spartanburg community indicators project

Inspiring dialogue, strategy and change.

www.strategicspartanburg.org

# THE STATUS OF THE NATURAL ENVIRONMENT

## Spartanburg County, South Carolina

*2015 Update*

MSI METROPOLITAN STUDIES INSTITUTE at USC UPSTATE

*Author:*
*Kathleen Brady, PhD*
*USC Upstate*

424 East Kennedy Street ▪ Spartanburg, SC 29302 ▪ 864-582-0138 ▪ strategicspartanburg.org

# TABLE OF CONTENTS

spartanburg community indicators project

Inspiring dialogue, strategy and change.

# Spartanburg Community Indicators Project

The Spartanburg Community Indicators Project reports on progress of key issues that are the clearest indicators of quality of life in Spartanburg County, South Carolina. Its goal is to report on data and community initiatives to inspire dialogue and strategy that leads to change within the community.

The Project is a collaboration of The Spartanburg County Foundation, United Way of the Piedmont, Spartanburg County, the University of South Carolina Upstate, Mary Black Foundation and Spartanburg Regional Foundation. It is designed to bring together community organizations, businesses and individuals to improve the quality of life in Spartanburg County.

The Project has identified six main Indicator Areas encompassing the factors affecting quality of life which are:

## Economy

Our citizens will have access to living wage jobs and our communities will be economically viable.

## Education

Our children will excel academically and our citizens will demonstrate high levels of baccalaureate degree attainment, rendering Spartanburg the best educated county in the state.

## Civic Health

Our citizens will have access to opportunities for civic engagement that promote community well-being and an enriched quality of life.

## Natural Environment

Our citizens will manage our natural resources in a way that will support current and future generations.

## Public Health

Our citizens will be increasingly healthy, demonstrating decreasing incidence and prevalence of health risk factors and poor health outcomes.

## Social Environment

Our community will be characterized by stable families, low crime, affordable housing and access to opportunity.

# Community Collaboration

## Indicator Area Leaders

The Spartanburg Community Indicators Project partners with Indicator Area Leaders to improve outcomes in each of its six Indicator Areas. These organizations set improvement goals based on indicator data and lead individuals, businesses and community groups to coordinate efforts and information, thus facilitating steady progress in quality of life improvement.

## Natural Environment Coalition

The Natural Environment Coalition serves as the Indicator Area Leader for the Natural Environment Indicator Area. The Coalition is an informal group of public, non-profit and private organizations working together to improve Spartanburg County's Natural Environment. They coordinate their efforts through a council and five Priority Groups to use the Natural Environment Indicators as the foundation of community efforts to drive the Natural Environment Indicators upward.

## Five Natural Environment Priority Groups

### Air Quality

Spartanburg County's air quality will meet or exceed all standards. Clean air will promote healthy citizens and economic development.

### Biodiversity

Spartanburg County will increasingly value protecting biodiverse places, building an understanding of ecosystem services and slowing the rate of development in areas of significant species richness while mindfully improving the biodiversity in areas of monoculture through innovative agricultural and silvicultural practices.

### Green Space & Protected Land

Spartanburg County will identify and protect lands of special natural, scenic, cultural, historic and agricultural importance and preserve park lands for public active and passive recreational use**.**

### Land Use Planning

Spartanburg County and its municipalities will reduce the fiscal and environmental impacts of population growth and achieve enhanced livability and economic prosperity.

### Water Quality & Supply

All Spartanburg County source waters will have improved water quality through the reduction of contaminants.

# Introduction

Community Indicators are measurements of civic, economic, educational, environmental, health, and social status that provide information about past and current trends and inform the decisions that affect the community's well-being. Communities do well to employ data-driven decision-making strategies as they plan programs and allocate limited resources. Likewise, it is advisable to periodically monitor and update these data to determine if conditions have changed and to gauge the return on the community's investments.

Because no one metric is an adequate reflection of the state of the Natural Environment, multiple measures are considered. Some of the Indicators correlate or may be causal of one another. The data provided in this report include Leading, Secondary and Crosscutting Indicators, disaggregated variously and delivered in context to provide a comprehensive picture of the health of the environment, in so far as possible, in Spartanburg County, South Carolina.

The Leading Indicators chosen for this report are the most robust measures of the status of Natural Environment in Spartanburg County. These are disaggregated as instructive. Secondary Indicators are other measures of Natural Environment, variables that have a direct impact on the environment, are tangentially reflective of the state of Natural Environment, or derive from the Leading Indicators. Crosscutting Indicators, those from other Indicator Areas that have tangential or predictive impact on Natural Environment, are also provided. All data are from sources recognized as valid and reliable. In order to provide context, most data are reported with appropriate comparison data or trend data. Original sources are provided so that the reader can delve further into the data. Where valid and reliable data sources are limited, the data are likewise limited. Any questions may be addressed to the author of this study through the Metropolitan Studies Institute at USC Upstate.

Kathleen Brady, PhD

MSI
METROPOLITAN STUDIES INSTITUTE
at USC UPSTATE

*The author wishes to convey special thanks to Alissa Ritzo Duncan, MCRP and Principal at Broadmoor Planning, for her assistance in portions of this report.*

# Leading Indicators

Leading Indicators are the key variables that are most reflective of, or predict trends in, Natural Environment conditions. They are Air Quality, Water Quality and Supply, Land Use and Biodiversity.

## I. Air Quality

The US Environmental Protection Agency (EPA) is responsible for setting National Ambient Air Quality Standards (NAAQS) for airborne pollutants considered harmful to public health and the natural environment. Currently there are six principal pollutants for which there are regulatory standards. These are called criteria pollutants. They are ozone, particulate matter, carbon monoxide, nitrogen oxide, sulfur dioxide and lead.

Since 1959, air quality has been monitored throughout South Carolina. The SC Department of Health and Environmental Control (DHEC) is responsible for air quality monitoring and reporting and through its Bureau of Air Quality maintains a monitoring network for all criteria pollutants. There are 11 monitoring sites in the Upstate, two of which are in Spartanburg County. These are the North Spartanburg Monitoring Station which only measures ozone and the TK Gregg Monitoring Station that only measures particulate matter.

The NAAQS use the annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years, as the form of the standard. That is, in designating areas for attainment or nonattainment of the standard, DHEC examines monitor data over the past three years to get an average 8-hour reading.

### Ground Level Ozone and Particulate Matter

Although all of the six criteria pollutants have the potential to cause damage to human health and the environment, ground-level ozone and particle pollution pose the most widespread health threats.

### Ozone

Ozone is a form of elemental oxygen that has three oxygen atoms per molecule ($O_3$). While the ozone layer in the upper atmosphere protects humans and animals from harmful solar rays, ground-level ozone is a type of air pollution that forms on hot sunny days when nitrogen oxides (NOx) and volatile organic compounds (VOCs), both of which are precursor emissions, react to the sun's heat. The EPA states succinctly, "$O_3$ [ozone] concentrations are influenced by complex interactions between precursor emissions, meteorological conditions and surface characteristics." Exposure to ground-level ozone can irritate the respiratory system, causing shortness of breath, wheezing, coughing and exacerbating conditions such as asthma and bronchitis.

The current ozone National Ambient Air Quality Standard (NAAQS) is 0.075 ppm (parts per million). The EPA revises its standards for ozone periodically and a more stringent standard, expected for some time, was proposed by EPA in November 2014. The new ozone standard is expected to be within the range of 0.065 - 0.070 ppm. A final determination will be made by October 1, 2015. Many municipalities and regions are examining and implementing collective efforts to improve air quality given the expected new standard.

South Carolina ozone summary data from DHEC for 2010-2011 showed significant ozone attainment concerns for Spartanburg and several other areas of the state. Spartanburg was one of the three counties in the state with the highest number of days in 2008 with ozone concentration exceeding the NAAQS standards. The latest data show improvements in ozone attainment as demonstrated in the table below. The current 3-year average (2011-2013) shows that none of the monitors in the Upstate exceeded the current ozone standard; however, the highest 3-year average reading was on the North Spartanburg monitor (0.070 ppm). Since attainment is currently barely within the expected more stringent standard, it is a cause for concern.

| | | 4th 8-hr Average (ppm) | | | | 3 Year Average (ppm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| **County** | **Monitoring Site** | 2010 | 2011 | 2012 | 2013 | 2008-10 | 2009-11 | 2010-12 | **Current 2011-13** |
| Anderson | Big Creek | 0.072 | 0.076 | 0.071 | 0.051 | 0.066 | 0.069 | 0.073 | 0.067 |
| Cherokee | Cowpens | 0.072 | 0.070 | 0.070 | 0.054 | 0.069 | 0.066 | 0.070 | 0.066 |
| Greenville | Famoda Farm | 0.070 | 0.066 | 0.063 | 0.055 | 0.066 | 0.067 | 0.066 | 0.063 |
| Greenville | Hillcrest | 0.069 | 0.068 | 0.070 | 0.051 | 0.068 | 0.068 | 0.069 | 0.064 |
| Oconee | Long Creek | 0.069 | 0.061 | 0.063 | 0.000 | 0.069 | 0.065 | 0.064 | 0.048 |
| Pickens | Clemson | 0.072 | 0.075 | 0.068 | 0.051 | 0.072 | 0.071 | 0.071 | 0.066 |
| Pickens | Wolf Creek | | 0.074 | 0.063 | 0.053 | 0.065 | 0.069 | 0.068 | 0.063 |
| Spartanburg | N. Spartanburg | 0.076 | 0.081 | 0.070 | 0.056 | 0.076 | 0.074 | 0.075 | 0.070 |

*Source: SC DHEC Current Ozone Monitoring Data*

Depending on where the new ozone standard falls in the 0.065 to 0.070 ppm range, and using the 2011-2013 Current 3-Year Average data, four Upstate SC monitors would fall within range. If the standard is within the 0.065 to 0.066 ppm range, four monitors would fail to meet the standard. If the standard is at 0.067 ppm, two monitors would fail. At a standard within the 0.068 to 0.070 ppm range, only one monitor would fail.

According to the EPA, the proposal to strengthen the standard will improve public health protection, particularly for children, the elderly and people of all ages who have lung diseases such as asthma. Anticipating a more stringent ozone standard, public and private organizations, non-profits, businesses and industries in the Upstate have renewed discussions to keep the region in attainment, with Ten at the Top (TATT) acting as facilitator.

## Particulate Matter

Particulate matter consists of solid particles and liquid droplets that are suspended in the air and may include dust, dirt, soot and smoke. Particulate matter pollution is the major cause of reduced visibility due to atmospheric haze in many parts of the United States. Currently there are two standards for inhalable particulate matter, $PM_{10}$ and $PM_{2.5}$. Each has its own annual and 24-hour standards. $PM_{10}$, or "Primary Particles," range in size from 2.5-10 microns in diameter and come from a wide variety of stationary, mobile and natural sources such as construction sites, power production, diesel trucks, smokestacks and forest fires. $PM_{2.5}$, or "Secondary Particles," are fine particles that have a diameter of 2.5 microns or less and come from the same sources as primary particles. To provide perspective, a human hair is approximately 70 microns in diameter.

Particulate matter can enter the body by breathing polluted air and accumulate in the respiratory system and may cause or exacerbate respiratory conditions such as asthma and lung disease by damaging lung tissue and reducing lung capacity. Particulate matter can have significant impacts on

the health of sensitive groups such as children, people with lung disease and people who are active outdoors.

The EPA regulates $PM_{10}$ and $PM_{2.5}$. Particles larger than 10 microns are not regulated by the EPA. In South Carolina, there are nine monitoring stations for particulate matter ($PM_{2.5}$) including one in Spartanburg County. In 2008, all of these stations indicated that South Carolina was in compliance with the annual and 24-hour Particulate Matter standards. The latest data (2011) indicate that only Charleston County and Edgefield County had days above the level of the standard at 1.1% of days and 0.9% of days, respectively.

### Emissions

The primary source of ground-level ozone and particle pollution are emissions of various sources, either stationary or mobile. An inventory of emissions in the Upstate, released by the Greenville County Administrator's office in December 2014, assesses emissions from nonpoint, non-road, on-road and point sources for each Upstate county. Because air quality does not start and stop at county boundaries, emissions data are provided for the Upstate as a whole, including Anderson, Cherokee, Greenville, Oconee, Pickens and Spartanburg Counties. The primary precursor emissions are volatile organic compounds and nitrogen oxides. They are measured in tons per year (tpy).

