

# Measuring Access to Obstetric Services in South Carolina

**Kevin J. Bennett, PhD • Jessica Purser • Charles Carter, MD • Michele Stanek**

Obstetrics and gynecology services are a vital part of the health care delivery system. Unfortunately, these services are not always easily accessible by women needing their services. The purpose of this brief is to examine the current distribution of providers, and to identify areas in need of such services, particularly for rural populations in South Carolina. The results can then be utilized to strategically place providers to serve these areas.

## Key Findings

- Residents of many areas in the state live more than 30 minutes from an obstetrics provider. These areas include:
  - Southwest, near the Georgia Border
  - Low Country, -northwest of Charleston
  - Near the North Carolina Border, outside of the Greenville/Spartanburg area
  - Residents of rural areas are more likely to have a longer travel time
- These travel times can be explained by provider distributions
  - Ten counties (Abbeville, Allendale, Bamberg, Barnwell, Calhoun, Edgefield, Hampton, Lee, McCormick, and Saluda) have zero providers in their county.
  - Providers cluster in areas near urban centers and/or birthing hospitals
- Using a multifactor scoring index, counties, and zip codes within those counties, were identified as high need for services
  - Placements can now be targeted by high need county, then high need zip code within that county.

For this brief, obstetric providers included those with an active license for the following specialties: Obstetrics, Obstetrics and Gynecology, Gynecology, Neo-Natal, Maternal Fetal Medicine, and Neonatal-Perinatal Medicine. Also included in these data are Family Medicine residency sites that are known to provide obstetric services. Other FM providers are not included, as these data do not inform their obstetric service capabilities.

Data were drawn from licensure data, up to date as of September 2018.



## **Distribution of Obstetric Providers**

### Travel Time

A robust indicator for access to services is to estimate the travel to from a location to the nearest service<sup>1</sup>. As Figure 1 demonstrates, a substantial portion of the state is more than 30 minutes from an obstetrics provider (approximately 65% of the geographic area).

Many areas greater than 30 minutes from an obstetrics provider are uninhabitable or natural areas, such as national forests (See Figure 1). This occurs particularly near urban areas such as the wetlands south and west of the Charleston metro area and south and east of the Columbia metro area. However, some areas, such as portions of Florence and Marion County, have gaps despite their relative proximity to larger population centers. Many rural areas are populated yet are still more than 30 minutes away. These include a large contiguous portion of the western part of the state, the area between Augusta and Orangeburg, and the area between Augusta and Greenwood. Small gaps exist in counties such as in Chesterfield, Orangeburg, Berkeley, Colleton, Kershaw, Florence, Jasper, and Darlington. Fortunately, further analysis indicates that nearly 100% of the state is within 60 minutes of a provider.

### Distribution

These disparate travel times are reflect where providers choose to practice. As of July 2017, there were 928 active providers serving patients in South Carolina, for a ratio of 0.43 per 1,000 SC women aged 15-50 years old.

These providers are not distributed evenly across the state, with several large gaps and underserved areas. The ratio of OB/GYN to 1,000 residents, at the county level, ranges from 0.043 in Berkeley County to 1.218 in Charleston County (Table 1). The median ratio among counties with a provider was 0.24 (mean 0.31). Ten counties (Abbeville, Allendale, Bamberg, Barnwell, Calhoun, Edgefield, Hampton, Lee, McCormick, and Saluda) have zero providers in their county.

---

<sup>1</sup> Bosanac, E. M., Parkinson, R. C., & Hall, D. S. (1976). Geographic access to hospital care: a 30-minute travel time standard. *Medical Care*, 14(7), 616–624.



