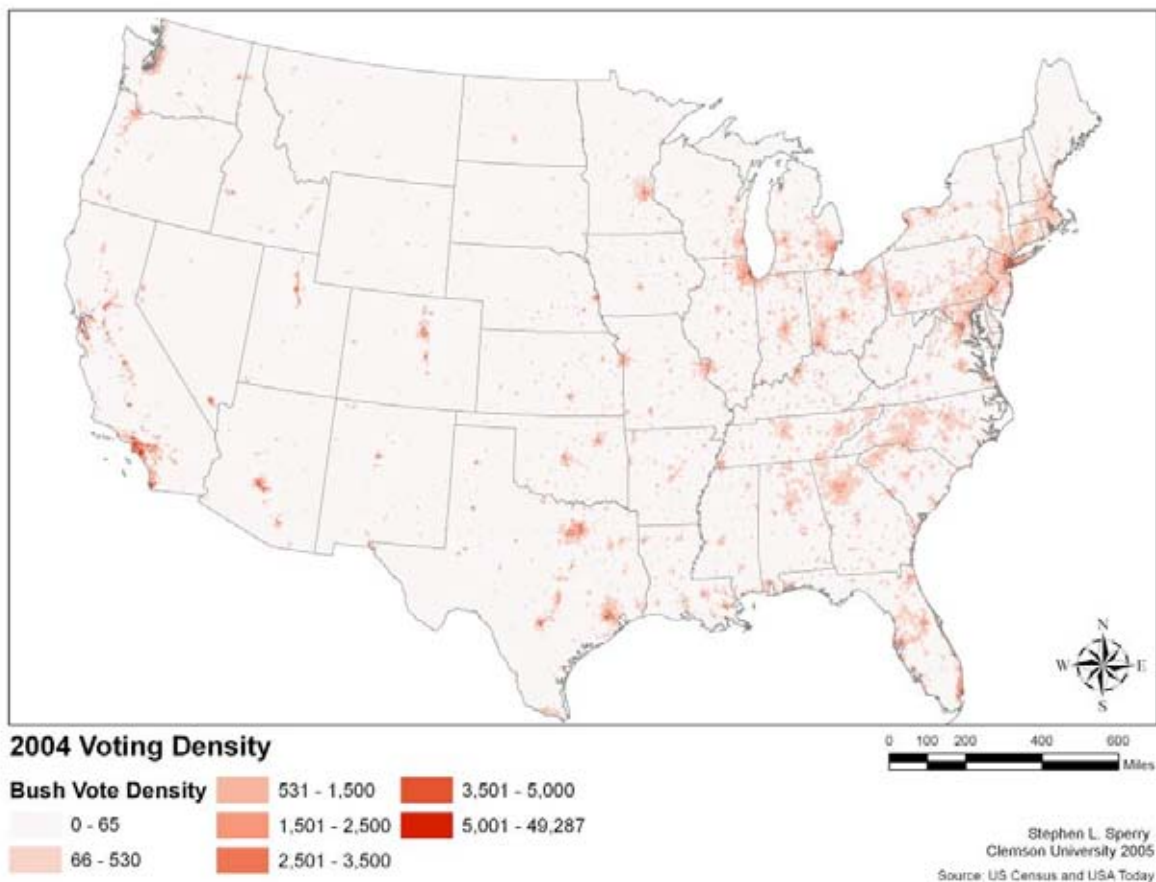
