Introduction

In this article we use a variety of mapping methods to visualize geographic changes in the Virginia electorate between 2000 and 2012. Instead of relying on traditional mapping techniques that attach electoral results to localities drawn to represent their land areas, we argue that cartograms, maps that scale localities by their populations instead of their physical areas, better represent the political geography of Virginia. Additionally, mapping the changing geography of support for Republicans and Democrats on a population cartogram allows rapidly suburbanizing counties—the new political battlegrounds—to be easily identified. Finally, precinct-level maps of those counties provide insights about the new suburbanites most responsible for these shifts.

The Changing Nature of Virginia Politics

During the past two presidential elections, the news media and political analysts have devoted much attention to Virginia’s new status as a swing state, which could tilt either “blue” or “red.” From 1968 through 2004, Republican presidential candidates won the commonwealth, often by considerable margins. In 2008, however, Democrat Barack Obama narrowly defeated Republican John McCain and revealed the decidedly “purple” nature of Virginia’s contemporary electorate. This Democratic success in the state was repeated in 2012 despite the considerable efforts of Republicans to put Virginia back into the red column.

At the national level, political analysts increasingly note the deepening divide between rural and white voters, who form the Republican Party’s base, and urban and non-white voters who overwhelming support Democratic candidates. This divide makes the suburbs the main battleground between the two parties, both nationally and in Virginia. In the rest of the article we will show how innovative forms of map-making can shed light on how new details of electoral trends, often hard to pin down with conventional voting maps, can be revealed.

Not that long ago, Republicans couldn’t ask for more from most of Virginia’s suburbs. Large Republican margins in nearly all but the most settled suburban counties, coupled with GOP victories in the most rural communities, overwhelmed the heavily Democratic base in the largest cities and in the jurisdictions closest to Washington, D.C.

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The first waves of suburban settlement helped fuel the GOP’s rise to dominance in the state and in many other southern states during recent decades. These earlier suburbanites often sought new single-family homes on large tracts of land. This first wave of new suburban residents was generally conservative, just like their rural neighbors who had long called these growing counties home. Even as recently as the 2000 presidential election, Republicans could count on capturing 60 percent of the presidential vote in less suburbanized counties like Chesterfield, Stafford and Spotsylvania.1

In Virginia, as elsewhere, suburban areas are neither monolithic nor static. Over time their population densities have increased and their residents have become more diverse in terms of race, income and age. As a result, Virginia Republicans now risk being swamped in statewide elections by the latest wave of suburban migration. The newer migrants to suburbs more distant from central cities are making voting patterns in Chesterfield look more like Henrico. Politically speaking, Stafford is starting to resemble Prince William as well.

Compared to earlier waves of suburban settlement, these newer transplants tend to be younger, more multicultural, and less conservative on social issues. Many cannot afford—or at least tend not to want to live in—large single-family houses. Instead they favor townhouses closer to major highways and mass transit. These new residents in the suburbs more distant from the urban centers, in short, are the sorts of voters who turned once-Republican counties like Henrico, Albemarle and Fairfax away from the GOP in recent presidential election cycles.

For cartographers (map makers), political scientists, and journalists a key challenge has been how to represent these changes visually via the most effective illustrations. For much of U.S. electoral history, maps have been used to present the results of elections and to analyze these results. Yet, most maps that are used to report election results continue to rely on traditional cartographic methods...

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The Virginia News Letter

Political Cartography and Presidential Elections

For much of American electoral history, political analysts working in the news media have used maps to present election results and to examine these results. Such use intensified as first television and then Internet news outlets, racing to be the first to call a state for a particular candidate, made maps central in their presidential election night coverage. This race to call elections promptly with these new illustrations created no end of trouble for network television news during the razor-thin 2000 presidential election, when the color-coding for the state of Florida changed repeatedly through election night.

Even before the 2000 contest, however, most media outlets had settled on the same set of cartographic conventions for these maps. At the beginning of the evening’s news reports, audiences see a blank map most often just showing state boundaries. As the news outlet report preliminary results, states that appear to have been won by Republican candidates turn red while those won by Democratic candidates turn blue. The following morning, newspapers print very similar maps as part of their reporting and analysis.