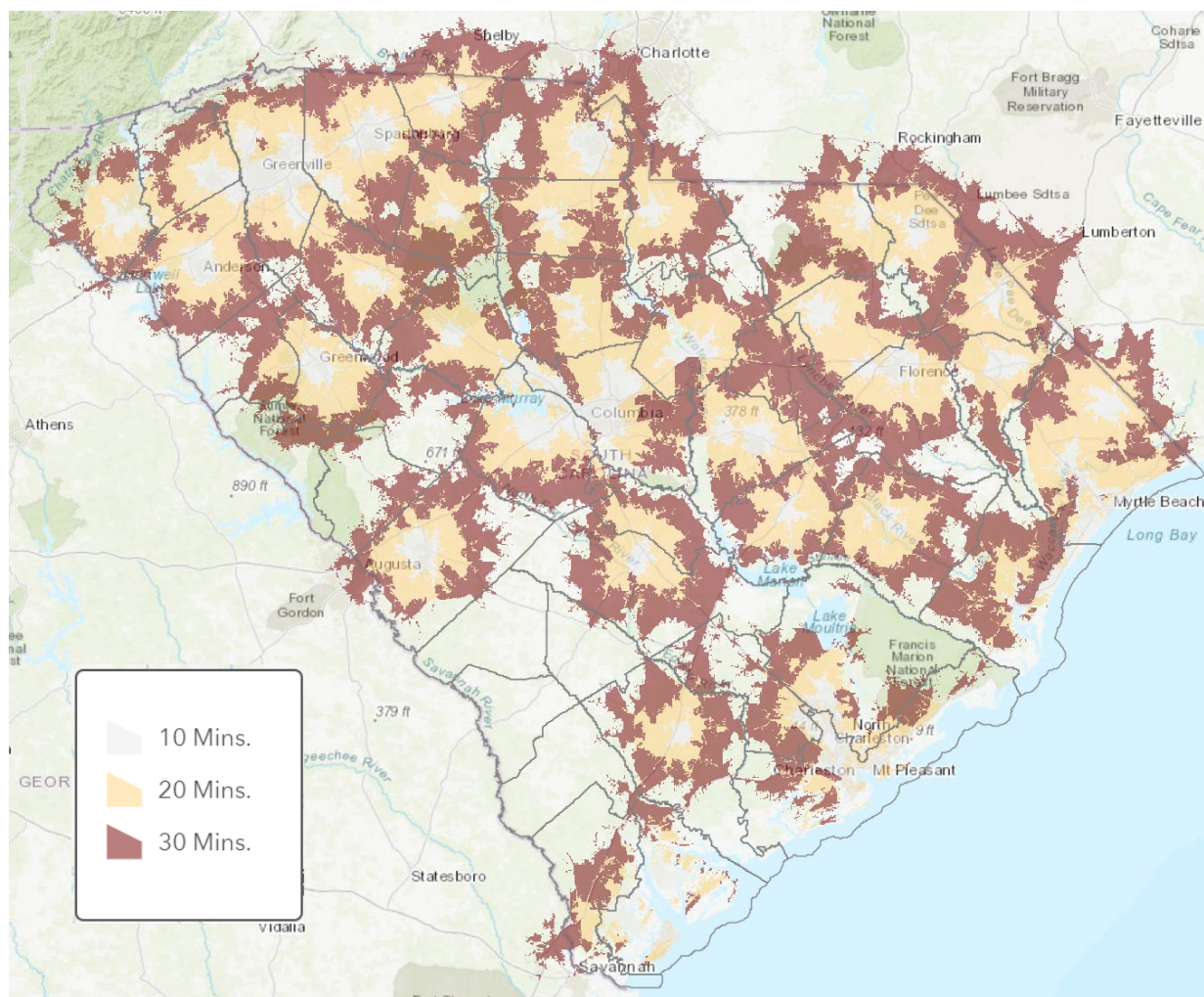
Using just the provider to resident ratios, one can identify counties that have none, low, medium, or high ratios (See Figure 2). Focusing on areas of high need, there are several counties that would theoretically demonstrate a high need for obstetric services. These counties are distributed throughout the state, particularly along the western border. These data can be misleading, however, as demonstrated in Figure 3. This figure displays results of the same division of ratios (none, low, medium, and high). These results demonstrate a much larger portion of the state's zip codes without providers at all, and very few with a high ratio.

