



Charting a Course to 2040

SOUTH CAROLINA MULTIMODAL TRANSPORTATION PLAN

Technical Memorandum

EXISTING CONDITIONS

Prepared for:



Prepared by:



April 2013



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1. INTRODUCTION

This report was prepared during development of the 2040 South Carolina Multimodal Transportation Plan.

1.1 REPORT PURPOSE

The purpose of this report is to summarize the existing conditions on the South Carolina’s multimodal transportation system. This information will provide the foundation upon which multimodal needs analyses will be conducted.

1.2 REPORT STRUCTURE

This report is divided into the following eight sections:

1. Introduction
2. Socioeconomic Conditions
3. Highways and Bridges
4. Aviation
5. Freight and Passenger Rail
6. Ports and Waterways
7. Public Transportation
8. Bicycle and Pedestrian

1.3 STRATEGIC PARTNERSHIPS

The South Carolina Department of Transportation (SCDOT) has the federally mandated responsibility to develop a statewide transportation plan with a 20-year horizon. The development of the 2040 South Carolina Multimodal Transportation Plan is being conducted in partnership and in coordination with the South Carolina Department of Commerce (DOC), South Carolina Ports Authority (SCPA), and Federal Highway Administrations (FHWA), as well as hundreds of regional and local stakeholders from a variety of agencies and organizations throughout the state.

- South Carolina Department of Transportation (SCDOT) is charged with the responsibility for the systematic planning, design, construction, maintenance, and operation of the state highway system and coordinating mass transit services. SCDOT operates and maintains 41,409 miles of roads and bridges, which ranks as the fourth largest state-owned highway system in the nation. The agency emphasizes the importance of safety, environmental stewardship, and system maintenance and preservation through its “Fix It First” strategy. The Department coordinates state and federal programs relating to highways among all departments, agencies, and government entities of South Carolina along with other duties and matters as may be delegated to it pursuant to law. With the recent increase in local-option sales taxes for transportation, the creation of the

South Carolina Transportation Infrastructure Bank, and the expansion of regional and metropolitan planning organizations, the importance of partnering has grown.

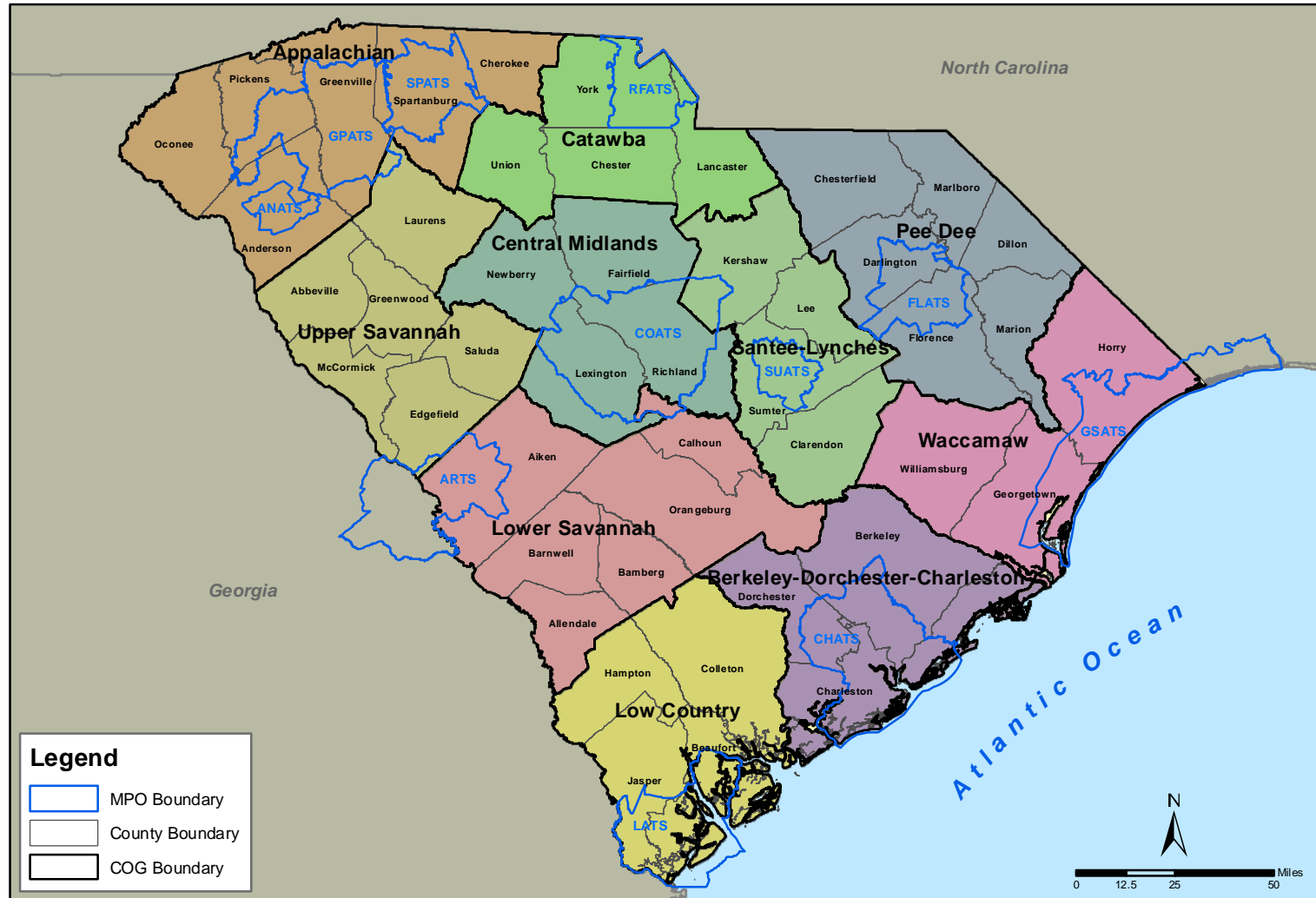
- South Carolina Department of Commerce promotes economic opportunity for individuals and businesses in the state, through the recruitment of new businesses and assisting existing businesses with growth.
- South Carolina Ports Authority works to increase economic investment to South Carolina while operating the state's seaport assets in Charleston and Georgetown, as well as the Inland Port located in Greer in the Upstate.

Within South Carolina, transportation planning at the urban and regional levels is conducted by 10 Metropolitan Planning Organizations (MPOs) and 10 Councils of Governments (COGs), as listed below and shown in **Figure 1-1**.

Metropolitan Planning Organizations

- ANATS – Anderson Area Transportation Study
- ARTS – Augusta/Aiken Area Transportation Study
- CHATS – Charleston Area Transportation Study
- COATS – Columbia Area Transportation Study
- FLATS – Florence Area Transportation Study
- GRATS – Greenville Area Transportation Study (boundary revised following the 2010 Census)
- GSATS – Myrtle Beach Area Transportation Study
- RFATS – Rock Hill Area Transportation Study
- SPATS – Spartanburg Area Transportation Study
- SUATS – Sumter Area Transportation Study

Figure 1-1: South Carolina MPOs and COGs



Source: SCDOT

Councils of Government

- Appalachian Council of Governments (Anderson, Cherokee, Greenville, Oconee, Pickens, Spartanburg)
- Berkeley-Charleston-Dorchester Council of Governments (Berkeley, Charleston, Dorchester)
- Catawba Regional Planning Council (Chester, Lancaster, Union, York)
- Central Midlands Council of Governments (Fairfield, Lexington, Newberry, Richland)
- Lowcountry Council of Governments (Beaufort, Colleton, Hampton, Jasper)
- Lower Savannah Council of Governments (Aiken, Allendale, Bamberg, Barnwell, Calhoun, Orangeburg)
- Pee Dee Regional Council of Governments (Chesterfield, Darlington, Dillon, Florence, Marion, Marlboro)
- Santee-Lynches Regional Council of Governments (Clarendon, Kershaw, Lee, Sumter)
- Upper Savannah Council of Governments (Abbeville, Edgefield, Greenwood, Laurens, McCormick, Saluda)
- Waccamaw Regional Planning and Development Council (Georgetown, Horry, Williamsburg)

This strategic partnership creates a strong foundation to identify multimodal transportation needs and joint solutions that will improve the movement of people and goods throughout the entire state.



2. SOCIOECONOMIC CONDITIONS

Demand for transportation services are primarily driven by socio-economic factors such as population and employment. Trends in these factors are summarized below as they provide the foundation for the projected growth in transportation demand.

2.1 POPULATION TRENDS

2.1.1 Historical Trends

Between 2000 and 2010, the population of South Carolina increased by 15 percent, from 4.012 million to 4.625 million. Compared to the U.S. growth during the same period of 9 percent, South Carolina’s growth was almost 70 percent greater than the nation’s, but comparable to nearby states. Population totals and growth rates in the past two decades are shown in **Table 2-1** and **Figure 2-1** for South Carolina, nearby states and the country as a whole.

South Carolina’s 2010 population placed it 24th in rank compared to other states, compared to 26th in 2000 and 25th in 1990.

Table 2-1: South Carolina Population in 1990, 2000, and 2010

State	Population			Annual Growth Rate	
	1990	2000	2010	1990-2000	2000-2010
South Carolina	3,486,703	4,012,012	4,625,364	1.51%	1.53%
North Carolina	6,628,637	8,049,313	9,535,483	2.14%	1.85%
Tennessee	4,877,185	5,689,283	6,346,105	1.67%	1.15%
Georgia	6,478,216	8,186,453	9,687,653	2.64%	1.83%
Alabama	4,040,587	4,447,100	4,779,736	1.01%	0.75%
United States	248,709,873	281,421,906	308,745,538	1.32%	0.97%

Source: U.S. Census Bureau

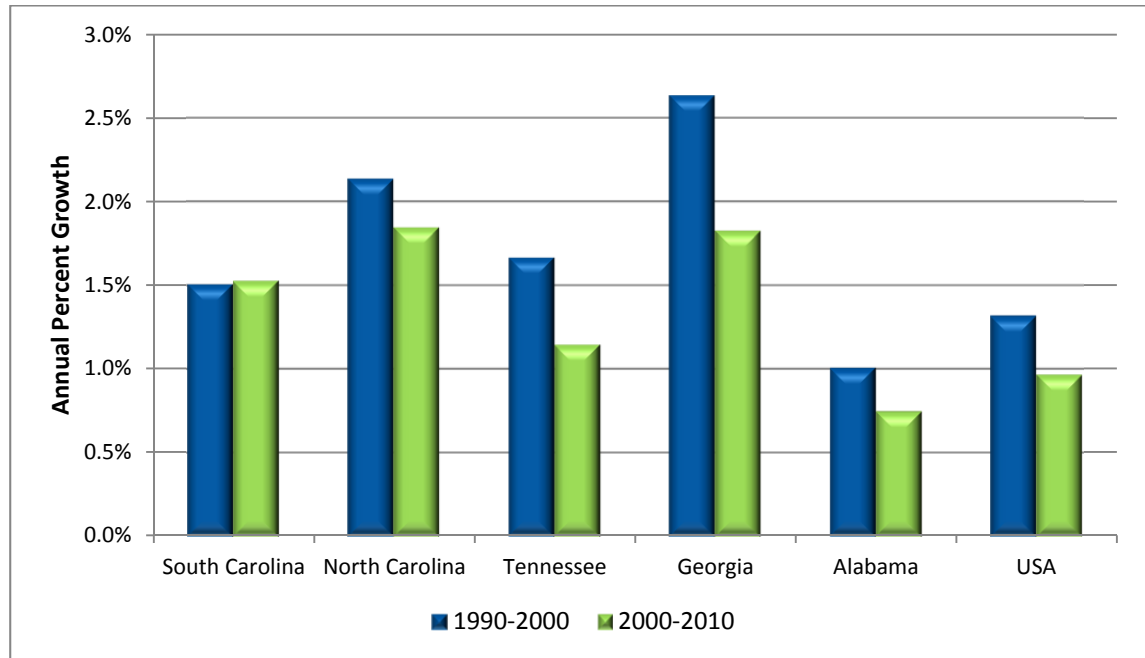
2.1.2 Population Projections

Population projections for South Carolina and nearby states, based on U.S. Census Bureau publications,¹ are summarized in **Table 2-2**.