Volatile Organic Compounds (VOCs) are a large family of carbon-containing compounds, some of which are toxic and/or carcinogenic. Most VOCs contribute to the formation of ground level ozone. They can also enter the water supply through ground water runoff. Nitrogen oxides (NOx), especially nitrogen dioxide, are emitted from high temperature combustion. NOx is manifest as an air pollutant in the brownish haze above or downwind of cities. The Upstate Emissions Inventory provides the following data relative to both NOx and VOCs for 2011 (the latest data available) and with 2010 comparison data. The primary sources of emissions in the Upstate include:

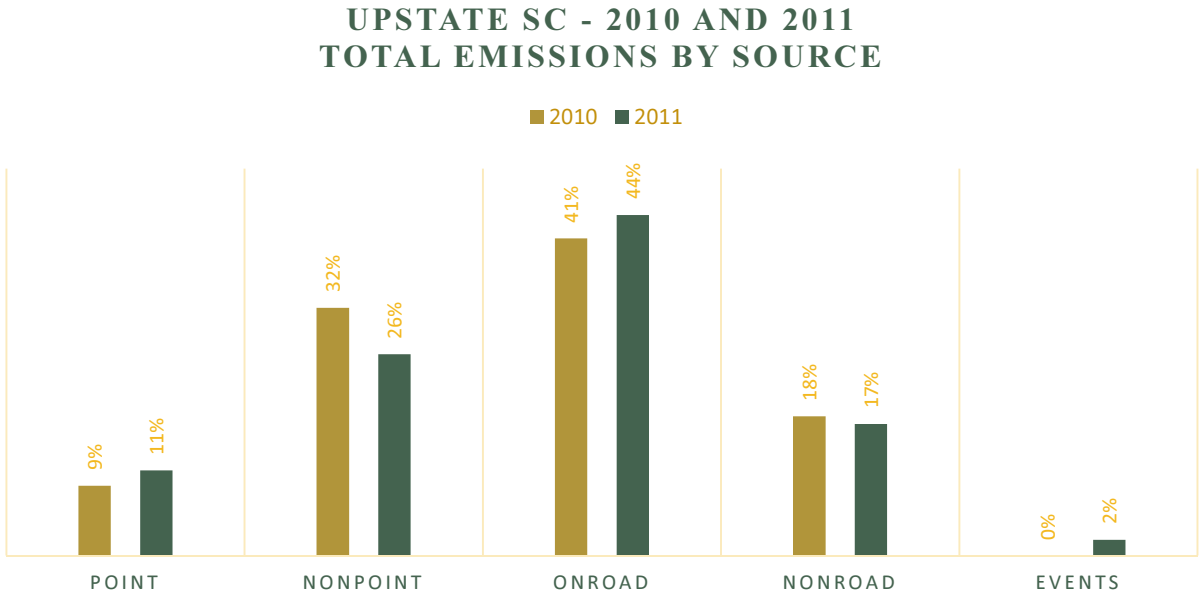
| Source Category | Source Description | |
|---|---|---|
| **Events** | • Fires: prescribed and wildfires | |
| **Nonpoint** | • Commercial Cooking<br>• Fires: Agricultural Field Burning<br>• Fuel Combustion: Commercial/Institutional<br>• Fuel Combustion: Industrial<br>• Fuel Combustion: Residential | • Miscellaneous Activities<br>• Open Burning<br>• Petroleum Products: Storage/Transport<br>• Solvent Usage<br>• Wastewater Treatment |
| **Nonroad** | • Compressed Natural Gas<br>• Line Haul Railroads<br>• Liquid Propane Gas<br>• Off-highway Vehicle Diesel | • Off-highway Vehicle Gasoline, 2-stroke<br>• Off-highway Vehicle Gasoline, 4-stroke<br>• Pleasure Craft |
| **Onroad Mobile** | • Mobile: On-road Diesel Heavy Duty Vehicles<br>• Mobile: On-road Diesel Light Duty Vehicles | • Mobile: On-road Gasoline Heavy Duty Vehicles<br>• Mobile: On-road Gasoline Light Duty Vehicles |
| **Point** | • Industries<br>• Business | • Private and public facilities |

*Source: Upstate SC 2011 Emissions Inventory*

According to the NOx and VOC emissions inventory, the total 2011 emissions in Upstate South Carolina decreased to 78,909 tpy (tons per year), a reduction of 4,823 tpy (5.76%) compared to the

2010 total emissions of 83,732 tpy. While both VOC and NOx emissions are important, the ratio of VOC to NOx has impact on reducing ozone, the specifics of which are beyond the scope of this report.

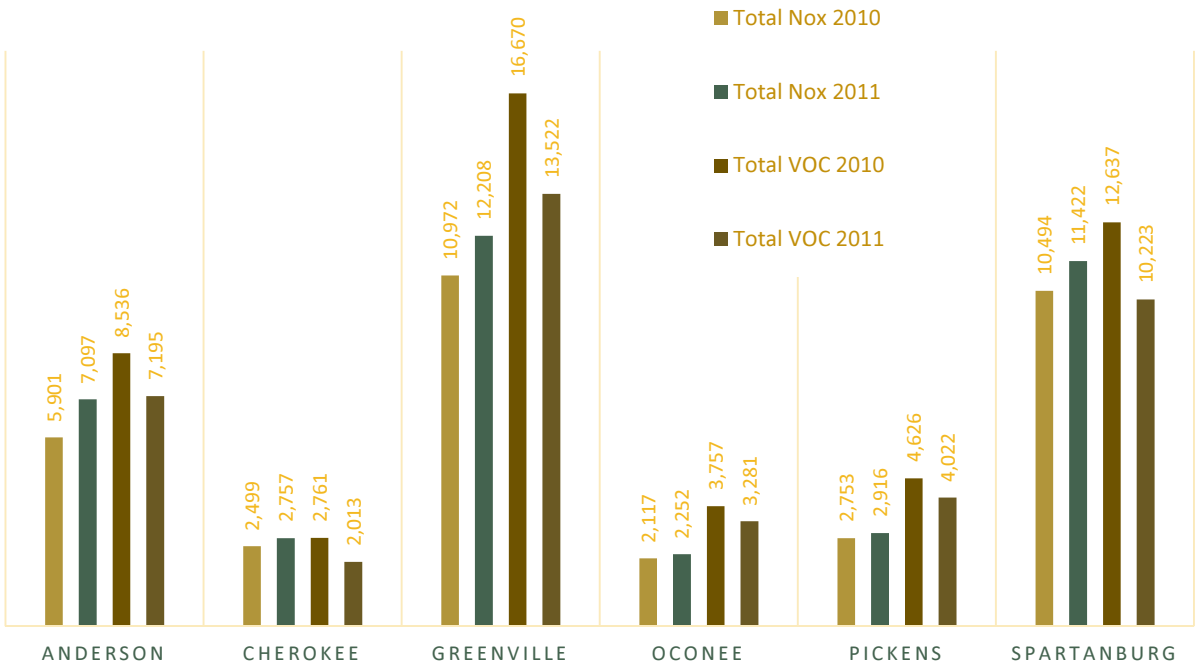
For both 2010 and 2011, on-road sources generated most of the pollutants in the Upstate, followed closely by nonpoint sources. Nonpoint sources continue to generate most of the VOC pollution in the Upstate, while on-road sources continue to generate most of the NOx pollution.




*Source: SC Upstate Emissions Inventories*

NOx emissions from on-road mobile sources are on the rise. In the Upstate in 2011, these emissions increased to 64% of total emissions, up from a 58% in 2010. It is common belief that industries contribute most to air pollution. This is not the case in the Upstate. In 2010, on-road emissions were the highest contributors with 58% of the share of total NOx and nonpoint emissions were 47% of the total VOC emissions. In 2010, point emissions from industries in the Upstate accounted for only 11% of total NOx and 8% of total VOC emissions. In 2011, point emissions from industries in the Upstate accounted for 11% of NOx and VOC emissions. Point emissions were 9% of total emissions in 2010 and 11% in 2011. Total NOx and VOC point emissions increased by approximately 557 tons and 743 tons, respectively, from 2010 to 2011. The highest point emissions increase was at the Duke Energy Lee Steam Station with a total increase of 425 tons (412 tons of NOx and 13 of VOC), followed by BMW Manufacturing with an increase of 316 tons (20 tons of NOx and 296 tons of VOC). According to Duke Energy, the Lee Steam Station officially retired as a coal plant on November 6, 2014. One of the units has been converted to burn natural gas and construction on a separate natural gas combined-cycle plant will begin in 2015. It is anticipated that this will result in reduced emissions.

## UPSTATE SC- TOTAL NOX AND VOC EMISSIONS BY COUNTY (TPY) 2010 & 2011




*Source: SC Upstate Emissions Inventories*

Greenville and Spartanburg continue to lead the Upstate counties as the highest producers of both NOx and VOC emissions. Greenville County NOx emissions increased in 2011 by 1,236 tpy and VOC emissions decreased by 3,148 tpy. Spartanburg County NOx emissions increased in 2011 by 928 tpy and VOC emissions decreased by 2,414 tpy.

Total NOx emissions for the six counties increased 3,907 tons from 2010 to 2011. Greenville County had the highest NOx emissions increase followed by Anderson and Spartanburg counties. Total VOC emissions decreased by 8,731 tons. Greenville County had the largest decrease (3,148 tons) followed by Spartanburg and Anderson counties.

*Sources:*

Duke Energy: https://www.duke-energy.com/south-carolina.asp

Yudice, S.E. (2014, December). *Upstate SC 2011 Emissions inventory*.

SC DHEC:

http://www.scdhec.gov/HomeAndEnvironment/Air/AirPollutionData/

http://www.scdhec.gov/HomeAndEnvironment/Air/

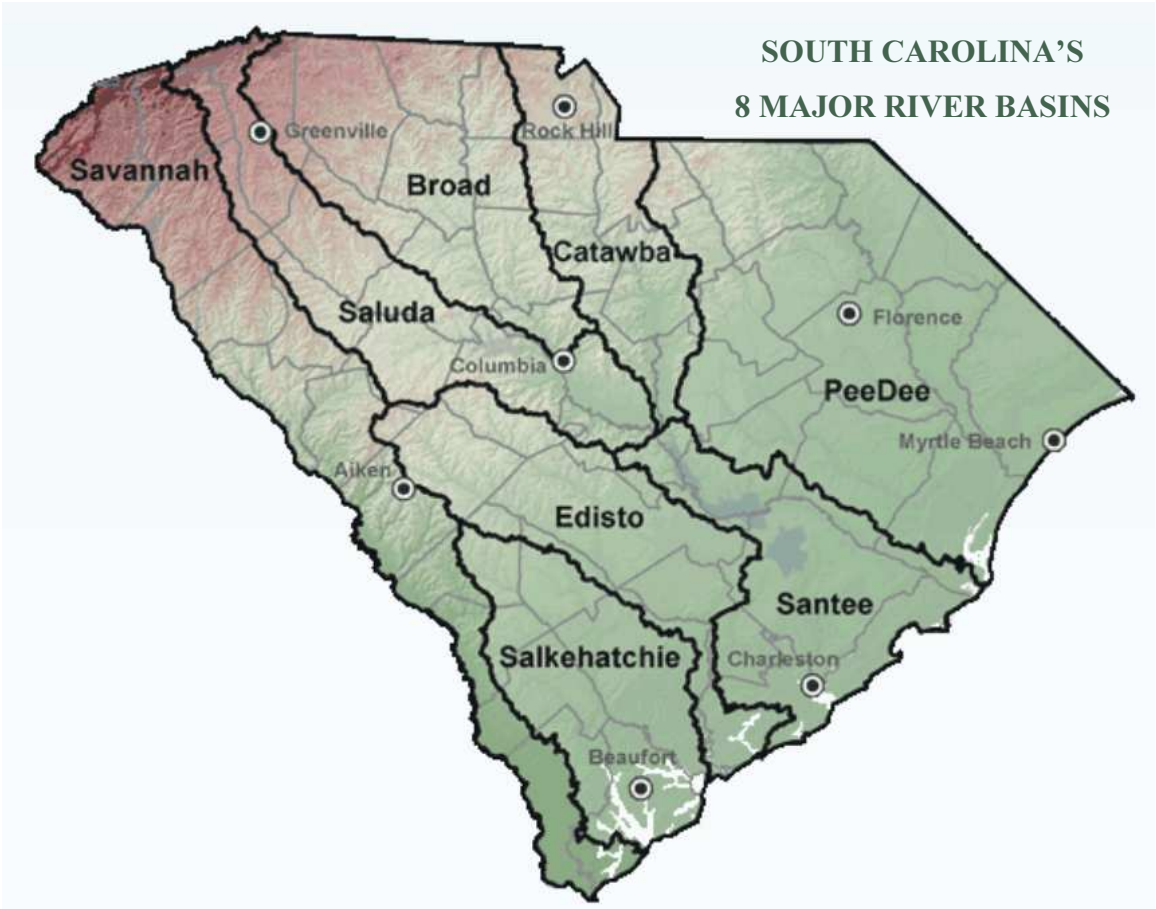
http://www.scdhec.gov/HomeAndEnvironment/Air/MostCommonPollutants/Ozone/DataReports/

## II. Water Quality and Supply

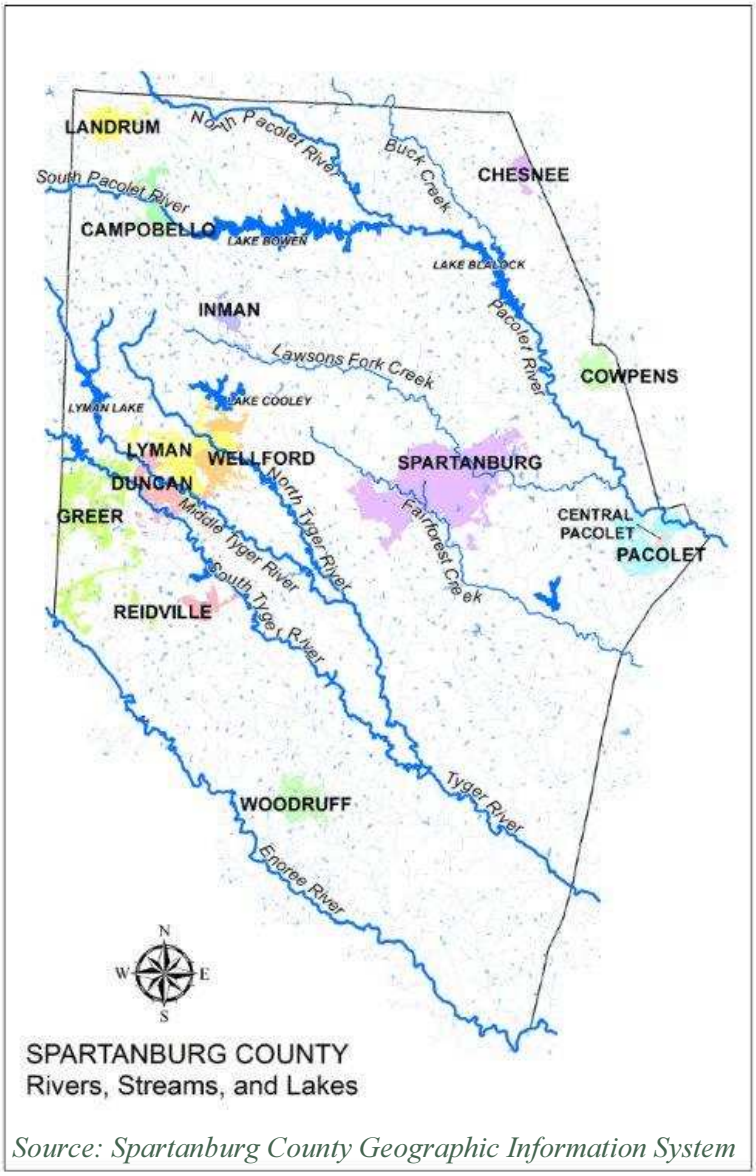
Water is a fundamental human need. Each person on Earth requires at least 5 to 13 gallons of clean, safe water a day for drinking, cooking and hygiene. The United Nations considers universal access to clean water a basic human right. Access to public water sources that are safe and reliable is crucial for a community's domestic, industrial, agricultural, medical and recreational needs. During the past century, water treatment and disinfection have made US tap water one of the safest and healthiest drinking water supplies in the world.