**Table 1: Obstetric Providers per 1,000 Residents, by County**

County	Obstetric/FM Providers per 1,000 residents	County	Obstetric Providers per 1,000 residents
Abbeville County	0	Greenwood	0.539
Aiken County	0.158	Hampton County	0
Allendale County	0	Horry County	0.282
Anderson County	0.195	Jasper County	0.333
Bamberg County	0	Kershaw County	0.192
Barnwell County	0	Lancaster County	0.148
Beaufort County	0.550	Laurens County	0.139
Berkeley County	0.043	Lee County	0
Calhoun County	0	Lexington County	0.288
Charleston County	1.218	Marion County	0.229
Cherokee County	0.157	Marlboro County	0.255
Chester County	0.073	McCormick	0
Chesterfield County	0.050	Newberry County	0.194
Clarendon County	0.449	Oconee County	0.343
Colleton County	0.064	Orangeburg	0.227
Darlington County	0.173	Pickens County	0.170
Dillon County	0.533	Richland County	0.631
Dorchester County	0.203	Saluda County	0
Edgefield County	0	Spartanburg	0.357
Fairfield County	0.212	Sumter County	0.356
Florence County	0.497	Union County	0.350
Georgetown County	0.457	Williamsburg	0.076
Greenville County	0.803	York County	0.265