The 15.1 percent rate of growth in population experienced by South Carolina in the 1990s (1.51 percent annually) increased slightly during the 2000’s to 1.53 percent annually, but the rate of growth is projected to decrease over the next 20 years. Overall, between 2010 and 2030, it is projected that South Carolina’s population will increase by 11.1 percent, from 4,625,364 at the 2010 Census to approximately 5,148,569 in 2030.

¹ U.S. Census Bureau, website at <http://www.quickfacts.census.gov>

Figure 2-1: South Carolina and Nearby States Population Growth Rates



Source: U.S. Census Bureau

The population of South Carolina is projected by the U.S. Census Bureau to increase over the next two decades, but at a slower rate than adjacent states and slower than the United States as a whole. This projection would reverse the trend seen from 1990 to 2010 when South Carolina increased in population at a rate greater than that of the U.S. and at a pace to neighboring states.

Table 2-2: Population Projections, 2010 – 2030

State	Population ⁽¹⁾	
	2020	2030
South Carolina	4,822,577	5,148,569
North Carolina	10,709,289	12,227,739
Tennessee	6,780,670	7,380,634
Georgia	10,843,753	12,017,838
Alabama	4,728,915	4,874,243
United States	341,387,000	373,504,000

State	Annual Percentage Growth		Total Percent Growth 2010-2030
	2010-2020	2020-2030	
South Carolina	0.4%	0.7%	11.1%
North Carolina	1.2%	1.4%	26.5%
Tennessee	0.7%	0.9%	15.7%
Georgia	1.2%	1.1%	22.7%
Alabama	-0.1%	0.3%	2.0%
United States	1.1%	0.9%	20.0%

Note: (1) 1990, 2000 and 2010 populations from Census. 2020, 2030 populations are U.S. Census Bureau projections from 2008. Projections to 2040 have not yet been released by the US Census Bureau.

2.1.3 Population Trends Within the State

The growth in population in South Carolina over the last 20 years has not been evenly distributed throughout the state. Growth in ten regions is shown in **Table 2-3**. Projected populations are also shown to 2040. These regions follow COG boundaries, shown previously in Figure 1-1.

Table 2-3: Population Growth by Council of Government

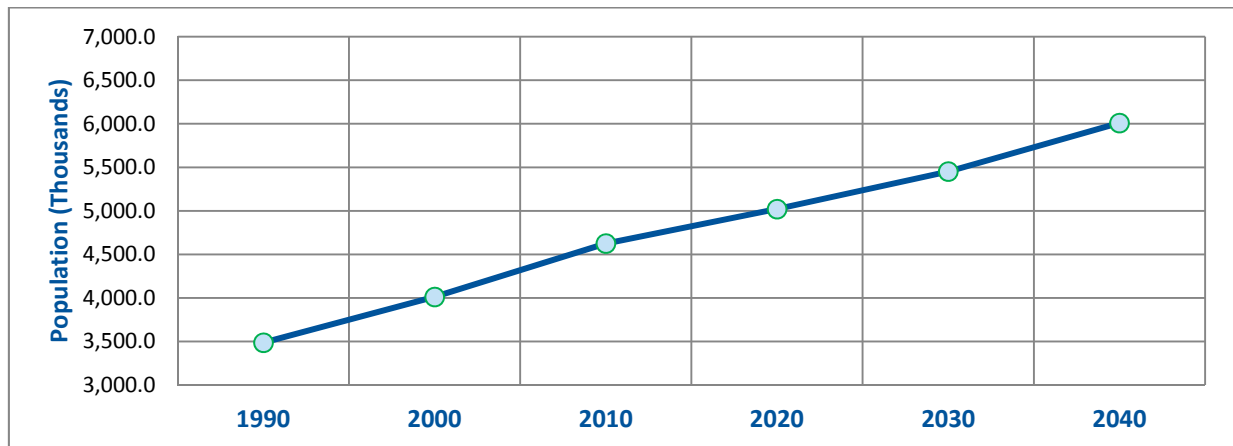
Council of Government Areas	Population (Thousands)						Annual Growth				
	1990	2000	2010	2020	2030	2040	90-00	00-10	10-20	20-30	30-40
Appalachian COG	888.0	1,028.7	1,171.5	1,260.2	1,371.3	1,512.4	1.5%	1.3%	0.7%	0.8%	1.0%
Berkeley-Charleston-Dorchester COG	506.9	549.0	664.6	736.0	806.0	891.6	0.8%	1.9%	1.0%	0.9%	1.0%
Catawba RPC	248.5	289.9	364.8	419.4	476.5	522.8	1.6%	2.3%	1.4%	1.3%	0.9%
Central Midlands	508.8	596.3	708.4	778.5	853.5	940.2	1.6%	1.7%	0.9%	0.9%	1.0%
Lowcountry COG	154.5	201.3	247.0	276.9	304.3	335.6	2.7%	2.1%	1.1%	0.9%	1.0%
Lower Savannah COG	300.7	309.6	313.3	327.4	338.8	380.0	0.3%	0.1%	0.4%	0.3%	1.2%
Pee Dee Regional	307.1	330.9	346.3	355.1	366.1	404.3	0.7%	0.5%	0.3%	0.3%	1.0%
Santee-Lynches COG	193.1	209.9	223.3	231.2	239.5	261.8	0.8%	0.6%	0.3%	0.4%	0.9%
Upper Savannah COG	185.2	215.7	218.7	220.6	226.0	247.5	1.5%	0.1%	0.1%	0.2%	0.9%
Waccamaw Reg. PDC	227.2	289.6	363.9	415.5	469.7	513.1	2.5%	2.3%	1.3%	1.2%	0.9%
South Carolina	3,486.7	4,012.0	4,625.4	5,020.8	5,451.7	6,009.3	1.4%	1.4%	0.8%	0.8%	1.0%

Source: South Carolina Data Center

All COG regions experienced growth from 1990 to 2010. In seven of the regions, growth was higher during the first decade than the second. Waccamaw Regional PDC and Lowcountry COG, both of which lie along the coast, saw the highest population increases over the two decades with Lower Savannah COG and Pee Dee Regional COG seeing the lowest.

Based on the regional population projections from the state data center the Catawba RPC and Waccamaw PDC will be the fastest growing regions over the 30-year period from 2010 to 2040. The Upper Savannah, Pee Dee Regional, and Santee-Lynches COGs are projected to have the lowest growth. Based on these projections the population of South Carolina will reach 6.0 million by 2040, some 30 percent higher than at the 2010 census, as shown in **Figure 2-2**.

Figure 2-2: South Carolina Population: 1990 to 2040



Source: U.S. Census Bureau - 1990, 2000, 2010, SC State Data Center - 2020, 2030, 2040

2.2 EMPLOYMENT TRENDS

South Carolina’s continued economic development depends heavily on the transportation infrastructure. The transportation system can also greatly influence the character and impact of development. If the system fails to provide the means for efficient and convenient movement of people and goods, the state’s economy may fail to grow to its potential.

2.2.1 Statewide Employment

Between 2000 and 2010 South Carolina’s employment rate as a percentage of the employable population (population over 16 years of age in the labor force) decreased from 63.40 percent to 62.89 percent. However the number employed grew by 269,475 or approximately 1.37 percent per year.

Table 2-4 compares employment data for South Carolina, nearby states and the nation. Employment growth in the state was greater than the nation’s rate of 1.12 percent per year. Nearby states ranged from 0.9 percent in Alabama to 1.55 percent in Georgia. South Carolina grew employment at a slower rate than population during the 10-year period, as was the case in all neighboring states except Alabama. Population aged 16 years and older is also shown to provide a comparison of the number of employed to the number of employable. This number can also be compared to population numbers above to see how much of the total population is employable.

Table 2-4: Statewide Employment Data for 2000 and 2010

State	2000	2010	Annual Growth		
	Employment	Employment	Employment	Population	2010 16 + Pop
South Carolina	1,974,222	2,243,697	1.37%	1.53%	3,567,959
North Carolina	4,130,579	4,725,801	1.44%	1.85%	7,287,107
Tennessee	2,822,908	3,098,473	0.98%	1.15%	4,919,958
Georgia	4,129,666	4,770,546	1.55%	1.83%	7,287,745
Alabama	2,061,169	2,246,848	0.90%	0.75%	3,714,504
United States	138,820,935	154,400,000	1.12%	0.97%	243,275,505

Source: U.S. Census Bureau. Employed persons 16 and over, excluding Armed Forces.

2.2.2 Employment Projections

Future trends for South Carolina employment are based on data obtained through the SC Works online website application. This site provided Occupational Employment Projections in South Carolina for all occupations using a base year of 2010 and a projected year of 2020. Employment projections are shown in **Table 2-5**.

Table 2-5: South Carolina Occupational Employment Projections – All Occupations

	2010 Estimated Employment	2020 Projected Employment	Employment Change	Annual Average Percent Change	Total Percent Change
All Occupations	1,956,014	2,227,380	271,366	1.3%	14.0%

Source: SC Works website



3. HIGHWAYS AND BRIDGES

3.1 HIGHWAY SYSTEM

3.1.1 Roads by Ownership and Road Classification

The number of center line miles and lane-miles of road maintained by SCDOT and by other agencies, such as cities, counties and private entities, is shown in **Table 3-1**. The distribution of SCDOT centerline miles and lane miles by District is shown in **Table 3-2**.