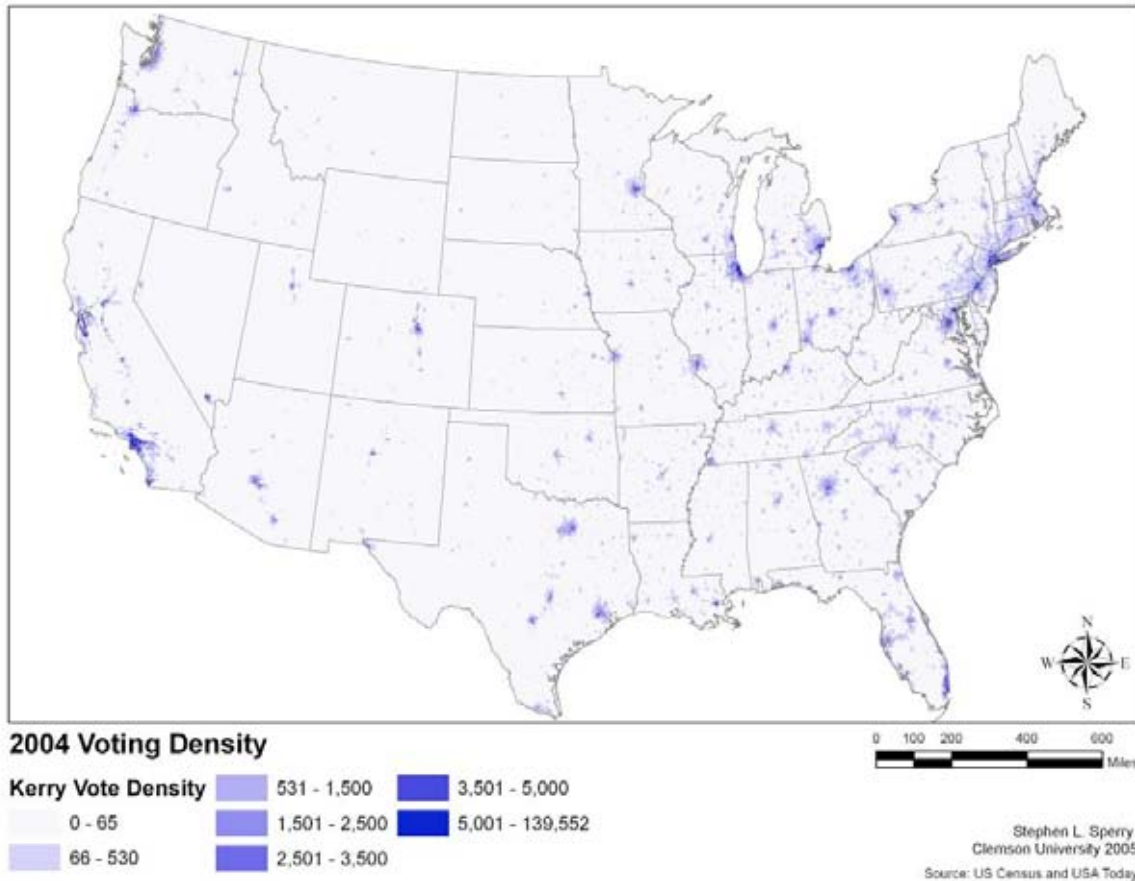