These maps are very simple examples of what cartographers call choropleth maps. Usually employed to map quantitative data, such as population densities, these maps assign a color representing the value of a variable to each areal unit, such as a state or county. Most commonly, a lighter shade represents a lower value while a darker shade represents a higher value. Finally, to help map-readers see patterns more readily, areas with similar values all receive the same color shade. In other words, areal units are grouped into relatively few classes—each class is given a color shade that represents a range of quantitative values. Choropleth maps can be used to display qualitative data, such as land use, as well. In this case, completely different colors, such as red, blue, or green, are assigned to represent qualitatively different values. On a land use map, residential neighborhoods might be colored green while commercial areas are colored red. The now iconic “red state versus blue state” maps are effectively...
qualitative choropleth maps. While the results are determined by the number of people who vote for each candidate, each geographical area is simply presented as won by a Republican or Democrat.

During the first decade of this century, more and more media outlets adopted Geographic Information System (GIS) software and hired staff capable of using this new tool. When combined with the content demand of the 24-hour cable and Internet news outlets and the increasing dominance of “horse-race reporting,” the intense journalistic focus on the latest poll results, this new technology made electoral maps even more pervasive. During the presidential primary season, television and Internet political analysts use state and county level maps to predict, report and explain results. By 2008, reporters used touchscreens during live broadcasts to zoom in to battleground states and show viewers the localities most important in determining which party would win. They could also touch a state or county to bring up vote counts and percentages as tables or graphs.

Despite the new technologies, the basic design of these maps remains relatively unchanged. States and counties are still simply colored red or blue to reflect the actual results or a political analyst’s predictions. To an extent, this is appropriate given the winner-take-all nature of this country’s electoral system. Furthermore, mainstream media outlets avoid presenting complicated data because they worry viewers will tune out. The simple red state versus blue state map is now deeply embedded into our political culture and, therefore, easily understood.

Academic criticism of this style of election mapping increased in the wake of the 2000 and 2004 presidential elections. While George W. Bush only won 48 percent of the popular vote in 2000 and 51 percent four years later, the Republican red dominated maps of the results. As Michael Gastner, Cosma Shalizi and Mark Newman note, the reason for this apparent advantage on the two-color map is simple. The size of each state on a map of the United States is determined by its physical area. Yet, Electoral College votes are apportioned to states based on population not physical area. Given that Republicans tend to win Montana, Utah, the Dakotas and other mountain or plains states with large areas but low populations, the simple choropleth map dominating the reporting of election results over the past several decades visually exaggerate Republican areas.

Gastner, Shalizi and Newman argue that using population cartograms to map election results yields a more accurate picture of the results. On a cartogram, the area of each state is scaled by its population, or some other relevant variable, rather than its physical area. Massachusetts, with over 6 million people, will be more than ten times the size on a cartogram than Wyoming, with fewer than 600,000 residents. On Gastner, Shalizi and Newman’s cartograms, the more populous blue states of New York, California and New Jersey visually balance the now smaller plains and mountain states thereby suggesting a much closer electoral outcome.

Other analysts note that simple qualitative choropleth maps hide the millions who voted for the candidate who lost each state. While representing the winner-take-all nature of the Electoral College system, such maps do not allow analysts or the general public to see how close an election was in any particular state. To counter this, Robert J. Vanderbei created the “Purple America” map beginning in 2000. Rather than grouping counties with similar values and giving them all the same color, this map assigned a unique mixture of red and blue to each county calculated from percent of total votes won by Republicans and Democrats.

To illustrate the changing geography of presidential elections in Virginia, we begin with the Gastner, Shalizi and Newman population cartogram algorithm to map the results of the 2012 election results by county and independent city. An algorithm is a step-by-step procedure for calculations. “ScapeToad,” a free computer application, makes this process simple. It requires a digital map in the shapefile format used in mapping software developed by the ESRI Company and population values for the political units on the map. The output is another ESRI shapefile with the political units sized according to their total population. For our cartogram, we used county and independent city populations from the 2010 U.S. Census. Within ArcGIS, the industry-standard Geographic Information System (GIS), election results for each county were joined to the cartogram. The result combines county areas scaled by population with a quantitative choropleth map of election results. While other techniques, such as graduated symbol or 3-D maps help readers understand the magnitude of votes given to one party or the other, they continue to rely on land area to symbolize the counties and cities themselves. A cartogram, by contrast, discards land area completely, providing readers a more striking visualization of the state’s population distribution and its impact on election results.