3.1.2 Trends in Vehicle-Miles of Travel

The last few years have seen a reversal of the customary trend of ever increasing usage of the highway system as measured by annual vehicle-miles of travel (VMT). Vehicle-miles of travel on South Carolina roads peaked in 2007 at 51 billion, as it did for the nation as a whole at 3,030 billion. Since 2007 VMT in South Carolina has fallen by an average of 1.2 percent per year, somewhat faster than the 0.7 percent rate for the U.S.A., as shown in **Figure 3-1**. While the decline in VMT is commonly attributed to the recent economic recession it remains to be seen whether an improving economy will result in a resumption of the historical trend of increasing annual levels of travel (VMT). The state-maintained road network is illustrated in **Figure 3-2**. **Table 3-3** shows vehicle-miles of travel in the state and nation from 1999 to 2011.

Table 3-1: Roadway Miles by Ownership

Road Classification	SCDOT		Federal, Local, etc.		Total	
	Miles	Lane Miles	Miles	Lane Miles ⁽¹⁾	Miles	Lane Miles
Rural Roads						
Rural Interstates	580.5	2,375.9	-	-	580.5	2,375.9
Rural Principal Arterials	1,289.4	3,860.0	70.9	283.8	1,360.4	4,143.7
Rural Minor Arterials	3,278.7	7,247.1	8.8	18.7	3,287.5	7,265.8
Rural Major Collectors	10,318.0	20,734.3	160.0	322.8	10,478.0	21,057.1
Rural Minor Collectors	1,976.2	3,952.3	177.2	354.4	2,153.4	4,306.8
Rural Local Roads	12,822.2	25,660.7	19,012.4	38,007.1	31,834.6	63,667.8
Rural Totals	30,264.9	63,830.3	19,429.4	38,986.8	49,694.4	102,817.1
Urban Roads						
Urban Interstates	270.1	1,423.6	-	-	270.1	1,423.6
Urban Expressways	81.8	320.4	6.8	39.8	88.6	360.2
Urban Principal Arterials	1,053.3	3,951.7	1.6	3.6	1,054.9	3,955.3
Urban Minor Arterials	1,477.7	3,968.2	40.7	107.9	1,518.3	4,076.1
Urban Collectors	2,207.4	4,646.4	247.0	710.8	2,454.4	5,357.2
Urban Local Roads	6,054.1	12,204.8	4,939.8	9,938.7	10,993.9	22,143.4
Urban Totals	11,144.4	26,515.1	5,235.9	10,800.7	16,380.2	37,315.8
Rural + Urban	41,409.3	90,345.4	24,665.3	49,787.5	66,074.6	140,132.9

Source: 2012 SCDOT Highway Performance Management System (HPMS) database

Note: (1) Some records lacked number of lanes, so two-lane were assumed in these cases. These numbers are therefore estimates and not official totals.

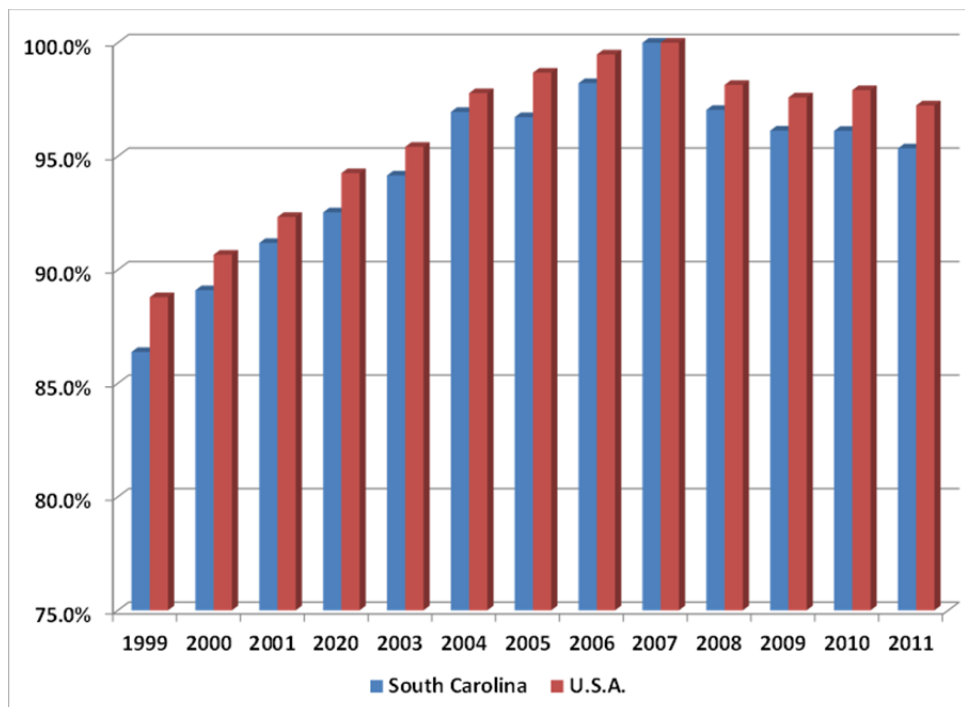
Table 3-2: Mileage by SCDOT District and Functional Class

	SCDOT District ⁽¹⁾							Total
	1	2	3	4	5	6	7	
Rural Roads								
Interstates	92.6	89.9	50.9	64.5	51.1	100.4	131.3	580.5
Principal Arterials	149.9	190.0	65.2	200.2	308.9	174.5	200.8	1,289.4
Minor Arterials	324.9	588.4	389.6	537.2	530.9	406.8	500.9	3,278.7
Major Collectors	1,272.0	1,833.4	971.8	1,609.3	1,879.2	946.5	1,805.8	10,318.0
Minor Collectors	154.2	280.5	163.7	348.9	460.2	281.4	287.3	1,976.2
Local Roads	1,530.7	2,174.5	871.6	2,115.1	2,335.9	1,349.9	2,444.5	12,822.2
Rural Totals	3,524.2	5,156.7	2,512.6	4,875.3	5,566.2	3,259.4	5,370.6	30,264.9
Urban Roads								
Interstates	76.6	12.7	79.9	20.0	16.3	49.4	15.3	270.1
Expressways	17.3	0.0	25.1	3.2	22.2	14.0	0.0	81.8
Other Principal Arterials	177.2	126.0	202.7	101.0	179.3	183.1	84.0	1,053.3
Minor Arterials	292.8	158.1	312.7	172.8	215.3	191.7	134.1	1,477.7
Collectors	382.3	277.7	604.1	231.0	277.0	259.9	175.3	2,207.4
Local Roads	1,332.6	530.6	638.6	715.0	1,043.9	982.4	811.1	6,054.1
Urban Totals	2,278.8	1,105.1	1,863.1	1,243.0	1,754.0	1,680.6	1,219.8	11,144.4
Rural + Urban	5,803.0	6,261.7	4,375.8	6,118.2	7,320.2	4,940.0	6,590.4	41,409.3

Note (1) District Office Location: 1. Columbia, 2. Greenwood, 3. Greenville, 4. Chester, 5. Florence, 6. North Charleston, 7. Orangeburg. Miles are SCDOT maintained miles.

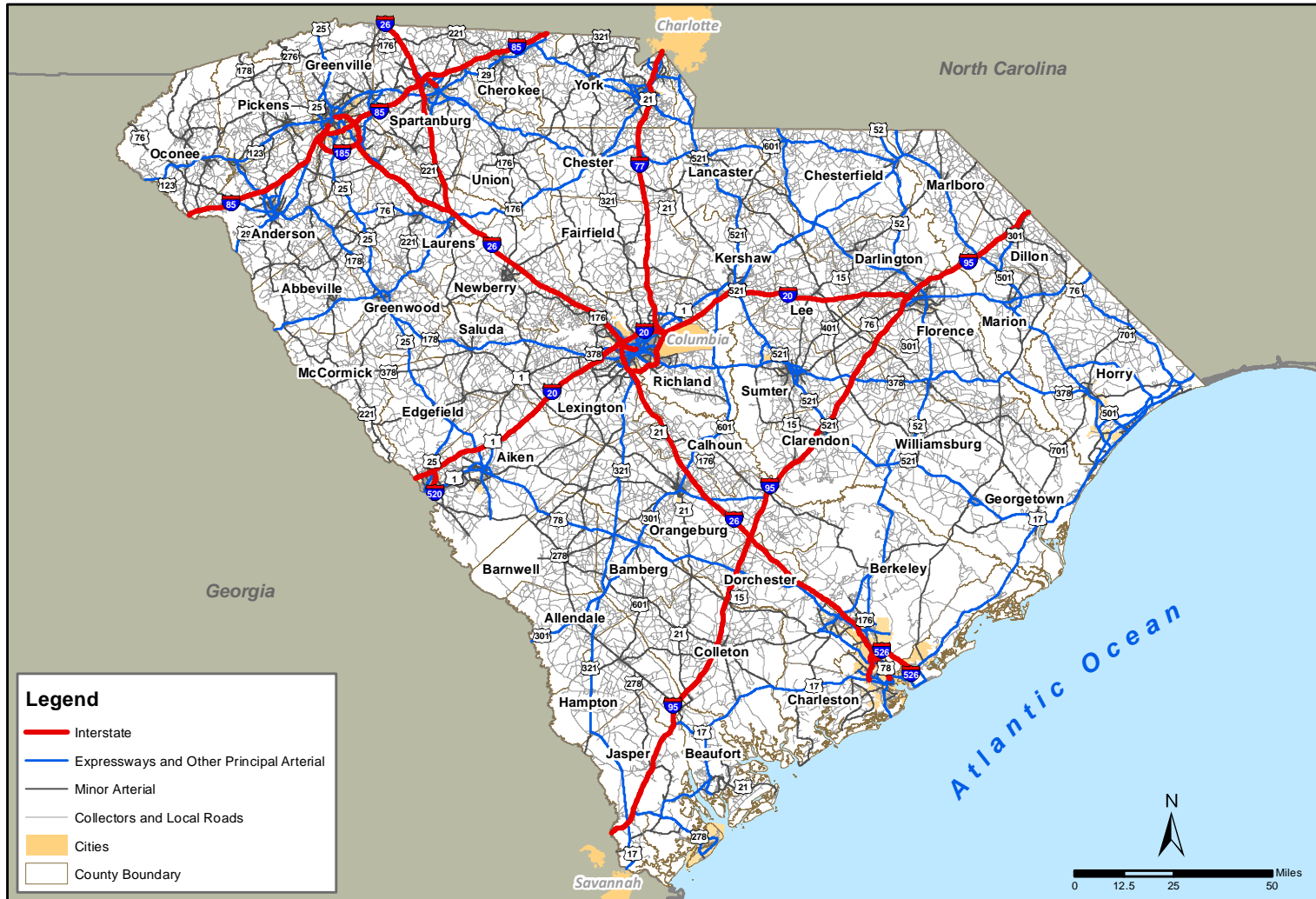
Source: SCDOT Highway Performance Management System (HPMS) database

Figure 3-1: Trends in Vehicle-Miles of Travel Before and After Peak in 2007



Source: FHWA, Office of Highway Policy Information, Highway Statistics Series.