Figure 11: Democratic Vote Density



Sprawl Analysis – *The Spatial Distribution of Bush's Vote*

Between 2000 and 2004, there was a net shift of about 4 million votes in Bush's direction (USA Today, 2004). The analysis shows that Bush made gains across the board when you examine counties sorted into nine categories, going from most urban to most rural. This analysis uses the rural-urban continuum codes developed by Calvin Beale of the USDA's Economic Research Service (ERS). The study also compares the vote in the top 83 sprawl regions as defined by Reid Ewing and others in the report *Measuring Sprawl and Its Impacts* (Ewing, 2003).

The 2003 rural-urban continuum codes form a classification scheme that categorizes metropolitan counties by size and non-metropolitan counties by degree of urbanization and proximity to metro areas (see Figure 12 and Table 1). ERS developed the classifications to measure rural characteristics and assess the economic and social diversity of rural America. The rural-urban continuum codes are used to classify counties, census tracts, and ZIP codes by the different rural codes. These codes classify rural counties by their economic and policy types.

The standard Office of Management and Budget (OMB) metro and non-metro categories have been subdivided into three metro and six non-metro categories, resulting in the 9-part county codification. This scheme was originally developed in 1974. The codes were updated in 1983 and 1993, and 2003. This scheme allows researchers to break county data into finer residential groups, beyond metro and non-metro, particularly for the analysis of trends in non-metro areas that are related to population density and metro influence. The versions based on the 1970, 1980, 1990 and 2000 Censuses are found on the ERS website. (Economic Research Service, 2004)

The classifications starts with the highest urban concentration (see Table 2). They are the central counties of large (one million or more) metro areas. This class represents 53% of the US population. These urban areas have the highest population density and the highest median income of the nine categories. It also represents over 50% of the 2004 vote. Bush received over 46% of his total vote in this category while John Kerry received nearly 57% of his vote. The metro counties (the top three categories) accounted for 82% of the nation vote. Bush received 79% his vote there while Kerry got 85% of his total votes in these three urban classes. Kerry had nearly a 600,000 vote margin over t his Republican rival. Bush, however, won eight of the nine categories except in the most urban category. His vote margin percentage increased as a category became more rural from 46.5% to 62.8%.

Within the 83 sprawl regions (which accounts for over 50% of the nation's population), the voting was better for Kerry (see Table 3). The top three categories accounted for over 98% of the vote for each candidate. In the top three categories, Kerry's margin was over 4,200,000 votes. Within the 83 regions, there are only six of the nine categories. Bush carried five of the six categories but with closer margins than the country vote outside the sprawl regions. Within these regions, John Kerry received over 3,100,000 more votes than George Bush.

In fringe or exurban counties of these large metro areas, Bush improved his winning margin. Because these exurban areas contain far fewer people than the central counties, Bush received only 8% of his vote from these counties.

More important to Bush's vote gains were the medium-sized metro areas (250,000 to a million in population) and the counties in the metro area with less than 250,000, where he had his largest vote margin over Kerry. Bush received over 32 percent of his net vote gain from the medium-sized metro areas counties. In these smaller metro areas, Bush received over 3,500,000 more votes than Kerry. In the 83 sprawl regions, Bush's margin was over 1,500,000 votes

Turning to non-metro counties or rural, these categories have urban concentrations that range from a high of 20,000 to a low of fewer than 2,500 people. Bush did the best in non-metro counties that are adjacent to a metro area and have an urban population of between 2,500 and 20,000. Nationally his vote percentage was over 60%. In the sprawl regions, those percentages were similar.

Nationally, the Republican concentration is in the urban area of less than one million people. It accounted for 79% of their vote margin. On the other hand in the 83 sprawl regions, Bush's most successful region was the urban population of 250,000 or more, adjacent to a metro area. Bush beat Kerry by over one million votes. Finally, other than

the most urban concentration, the vote percentage were with one to two percentage points showing that both candidates can attract votes in each of the nine code classes. Contrary to the media portrayal, we are not segregating into common camps. We are more diversified than the press wants to believe.