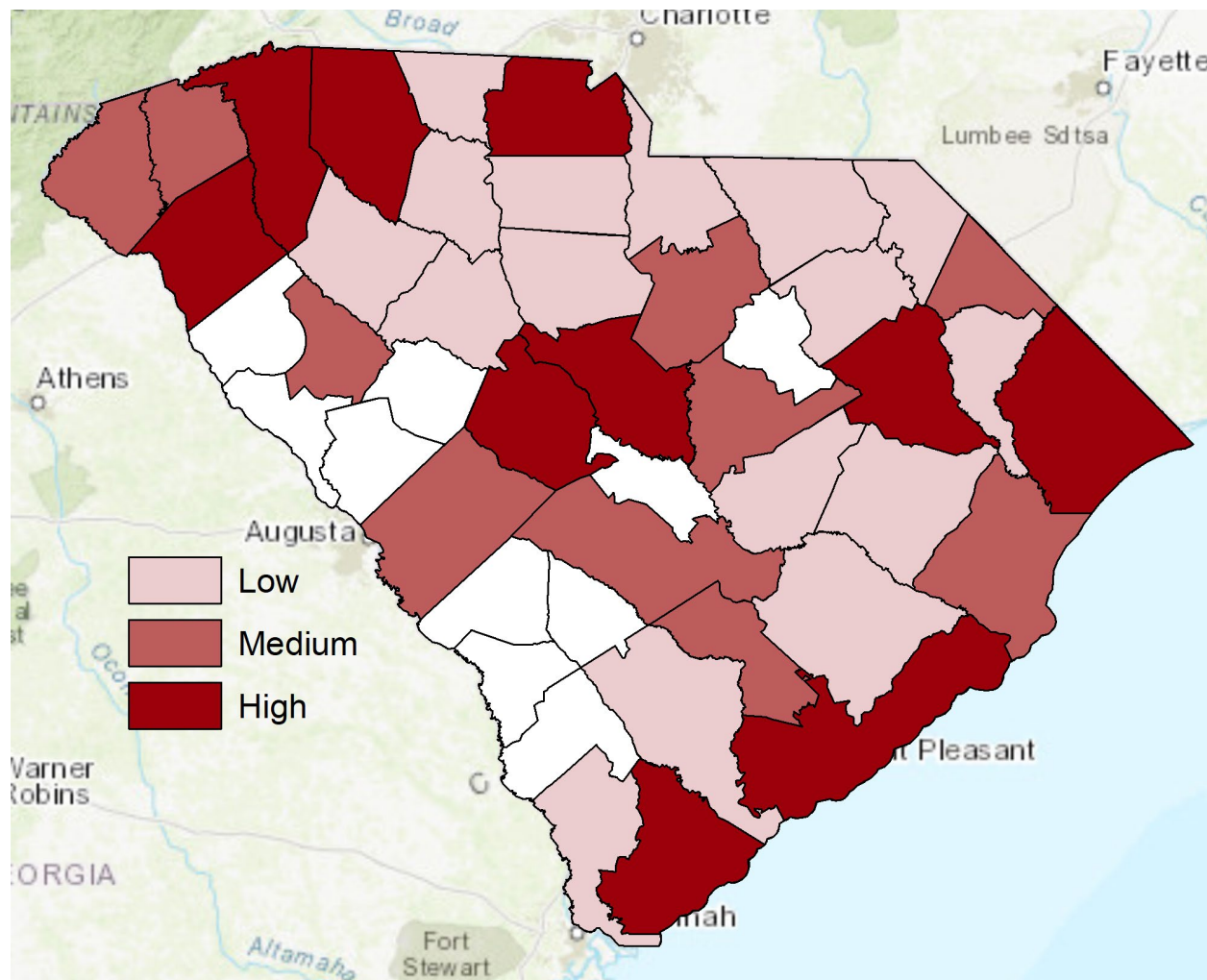


**Figure 1: Travel time (minutes) to reach an Obstetric Provider in South Carolina**

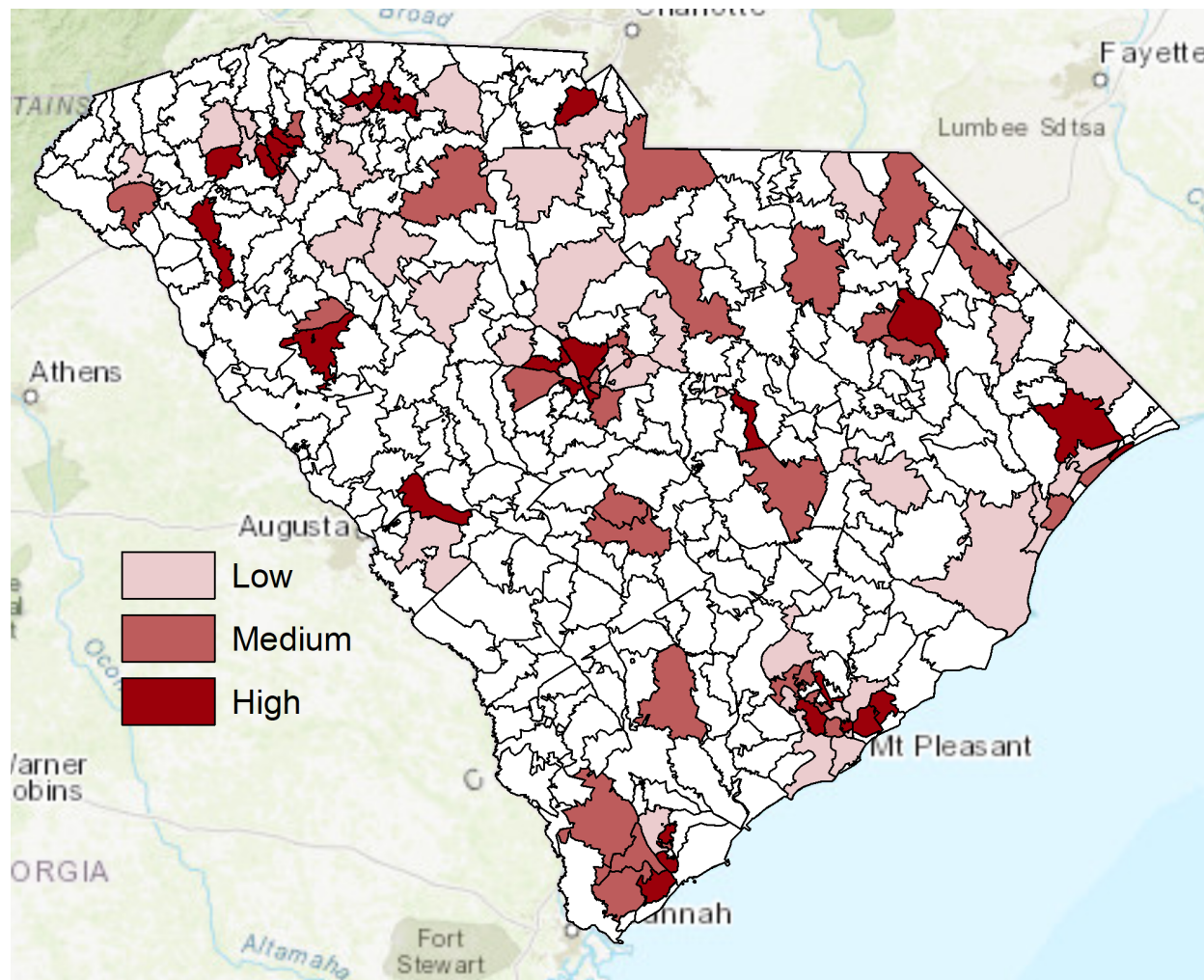




**Figure 2: Distribution of Obstetric Providers, by County**



**Figure 3: Distribution of Obstetric Providers, by Zip Code**



## Identifying areas of need

In order to target areas that would benefit from an obstetrics provider, we utilized the data displayed above, as well as additional community-level information, to create a need index for obstetrics services. This index utilized several factors that would indicate a higher need for such services. These include:

- Obstetric Providers per 1,000
- Number of Health Care Facilities
- Percentage not within 30 minutes of an OBGYN
- Number of women aged 15-50
- Birth Rate
- Percent rural (according to census data)

These factors were standardized, summed, then re-scaled to range from 0-100 (with 100 indicating an area with the highest need for services). A need index was calculated for both the county and zip code level.

Using this index, the average score at the county level was 32.2 (median 30.8). Fourteen counties had a score greater than 40, with 7 of those scoring greater than 60 (McCormick had a score of 100, indicating the highest need – See Table 2). All of these counties were also predominately rural.

**Table 2: Index Scores, by county**

County	Need Index	County	Need Index	County	Need Index