Figure 3-2: State Maintained Highway System



Source: SCDOT

Table 3-3: Vehicle-Miles of Travel in South Carolina and U.S.A., 1999-2011

Road Classification	South Carolina Annual VMT (Millions)												
	1999	2000	2001	2020	2003	2004	2005	2006	2007	2008	2009	2010	2011
Rural Roads													
Interstates	8,081	8,472	8,596	8,758	9,015	9,413	7,441	7,570	7,694	7,355	7,411	7,596	7,461
Principal Arterials	4,676	4,724	4,692	4,836	4,920	4,958	3,637	3,655	3,678	3,548	3,482	3,510	3,448
Minor Arterials	6,440	6,598	6,707	6,851	6,787	7,038	5,321	5,201	5,385	5,102	5,000	4,982	4,947
Major Collectors	5,294	5,772	5,899	5,867	5,953	6,479	5,543	5,820	5,947	5,558	5,743	4,970	4,889
Minor Collectors	725	739	744	752	754	761	301	300	304	296	295	292	278
Local Roads	2,646	2,704	3,150	3,278	3,388	3,440	2,228	2,310	2,331	2,329	2,321	2,332	2,378
Rural Totals	27,862	29,009	29,788	30,342	30,817	32,089	24,471	24,856	25,339	24,188	24,252	23,682	23,401
Urban Roads													
Interstates	3,344	3,466	3,520	3,631	3,747	3,877	5,995	6,029	6,176	6,044	5,989	6,144	6,105
Expressways	726	746	753	788	778	801	803	831	852	835	838	812	813
Principal Arterials	5,236	5,237	5,212	5,264	5,307	5,368	7,570	7,581	7,662	7,452	7,294	7,304	7,250
Minor Arterials	3,953	3,989	4,025	4,024	4,079	3,991	5,183	5,353	5,491	5,471	5,245	5,590	5,566
Collectors	2,006	2,045	2,091	1,991	2,104	2,102	3,424	3,467	3,474	3,513	3,436	3,497	3,455
Local Roads	1,021	1,046	1,212	1,250	1,288	1,323	1,988	2,082	2,115	2,094	2,076	2,094	2,141
Urban Totals	16,286	16,529	16,813	16,948	17,303	17,462	24,963	25,343	25,770	25,409	24,878	25,442	25,329
Rural + Urban	44,148	45,538	46,601	47,290	48,120	49,551	49,434	50,199	51,109	49,597	49,130	49,124	48,730

Road Classification	U.S. Total Annual VMT (Millions)												
	1999	2000	2001	2020	2003	2004	2005	2006	2007	2008	2009	2010	2011
Rural Roads													
Interstates	260,166	268,180	273,619	279,962	269,945	266,996	258,790	257,913	256,438	243,290	248,549	265,250	263,026
Principal Arterials	244,045	248,725	253,259	257,587	245,345	241,046	233,999	231,865	232,054	222,298	215,346	205,782	204,204
Minor Arterials	169,275	171,874	174,223	176,218	171,251	168,898	164,933	162,634	161,411	151,975	151,144	151,028	149,457
Major Collectors	206,831	209,659	211,830	213,503	203,368	200,792	193,288	193,287	193,333	186,139	177,554	176,162	174,458
Minor Collectors	57,622	57,572	60,279	61,504	60,294	60,139	58,299	58,088	58,181	55,019	53,782	53,195	53,296
Local Roads	124,684	127,142	137,487	139,386	135,182	132,377	128,628	133,282	133,886	131,697	135,805	132,731	129,597
Rural Totals	1,062,623	1,083,152	1,110,697	1,128,160	1,085,385	1,070,248	1,037,937	1,037,069	1,035,303	990,418	982,180	984,148	974,038
Urban Roads													
Interstates	383,259	393,465	399,986	408,618	432,633	454,385	469,070	477,283	483,315	476,091	474,798	477,693	476,704
Expressways	171,515	177,222	182,485	189,634	199,520	207,929	213,727	217,067	220,335	222,624	220,574	220,861	221,986
Principal Arterials	392,688	398,772	401,337	408,336	425,622	450,142	463,100	466,949	469,681	462,569	456,477	457,153	453,815
Minor Arterials	313,950	324,398	330,114	339,387	348,794	362,018	371,392	376,082	378,114	377,033	376,478	374,557	368,303
Collectors	131,603	135,372	137,921	141,874	153,751	162,108	168,038	173,210	174,661	175,389	179,993	180,565	178,778
Local Roads	234,603	234,544	234,799	239,747	245,188	255,683	266,543	266,456	268,413	269,385	266,264	271,528	272,507
Urban Totals	1,627,618	1,663,773	1,686,642	1,727,596	1,805,508	1,892,265	1,951,870	1,977,047	1,994,519	1,983,091	1,974,583	1,982,358	1,972,094
Rural + Urban	2,690,241	2,746,925	2,797,339	2,855,756	2,890,893	2,962,513	2,989,807	3,014,116	3,029,822	2,973,509	2,956,764	2,966,506	2,946,131

Source: Highway Statistics Series, Federal Highway Administration

Changes in vehicle-miles of travel by region are shown in **Table 3-4** from 2004 to 2011. VMT in all regions peaked in or around 2007 in line with the state and country as a whole. Regions whose growth in VMT has exceeded the state average since 2004 include the Appalachian, Berkeley-Dorchester-Charleston, Catawba, and Central Midlands COGs. Note that while increasing VMT has historically been regarded as an indicator or consequence of economic growth its use as an indicator of economic health may be problematic in future years in urban areas as alternative modes of transport to the single occupant vehicle (SOV) become more readily available and attractive.

Table 3-4: Changes in VMT by Region, 2004-2011

Council of Governments	Annual VMT (Millions)								Change 04-11
	2004	2005	2006	2007	2008	2009	2010	2011	
Appalachian	10,620	10,673	11,316	11,562	11,289	11,116	11,309	11,239	5.8%
Berkeley-Dorchester-Charleston	5,863	5,990	6,326	6,453	6,260	6,176	6,206	6,172	5.3%
Catawba	3,288	3,326	3,473	3,544	3,487	3,472	3,490	3,458	5.2%
Central Midlands	7,342	7,419	7,696	7,883	7,719	7,734	7,826	7,776	5.9%
Low Country	3,216	1,900	3,384	3,337	3,223	3,219	3,233	3,199	-0.5%
Lower Savannah	4,130	4,160	4,319	4,331	4,171	4,156	4,259	4,205	1.8%
Pee-Dee	4,100	4,051	4,164	4,210	4,040	3,957	3,998	3,933	-4.1%
Santee-Lynches	2,680	3,054	2,786	2,799	2,723	2,713	2,765	2,752	2.7%
Upper Savannah	2,142	2,133	2,246	2,298	2,197	2,187	2,212	2,171	1.4%
Waccamaw	3,881	3,903	4,091	4,162	3,948	3,867	3,825	3,826	-1.4%
Total	47,263	46,609	49,801	50,580	49,057	48,598	49,124	48,732	3.1%

Source: SCDOT

3.1.3 Commuter Flow Estimates for South Carolina Residents

The U.S. Census Bureau’s American Community Survey (ACS) 2006-2010 surveyed communities throughout the country on social and economic demographic data. The ACS asked respondents to geographically identify their place of residence and, for those aged 16 years or older, their primary place of work.² By pairing respondents’ residence and primary workplace locations, the ACS was able to estimate county-level commute flow during a typical week.

According to the 2010 U.S. Census, there were 3,669,965 South Carolina residents 16 years of age or older. The ACS 2006-2010 data estimated commuting patterns for 1,989,319, or approximately 54 percent of South Carolina residents aged 16 or over.

Intra-county Commuters – Within South Carolina, eleven intra-county commuting patterns make up more than half of the 1,989,319 total commutes of state residents, as shown in **Table 3-5**. The percentage of intra-county commuters is illustrated in **Figure 3-3** for all counties in the state. Of all the counties, only in Dorchester was the commute flow to another county greater than the commute flow within the county; 46.7 percent of Dorchester residents commuted from Dorchester County to Charleston County, whereas 37.5 percent commuted within Dorchester County.

² Individuals who worked at more than one location were to identify the location at which they worked the greatest number of hours.

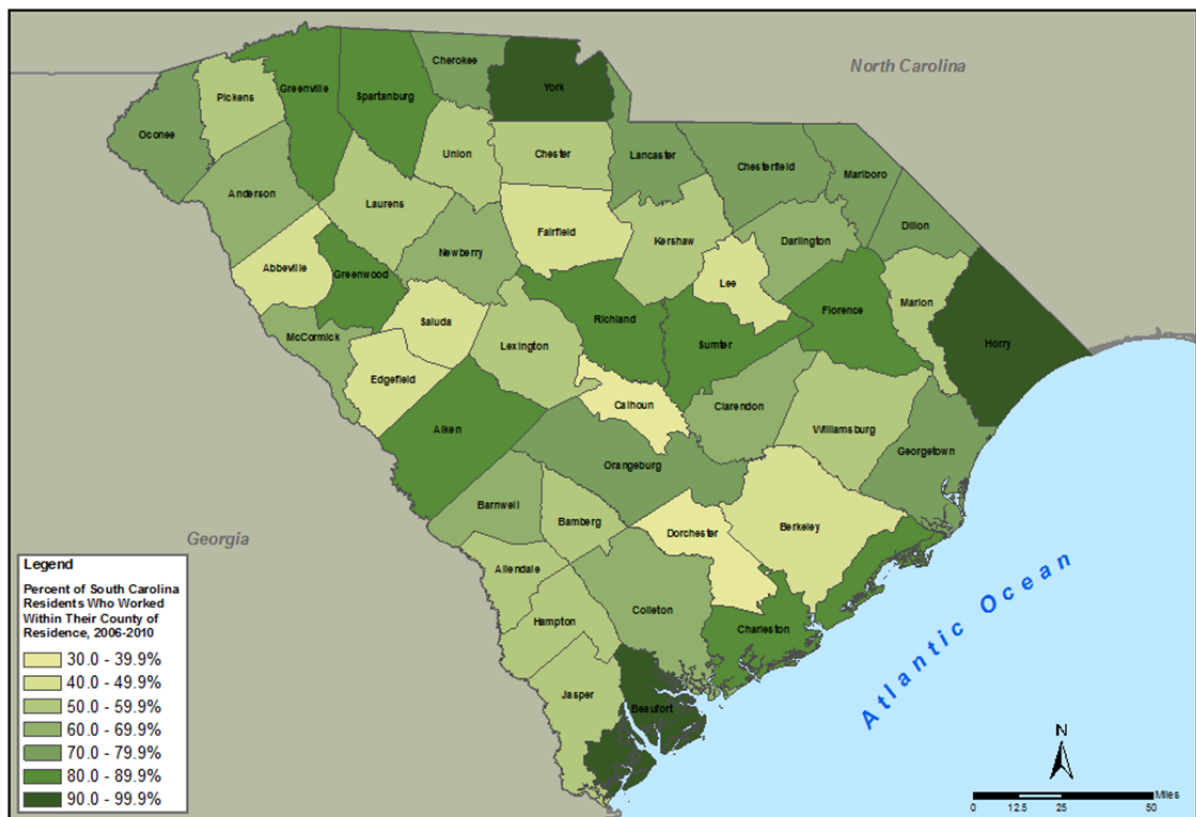
Table 3-5: Most Frequent Intra-County Commute Flow Patterns, 2006-2010

County of Residence	County of Workplace	Number of Workers in Flow	Percent of Total Commuters
Aiken County	Aiken County	46,972	2.4%
Florence County	Florence County	48,848	2.5%
Anderson County	Anderson County	52,413	2.6%
Beaufort County	Beaufort County	64,343	3.2%
York County	York County	64,344	3.2%
Lexington County	Lexington County	69,903	3.5%
Spartanburg County	Spartanburg County	95,011	4.8%
Horry County	Horry County	108,589	5.5%
Charleston County	Charleston County	146,452	7.4%
Richland County	Richland County	148,134	7.4%
Greenville County	Greenville County	171,274	8.6%
TOTAL		1,016,283	51.1%

U.S. Census Bureau's American Community Survey (ACS) 2006-2010

The average percentage of South Carolina workers who worked within their county of residence is 65.9 percent. This compares to the national average of 76.4 percent.