Figure 12: USDA Urban Rural Codes

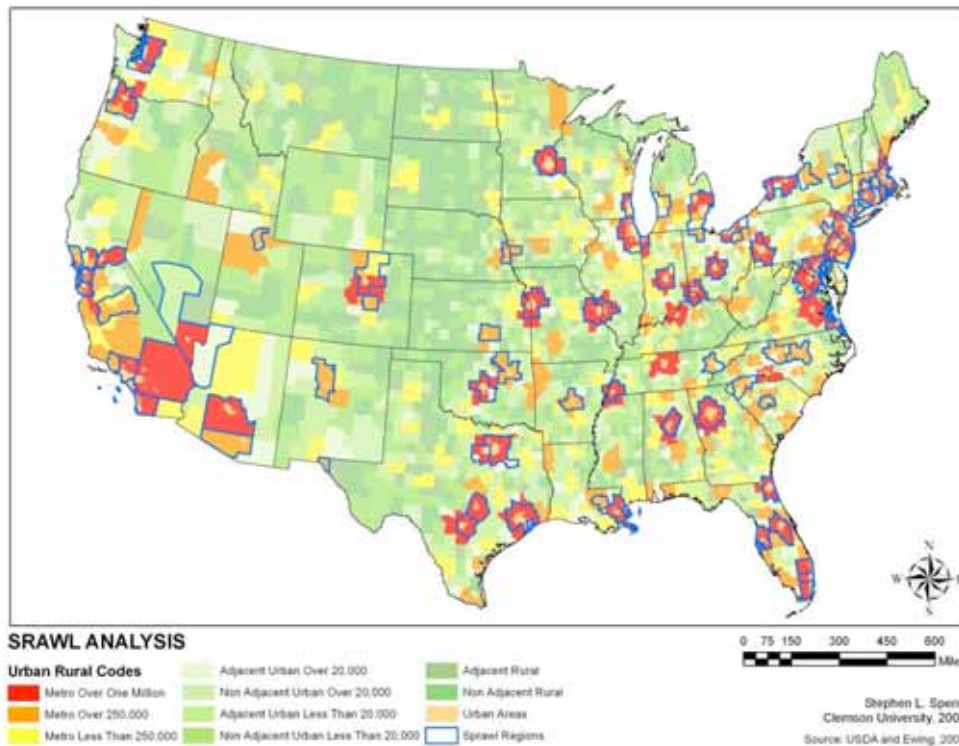


Table 1: National Metropolitan Analysis

Description									
Code		Number of Counties	Total Area	2000 Population	Population Percentage	Population Per Square Mile	Median Income	Poverty Percentage	College Degree Percentage
Metro counties:									
1	Counties in metro areas of 1 million population or more	413	273,670	149,224,067	53.0%	545.3	\$ 47,257	9.6%	15.1%
2	Counties in metro areas of 250,000 to 1 million population	325	314,065	55,514,159	19.7%	176.8	\$ 39,728	12.0%	12.7%
3	Counties in metro areas of fewer than 250,000 population	351	327,380	27,841,714	9.9%	85.0	\$ 36,367	13.5%	11.6%
Nonmetro counties:									
4	Urban population of 20,000 or more, adjacent to a metro area	218	227,984	14,442,161	5.1%	63.3	\$ 35,593	13.8%	10.5%
5	Urban population of 20,000 or more, not adjacent to a metro area	105	163,541	5,573,273	2.0%	34.1	\$ 34,678	15.1%	12.2%
6	Urban population of 2,500 to 19,999, adjacent to a metro area	609	549,877	15,134,357	5.4%	27.5	\$ 32,267	15.6%	8.5%
7	Urban population of 2,500 to 19,999, not adjacent to a metro area	450	786,012	8,463,700	3.0%	10.8	\$ 32,019	15.6%	9.8%
8	Completely rural or less than 2,500 urban population, adjacent to a metro area	235	384,751	2,425,743	0.9%	6.3	\$ 31,238	16.1%	8.8%
9	Completely rural or less than 2,500 urban population, not adjacent to a metro area	435	565,761	2,802,778	1.0%	5.0	\$ 30,119	16.2%	9.8%
Total/Average		3,141	3,593,040	281,421,952	100.0%	78.3	\$ 35,370	14.2%	10.8%