McCormick	100.0	Laurens	37.7	Anderson	17.2
Fairfield	65.8	Clarendon	36.8	Pickens	16.9
Calhoun	65.7	Jasper	34.2	Greenwood	16.0
Edgefield	64.2	Dillon	33.8	Berkeley	11.8
Saluda	61.9	Union	33.2	Florence	11.4
Lee	60.6	Cherokee	32.0	Sumter	10.4
Hampton	60.5	Kershaw	31.7	Beaufort	10.4
Williamsburg	56.0	Marlboro	30.0	Lexington	10.4
Allendale	51.0	Darlington	28.9	Spartanburg	10.0
Abbeville	49.4	Orangeburg	28.6	York	8.4
Newberry	45.5	Lancaster	27.4	Dorchester	7.4
Barnwell	44.7	Georgetown	24.6	Greenville	2.3
Chesterfield	43.9	Bamberg	21.7	Richland	0.9
Colleton	43.5	Marion	20.2	Charleston	0.0
Chester	39.5	Aiken	18.9		
Oconee	39.1	Horry	17.7		



If we were to focus on just those counties with the highest scores, we can then narrow down the placement process to zip codes within each county. This will help to ensure the greatest potential for impact of such a placement. Table 3 displays the zip codes within each of these 14 counties. For example, McCormick County has the highest overall need score, of 100. The zip codes that are within this county, however, range in need scores from 95.5 to 22.4. In addition, we can identify those zip codes that not only have a high score, but are mostly within the high need counties. Using this additional information, one would target zip codes 29899 (score of 95.5, 100% in the county) over 29819 (score of 77.4, but only 0.7% in the county).