Figure 3-3: Percent of Residents Who Worked Within Their County of Residence, 2006-2010



U.S. Census Bureau's American Community Survey (ACS) 2006-2010

Inter-County Commuters – Table 3-6 displays the ten most frequent inter-county commute patterns within South Carolina. The commutes between Lexington County and Richland County, in both directions, are among the most used.

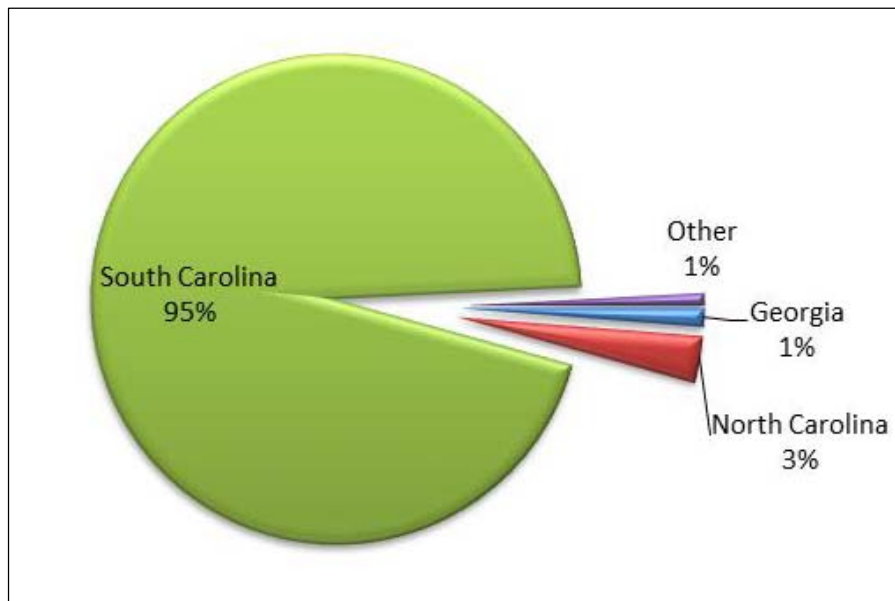
Table 3-6: Most Frequent Inter-County Commuter Flow Patterns, 2006-2010

County of Residence	County of Workplace	Number of Workers in Flow	Percent of Total Commuters
Kershaw County	Richland County	9,156	0.5%
Charleston County	Berkeley County	9,932	0.5%
Pickens County	Greenville County	13,492	0.7%
Greenville County	Spartanburg County	14,910	0.7%
Anderson County	Greenville County	15,561	0.8%
Spartanburg County	Greenville County	15,920	0.8%
Richland County	Lexington County	25,396	1.3%
Dorchester County	Charleston County	27,878	1.4%
Berkeley County	Charleston County	36,248	1.8%
Lexington County	Richland County	47,271	2.4%
TOTAL		215,764	10.8%

U.S. Census Bureau's American Community Survey (ACS) 2006-2010

Commuting to a Neighboring State – As shown in Figure 3-4, during the 2006-2010 period approximately 5 percent of South Carolina residents commuted to work outside of the state during a typical week.

Figure 3-4: Workplace Location of South Carolina Residents, 2006-2010

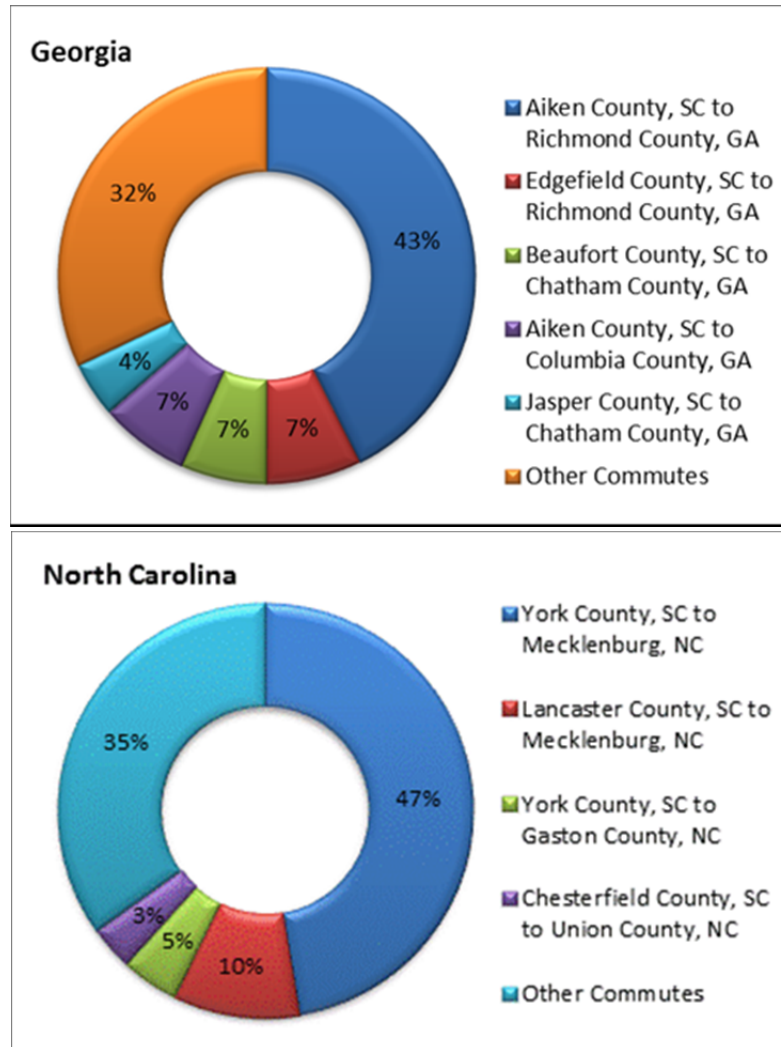


U.S. Census Bureau's American Community Survey (ACS) 2006-2010

Approximately one percent of South Carolina residents commuted to Georgia for work. Of these nearly 43 percent traveled from Aiken County, South Carolina to Richmond County, Georgia. Approximately three percent of South Carolina residents commuted to North Carolina for work, just under half of whom (47 percent) traveled from York County, South Carolina to Mecklenburg, North Carolina.

Figure 3-5 shows the most frequent commute flows from South Carolina to Georgia and South Carolina to North Carolina.

Figure 3-5: Common Commuter Flows to Neighboring States, 2006-2010

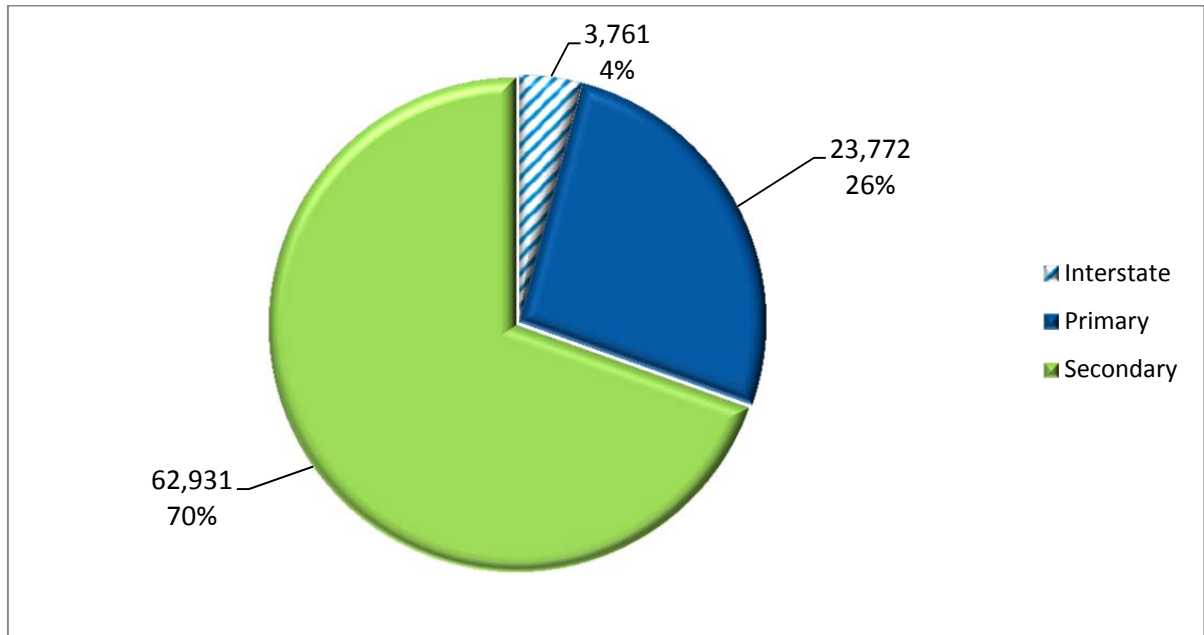


U.S. Census Bureau's American Community Survey (ACS) 2006-2010

3.2 EXISTING PAVEMENT CONDITIONS

South Carolina maintains over 41,000 centerline miles and over 90,000 lane miles of roadways across the state. As shown in Figure 3-6, the state-maintained lane miles have been categorized into three groups; Interstate, Primary, and Secondary. The Primary group consists of all roads designated as U.S. highways or SC-routes. Secondary roads, which are the remaining state-maintained roads not classified as Interstates or Primary roads, amount to almost 63,000 lane miles or over 70 percent of the lane miles maintained by the state. Primary roads are the second largest group with 23,772 lane miles, while Interstate highways account for only 3,761 lane miles or 4 percent of the state system.