Water quality is a measure of the condition of water relative to the requirements of one or more biotic species or to any human need or purpose. Water quality references a set of standards against which compliance can be assessed. The most common standards used to assess water quality relate to health of ecosystems and safety for human consumption. Industrial and commercial activities (e.g. manufacturing, mining, construction, transport) are a major cause of water pollution, as are runoff from agricultural areas, urban areas and discharge of untreated or improperly treated sewage.

There are eight major river basins or watersheds in South Carolina. For each of the eight basins, South Carolina Department of Health and Environmental Control (DHEC) produces a Watershed Water Quality Assessment every five years, providing information on water chemistry, biological monitoring, physical characteristics, natural resources, growth potential, potential nonpoint source contributions and point source discharges.




*Source: SC DHEC Bureau of Water, Watershed Water Quality Assessment, December 2007*




*Source: Spartanburg County Geographic Information System*

Spartanburg County lies within the **Broad River Basin** which is further subdivided into 17 watersheds. The **Pacolet River Watershed** is the entire land area that drains to the Pacolet River, including Lawson's Fork Creek and the North and South Pacolet Rivers. The **Tyger River Watershed** is the entire land area that drains to the Tyger River, including the North, Middle and South Tyger Rivers. Both the Pacolet River Watershed and the Tyger River Watershed provide drinking water to residents of Spartanburg County. The quality and supply of water throughout the county is a function of the health of the watershed.

DHEC's Bureau of Water coordinates watershed planning and water quality management including monitoring, problem identification and prioritization, water quality modeling, planning, permitting and other activities. It is DHEC's responsibility to ensure that the water in South Carolina is safe for drinking and recreation and that it is suitable to support and maintain aquatic flora and fauna. Ambient (environmental) monitoring data are used to formulate permit limits for wastewater discharges with the goal of maintaining state and federal water quality standards in the receiving streams in accordance with the goals of the Clean Water Act. These standards define the in-stream chemical concentrations that provide for protection and reproduction of aquatic flora and fauna, help determine support of the classified uses of each water body and serve as in-stream limits for the regulation of wastewater discharges and other activities.

Spartanburg County's Municipal Separate Storm Sewer System (MS4) Monitoring System began in 2011 and establishes and maintains monitoring stations on critical impaired water bodies in unincorporated areas of the county. On some sites, permanent equipment takes regular readings of water quality while other sites are periodically monitored. Monitoring activities are required by the Clean Water Act to provide information on the health of water bodies and to develop a strategy to improve overall water conditions in the county to ensure the county's continued compliance with regulations and prevent sanctions.

## Impaired Water Bodies

The Environmental Protection Agency (EPA) requires all states to develop a list of water bodies that do not meet water quality standards. This requirement comes from Section 303(d) of the Clean Water Act, hence the common name "the 303(d) list." The water bodies on this list do not meet water quality standards even after controls for point and nonpoint source pollution have been put in place and/or a Total Maximum Daily Load (TMDL) for the pollutant has been developed. Subject matter experts assert that most of the over 100 streams in Spartanburg are impaired by E. coli, but there are limited data available to prove or disprove this. The level of impairment is being evaluated with the work being done on storm water management and a developing effort to establish a citizen's monitoring system.

The table below from DHEC's *2014 South Carolina Listing of Impaired Waters* reports on the 17 identified impaired water bodies in Spartanburg County. The full, detailed list is available on DHEC's website (http://www.scdhec.gov).

IMPAIRED WATER BODIES IN SPARTANBURG COUNTY, 2014

| Location | Use | Cause |
|---|---|---|
| Little Thicketty Creek at S-42-307 1.2 mi NE of Cowpens | Aquatic Life | Macroinvertebrate |
| Obed Creek at Unnumbered Christopher Road off SC 11 | Aquatic Life | Macroinvertebrate |
| Motlow Creek at SR 888 | Aquatic Life | Macroinvertebrate |
| Lawson's Fork Creek at S-42-40 BL Inman Mill Eff | Aquatic Life | Macroinvertebrate |
| Meadow Creek at SR 56 | Aquatic Life | Macroinvertebrate |
| Lawson's Fork Creek at S-42-108 | Aquatic Life | Macroinvertebrate |
| Lake Blalock at US 221 | Aquatic Life | Copper |
| Potter Br on RD 30 BL Outfall from Housing project Cowpens | Aquatic Life | Dissolved Oxygen |
| Beaverdam Creek at SC 357 | Aquatic Life | Macroinvertebrate |
| N Tyger River at US 29 7.2 miles W of Spartanburg | Aquatic Life | Macroinvertebrate |
| Unnamed Tributary to Timms Creek, first Tributary entering Timm Creek downstream of Montgomery Pond | Aquatic Life | Macroinvertebrate |
| Timm Creek, 100 meters upstream of Felt Rd | Aquatic Life | Macroinvertebrate |
| South Tyger River at 293 | Aquatic Life | Macroinvertebrate |
| Unnamed Tributary to South Tyger River, Rogers Mill Subdivision, downstream of the 2nd Storm Water Discharge | Aquatic Life | Macroinvertebrate |
| Tributary to Fairforest Ck 200 ft below S-42-65 | Aquatic Life | Nickel, Hydrogen Ion Concentration |
| Fairforest Ck at SC 56 | Aquatic Life | Macroinvertebrate |
| Lake Johnson at Spillway at S-42-359 | Aquatic Life | Chlorophyll A, Dissolved Oxygen, Hydrogen Ion Concentration, Total Phosphorus |

*Source: SC DHEC*

The number of listed impaired water bodies in Spartanburg County has decreased by five since 2010. There are three ways for impaired water bodies to be removed from the 303(d) list: the South Carolina water quality standard has been attained, a listing error has been identified, or a TMDL has been developed and approved. The water bodies removed from the list are:

- S. Pacolet River at S-42-866 1 mile SE of Campobello
- Lake Bowen 0.3 mile W of SC 9
- Pacolet River at S-42-59, Beacon Light Rd in Clifton
- Middle Tyger River at S-42-64
- Jimmie's Creek at Stewart Rd, 1 mile upstream of SR113

*Source: SC DHEC*

## Drinking Water

The US Environmental Protection Agency (EPA) maintains national health-based standards for drinking water quality to protect the public from various disease organism and chemical contaminants. In South Carolina, the Department of Health and Environmental Control (DHEC) regulates public water systems to ensure that these standards are met in accordance with the Safe Drinking Water Act Amendments and performs a source water assessment for all drinking water supplies in South Carolina. Public water systems are required to test their water for chemical and biological contaminants at frequent intervals and to make the results public via a water quality report known as the Consumer Confidence Report. Drinking water comes from either ground water or surface water. Drinking water that comes from ground water through private wells is not regulated by federal standards, while treated ground water and surface water is regulated. Potential water contaminants that are monitored include:

- Microbiological contaminants such as viruses and bacteria (e.g. fecal coliform or E. Coli) which may come from incompletely treated sewage, leaking septic systems, agriculture, pet waste and wildlife waste
- Inorganic contaminants such as salts and metals (e.g. fluoride, nitrate, chlorine) which can be naturally occurring or due to urban storm water runoff, wastewater discharges or industrial discharge
- Organic chemical contaminants (e.g. organic carbon, trihalomethanes, haloacetic acids) which include byproducts of industrial processes, urban storm water runoff and failed septic systems
- Pesticides and herbicides that may come from a variety of sources such as agriculture, urban storm runoff and residential use
- Radioactive contaminants which can be naturally occurring or the result of mining or oil and gas production

Drinking water (not supplied by private wells) comes from three water districts in Spartanburg County – the Spartanburg Water System (SWS), the Woodruff-Roebuck Water District (WRWD), and the Startex-Jackson-Wellford-Duncan Water District (SJWD).

Water supplied through the SWS comes from Lake Bowen, Lake Blalock, Municipal Reservoir #1 and lakes located on the Tyger River. The North and South Pacolet Rivers and their tributaries feed these water sources. Two facilities treat the water from the three lakes. SWS, metro sub districts and DHEC routinely monitor for over 150 chemical and biological contaminants. According to the SWS 2013 Water Quality Report, SWS continues to meet and surpass all state and federal water quality standards under the Safe Drinking Water Act. Although most contaminants are not present in the system's drinking water, there are some exceptions. The presence of contaminants, however, does not necessarily indicate that water poses a health risk.

Water supplied through WRWD comes from the North and South Tyger Rivers, just before their confluence into the Tyger River, and is treated at one plant. There is an intake on each river capable of delivering the full plant capacity from either river. WRWD routinely monitors for 81 contaminants in drinking water. According to the 2015 WRWD Consumer Confidence Report, there was one Maximum Contaminant Level (MCL) exceeded - Total Trihalomethanes, a byproduct of drinking water disinfection that, with extensive exposure, can cause problems with various organs and may increase cancer risk. There were no other violations of water quality measures, although a variety of contaminants were detected.

Water supplied through SJWD, a Special Purpose District created in 1958 for the purpose of providing drinking water to western Spartanburg County, comes from the Middle Tyger River (Lyman Lake) and the North Tyger River (Lake Cooley and North Tyger Reservoir). All water is treated at the SJWD water treatment facilities in Lyman, SC. According to the 2013 SJWD Water Quality Report, there were no violations of water quality measures, although a variety of contaminants were detected.

Homeowners whose drinking water comes from a private well are responsible for their own drinking water safety. Because EPA rules do not apply to private wells, it is recommended that well owners have their water tested annually.

While at this time there is not a water shortage in Spartanburg County, water conservation is important for future water supply. Since Spartanburg County is near the top of its watershed, it receives high quality drinking water compared to those farther downstream, especially during times of drought. While the county currently has an adequate amount of water for domestic, agricultural and industrial use, there will be cycles of limited rainfall. The water districts in the county have contingency plans related to water supply, but there is not a countywide plan in place. Water conservation by Spartanburg County residents will improve supply in the future and for downstream users.

Source water is the untreated water in creeks, rivers, lakes and streams. Source water quality is a measure of the condition of water relative to the requirements of one or more biotic species or to any human need or purpose. Water quality standards relate to the health of ecosystems and safety for human use. Along with industrial, commercial and agricultural activities, storm water runoff is a major cause of source water pollution.

### Storm Water Runoff

Storm water runoff carries various pollutants on the ground into lakes, rivers, wetlands and ground waters, many of which are sources of drinking water. Sources of pollution are classified as "nonpoint source" and "point source." Nonpoint source pollution includes pet waste, fertilizers, oil and gasoline from roads and driveways and other pollutants carried by storm water as it flows naturally over the ground into streams and other bodies of water. Point source pollution may come from industrial effluent and domestic water treatment facilities that discharge treated water to streams at discrete locations in accordance with conditions of a permit issued by the state. Point source pollution can be easily regulated or eliminated, whereas nonpoint source pollution is much more difficult to regulate and eliminate.

Impervious surfaces such as asphalt and concrete seal soil surfaces so that runoff from rain and snowmelt is not absorbed to filter and renew groundwater. Instead, runoff travels over the ground or is drained into storm sewer systems, carrying with it trash and other pollutants. Polluted storm water runoff is commonly transported through Municipal Separate Storm Sewer Systems (MS4s), from which it is often discharged untreated into local water bodies. An MS4 is a system of conveyances that include, but are not limited to, catch basins, curbs, gutters, ditches, man-made channels, pipes, tunnels and/or storm drains that discharge into any water body within the state, large or small, and ultimately into the Atlantic Ocean. Operators of large, medium and regulated small MS4s are required to obtain National Pollutant Discharge Elimination System (NPDES) permits in order to discharge pollutants into surface waters.

South Carolina has one large MS4 - South Carolina Department of Transportation - and three medium MS4s - City of Columbia, Greenville County and Richland County. These MS4s receive individual NPDES permits for their discharges. There are also over 70 regulated small MS4s in South Carolina, including Spartanburg County, the City of Spartanburg, Duncan, Lyman, Inman, Cowpens and Wellford. Each regulated MS4 is required to develop and implement a Storm Water Management Program (SWMP) to reduce the contamination of storm water runoff and prohibit illegal discharges.

Spartanburg County's MS4 Monitoring System began in 2011 through its storm water ordinance (last updated in November 2014) and establishes and maintains approximately seven monitoring stations on critical impaired water bodies in unincorporated areas of the county. On some sites, permanent equipment takes regular readings of water quality while other sites are periodically monitored. Monitoring activities are required by the Clean Water Act to provide information on the health of water bodies and to develop a strategy to improve overall water conditions in the county to ensure the county's continued compliance with regulations and to prevent sanctions.

Spartanburg County's Storm Water Management Ordinance establishes minimum requirements and procedures to control storm water runoff associated with both future land development and existing developed land. Spartanburg County is the permitting authority for all land disturbing activities and requires the land owner to maintain controls required by the approved storm water control plan. The county will only provide construction permits to projects that establish a plan to manage storm water runoff occurring during the construction process. Enforcement of these requirements by Spartanburg County Storm Water Management has led to continuous improvement in water quality through runoff control. Since 2010, the county has been involved in creating and implementing storm water runoff control utilizing 319 DHEC grants to help land owners solve runoff issues from livestock, pet waste, septic tanks, erosion and other problem areas impacting the Pacolet and Enoree Rivers.

Organizations such as Upstate Forever and Spartanburg County promote Low Impact Development to reduce impervious surfaces and to manage storm water via cost-effective landscape features throughout Spartanburg County. The parking lot of Spartanburg County's administration building includes a demonstration rain garden for storm water runoff. Developers are able to learn from and apply the principles of the rain garden to properties throughout the county.