The fourth column in Table 3 produces a weighted score for each zip code in the high need counties – this is simply the individual zip code score multiplied by the percentage in the county. Using this score, priorities for that specific county would emerge.

**Table 3: Need Scores by County and Zip, weighted and Unweighted**

<u>County/Zip</u>	<u>Index</u>	<u>Percent in the County</u>	<u>Weighted Score</u>
<b>McCormick</b>	<b>100.0</b>		
29899	95.5	100.0%	95.5
29819	77.4	0.7%	0.6
29848	76.4	9.9%	7.6
29838	71.4	64.0%	45.7
29840	69.4	100.0%	69.4
29845	67.2	98.7%	66.4
29835	65.7	94.6%	62.1
29821	46.1	54.5%	25.1
29844	40.2	100.0%	40.2
29620	22.4	0.4%	0.1
<b>Fairfield</b>	<b>65.8</b>		
29130	81.5	78.6%	64.0
29132	81.5	100.0%	81.5
29055	76.7	17.4%	13.3
29014	75.6	32.8%	24.8
29031	70.6	10.9%	7.7
29065	67.8	100.0%	67.8
29015	59.8	100.0%	59.8
29180	46.2	98.0%	45.2
29045	33.9	0.4%	0.1
29016	33.0	2.0%	0.7
<b>Calhoun</b>	<b>65.7</b>		
29047	82.4	49.5%	40.8
29160	75.2	25.1%	18.9
29030	72.5	73.4%	53.2
29135	70.2	97.0%	68.1
29112	62.3	4.7%	2.9
29053	41.5	6.5%	2.7





	29118	29.7	1.6%	0.5
<b>Edgefield</b>		<b>64.2</b>		
	29848	76.4	0.4%	0.3
	29838	71.4	36.0%	25.7
	29832	70.0	93.2%	65.2
	29129	69.6	4.9%	3.4
	29847	69.4	76.1%	52.8
	29845	67.2	1.3%	0.9
	29835	65.7	5.4%	3.6
	29821	46.1	45.5%	20.9
	29138	45.6	0.1%	0.1
	29824	32.7	100.0%	32.7
	29860	25.3	57.9%	14.6
	29841	2.1	0.0%	0.0
<b>Saluda</b>		<b>61.9</b>		
	29666	75.4	3.0%	2.3
	29127	70.5	0.1%	0.1
	29832	70.0	6.5%	4.6
	29129	69.6	33.7%	23.4
	29105	68.9	20.7%	14.3
	29070	62.5	16.9%	10.6
	29166	51.1	100.0%	51.1
	29006	46.8	24.5%	11.5
	29138	45.6	98.1%	44.7
	29824	32.7	0.0%	0.0
<b>Lee</b>		<b>60.6</b>		
	29104	85.5	52.7%	45.1
	29128	85.0	14.1%	12.0
	29069	83.8	9.2%	7.7
	29009	68.6	2.0%	1.4
	29032	67.5	6.5%	4.4
	29080	55.3	50.2%	27.8
	29010	50.0	99.3%	49.6
	29550	39.8	0.9%	0.3
	29153	39.6	3.2%	1.3
	29040	32.0	8.8%	2.8
	29020	30.8	2.9%	0.9
	29046	10.8	100.0%	10.8
<b>Hampton</b>		<b>60.5</b>		
	29934	72.9	10.9%	8.0
	29921	70.1	100.0%	70.1
	29939	68.7	100.0%	68.7
	29945	64.6	30.7%	19.8
	29923	64.3	100.0%	64.3
	29911	63.1	100.0%	63.1
	29916	62.5	58.9%	36.8
	29827	62.4	3.4%	2.1
	29932	61.0	100.0%	61.0
	29933	61.0	100.0%	61.0
	29918	55.5	100.0%	55.5
	29922	52.4	79.0%	41.4
	29944	35.7	100.0%	35.7