Table 2: National Metropolitan Vote Analysis

Code	Description	Number			Bush Margin	Bush Percentage	Percent of Bush's Total Vote	Percent of Kerry's Total Vote	Percent of Total Vote	
		of Counties	Bush Votes	Kerry Votes						Nader Votes
Metro counties:										
1	Counties in metro areas of 1 million population or more	413	27,736,596	31,816,697	181,972	(4,080,101)	46.4%	46.5%	56.7%	51.4%
2	Counties in metro areas of 250,000 to 1 million population	325	12,450,410	10,924,349	87,780	1,526,061	53.1%	20.9%	19.5%	20.2%
3	Counties in metro areas of fewer than 250,000 population	351	6,934,487	4,979,517	47,440	1,954,970	58.0%	11.6%	8.9%	10.3%
Nonmetro counties:										
4	Urban population of 20,000 or more, adjacent to a metro area	218	3,607,318	2,522,126	22,918	1,085,192	58.6%	6.0%	4.5%	5.3%
5	Urban population of 20,000 or more, not adjacent to a metro area	105	1,336,202	964,734	11,555	371,468	57.8%	2.2%	1.7%	2.0%
6	Urban population of 2,500 to 19,999, adjacent to a metro area	609	3,837,788	2,500,736	23,150	1,337,052	60.3%	6.4%	4.5%	5.5%
7	Urban population of 2,500 to 19,999, not adjacent to a metro area	450	2,162,112	1,408,603	16,753	753,509	60.3%	3.6%	2.5%	3.1%
8	Completely rural or less than 2,500 urban population, adjacent to a metro area	235	660,647	456,055	4,809	204,592	58.9%	1.1%	0.8%	1.0%
9	Completely rural or less than 2,500 urban population, not adjacent to a metro area	435	971,202	564,950	10,455	406,252	62.8%	1.6%	1.0%	1.3%
Total/Average		3,141	59,696,762	56,137,767	406,832	3,558,995	51.4%	100.0%	100.0%	100.0%

Tables 3: Sprawl Regions Analysis

Code	Description	Number		2000 Population	Population Per Square Mile	Bush Votes	Kerry Votes	Nader Votes	Bush Margin	Bush Percentage	Percent of Bush's Total Vote	Percent of Kerry's Total Vote	Percent of Total Vote
		of Counties	Total Area										
Metro counties:													
1	Counties in metro areas of 1 million population or more	308	220,120	142,389,744	646.9	25,949,259	30,529,534	176,083	(4,580,275)	45.8%	81.1%	84.6%	82.9%
2	Counties in metro areas of 250,000 to 1 million population	88	78,021	24,105,787	309.0	5,108,793	4,871,816	42,743	236,977	51.0%	16.0%	13.5%	14.7%
3	Counties in metro areas of fewer than 250,000 population	16	13,507	2,469,338	182.8	617,979	497,878	5,250	120,101	55.1%	1.9%	1.4%	1.6%
Nonmetro counties:													
4	Urban population of 20,000 or more, adjacent to a metro area	14	21,377	1,176,765	55.0	298,809	185,492	2,515	113,317	61.4%	0.9%	0.5%	0.7%
5	Urban population of 20,000 or more, not adjacent to a metro area										0.0%	0.0%	0.0%
6	Urban population of 2,500 to 19,999, adjacent to a metro area	3	18,799	87,963	4.7	22,678	17,247	157	5,431	56.6%	0.1%	0.0%	0.1%
7	Urban population of 2,500 to 19,999, not adjacent to a metro area										0.0%	0.0%	0.0%
8	Completely rural or less than 2,500 urban population, adjacent to a metro area	1	185	16,803	90.7	5,144	2,739	-	2,405	65.3%	0.0%	0.0%	0.0%
9	Completely rural or less than 2,500 urban population, not adjacent to a metro area										0.0%	0.0%	0.0%
Total/Average		430	352,009	170,246,400	483.6	32,002,662	36,104,706	226,748	(4,102,044)	46.8%	100.0%	100.0%	100.0%

Conclusion – *The Roads to the Vote*

In this paper a general method for constructing density-equalizing vote display, provides an invaluable tool for the presentation and analysis of political demographic data. The method allows for an easier understanding of the voter pattern in the US. It shows where the votes were concentrated. The technique generates more accurate and readable maps. The method allows people to see the balance between good density equalization and voter spatial patterns. The approach may help the media to convey voting analysis.