*Sources:*

Spartanburg Water 2013 Water Quality Report: http://spartanburgwater.org/water-sewer/water-quality.php

South Carolina Department of Health and Environmental Control. 2007. *Watershed Water Quality Assessment: Broad River Basin.* Technical Report No.006-07. Bureau of Water, Columbia, SC

South Carolina Department of Health and Environmental Control, MS4 Overview: http://www.scdhec.gov/Environment/WaterQuality/Stormwater/RegulatedMS4s/MS4Overview/

Startex-Jackson-Wellford-Duncan Water District: http://www.sjwd.com/

South Carolina Department of Health and Environmental Control Bureau of Water: http://www.scdhec.gov/HomeAndEnvironment/Water/

Woodruff Roebuck Water District: http://wrwd.org/

# III. Land Use

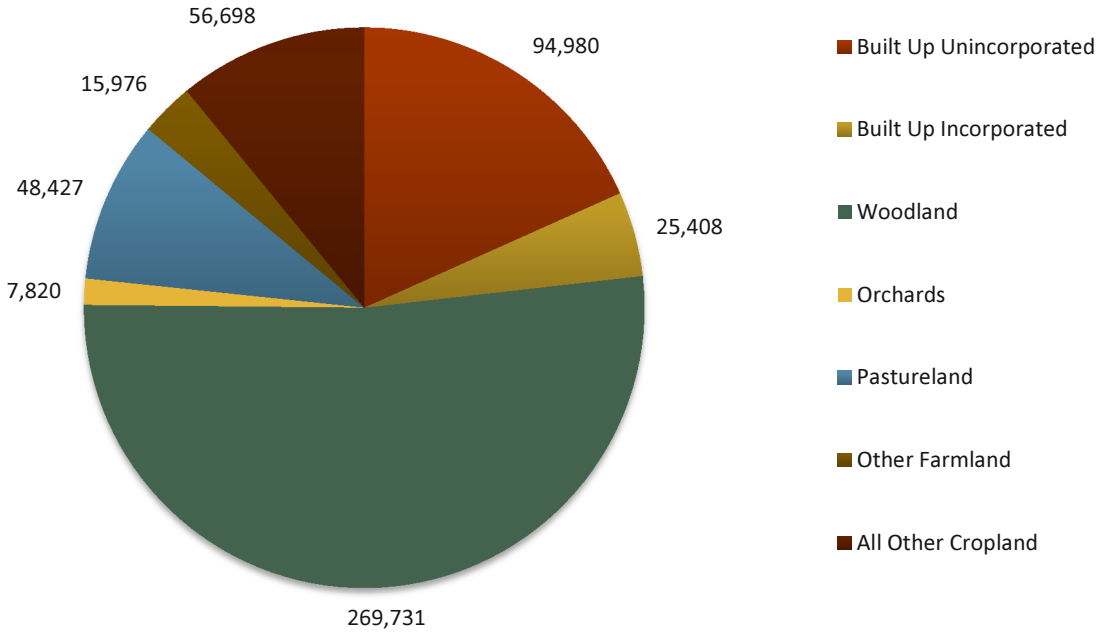
Land in Spartanburg County is used for a multitude of activities and includes everything from farms to golf courses, houses to fast food establishments, and hospitals to grave yards.
All uses are interconnected. The location of any given use impacts in some way the larger environ of which it is a part.
*Spartanburg County Comprehensive Plan*

The way land is used determines whether natural resources are preserved and whether communities are sustainable. Land use planning encompasses various disciplines to systematically assess land and water potential, alternatives for land use, and economic and social conditions in order to select and adopt the best land-use options. Its purpose is to select and put into practice those land uses that will best meet the needs of people while safeguarding resources for the future in the most ethical and efficient manner.

A land use plan is often one element of a comprehensive plan that dictates public policy in terms of transportation, utilities, land use, recreation and housing. The terms land use planning, regional planning, urban planning, urban design and smart growth are often used interchangeably. Land use planning often leads to land use regulations such as zoning, a tool for implementing land use plans.

The current Spartanburg County Comprehensive Plan reports the following data for Spartanburg County:

**EXISTING LAND USE (ACRES) IN SPARTANBURG COUNTY**




*Source: Spartanburg County Comprehensive Plan*

The data contained in this graphic, however, are old. It will be instructive to compare the same data when the 2015 Comprehensive Plan is released.

The 1998 County Comprehensive Plan makes a case for an orderly, coordinated development process focusing on common goals and objectives. The goals and strategies in the plan are:

**SPARTANBURG COUNTY DEVELOPMENT OBJECTIVES AND STRATEGIES**

| Map Designation | Geographic Objective<br>Recommended Strategies |
|---|---|
| **Existing Residential** | **Protect the character and present use of existing residential subdivisions and neighborhoods** |
| | Discourage or prohibit development which would alter the character and live-ability of existing residential areas and devalue homes in such areas. |
| | Encourage continued residential infill of such areas. |
| | Encourage the maintenance and/or revitalization of established subdivisions and neighborhoods. |
| **Developing Residential** | **Promote and accommodate development in residential areas** |
| | Ensure orderly and cohesive design and development of such areas through timely provision of infrastructure incentives. |
| | Encourage backing residential subdivisions along arterial streets; discourage strip residential development and control curb cuts along such streets. |
| | Enact habitability, siting, and safety standards for relocated manufactured homes, and encourage compatibility with conventional dwellings. |
| | Reward site designs and residential projects that conserve on-site resources. |
| | Ensure that the level and type of proposed residential development will be compatible with the physical limitations of the land and established land uses in the area. |
| | Provide opportunities for an appropriate mix of dwelling types, sites, and prices in order to meet current and projected housing needs of county residents in keeping with their financial capabilities and preferences. |
| | Promote new and innovative approaches to residential development which will expand the variety of housing opportunities and/or minimize public and private costs. |
| | Encourage the maintenance and/or revitalization of established neighborhoods and communities. |
| | Encourage the development of and map an expanded arterial street system, with super blocks, as a means of supplementing the existing arterial system, minimizing traffic congestion on these highways, and facilitating vehicular movement. |
| | Consider for adoption growth incentive strategies that address and coordinate the following:<br>1. The quantity of development – that is, the amount of development. |

| | |
|---|---|
| | 2. The type of development, both major types (such as residential, commercial, industrial, and open space) and subtypes (such as single or multifamily residential).<br>3. The location of development, both the geographic direction of growth and the types of development that can take place.<br>4. The timing or rate of growth.<br>5. The density or intensity of development.<br>6. The quality of development.<br>7. Land practices and development impacting the county's reservoir watershed areas. |
| **Industrial Business** | **Create Industrial / Business Development Opportunities** |
| | Identify areas with industrial and business potential. |
| | Encourage the development of industrial and office parks. |
| | Assist in facilitating potential sites for industrial and related development. |
| | Reduce potential land use compatibility conflicts between industrial (existing and future use) and residential uses, i.e. buffers. |
| **Transitional** | **Encourage the highest and best use of land, with sensitivity to the impact on surrounding uses and resources.** |
| | Employ the use of buffers and/or site design techniques to promote compatibility between potentially incompatible uses. |
| | Promote landscaping as a means of improving aesthetics and compatibility. |
| | Monitor the transitional process. |
| **Rural and Rural Residential** | **Conserve rural characteristics and resources and maintain a balanced rural-urban environment.** |
| | Monitor proposed changes which would alter or compromise the rural character of such areas. |
| | Encourage cluster development in addition to large lot development with open space-agricultural land set-asides in conjunction with such development. |
| **Commercial Nodes** | **Meet convenience commercial and service needs of surrounding communities.** |
| | Encourage the concentration of commercial activity in selected nodes convenient to population concentrations. |
| **Use Corridors:** | **Accommodate in an orderly manner the highest and best use of property fronting on and/or accessible to such designated streets and roads.** |
| High Intensity<br>Low Intensity | Enact corridor development policies that:<br>1. Minimize the impact of development on traffic movement and the carrying capacity of such corridors.<br>2. Promote safety. |

| | |
|---|---|
| | 3. Address appearance and alignment of buildings.<br>4. Make landscaping an integral part of all future development.<br>5. Promote street tree plantings and the greening of corridors.<br>6. Address signage and the proliferation thereof. |
| **Watershed** | **Protect the county's water supply** |
| | Require the use of Best Management Practices (BMP's) in all land disturbing activity. |
| | Encourage low-intensity development. |
| | Discourage expansive paved parking lots and uses which contribute to excessive storm water runoff. |
| | Require homes and other uses to tie into community sewer systems where feasible. |
| | Closely monitor on-site (septic tank) disposal systems to ensure that they operate properly. |
| | Prevent clear cutting of forested areas. |

*Source: Spartanburg County Comprehensive Plan*

Changes to these strategies may be reflected in the 2015 Comprehensive Plan.

In fall 2014, students and faculty in the City and Regional Planning Master's program at Clemson University, in partnership with Ten at the Top (TATT), did a comparative analysis of the County Comprehensive Plans for all 10 Upstate counties. Using the county data, the team conducted a series of regional analyses to highlight the strengths, weaknesses, opportunities, and threats (SWOT) to the Upstate region by element. The project was designed to highlight regional trends and issues facing the Upstate as a whole. Below are the results of the SWOT analysis for the land use element of the combined comprehensive plans.

### LAND USE SWOT ANALYSIS FOR UPSTATE, SC (2014)

| **Strengths** | **Weaknesses** |
|---|---|
| • Increasing consciousness of sustainable, compact development patterns<br>• Abundant supply of open space<br>• Regulations support industrial/commercial development | • Sprawling land use patterns dominate much of the Upstate<br>• Development patterns outpacing community facilities and services<br>• General lack of zoning |
| **Opportunities** | **Threats** |
| • Large tracts of undeveloped land provide flexibility<br>• Better integration of transportation and land use planning<br>• Focus on redeveloping and revitalizing downtowns | • Development pressure on prime farmland<br>• Insufficient protection for established residential areas from incompatible development<br>• Incompatible land uses across county borders |

*Source: 2014 Upstate Comprehensive Plan Analysis*

*Sources:*

Clemson University City and Regional Planning Program. (2014, Fall). *Upstate Comprehensive Plan Analysis.*

*Spartanburg County Comprehensive Plan*: www.spartanburgcounty.org/govt/depts/pln/compplan/TOC.htm

### Development and Sprawl

Land use practices over the past several decades have converged to generate haphazard, inefficient and unsustainable urban sprawl across the nation.

Researchers from Smart Growth America first issued detailed data on urban sprawl in their 2002 report, *Measuring Sprawl and its Impact,* by ranking 83 US metropolitan areas. The formula used to calculate sprawl includes four factors: development density, land use mix, activity centering and street accessibility. The average index is 100, meaning areas with scores higher than 100 tend to be more compact and connected while areas with scores lower than 100 are more sprawling. The report provides detailed data and rankings for each of the four factors, but overall rankings for sprawl are listed in the tables below. In 2010, Greenville-Spartanburg ranked as the 5th most sprawling metro region in the US.

**MOST SPRAWLING AREAS, OVERALL MEASURE BY METROPOLITAN REGION, 2010 EDITION**

| Rank | Metropolitan Region | Density Score |
|---|---|---|
| 1 | Riverside-San Bernardino, CA MSA | 14.2 |
| 2 | Greensboro-Winston-Salem-High Point, NC MSA | 46.8 |
| 3 | Raleigh-Durham, NC MSA | 54.2 |
| 4 | Atlanta, GA MSA | 57.7 |
| 5 | Greenville-Spartanburg, SC MSA | 58.6 |
| 6 | West Palm Beach-Boca Raton-Delray Beach, FL MSA | 67.7 |
| 7 | Bridgeport-Stamford-Norwalk-Danbury MSA | 68.4 |
| 8 | Knoxville, TN MSA | 68.7 |
| 9 | Oxnard-Ventura, CA PMSA | 75.1 |
| 10 | Fort Worth-Arlington, TX PMSA | 77.2 |

*Source: Smart Growth America, 2010*

The 2002 report found that medium-sized metro areas in the Southeast had the lowest housing density, one of the four measures of sprawl. In fact, Greenville-Spartanburg was noted to have the 2nd lowest housing density (second highest sprawl by this measure). These metro areas are places where growth has mostly occurred during the automobile era, without topographic or water-related constraints that otherwise restrict development.

In the *Measuring Sprawl 2014* update, Smart Growth researchers analyzed development patterns in 221 metropolitan areas and 994 counties in the United States. The two tables below report the latest data on the most sprawling metropolitan areas and the most compact / connected metropolitan areas

in the country. Greenville-Mauldin-Easley metropolitan area now ranks as the 3rd most sprawling metropolitan area in the country. (Changes in reported geographies are due to US Census changes in Metropolitan Statistical Areas.)

**MOST SPRAWLING AREAS, OVERALL MEASURE BY METROPOLITAN REGION, 2014 EDITION**

| Rank | Metropolitan Region | Density Score |
|---|---|---|
| 221 | Hickory/Lenoir/Morgantown, NC | 24.9 |
| 220 | Atlanta/Sandy Springs/Marietta, GA | 41.0 |
| 219 | Clarksville, TN-KY | 41.5 |
| 218 | Prescott, AZ | 49.0 |
| 217 | Nashville-Davidson/Murfreesboro/Franklin, TN | 51.7 |
| 216 | Baton Rouge, LA | 55.6 |
| 215 | Riverside-San Bernardino/Ontario, CA | 56.2 |
| 214 | Greenville/Mauldin-Easley, SC | 59.0 |
| 213 | Augusta/Richmond County, GA-SC | 59.2 |
| 212 | Kingsport/Bristol/Bristol, TN-VA | 60.0 |