	29924	24.2	100.0%	24.2
<b>Williamsburg</b>		<b>56.0</b>		
	29518	80.3	97.9%	78.6
	29056	79.8	100.0%	79.8
	29580	78.7	100.0%	78.7
	29590	77.9	100.0%	77.9
	29554	60.9	57.7%	35.2
	29555	53.2	3.0%	1.6
	29510	45.5	38.6%	17.6
	29556	40.7	100.0%	40.7
	29440	37.3	0.1%	0.0
	29564	34.6	100.0%	34.6
	29560	27.5	10.4%	2.9
<b>Allendale</b>		<b>51.0</b>		
	29836	71.4	90.4%	64.6
	29846	67.2	100.0%	67.2
	29827	62.4	96.6%	60.3
	29849	53.7	81.8%	43.9
	29810	19.7	100.0%	19.7
<b>Abbeville</b>		<b>49.4</b>		
	29819	77.4	5.1%	4.0
	29638	75.0	82.2%	61.7
	29653	74.4	2.6%	1.9
	29639	65.0	100.0%	65.0
	29692	63.9	14.9%	9.5
	29655	59.6	33.8%	20.2
	29628	52.1	100.0%	52.1
	29659	48.1	100.0%	48.1
	29627	46.3	0.2%	0.1
	29654	41.4	19.0%	7.9
	29620	22.4	99.6%	22.3
	29646	20.4	0.4%	0.1
	29649	13.6	0.7%	0.1
<b>Newberry</b>		<b>45.5</b>		
	29122	82.3	100.0%	82.3
	29037	80.4	96.7%	77.7
	29075	79.3	66.0%	52.3
	29145	79.2	100.0%	79.2
	29332	73.7	7.0%	5.1
	29178	73.7	88.4%	65.1
	29127	70.5	99.9%	70.4
	29126	64.3	100.0%	64.3
	29108	31.9	100.0%	31.9
	29036	20.8	1.3%	0.3
	29355	6.8	53.5%	3.6
<b>Barnwell</b>		<b>44.7</b>		
	29808	78.9	100.0%	78.9
	29836	71.4	9.6%	6.9
	29853	69.2	79.8%	55.3
	29843	64.7	34.2%	22.1
	29826	62.4	100.0%	62.4
	29849	53.7	18.2%	9.8



29817	36.6	96.1%	35.2
29812	33.3	100.0%	33.3
29813	33.3	100.0%	33.3
<b>Chesterfield</b>	<b>43.9</b>		
29709	80.9	100.0%	80.9
29101	80.4	80.7%	64.9
29741	76.1	100.0%	76.1
29593	74.5	24.0%	17.9
29067	70.6	0.1%	0.0
29727	66.7	100.0%	66.7
29718	61.3	89.1%	54.6
29584	48.4	100.0%	48.4
29550	39.8	6.4%	2.5
29728	34.9	100.0%	34.9
29520	34.2	100.0%	34.2
<b>Colleton</b>	<b>43.5</b>		
29474	79.4	100.0%	79.4
29475	77.2	100.0%	77.2
29082	75.4	97.3%	73.4
29435	72.9	100.0%	72.9
29929	72.1	100.0%	72.1
29472	71.7	11.0%	7.9
29446	71.1	100.0%	71.1
29481	66.3	87.8%	58.2
29945	64.6	36.4%	23.5
29493	63.7	100.0%	63.7
29438	56.9	39.8%	22.7
29432	54.2	0.3%	0.2
29452	51.9	100.0%	51.9
29081	44.0	1.2%	0.5
29488	41.7	100.0%	41.7