Figure 3-6: State-Maintained Lane Miles by Route Type

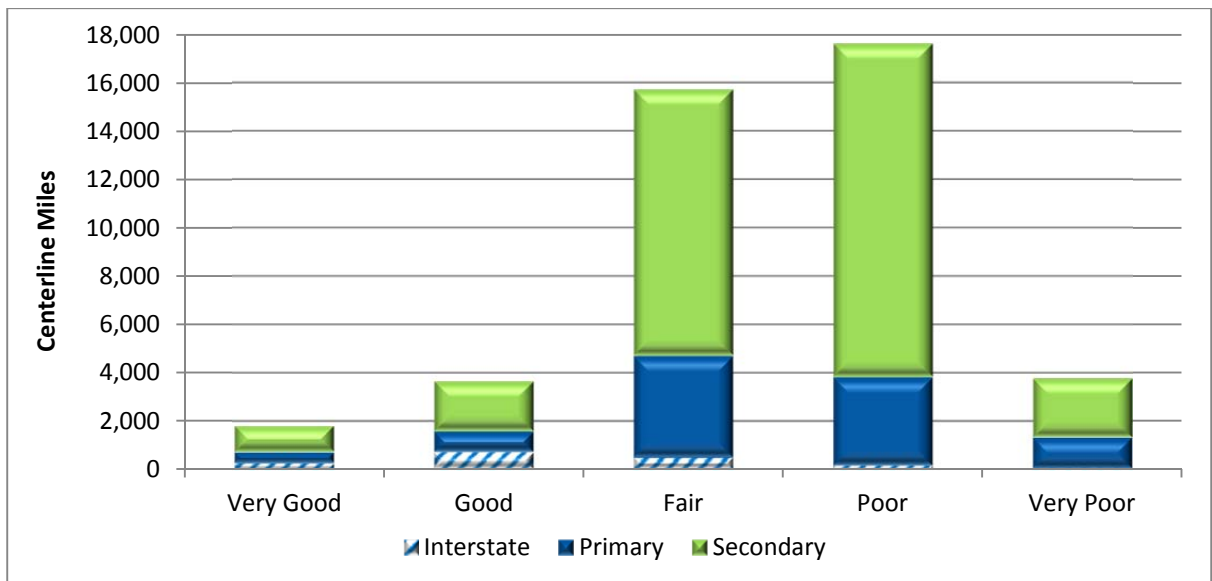


Source: South Carolina State of the Pavement Report (2012)

3.2.1 Pavement Conditions

The state-maintained roadway conditions are rated by SCDOT’s Pavement Management Department. Pavement conditions are shown in **Figure 3-7** by route type. The majority of Interstate centerline miles are categorized as being in very good or good condition (58 percent), with 30 percent in fair condition. Approximately 13 percent of Primary centerline miles are categorized as being in very good or good condition, with 40 percent in fair condition. Approximately 13 percent of Primary centerline miles are categorized as being in very good or good condition, with 40 percent in fair condition.

Figure 3-7: 2012 Pavement Condition of State Maintained by Route Type



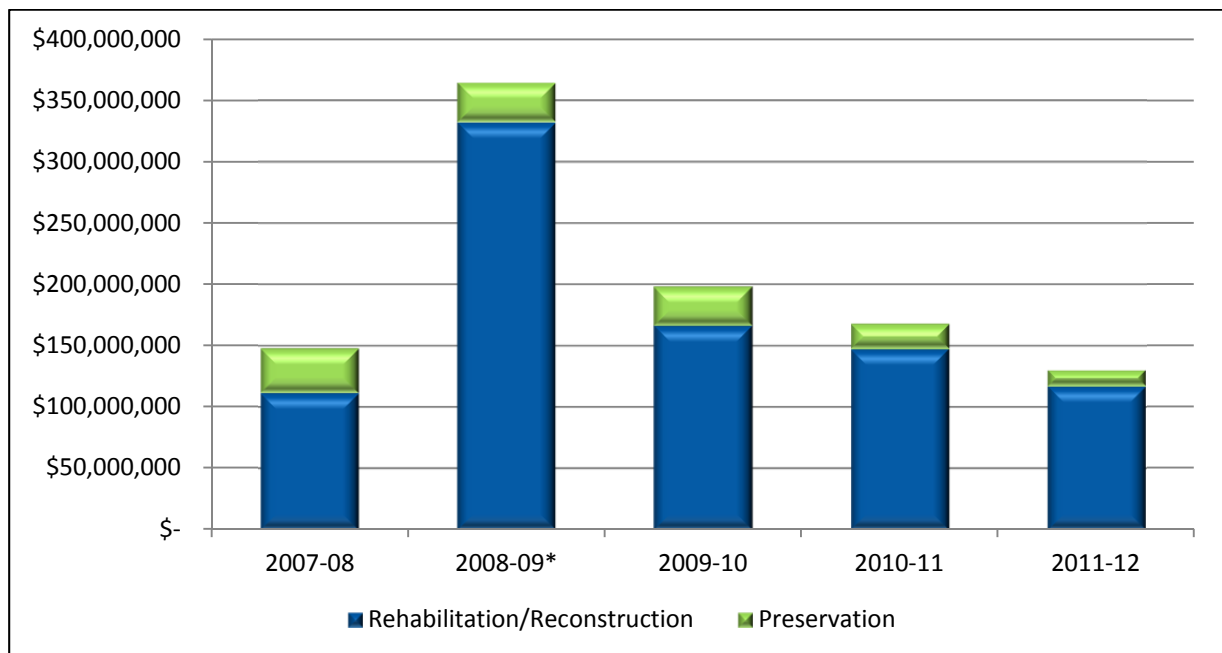
Source: South Carolina State of the Pavement Report (2012)

Over 10 percent of Secondary roads are in very good or good condition, while 36 percent are in fair condition. Among Secondary roads the most common condition is poor with 45 percent. Secondary roads represent the largest group of roads on the state system with over 62,900 centerline miles.

3.2.2 Trends in Pavement Surface Life

The Rehabilitation/Reconstruction and Preservation Investment for non-interstate roads in **Figure 3-8** shows program funding over the last five years. The majority of the program funds are allocated to rehabilitation and reconstruction investments. Rehabilitation/reconstruction allocations have been over \$100 million every year over the five-year period. The lowest annual allocation during this period was during 2007-2008 with \$111 million, while the highest funding year, excluding 2008-2009 ARRA³ funding year, was 2009-2010 with \$166 million. Examples of rehabilitation/reconstruction investments include resurfacing, roller-compacted concrete, and reclamation.

Figure 3-8: Investment on Non-Interstate Roads



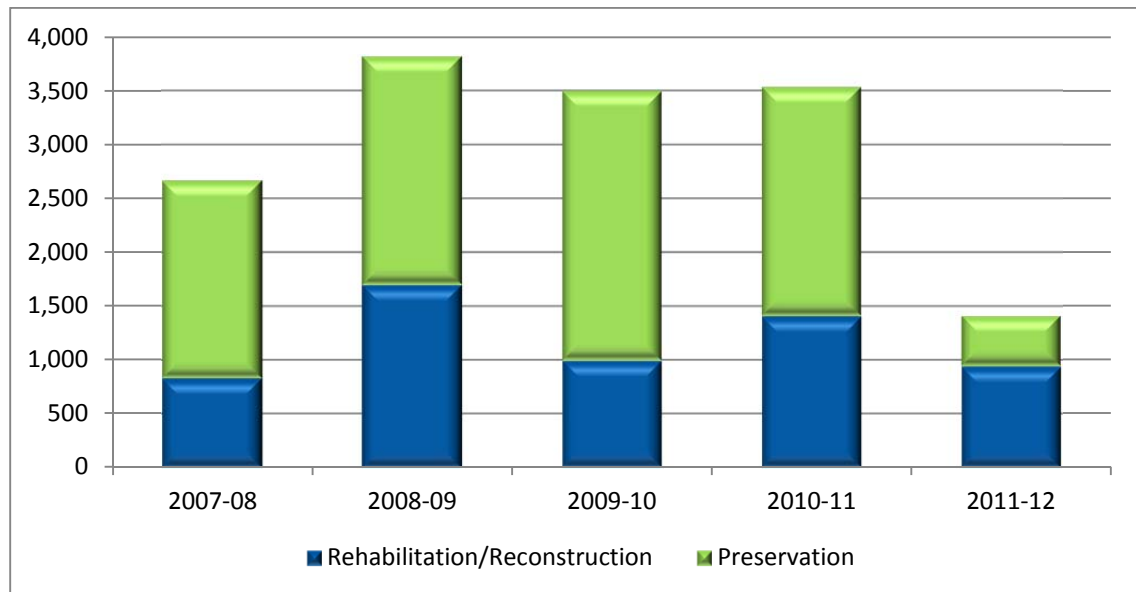
*Increase due to American Recovery and Reinvestment Act (ARRA) funding
Source: South Carolina State of the Pavement Report (2012)

The Preservation investment on non-interstate roads during the last five years is significantly smaller than the Rehabilitation/Reconstruction program. Funding for the Preservation program has gone down over the last five years from \$36 million in 2007-2008 to \$13 million in 2011-2012. Preservation investment in 2011-12 was almost one-third of the 2007-08 allocation. Examples of preservation investments include micro-surfacing, chip seal, ultra-thin lift HMA overlay, crack seal, full depth patching.

³ American Recovery and Reinvestment Act of 2009.

Shown in **Figure 3-9**, the total number of centerline miles on non-interstate roads rehabilitated / reconstructed and preserved from 2007-2012 is just less than 15,000 miles. The preservation program averaged 2,150 centerline miles per year during the 2007-2011 period. In 2011-2012 the mileage preserved, 470 miles, was only one-quarter of this amount.