Yet, while county-level population cartograms better reflect the geography of Virginia’s voting patterns than traditional choropleth maps, they mask how this geography is changing through time. The simplest technique to show geographic
patterns of voting trends is to create a series of cartograms—one map for each election year. This method, however, may not reveal counties where support for Republicans, for example, is declining even though they continue to win those counties. For that reason, we have calculated changes in the percent of all votes cast between 2000 and 2012 and mapped the results on the same population cartogram.

Additionally, a more detailed picture of changing voting patterns within key suburban counties can help explain their recent shift from solidly Republican to toss-up or even leaning Democratic. For that reason we mapped the 2000 and 2012 election results by precinct in the Richmond and Fredericksburg areas. Because precinct boundaries change over time, especially in fast-growing suburban counties, there is no simple way to show changes in support for one party or the other on a single map.

**Visualizing Recent Presidential Elections in Virginia**

The suburban counties that Republicans continue to win were marked in 2012 by far more modest majorities than in previous election cycles. In Chesterfield, one of the state’s most conservative large counties, Barack Obama received 45.4 percent of the vote, more than ten points above Al Gore’s share in 2000. Virginia Beach also went for Mitt Romney, but Obama’s 48 percent showing there was well above Gore’s 41.6 percent. Further north, it is the same story. In Stafford and Spotsylvania, the two most populous counties in Washington, D.C.’s outer ring suburbs that supported Romney in the 2012 election, Obama received 44.9 percent and 43.4 percent respectively. (Gore failed to crack 40 percent in those two counties in 2000.)

The aggressive Democratic get-out-the-vote efforts of recent years may explain some of these narrowing margins in these traditionally Republican areas. After all, the Democrats did not really focus on Virginia’s Electoral College votes until 2008. Republicans, though, also have scaled up their voter contact operations in the state over the past two presidential election cycles.

As noted above, Republicans frustrated with the 2012 election may try to comfort themselves in the sea of red that marks the national electoral map. In a presidential election, Wyoming, Montana and other states with large geographic areas but small populations visually overwhelm small but more populous states in the Midwest and Northeast. Given these advantages in acreage for the Mountain and Southern states, a traditional map can make it look like Republican candidates win even when they lose.

The same is true when looking at county level results in Virginia. As shown in Figure 1, large counties in the Shenandoah Valley and the outer suburbs make the commonwealth’s independent cities and inner suburbs, with the exception of those with large land areas in Hampton Roads, all but invisible. And, since Democratic supporters are clustered in these more urbanized areas, their share of Virginia as mapped usually looks rather small.

This traditional choropleth map of 2012 election results in Virginia demonstrates this technique’s shortcomings. The jurisdictions where Obama won the largest margins are, almost without exception, independent cities with small geographic areas. By contrast, the counties where

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**Figure 1: Traditional Choropleth Map of 2012 Presidential Results for Virginia**

<table>
<thead>
<tr>
<th>Percent of Votes by County and Independent City</th>
<th>For Romney</th>
<th>For Obama</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 to 60%</td>
<td><img src="http://www.sbe.virginia.gov/ElectionResults.html" alt="Map" /></td>
<td><img src="http://www.sbe.virginia.gov/ElectionResults.html" alt="Map" /></td>
</tr>
<tr>
<td>61 to 70%</td>
<td><img src="http://www.sbe.virginia.gov/ElectionResults.html" alt="Map" /></td>
<td><img src="http://www.sbe.virginia.gov/ElectionResults.html" alt="Map" /></td>
</tr>
<tr>
<td>&gt; 70%</td>
<td><img src="http://www.sbe.virginia.gov/ElectionResults.html" alt="Map" /></td>
<td><img src="http://www.sbe.virginia.gov/ElectionResults.html" alt="Map" /></td>
</tr>
</tbody>
</table>


Map by Stephen P. Hanna, University of Mary Washington Geography Department.
Romney won the largest margins tend to be sparsely populated rural counties with large land areas. In addition, the Republican ticket carried the majority of the state's counties despite losing the popular vote by 150,000 votes.Mapped in this way, Virginia appears to be solidly Republican.

Mapping the same results on a population cartogram, as shown in Figure 2, changes this picture drastically. Counties and independent cities are scaled by their 2010 populations. While there are some variations in age distribution and voter turnout among Virginia’s counties and cities, population remains highly correlated with vote counts—especially in presidential elections when turnout is high. As a result, on this cartogram Fairfax County’s population of 1,081,726 ensures it takes up more than twice the space of Prince William County (population of 402,002).