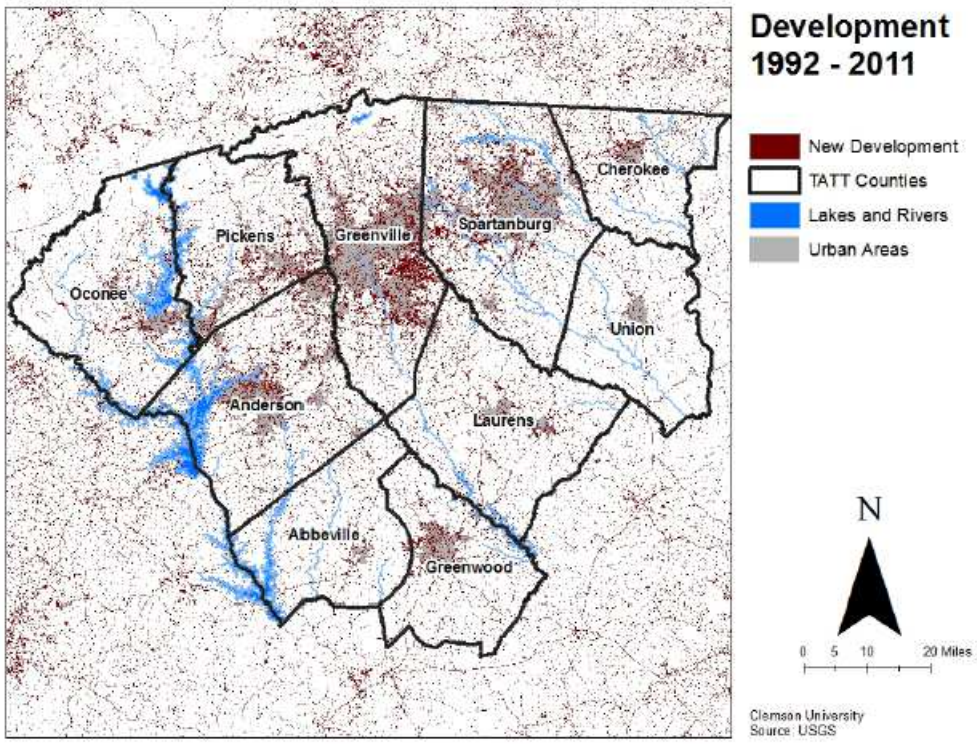
*Source: Smart Growth America, 2014*

**Most Compact Areas, Overall Measure by Metropolitan Region, 2014 Edition**

| Rank | Metropolitan Region | Density Score |
|---|---|---|
| 1 | New York/White Plains/Wayne, NY-NJ | 203.4 |
| 2 | San Francisco/San Mateo/Redwood City, CA | 194.3 |
| 3 | Atlantic City/Hammonton, NJ | 150.4 |
| 4 | Santa Barbara/Santa Maria/Goleta, CA | 146.6 |
| 5 | Champaign/Urbana, IL | 145.2 |
| 6 | Santa Cruz/Watsonville, CA | 145.0 |
| 7 | Trenton/Ewing, NJ | 144.7 |
| 8 | Miami/Miami Beach/Kendall, FL | 144.1 |
| 9 | Springfield, IL | 142.2 |
| 10 | Santa Ana/Anaheim/Irvine, CA | 139.9 |

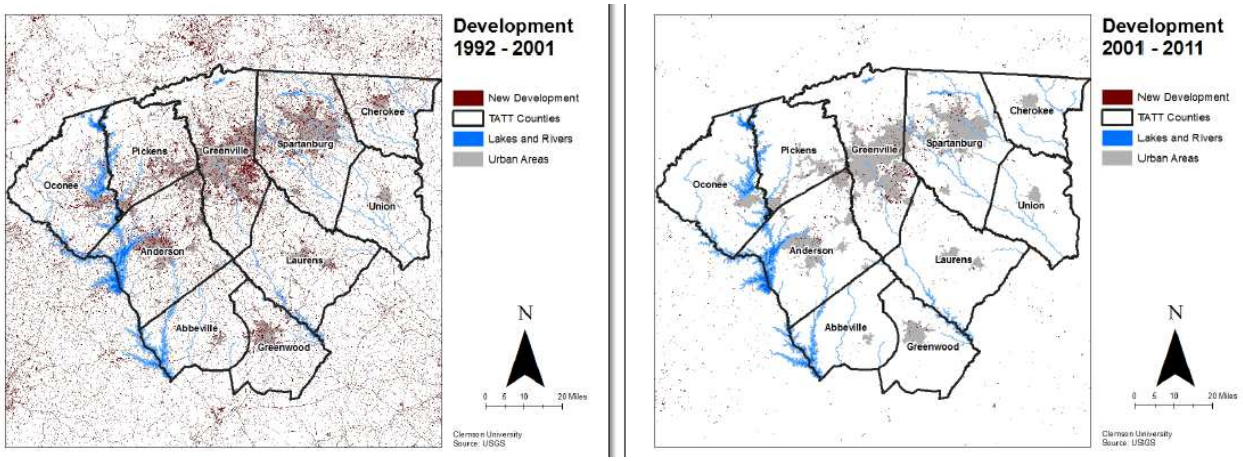
*Source: Smart Growth America, 2014*

According to Clemson University planners in the *2014 Upstate Comprehensive Plan Analysis*, in the Upstate between 1992 and 2011, the majority of new development occurred along major transportation corridors and around existing urban areas.



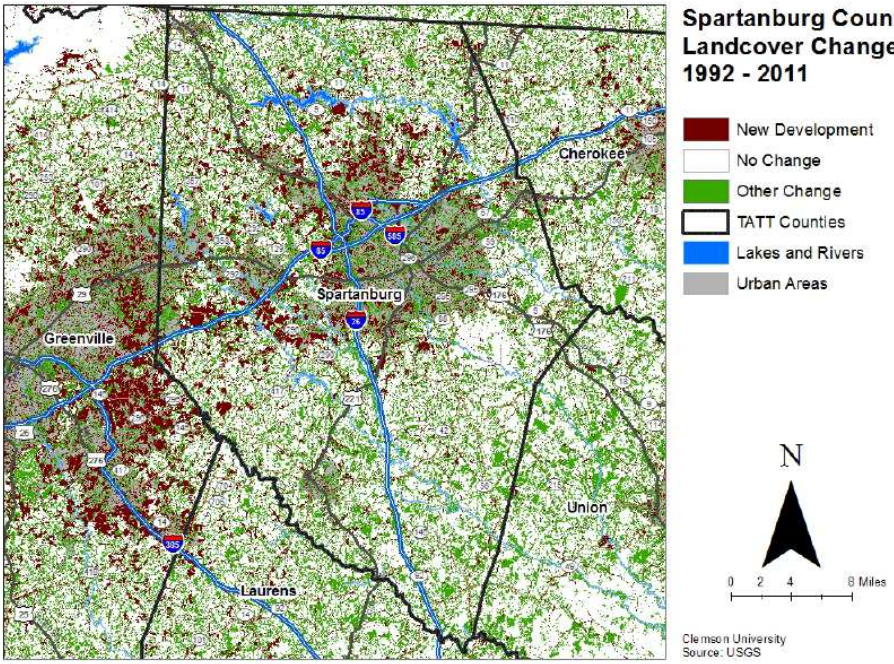

*Source: 2014 Upstate Comprehensive Plan Analysis*

When growth is viewed incrementally within the 1992-2011 time frame, it becomes clear that the majority of growth in the Upstate occurred between 1992 and 2001.



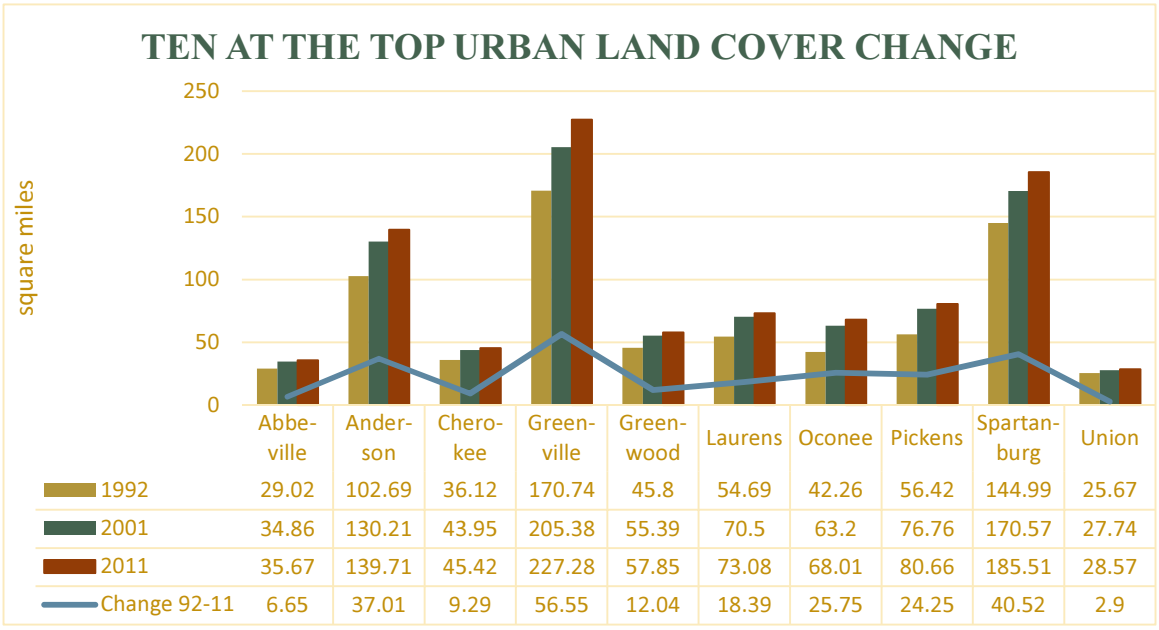

*Source: 2014 Upstate Comprehensive Plan Analysis*

In Spartanburg County, most new development has occurred north of the City of Spartanburg, in Greer, and along major transportation corridors as illustrated in the map below. New development is defined as any land classification that changed to developed open space, low density, medium density or high density. Any other changes to land cover are categorized as "other changes."




*Source: 2014 Upstate Comprehensive Plan Analysis*

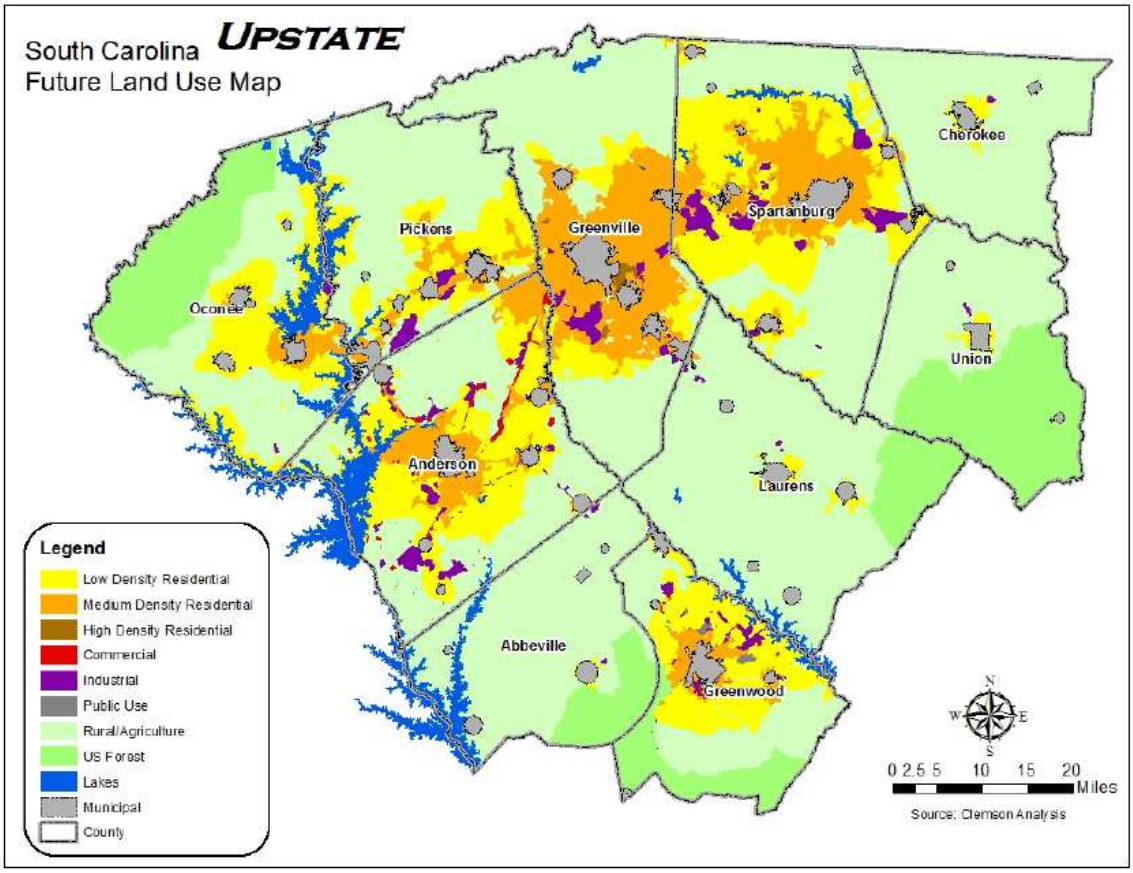
By Upstate county, the most growth and the fastest growth, in terms of urban land change, has occurred in Greenville, Spartanburg and Anderson Counties, respectively. In Spartanburg County, 40.53 square miles were developed between 1992 and 2011.




| | Abbe-ville | Ander-son | Chero-kee | Green-ville | Green-wood | Laurens | Oconee | Pickens | Spartan-burg | Union |
|---|---|---|---|---|---|---|---|---|---|---|
| 1992 | 29.02 | 102.69 | 36.12 | 170.74 | 45.8 | 54.69 | 42.26 | 56.42 | 144.99 | 25.67 |
| 2001 | 34.86 | 130.21 | 43.95 | 205.38 | 55.39 | 70.5 | 63.2 | 76.76 | 170.57 | 27.74 |
| 2011 | 35.67 | 139.71 | 45.42 | 227.28 | 57.85 | 73.08 | 68.01 | 80.66 | 185.51 | 28.57 |
| Change 92-11 | 6.65 | 37.01 | 9.29 | 56.55 | 12.04 | 18.39 | 25.75 | 24.25 | 40.52 | 2.9 |

*Source: United States Geological Service as cited in 2014 Upstate Comprehensive Plan Analysis*

In an effort to compare land use patterns across jurisdictional borders in the Upstate, Clemson University planners obtained ArcGIS Future Land Use files from the counties that were able to provide them. Analysis of the data resulted in the future land use map for the Upstate, below. This map can be viewed as a tool to identify key challenges and opportunities, such as incompatible development patterns or potential for inter-jurisdictional facilities.




*Source: Upstate Comprehensive Plan Analysis*

## Urban Design Movements

In recent years, the "livability" movement has emphasized development practices that favor urban infill (rather than hopscotch development farther and farther from central locations) and zoning ordinances that isolate residential areas from areas of employment, shopping and services. Infill has been promoted as an economical use of existing infrastructure and a remedy for automobile-dependent urban sprawl. This type of development focuses on the reuse of obsolete or underutilized buildings and sites and is viewed as essential to renewing blighted neighborhoods and aligning them with more prosperous communities. However, with infill comes the potential for overloading urban services, including increased traffic congestion and pollution and decreasing urban green-space. Therefore, planning must be done with care.

Livability means being able to take your kids to school, go to work, see a doctor, drop by the grocery or post office, go out to dinner and a movie, and play with your kids at the park, all without having to get into your car. Livability means building the communities that help Americans live the lives they want to live - whether those communities are urban centers, small towns, or rural areas.