Figure 3-9: Centerline Miles Treated on Non-Interstate Roads



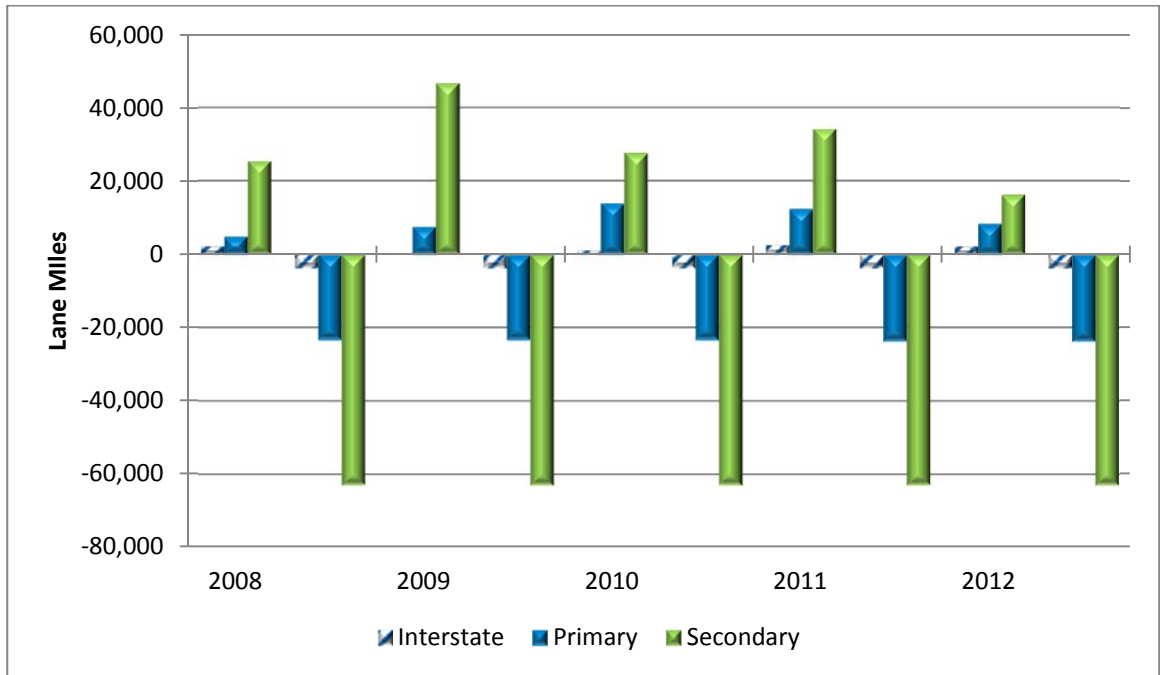
Source: South Carolina State of the Pavement Report (2012)

The number of centerline miles rehabilitated/reconstructed during the last five years has varied significantly from year to year. The average number of rehabilitated/reconstructed centerline miles was 1,176 per year. The lowest year was 2007-2008 with 832 centerline miles. The highest year was 2008-2009 with 1,700 centerline miles as improvements were made with stimulus funding from American Recovery and Reinvestment Act of 2009.

As investments are made in road rehabilitation/reconstruction and preservation, the service life of pavements is extended. At the same time the heavy traffic demands placed on the state’s roads result in deterioration and the loss of service life years.

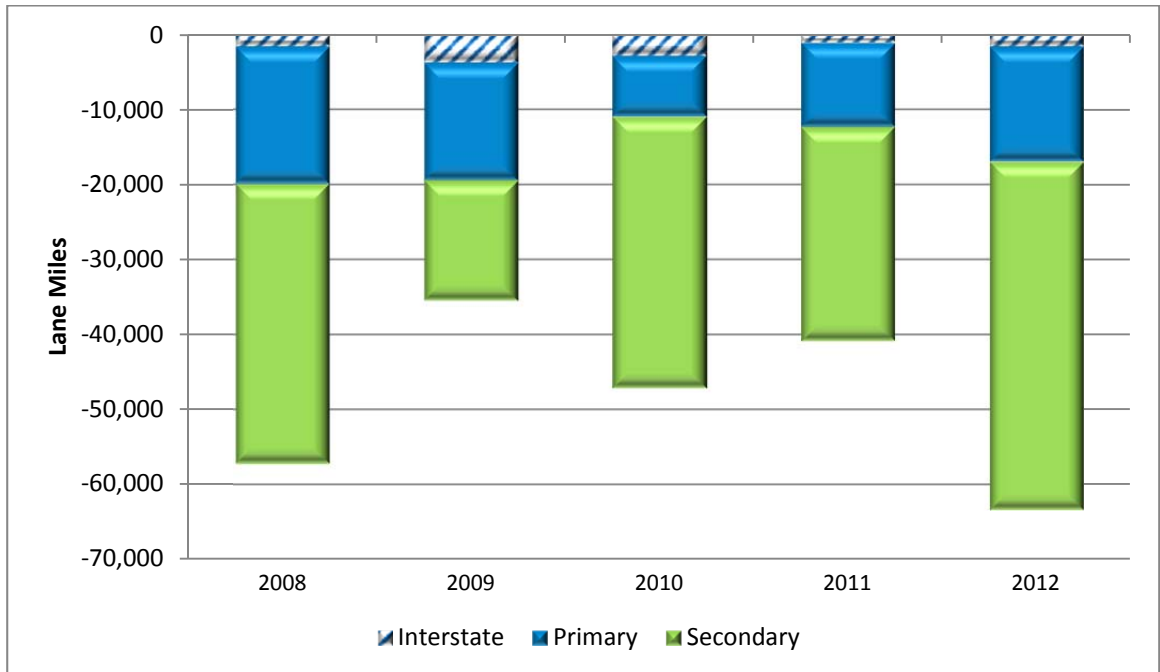
The number of service life years added to the system and lost from the system is shown in **Figure 3-10** in terms of lane miles. Even though the state continues to add service life years to the system through the resurfacing program, a far greater number of service life years are lost through deterioration resulting in net losses each year, as shown in **Figure 3-11**. Over 244,000 lane mile service years has been lost over the last five years, with Secondary roads leading the way with over 163,000 miles. Primary roads have lost almost 70,000 miles and Interstate roads having lost over 10,000 miles of service life.

Figure 3-10: Service Life Years Gained and Lost



Source: South Carolina State of the Pavement Report (2012)

Figure 3-11: Net Change in Service Life Years Since 2008



Source: South Carolina State of the Pavement Report (2012)

3.2.3 Maintenance Assessment Program

The SCDOT maintains an aging roadway system and due to lack of funding the Department is losing ground, which impacts quality of life, economic vitality, etc. The SCDOT Pavement Improvement and Preservation Program attempts to slow the deterioration of the state’s primary and secondary roadways; however, given the current funding trends, the system is deteriorating quicker than being repaired. Over time, the pavement condition will continue to grow worse without significant additional investment to the system.

3.3 BRIDGES

Information provided by SCDOT to FHWA for the 2012 National Bridge Inventory (NBI) was reviewed to summarize the existing condition of bridges in South Carolina. The NBI data include SCDOT maintained and non-SCDOT maintained bridges and include information on large culverts as well as bridges. Future needs will be determined for both types of structure, but through different methodologies.

3.3.1 Bridge Inventory

According to the FHWA annual system conditions report⁴, South Carolina has 9,270 bridges within the state boundary, which total a cumulative deck area of over 71.3 Million square feet. Of these, the South Carolina NBI database dated January 7, 2013 shows 8,380 bridge records that are State-Owned. This is 90.4 percent of all bridges in the state. The State-Owned bridge deck area totals 68.75 Million square feet, or 96.4 percent of the total square footage in South Carolina.

Almost 75 percent of the State-Owned bridges are in rural areas, with 26.1 percent of the total located on rural roads classified as major collectors, as shown in **Table 3-7**. Bridges on interstates, expressways, and other principal arterials account for 20.5 percent of the total.

Table 3-7: State-Owned Carolina Bridges by Road Functional Classification

Road Classification	Number of Bridges in South Carolina NBI					
	Number	Percent ⁽¹⁾	Number	Percent	Number	Percent
Rural Interstates	375	4.5%	6,276	74.9%	8,380	100.0%
Rural Principal Arterials	565	6.7%				
Rural Minor Arterials	685	8.2%				
Rural Major Collectors	2,188	26.1%				
Rural Minor Collectors	443	5.3%				
Rural Local Roads	2,020	24.1%	2,104	25.1%		
Urban Interstates	353	4.2%				
Urban Expressways	69	0.8%				
Urban Principal Arterials	356	4.2%				
Urban Minor Arterials	441	5.3%				
Urban Collectors	491	5.9%				
Urban Local Roads	394	4.7%				

Source: South Carolina National Bridge Inventory (NBI) database, January 7, 2013 data export

Note: (1) Value rounded to nearest tenth

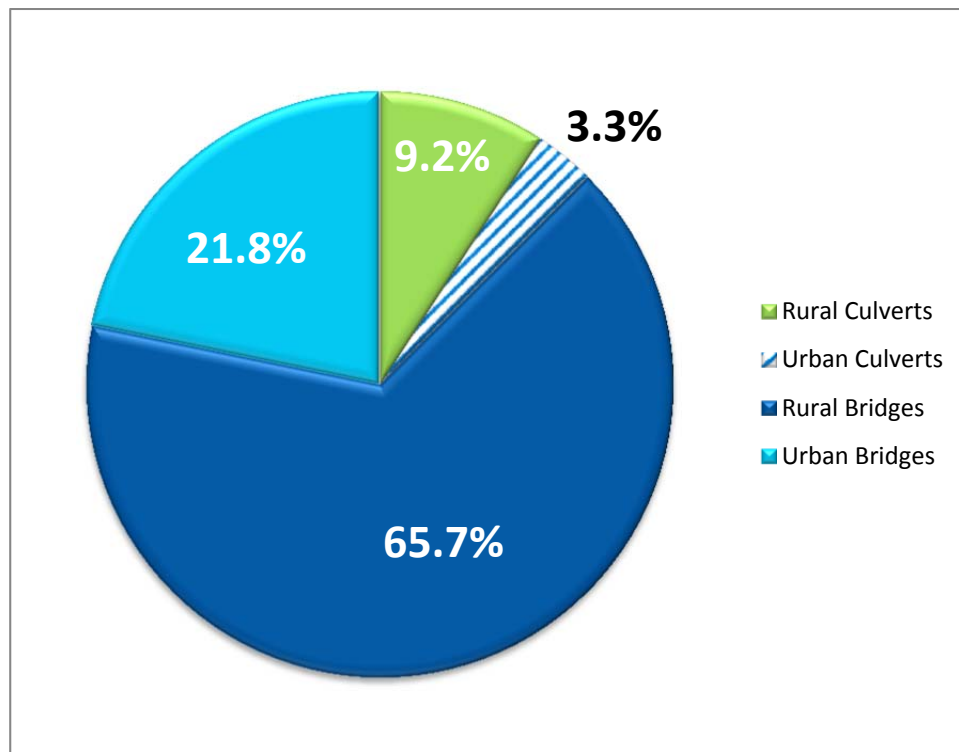
⁴ <http://www.fhwa.dot.gov/policyinformation/statistics/2011/>

Bridge size, as measured by deck area, ranges from less than 500 to over 1,250,000 square feet. Of these structures, 88 percent of bridges are 14,000 square feet or less. The average bridge size is 8,360 square feet, which is equivalent to a two-lane structure approximately 230 feet long. Just 1 percent of bridges exceed 80,000 square feet.

The largest structure in South Carolina is the Arthur J. Ravenel, Jr. Bridge located in Charleston. Also known as the Cooper River Bridge, the cable-stayed bridge was built in 2005. It has 1,255,400 square feet of area. The bridge carries U.S. Highway 17 and handles about 77,500 AADT on eight lanes of traffic.

The 8,380 State-Owned bridges in the NBI database include 7,330 traditional bridge structures and 1,050 culverts. The culverts can be found carrying every roadway functional class, but can be found mostly on rural minor arterials and major collectors. As shown in **Figure 3-12**, the 1,050 culvert comprise 12.5 percent of the state-owned structures. As shown previously in Table 3-3, 74.9 percent of the State-Owned bridges are in rural areas, with culverts accounting for 9.2 percent and traditional bridges the remaining 65.7 percent.