High population areas where Obama won over 70 percent of the vote, such as Richmond, Alexandria and Norfolk are now larger in size that the lightly populated counties in Southwest Virginia. More significantly, the Democratic ticket won 59.6 of the vote in the commonwealth’s most populous county, Fairfax, and won by smaller margins in Loudoun, Prince William and Henrico—all rapidly growing suburban counties that, as recently as 2004, supported Republican candidates. On the whole, the cartogram provides a better visualization of the actual results by highlighting the president’s success in the state’s most populous suburban counties.

Mapping changes in support for Republican and Democratic presidential candidates between 2000 and 2012 shows the correlation between high population areas and increasing support for Democrats even more starkly. On Figure 3 the counties and independent cities are sized, once again, by their populations, not their areas. However, the colors represent increases in the percentage of votes cast for the winning party from 2000 to 2012. For example, Obama earned 45.4 percent of the vote in Chesterfield County, while Gore only received 34.8 percent twelve years early. Therefore, a medium blue is assigned to the county since Democratic support increased by 10.6 percent. As this map indicates, Democrats have gained ground in all of Virginia’s urban and suburban counties while Republicans only enjoyed substantial increases in support in Southwest Virginia—an area where population growth is minimal or even negative. The rapidly growing suburban counties of Chesterfield, Stafford and Spotsylvania are especially noteworthy. While Republicans held on to all three, Support for Democratic candidates over this dozen-year period increased by 9.8 percentage points in Chesterfield, by 6.9 percentage points in Stafford, and by 5 percentage points in Spotsylvania.

Mapping the 2000 and 2012 presidential election results by precinct further demonstrates this trend in the suburbs. To compare, we use traditional choropleth maps with 2000 and 2012 presidential election results by precinct in the Fredericksburg area (Fredericksburg City and the counties of Stafford and Spotsylvania). Figures 4 and 5 show a similar pattern of change when comparing the results in 2000 and 12 years later in 2012. In Figure 4, which covers 2000, Gore received minimal support outside Fredericksburg.
Figure 3: Cartogram Map of Presidential Elective Voting Trends in Virginia by County and Independent City, 2000 to 2012

Increase in Percent of Votes Cast by County and Independent City
For Republicans
- < 5%
- 5 to 15%
- > 15%
For Democrats
- < 5%
- 5 to 15%
- > 15%

Map by Stephen P. Hanna, University of Mary Washington Geography Department.

Figure 4: 2000 Presidential Results, Fredericksburg Area

Percent of Votes by Precinct
For Bush
- 50 to 60%
- 61 to 70%
- > 70%

For Gore
- 50 to 60%
- 61 to 70%
- > 70%

Map by Stephen P. Hanna, University of Mary Washington Geography Department.
City’s fourth ward. He did not win a single precinct in the neighboring counties of Stafford and Spotsylvania. Twelve years later, however, Figure 5 illustrates that President Obama won every city precinct and secured clear majorities in precincts clustered along I-95 in both counties and within short drives of Virginia Railway Express stops. While conservatives may take comfort in the sizable acreage of Stafford and Spotsylvania that remain solidly Republican, these areas—like the reliably red rural counties and states on national maps—are not the fastest growing nor are they the most populous areas. The precincts with some of the greatest population increases—including those near I-95, Garrisonville Road and U.S. Route 17—are notably more Democratic than they were a dozen years ago. Several precincts in these two counties that remained Republican were noticeably less so in 2012.

Figures 6 and 7 show the same type of precinct analysis for the Richmond area, defined as the three most populous adjoining localities—Richmond City and the counties of Chesterfield and Henrico. In 2000, Figure 6 illustrates Gore’s strength in Richmond City as well as in several nearby precincts in Henrico County. Overall, though, Gore only won 42.6 percent of the vote in Henrico. In Chesterfield, the Democrat won only a few precincts, and 34.8 percent of the vote. In 2012, the Democrats continued to win Richmond City overwhelmingly and the party increased both the number of suburban precincts it won as well as increasing its vote share in the relatively small number of Henrico and Chesterfield precincts where it emerged victorious twelve years earlier. As shown in Figure 7, many of the Democratic gains in Chesterfield were clustered along I-95 and the fast-growing corridors near the Midlothian Turnpike (also known as U.S. Route 60), the Powhite Parkway, and U.S. Route 360.