*Secretary Ray LaHood, US Department of Transportation*

New Urbanism and Smart Growth are closely related urban design movements which promote compact, walkable urban centers and neighborhoods containing a range of housing and employment opportunities. These movements are strongly influenced by urban design practices that were prominent until the rise of the automobile prior to World War II, encompassing principles such as complete streets, mixed-use development, traditional neighborhood design (TND) and transit-oriented development (TOD). The goals of these design movements are to achieve a unique sense of community and place; expand the range of transportation, employment, and housing choices; equitably distribute the costs and benefits of development; preserve and enhance natural and cultural resources; and promote public health.

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
*World Commission on Environment and Development*

Advocates of these and other urban design movements are concerned with vacant and blighted spaces as they impact the environmental, economic and social health of the community. There has not been an updated inventory of vacant "big box" space in Spartanburg County since last done by Upstate Forever and reported in the 2009 Spartanburg Community Indicators Project report, *The Status of Natural Environment in Spartanburg County*. At that time, there were nearly 1,000,000 square feet of vacant big box space in Spartanburg County. At the end of 2004, there were 2.984 million square feet of empty retail space across Anderson, Greenville and Spartanburg Counties. Of that, 58% was vacant big box space. At that time, Spartanburg County had the highest percentage of empty big box space.

*Sources:*

Clemson University City and Regional Planning Program. (2014, Fall). *Upstate Comprehensive Plan Analysis.*

Spartanburg Community Indicators Project, *The Status of Natural Environment in Spartanburg County, SC – 2011 Update:* http://www.strategicspartanburg.org/

2002 Smart Growth America: Measuring Sprawl and Its Impact: Reid Ewing, Rutgers University, Rolf Pendall, Cornell University, Don Chen, Smart Growth America
http://www.smartgrowthamerica.org/research/measuring-sprawl-and-its-impact/

Smart Growth America, Measuring Sprawl 2014: www.smartgrowthamerica.org/

United Nations Brundtland Commission Report: http://www.un-documents.net/wced-ocf.htm

## Forested Acres

The number of forested acres in Spartanburg County has consistently decreased since 2001 as reported in the table below. Prior to 1993, data were kept on timberland rather than forestland. Forestland includes timberland and reserved timberland. Reserved timberland is defined as area taken out of timber production by statute of law. Spartanburg County does not have any lands regarded as reserved timberlands and likely has never had reserved timberlands. Therefore, estimates should be consistent between forestland and timberland for Spartanburg County.

**FORESTLAND ACRES, SPARTANBURG COUNTY, TREND**

| Year | 2013 | 2008 | 2003 | 2001 | 1993 | 1986 | 1978 | 1968 |
|---|---|---|---|---|---|---|---|---|
| Category | Forestland | Forestland | Forestland | Forestland | Timberland | Timberland | Timberland | Timberland |
| Acres | 225,640 | 232,823 | 249,110 | 256,868 | 262,954 | 254,865 | 271,113 | 261,585 |

*Source: SC Forestry Commission, Broadmoor Planning*

## Protected Land

> The ongoing urban land boom has brought us many benefits, including an economy which employs more people and is more diversified than it has ever been. However, these benefits have been obtained at some cost, notably the significant impacts to our habitat base, agricultural productivity, and inventory of open lands. Quality of life ranks high among the reasons people choose to invest in a move to South Carolina, yet the land on which this quality of life depends is a limited commodity.
>
> *South Carolina Conservation Bank*

Four primary nonprofit organizations in the county, Spartanburg Area Conservancy (SPACE), Pacolet Area Conservancy (PAC), Upstate Forever and Naturaland Trust, work to ensure that forests, waterways and other green spaces throughout the county are protected and preserved for future generations. These four nonprofits have protected a significant number of acres in parks, greenways and private lands in Spartanburg County and throughout the Upstate through various land protection tools such as conservation easements and fee simple ownership.

SPACE's land protection totals now are 3,865 acres including the three preserves owned and maintained by SPACE - the 118-acre Edwin M. Griffin Nature Preserve (home to the Cottonwood Trail), the 36-acre Upper Chinquapin Greenway and the 13-acre Glendale Shoals Preserve. In addition, SPACE was instrumental in protecting two preserves owned and maintained by the SC DNR Heritage Preserve Program - the 258-acre Pacolet River Heritage Preserve and the 156-acre Peters Creek Heritage Preserve.

Pacolet Area Conservancy has helped protect over 8,606 acres in the Upstate including 12 projects totaling 192 acres in northern Spartanburg County protected through conservation easements. These easements range in size from 1 to 52 acres. In total, PAC holds conservation easements on 60 protected properties and owns 25 properties in the Upstate. PAC is responsible for monitoring 68 easements annually, 6 of which are held by the state of North Carolina and one which is held by The

Nature Conservancy. PAC is responsible for monitoring a total of 4,827 acres annually to make certain that the terms of the conservation agreements are upheld.

Upstate Forever promotes sensible growth and protects special places in the ten county Upstate region. Their efforts in Spartanburg include the protection of 2,067 acres of land through conservation easements, including significant properties along the North Pacolet River, one agricultural tract in partnership with SPACE and a special farm in the Pauline area.

Naturaland Trust protects South Carolina's Blue Ridge Mountains and special places in the Piedmont, providing public access to open and wild spaces including waterfalls, mountain forests, wildlife and rare plant species. Naturaland Trust owns over 1,600 acres and has played a direct role in conserving and protecting another 70,000+ acres for public use. Naturaland Trust protects 9.2 acres in Spartanburg County.

*Sources:*

Naturaland Trust: http://www.naturalandtrust.org/

Pacolet Area Conservancy: http://pacolet.org/

South Carolina Conservation Bank: http://sccbank.sc.gov/about.html

Spartanburg Area Conservancy: http://spartanburgconservation.org/

Upstate Forever: http://www.upstateforever.org/protected-properties/

# IV. Biodiversity

Biodiversity is the degree of variation of living organisms – plants, animals, micro-organisms and the ecosystems of which they are a part. Variation can refer to genetic variation, ecosystem variation or species variation (number of species) within an area, biome or planet. Biodiversity is essential to the health of ecosystems. Although species extinction is a natural part of life due to natural shifts in the environment over long periods of time, non-natural environmental changes accelerate species extinction at a dangerous rate. Such extinction is often a result of habitat loss due to development, over-exploitation (e.g. overfishing), spread of non-native species or disease, climate change, and pollution.

The South Carolina Department of Natural Resources (SC DNR) collects species occurrence data; however, these data are incomplete as a complete survey of the state has never been done. Because the data set is incomplete, it is generally used by conservation groups, governments and environmental consultants to help determine what species might be impacted by land development or helped by land conservation.

An important indicator of biodiversity (or lack thereof) is the endangered species in a given area. SC DNR maintains an inventory of rare, threatened and endangered species by county. Last updated in June 2014, the data for Spartanburg County are reported below; however, in order to protect the areas where these species are located, SC DNR does not allow location data to be disclosed.

**RARE, THREATENED AND ENDANGERED SPECIES AND COMMUNITIES KNOWN TO OCCUR IN SPARTANBURG COUNTY (JUNE 2014)**

| Scientific Name | Common Name |
|---|---|
| **Vertebrate Animals** | |
| Microtus pennsylvanicus | Meadow Vole |
| **Vascular Plants** | |
| Aconitum uncinatum | Blue Monkshood |
| Circaea lutetiana ssp. canadensis | Enchanter's Nightshade |
| Cypripedium pubescens | Large Yellow Lady's Slipper |
| Fothergilla major | Mountain Witch Alder |
| Gaultheria procumbens | Teaberry |
| Hackelia virginiana | Virginia Stickseed |
| Helianthus laevigatus | Smooth Sunflower |
| Helianthus porteri | Porter's Goldeneye |
| Hexastylis naniflora | Dwarf-flowered Heartleaf |
| Isoetes piedmontana | Piedmont Quillwort |
| Juglans cinerea | Butternut |
| Juncus georgianus | Georgia Rush |
| Juniperus communis | Ground Juniper |
| Lonicera flava | Yellow Honeysuckle |
| Lygodium palmatum | Climbing Fern |
| Melanthium virginicum | Virginia Bunchflower |
| Minuartia uniflora | One-flower Stitchwort |
| Monotropis odorata | Sweet Pinesap |
| Nestronia umbellula | Nestronia |
| Rhododendron eastmanil | May White |
| Solidago bicolor | White Goldenrod |
| **Communities** | |
| Chestnut - Oak Forest | |
| Cove Forest | |
| Mesic Mix Hardwood Forest | |
| Oak - Hickory Forest | |
| Piedmont Seepage Forest | |
| **Geological** | |
| Granitic Flatrock | |
| Monadnock | |
| Outcrop | |

*Source: SC Department of Natural Resources*

SC DNR has also created a 27 Class Land Cover data layer. Certain types of land cover are highly indicative of areas supporting increased biodiversity. In 2010, Upstate Forever asked two local botany experts to rank the ecological importance of the 18 SC DNR land cover types found in Spartanburg County on a scale from 0 (least important) to 10 (most important). Their averaged responses are shown in the table below.

## ECOLOGICAL IMPORTANCE OF SPARTANBURG COUNTY'S LAND COVER TYPES

| Land Cover Type | Rank |
|---|---|
| Mesic deciduous forest/woodland | 10 |
| Rock outcrop | 10 |
| Aquatic Vegetation | 9 |
| Bottomland/floodplain forest | 9 |
| Dry deciduous forest/woodland | 9 |
| Dry mixed forest/woodland | 8 |
| Needle-leaved evergreen mixed forest/woodland | 8 |
| Closed canopy evergreen forest/woodland | 7 |
| Open canopy/recently cleared forest | 4 |
| Cultivated land | 0 |
| Dry shrub/shrub thicket | 0 |
| Fresh water | 0 |
| Grassland/pasture | 0 |
| Marsh/emergent wetland | 0 |
| Urban development | 0 |
| Urban residential | 0 |
| Wet shrub/shrub thicket | 0 |

*Source: Upstate Forever*

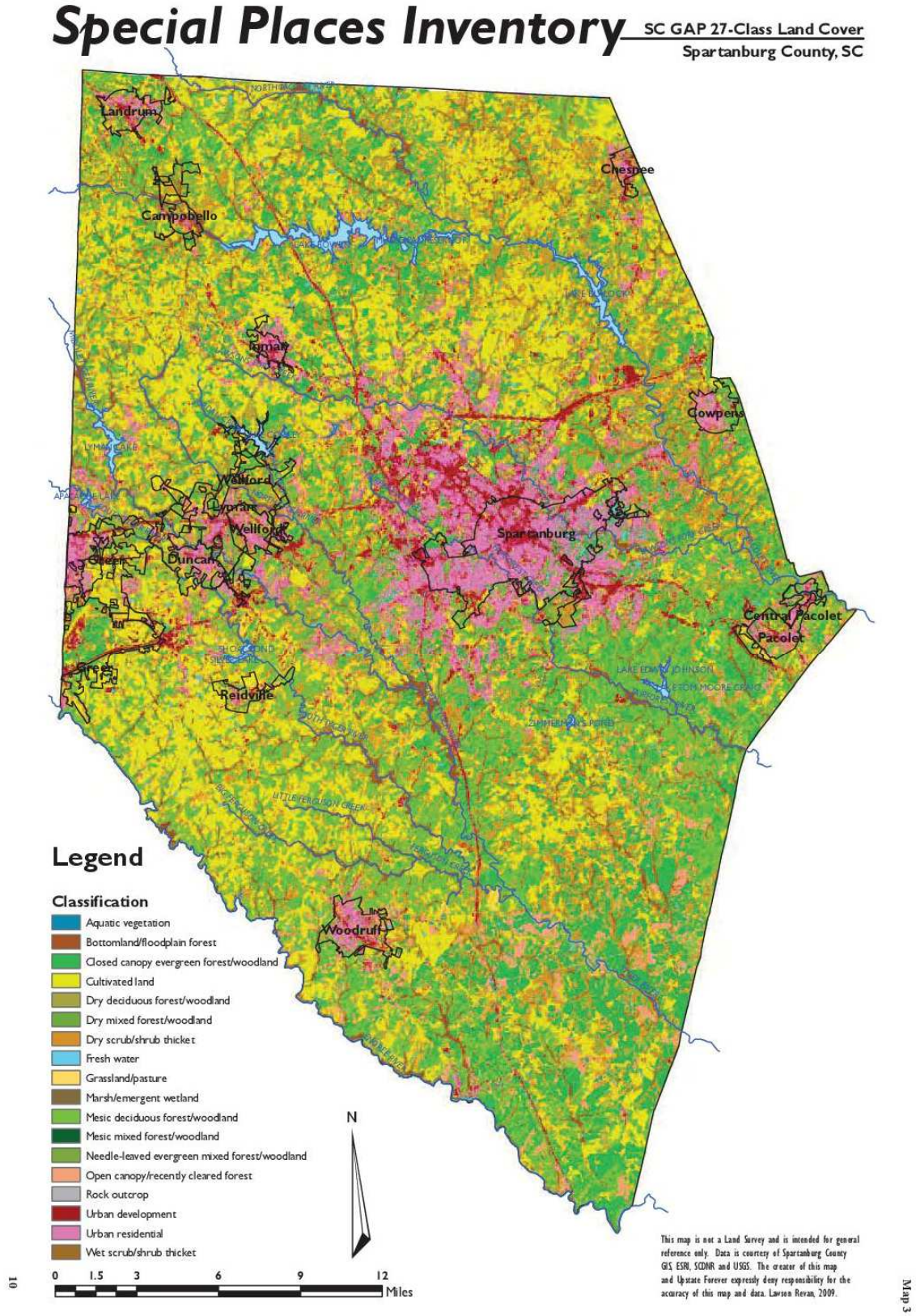
Upstate Forever conducted a Special Places Inventory in 2010. The results were mapped to graphically illustrate the locations of the various items found.

In the first map below, *SC GAP 27-Class Land Cover, Spartanburg County, SC*, the types of land cover in Spartanburg are shown.