Figure 3-12: Bridges and Culverts by Area Type, Maintained by SCDOT



Source: South Carolina National Bridge Inventory (NBI) database, January 7, 2013 data export

Culverts, as distinguished from other bridges, are usually covered with embankment and are composed of structural material around the entire perimeter, although some are supported on spread footings with the streambed serving as the bottom of the culvert⁵. In the future needs analysis, bridge needs and culvert needs will be determined through two methodologies because of the different structural aspects.

3.3.2 Bridge Sufficiency Ratings

Sufficiency Rating was previously used to determine eligibility of a bridge for Federal funding. However, MAP-21 does not mandate use of sufficiency rating as a funding criterion. Funding for bridges is now contained within four primary programs: National Highway Performance Program (NHPP), Surface Transportation Program (STP), Highway Safety Improvement Program (HSIP), and Congestion Mitigation and Air Quality Improvement Program (CMAQ).

Under MAP-21, states are required to maintain minimum thresholds for bridges on the National Highway System (NHS). No more than 10 percent of total NHS bridge deck area may be on structurally deficient bridges. A failure to meet this criterion will impact NHPP funding. Similarly, the other funding programs have flexible performance criteria for any federal-aid highway or public road.

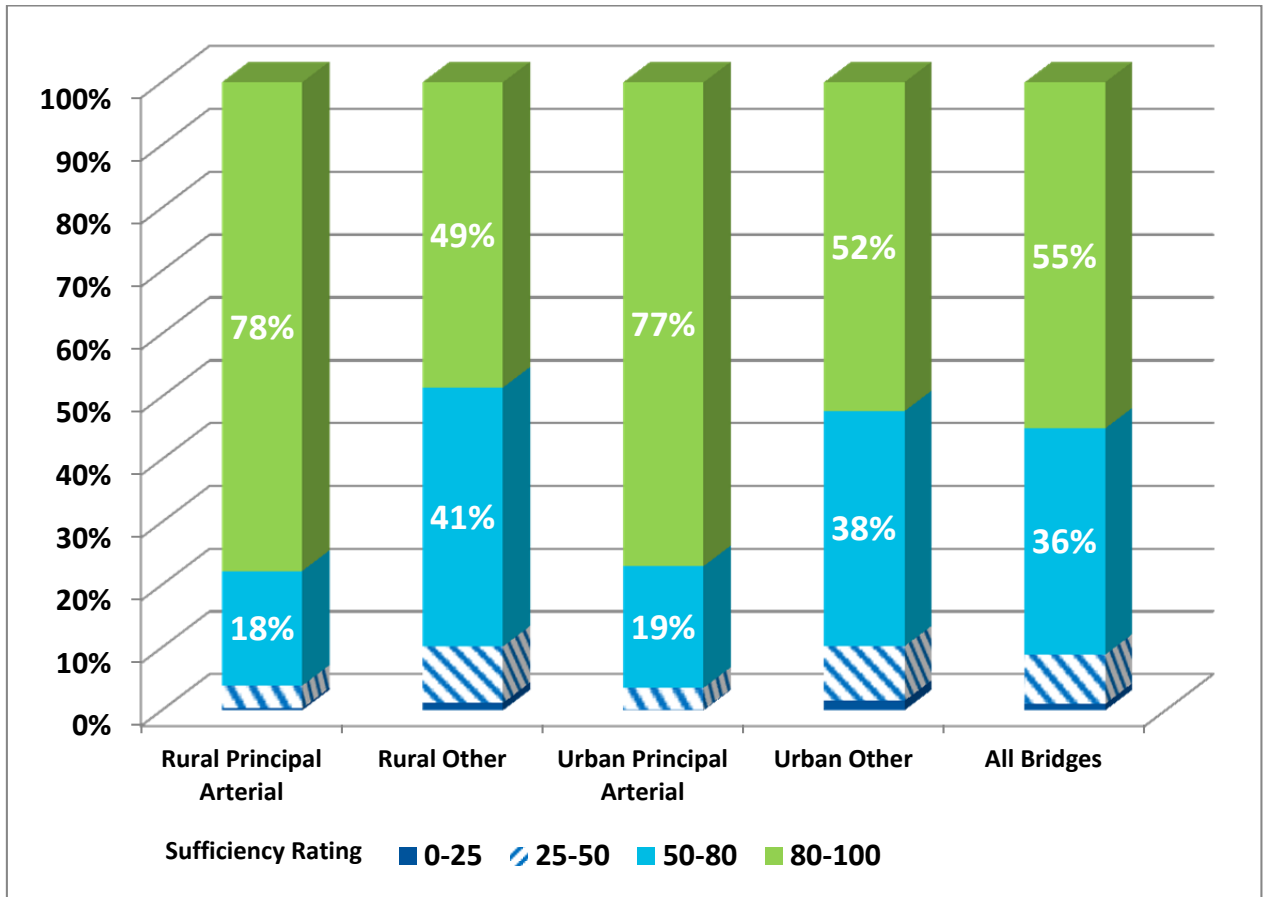
Therefore, sufficiency rating will be used solely for information purposes in this report. The sufficiency rating formula provides a method of calculating and evaluating numerous highway bridge factors to obtain a single numeric value that is indicative of bridge sufficiency to remain in service⁶. The formula includes factors for structural condition, bridge geometry, traffic considerations, and special items dealing with safety and detour length. This rating system, developed by FHWA, is on a scale from 0 to 100 with 0 being an unusable structure and 100 being new.

A review of the 8,380 bridge structures maintained by SCDOT, which includes both culverts and traditional bridges, indicates that 55 percent of the bridges (4,612) have a sufficiency rating of 80 or higher, while less than 9 percent (743) have a rating below 50, as shown in **Figure 3-13**. In this chart, the bridges in the “Rural Principal Arterial” include Interstates and Principal Arterials, such as U.S. roadways, in rural areas. “Rural Other” encompass the minor arterials, collectors, and local roadways in rural areas. “Urban Principal Arterial” includes Interstates, Freeways, Expressways, and Other Principal Arterials in urban and metropolitan areas, while “Urban Other” has the smaller urban roadways. “All Bridges” represents the total of all road bridges in the other four groups.

⁵ *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges*, Report No. FHWA-PD-96-001, US Department of Transportation.

⁶ <http://www.fhwa.dot.gov/bridge/preservation/guide/guide.pdf>

Figure 3-13: Sufficiency Ratings of Bridges Maintained by SCDOT



Source: South Carolina National Bridge Inventory (NBI) database, January 7, 2013 data export

3.3.3 Bridge Status

The NBI database defines the status of a bridge as:

- Not Substandard
- Structurally Deficient
- Functionally Obsolete

According to the FHWA, a bridge is “Structurally Deficient” if the load-carrying elements are in diminished condition due to deterioration and/or damage. A bridge may also be Structurally Deficient if the waterway opening is “extremely insufficient” and causes “intolerable traffic interruption.” Structurally Deficient bridges are not unsafe, but could require traffic limitations. On the other hand, the term “Functionally Obsolete” deals with geometric deficiencies (lane width, clearances, etc.) when compared to current design standards and traffic levels. A bridge that is both structurally deficient and functionally obsolete is classified only as structurally deficient.

When a bridge is “Not Substandard”, it is possible that the structure still has deficiencies, but these are not to the extent that require classification as structurally deficient or functionally obsolete.

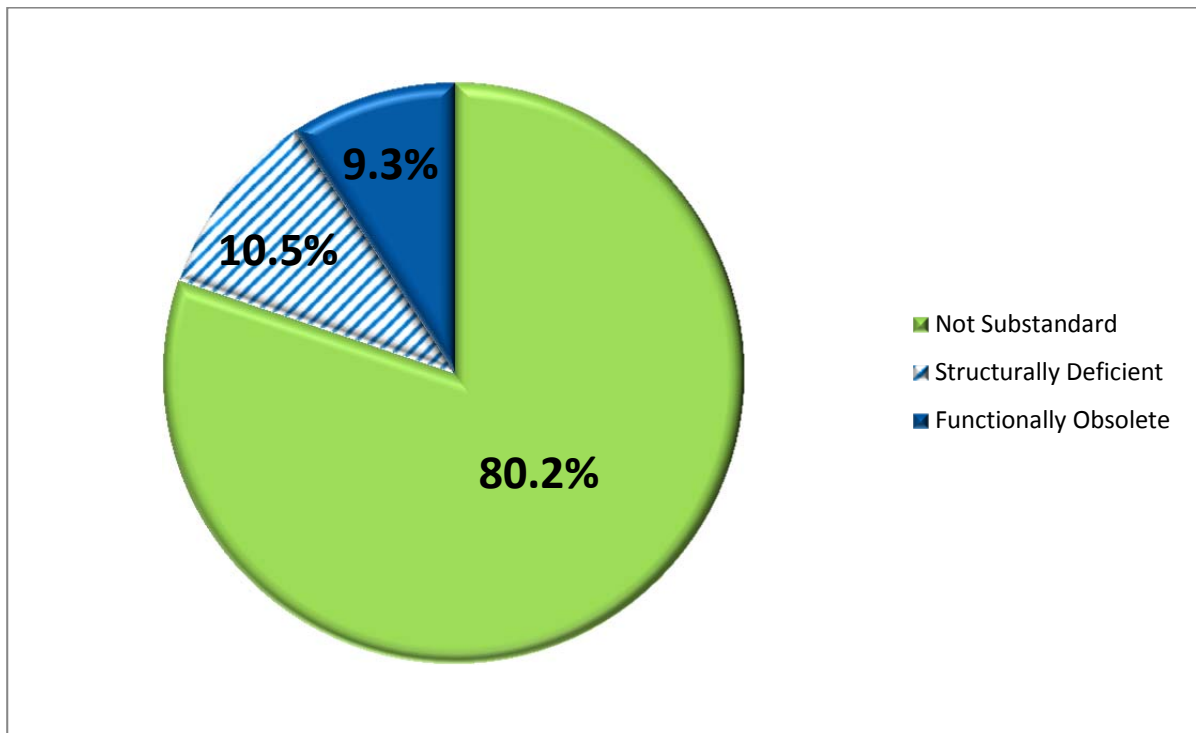
SCDOT produces a monthly report of condition trends that helps inform decision makers. Examples of this report can be found in **Appendix A**. As of January 2013, 10.5 percent (883) of state-owned bridges have a status of Structurally Deficient, while 9.3 percent (777) are Functionally Obsolete, as shown in **Table 3-8** and **Figure 3-14**. This is a total of 1,660 structures that are substandard.

Table 3-8: 2012 Bridge Conditions

Condition	SCDOT Maintained	
	Number	Percent
Not Substandard	6,720	80.2%
Structurally Deficient	883	10.5%
Functionally Deficient	777	9.3%
Total	8,380	

Source: South Carolina National Bridge Inventory (NBI) database, January 7, 2013 data export

Figure 3-14: Status of Bridges Maintained by SCDOT



Source: South Carolina DOT monthly bridge conditions report, January 1, 2013