Conclusions
When compared to more traditional mapping methods, a population cartogram displaying county-level election results provides a compelling picture of Virginia’s electoral geography for at least two reasons. First, it reminds viewers that elections are determined by people and

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The Virginia News Letter

Figure 6: 2000 Presidential Election Results, Richmond Area

Percent of Votes by Precinct
For Bush
- 50 to 60%
- 61 to 70%
- > 70%

For Gore
- 50 to 60%
- 61 to 70%
- > 70%

Precinct boundaries are from 2009 TIGER/Line Data: [http://www.esri.com/data/free-data](http://www.esri.com/data/free-data)
Map by Stephen P. Hanna, University of Mary Washington Geography Department.

Figure 7: 2012 Presidential election Results, Richmond Area

Percent of Votes by Precinct
For Romney
- 50 to 60%
- 61 to 70%
- > 70%

For Obama
- 50 to 60%
- 61 to 70%
- > 70%

Precinct boundaries are from 2009 TIGER/Line Data: [http://www.esri.com/data/free-data](http://www.esri.com/data/free-data)
Map by Stephen P. Hanna, University of Mary Washington Geography Department.
not acreage. Second, its distortions of the shapes of counties and the state as a whole is unfamiliar, perhaps even disturbing, to most people. This fact is key to a cartogram’s utility; it challenges readers to rethink their assumptions about voting patterns. Mapping changes in support for the two parties’ presidential candidates over the past twelve years on the same population cartogram is, perhaps, an even more startling visualization. Put simply, it reveals that demographic changes in all of Virginia’s most populous jurisdictions have greatly increased the likelihood that Democratic candidates will win the state.

It is important, however, not to rely on just a county-level map, especially when trying to understand the rapidly changing suburban battle- grounds. Such a picture is highly generalized and hides these county’s complexities. Supplementing the cartograms by mapping the results of different elections at the precinct level helps pinpoint those areas where support is shifting from Republican to Democratic presidential candidates most dramatically. Their locations along major commuting arteries in both the Fredericksburg and Richmond effectively illustrate the argument that newer suburban migrants tend to cluster in denser residential neighborhoods along primary commuter routes and that these more recent suburbanites are much less conservative than their predecessors.

The U.S. and Virginia are not lands of permanent majorities. Many Virginia suburbs, we have seen, are shifting rapidly in their partisan preferences. Both parties have shown themselves to be sufficiently flexible to win their share of elections over the years. When the state’s suburban winds blew to the right, the Democrats tried to respond. Now that the suburban winds are shifting, the Republicans may have to make their own course corrections to continue to compete for Virginia’s highly prized 13 Electoral College votes. These newer visual representations of voter preferences help illustrate more clearly these electoral trends and challenges.

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Stephen J. Farnsworth is professor of political science and international affairs at the University of Mary Washington, where he directs the university’s Center for Leadership and Media Studies. During more than a decade at the University of Mary Washington, Dr. Farnsworth has won three campus-wide teaching awards. His current research focuses on portrayals of the U.S. presidency in domestic and international media. Farnsworth received his Ph.D. and M.A. in government from Georgetown University, after having received a B.A. in history from the University of Missouri-Kansas City and a B.A. in government from Dartmouth College. He is the author or coauthor of four books as well as numerous articles on the mass media, the presidency, and U.S. and Virginia politics. Before becoming an academic, Farnsworth worked for ten years as a daily newspaper journalist, mostly with the *Kansas City Star & Times.*

**Endnotes**
1 All election data used in this paper were obtained from the Virginia State Board of Elections at its website: http://www.sbe.virginia.gov/
4 Mark Newman posts cartograms of election results at: http://www-personal.umich.edu/~mejn/election/2012/
[Note: there is a charge to access the text.]
6 ScapeToad, which uses the Java computer programming language, is at: http://scapetoad.choros.ch/index.php
7 An example of a graduated symbol map is available at http://www.gislounge.com/post-election-maps-for-the-2012-presidential-election/
8 An example of a 3-D map is available at http://www.wmhartnett.com/2008/11/10/county-level-2008-election-results-as-3d-maps/
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