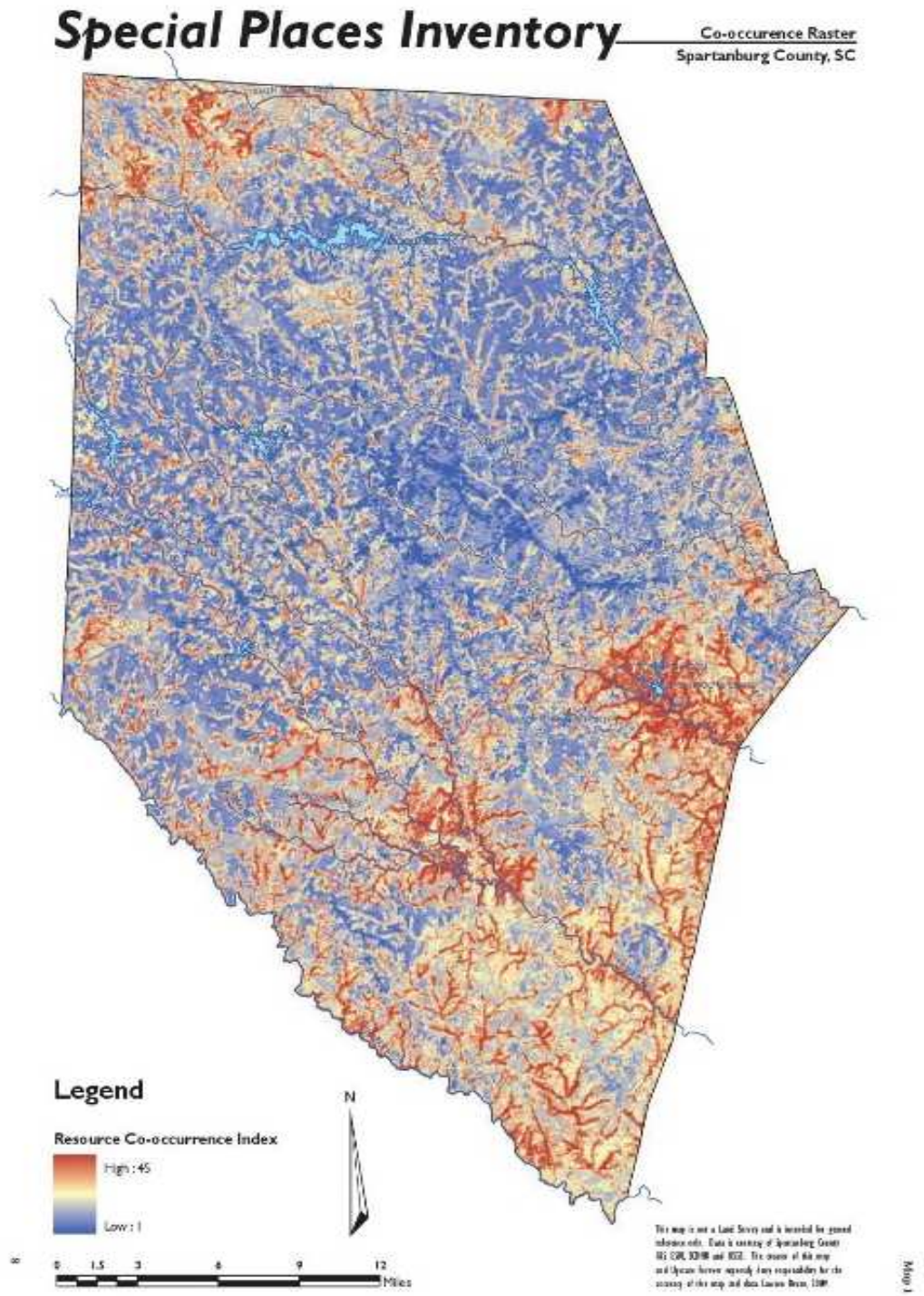
Upstate Forever also created a resource co-occurrence model for Spartanburg County in 2010 that shows where the biodiversity "hot spots" in the county are still intact. This model incorporates the following five data layers into one map:

- SC DNR Species Richness
- SC DNR Rare and Endangered Plants
- SC DNR 27 Class Land Cover
- Stream Systems
- Population Density

Each data point in the second map below, *Co-occurrence Roster, Spartanburg County, SC,* represents a cell size of 10 meters x 10 meters and each cell has a potential biodiversity richness score ranging from 0 to 50. The highest score a cell achieved in the county was 45 for an area near Landrum in the northwestern part of the county. On this map, the **best areas of remaining biodiversity** are shown in red and the **least biodiverse areas** are shown in blue. By establishing the Biodiversity Indicator in this report, it is hoped that data will become available through SC DNR to be able to re-run this model by 2018 to indicate how quickly or slowly the county is losing lands supportive of biodiversity.




*Source: Upstate Forever: A Special Places Inventory of Spartanburg County (2010)*




*Source: Upstate Forever: A Special Places Inventory of Spartanburg County (2010)*

*Sources:*

South Carolina Department of Natural Resources: http://www.dnr.sc.gov/GIS/gap/scgaphome.html

*Upstate Forever: A Special Places Inventory of Spartanburg County (2010)*
*http://upstateforever.org/pdfs/other/SpartSpecialPlacesInventory2010.pdf*

# Secondary Indicators

Secondary Indicators are other measures of the Natural Environment, variables that have a direct impact on the Natural Environment, are tangentially reflective of the state of the Natural Environment, or derive from the Leading Indicators.

## I. Parks

A valuable measure of quality of life in a community is the percentage of residents within a walkable distance of a park or recreation area. This reflects the extent to which residents can easily and equitably access open spaces that promote activity and support physical and mental health. Parks, fields, playgrounds, community centers, pools and other such spaces designed for congregating and active recreation contribute to healthy and active populations and help build community.

Park data for cities and counties must be considered separately because of the variables related to population density between these geographies.

Through its Center for City Park Excellence, the Trust for Public Land has been collecting a database of urban park facts for the last decade. The latest report, *2011 City Park Facts*, includes data on urban park acreage, spending, staffing and facilities. This report provides data for the 100 largest US cities, an increase from 85 cities in the 2009 report. The report shows that more than 120 parks were added in these cities in the past year. However, the median parkland per 1,000 city residents decreased from 12.9 in 2009 to 12.4 in 2011. Medians range from 6.8 acres per 1,000 residents in high density cities to 20.3 acres per resident in low density cities.

The 22,493 city parks profiled in the report serve 62 million urban residents with a wide array of facilities, including 419 public golf courses, 569 dog parks, 9,633 ball diamonds, 11,678 playgrounds and 14,415 basketball hoops. The total area covered by urban parkland in the United States exceeds one and a half million acres, with parks ranging in size from the 1.7-acre Post Office Square in Boston to the 490,125-acre Chugach State Park in Anchorage.

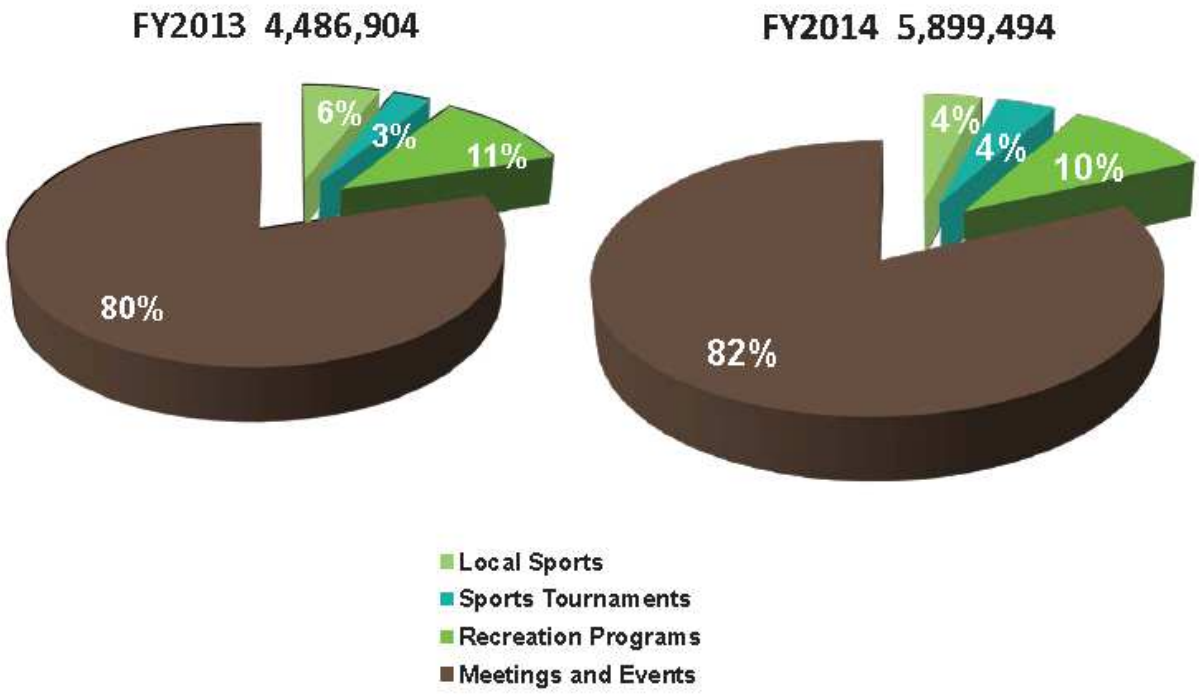
> Urban parks are more important than ever as cities grow larger and denser. Though budgets are tight everywhere, urban parks have consistently proven to be a wise investment, helping to improve health, increase environmental quality, and sustain property values.
>
> *Will Rogers, President, The Trust for Public Land*

When Spartanburg County Council created the Spartanburg County Parks Department in 2011, the Parks Department re-envisioned its role within a growing and changing Spartanburg community. According to the website, the Department now inventories all public and private parks and recreation facilities in Spartanburg County, regardless of what jurisdiction or group owns or operates the park or community center. There are over 100 parks and facilities listed in the Park Finder tool on the website, constituting approximately 900 acres of parkland in Spartanburg County. Data from 2006 indicate that there are 2.44 acres of parkland per 1,000 residents of Spartanburg County. Initial calculations indicate that the current figure is approximately 3.12 acres per 1,000 residents. Because

of the vast array of local variables, there is really no apples-to-apples comparison data that allows for a meaningful national average measure of parkland per person at the county level.

There was a substantial increase in the number of hours accessed by participants in county parks in fiscal year 2014 as compared to fiscal year 2013.

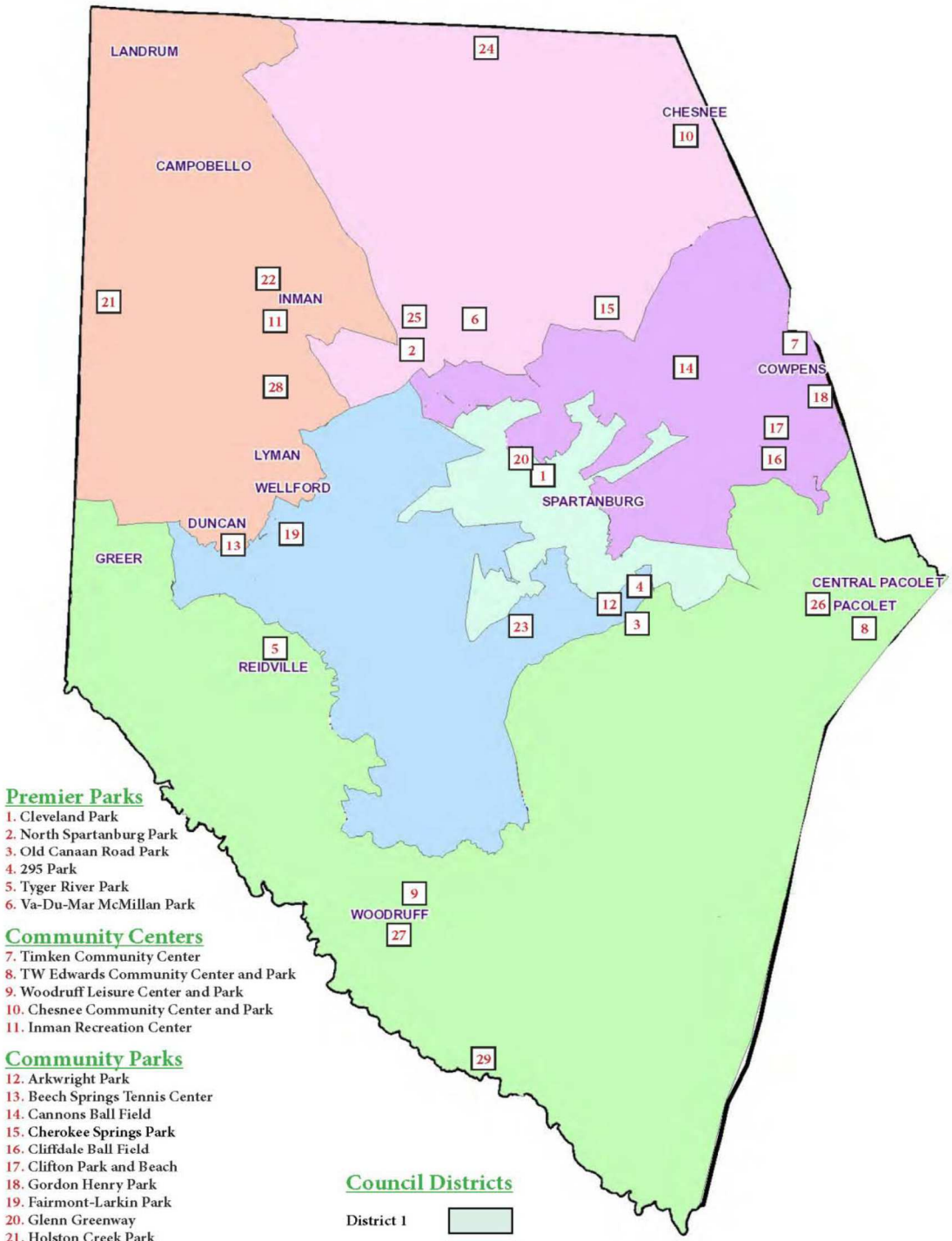
### PARTICIPANT HOURS, SPARTANBURG COUNTY PARKS, FY2013 AND FY2014




*Source: Spartanburg County Parks Department*

The Parks Department created the park system map below to illustrate parks and facilities projected for the system by December 2017.