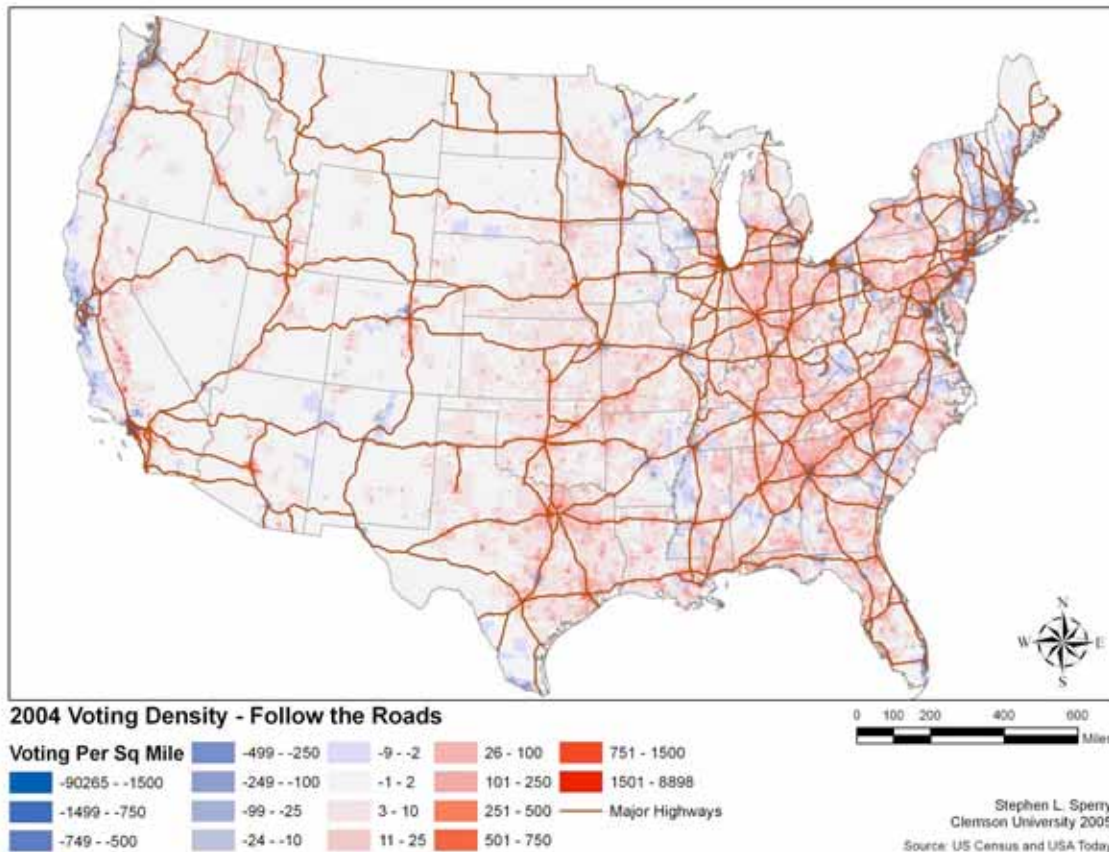
Does the analysis in the media justify the somewhat extravagant claims of polarization? When comparing the Republican and Democratic vote density maps (Figures 10 and 11), the country is not polarized into two camps. In fact, it appears to be a very diverse country. Your neighbor may have voted for the “other” candidate. Are Republican

Sprawlers? The answer is yes and no. In the analysis, the exurbs, defined as fringe counties of large metropolitan areas, contributed to Bush's gain in 2004. However, do not forget how many votes he received in Los Angeles and Chicago.

The Democratic concentration is in the most urban areas, but they also are within one to two percentage points of the Republicans' distribution in the other eight categories. The only consistent thread is in every one of the nine rural-urban continuum codes the Democratic demographics showed a higher population density than Republicans. So while the Democrats maybe Urbanists they have many of the same economic and social desires as Republicans. They just voted for a different candidate.

In the final analysis, it looks like Bush's victory was mostly attributable to modest, but broad-based, gains across every region of the country including the cities. The vote does not reflect any particular flavor of county. This may not follow the media's storyline but in the end, Democrats are proportionally within one to two percentage points of Republicans each of the rural-urban codes. Therefore, both parties have Sprawlers and New Urbanists. So if you are Ken Mehlman or Howard Dean in planning the 2008 election, just follow the roads and do not give up on any part of the country.

Figure 13: 2004 Voting Density and Major Highways



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