## SPARTANBURG COUNTY PARKS




### Premier Parks
1. Cleveland Park
2. North Spartanburg Park
3. Old Canaan Road Park
4. 295 Park
5. Tyger River Park
6. Va-Du-Mar McMillan Park

### Community Centers
7. Timken Community Center
8. TW Edwards Community Center and Park
9. Woodruff Leisure Center and Park
10. Chesnee Community Center and Park
11. Inman Recreation Center

### Community Parks
12. Arkwright Park
13. Beech Springs Tennis Center
14. Cannons Ball Field
15. Cherokee Springs Park
16. Cliffdale Ball Field
17. Clifton Park and Beach
18. Gordon Henry Park
19. Fairmont-Larkin Park
20. Glenn Greenway
21. Holston Creek Park
22. Inman Sports Complex
23. Linville Hills Park
24. Little Africa Park
25. Miracle Park (Carolina Miracle League)
26. Pacolet Park
27. Woodruff Greenway
28. Lake Cooley Outdoor Recreation Center and Park
29. Enoree Park

### Council Districts
District 1
District 2
District 3
District 4
District 5
District 6

SPARTANBURG COUNTY PARKS DEPARTMENT

All parks and facilities listed are maintained by the Spartanburg County Parks Department.

## Best Practice

## Shared Use Agreements – Partners for Active Living

One national best practice that addresses the lack of physical activity is now gaining traction in South Carolina, opening school playgrounds and athletic facilities to the community during non-school hours, like weekends and holidays. This "joint use" or "open use" agreement increases the number of places to play for children and families.

Partners for Active Living (PAL) facilitated city and school district conversations to make Spartanburg the first community in the state to sign an official agreement, opening facilities in District 6 and District 7 schools in the City of Spartanburg. The City Parks and Recreation department has provided some programming at the parks and PAL will continue to lead and implement best practice policies and places to enhance opportunities for all children, leading to physical activity and healthier lives.

The school playgrounds open on weekends and holidays include:

| | | |
|---|---|---|
| Jesse Boyd Elementary | Cleveland Elementary | Pine Street Elementary |
| Mary H. Wright Elementary | E.P. Todd Elementary | Spartanburg High School |
| McCracken Middle School | Carver Middle School | Jesse Bobo Elementary |
| Woodland Heights Elementary School | | |

*Source: Partners for Active Living*

*Sources:*

Partners for Active Living: http://www.active-living.org/

Spartanburg County Parks Department: http://spartanburgparks.org/

The Trust for Public Land: https://www.tpl.org/

# II. Transportation

In fall 2014, students and faculty in the City and Regional Planning Master's program at Clemson University, in partnership with Ten at the Top, did a comparative analysis of the county Comprehensive Plans for all 10 Upstate counties. Using the county data, the team conducted a series of regional analyses to highlight the strengths, weaknesses, opportunities and threats (SWOT) to the Upstate region by element. The project was designed to highlight regional trends and issues facing the Upstate as a whole. Below are the results of the SWOT analysis for the transportation element of the combined comprehensive plans.

**TRANSPORTATION SWOT ANALYSIS FOR UPSTATE, SC 2014**

| Strengths | Weaknesses |
|---|---|
| • Interstate 85 connects the Upstate to Atlanta and Charlotte<br>• Extensive freight rail network<br>• Wide variety of scenic highways<br>• Greenville-Spartanburg Airport and smaller, regional airports facilitate connections to local and national markets | • Limited public transit coverage<br>• Abundance of automobile-oriented development<br>• Lack of pedestrian and bicycle facilities<br>• Poor road quality<br>• Absence of transit oriented development (TOD) |
| **Opportunities** | **Threats** |
| • Open space and waterways could act as corridors for a regional greenway and multi-use trail network<br>• Commuting patterns create demand for cross-county transit | • Lack of sufficient funding for infrastructure improvements despite increased usage of roadways<br>• Increased congestion leads to poor air quality and the possibility of falling out of attainment<br>• Sprawling land use patterns are not pedestrian friendly |

*Source: 2014 Upstate Comprehensive Plan Analysis*

## Best Practice

## Highway 29 Transportation Corridor Study

In January 2015, nearly 100 people worked with a team of experts to identify practical recommendations for improving and expanding transportation choices along the Highway 29 corridor. A Technical Assistance Panel (TAP) from the Urban Land Institute (ULI) led the January 14 and 15 workshops "Linking Our Futures: Shaping a Transit-Ready Corridor." The seven-member group analyzed existing land use and transportation conditions along 33 miles of Highway 29 stretching between Greenville and Spartanburg by touring the corridor, holding public forums and speaking extensively with individual stakeholder groups.

The corridor connects three of the largest Upstate municipalities – Greenville, Greer and Spartanburg – and runs within one mile of the downtowns of Wellford, Duncan, Lyman, and Taylors. The panel's preliminary recommendation is to strengthen the cores of these communities to attract residents and increase density to the critical mass necessary to support transit. They also suggest improving connections to the corridor from these communities so that transit is accessible as it expands to service them. Additionally, they note that the corridor has little character or distinction between communities and that mobility options, especially for the elderly and disabled, are severely limited.

Upstate Forever will convene stakeholders to identify the next steps for improved land use and transportation integration.

*Source: Upstate Forever*

Communities that prioritize a clean and sustainable environment support low-carbon and high resource-efficiency transportation options by developing supportive infrastructure such as pedestrian and bike-friendly streets, connectivity, charging stations, tax incentives for fuel-efficiency, robust public transit and local fuel production among many others.

Spartanburg Area Transportation Study (SPATS) is the Metropolitan Planning Organization charged with identifying needed transportation projects within the Spartanburg urban area. SPATS is charged with designing and implementing a five year transportation improvement plan and a long-range transportation plan, both of which are designed to reduce projected Vehicle Miles Traveled (VMT). Of course, these efforts alone will not significantly reduce pollutants emitted by vehicles, but are a vital part of a comprehensive approach to doing so.

Completed in November 2008, the SPATS Long Range Transportation Plan is a multi-modal and fiscally constrained document that outlines transportation priorities and proposed projects to the year 2035. Project priorities are based upon growth patterns, population and employment projections and a transportation model that forecasts traffic and transportation needs to the year 2035. The total projects costs within the plan cannot exceed what SPATS is expected to accumulate by the year 2035, and inclusion in the plan is a prerequisite before funding can be committed within the SPATS Transportation Improvement Program (TIP).

*Sources:*

Clemson University City and Regional Planning Program. (2014, Fall). *Upstate Comprehensive Plan Analysis.*

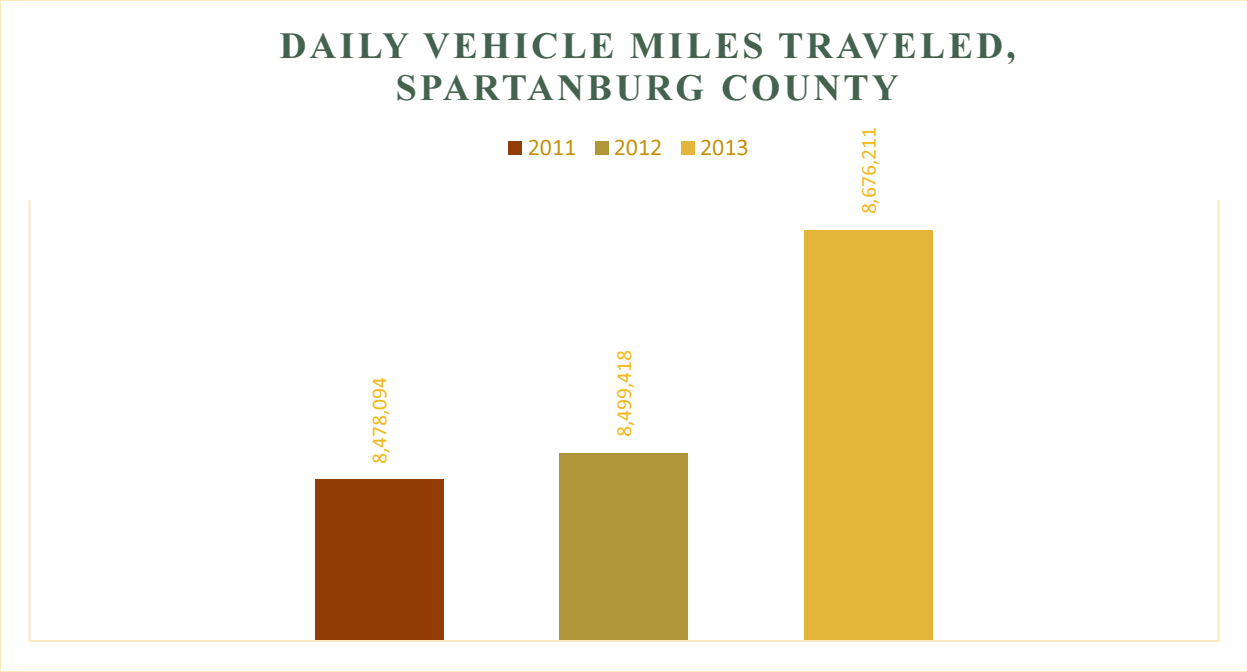
Spartanburg Area Transportation Study, Long-Range Transportation Plan: http://spatsmpo.org/planning/long-range-transportation-plan/

Upstate Forever: http://upstateforever.org/

## III. Vehicle Miles Traveled

Each month, the US Department of Transportation Federal Highway Administration's Office of Highway Policy Information compiles data relative to volume across the country, measured by Vehicle Miles Traveled (VMT). These data are used to identify traffic patterns and road usage and are essential to planning transportation infrastructure and maintenance. VMT is also a good indicator of pollution due to vehicle emissions.

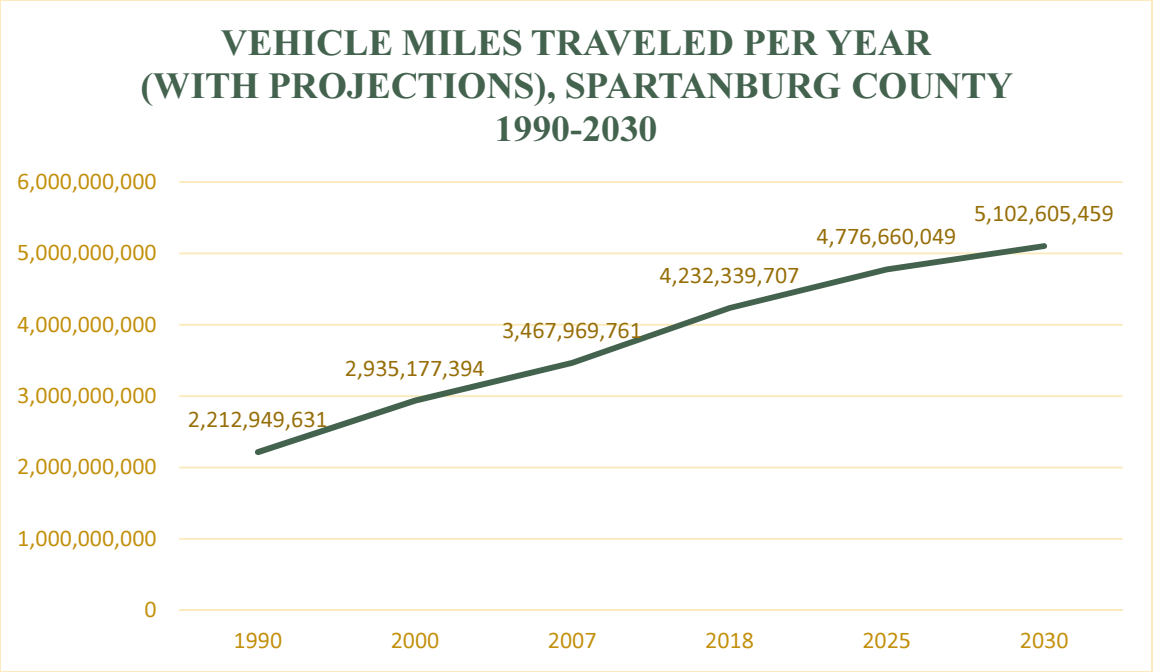
The graph below demonstrates that VMT has increased in Spartanburg County over the last three years. These VMT data include all roadway types except rural minor collector, rural local and urban local since these are not available on the county level. These are numbers for daily VMT.




*Source: U.S. Department of Transportation*

The increase in daily VMT in Spartanburg County is undoubtedly due to a number of factors including changes in population, changes in the commute shed and economic changes.

In December 2010, Upstate Forever released a report, *Assessing Upstate Greenhouse Gas Emissions from Transportation Sources Under Changing Land Use Patterns*. The authors provide annual projections for VMT through 2030 in accordance with current development trends. Their data, provided in the table below, demonstrate progressive and significant increases in VMT for Spartanburg County and projections for continued increases in VMT. The authors conclude, however, that enacting sensible growth strategies now will reduce VMT into the future.




*Source: Upstate Forever*

According to TRIP, a national transportation research organization, population and economic growth in South Carolina have resulted in increased VMT in the state.

- The state's population reached 4.7 million in 2012, a 35% increase since 1990. South Carolina had 3,455,931 licensed drivers in 2012.
- VMT in South Carolina increased from 34.4 billion in 1990 to 49 billion in 2012. This is a 43% increase.
- By 2030, VMT is projected to increase by another 25%.

*Sources:*

US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information: http://www.fhwa.dot.gov/policyinformation/statistics

TRIP: http://www.tripnet.org/SC_TRIP_Report_Jan_2015.php

Hennessy, J. & Tynan, J. (2010). *Assessing Upstate greenhouse gas emissions from transportation sources under changing land use patterns.* Retrieved from Upstate Forever: http://www.upstateforever.org/progCAWdocs/VMTGrowthAndGHG.pdf

# IV. Agriculture

Approximately 20% of the land in Spartanburg County is agricultural land and farming is an important economic sector in the county. Over the last three years for which the latest data are available, the number of farms and farm acreage in Spartanburg County have been sustained. Spartanburg County ranks 7$^{th}$ in the state as a producer of cattle and ranks significantly as a producer of certain crops.

**SPARTANBURG COUNTY ANNUAL FARM STATISTICS, 2009-2011**

| | 2011 | 2010 | 2009 |
|---|---|---|---|
| **Number of farms** | 1,242 | 1,242 | 1,242 |
| **Land in farms (acres)** | 109,917 | 109,917 | 109,917 |
| **Average farm size (acres)** | 89 | 89 | 89 |
| **Crops: acres harvested and (rank by SC County)** | | | |
| **Corn for grain** | 400 (26) | 800 (26) | 500 (25) |
| **Hay** | | 22,000 (5) | 21,700 (9) |
| **Soy beans** | 1,300 (25) | 900 (28) | 800 (28) |
| **Wheat (winter)** | 400 (24) | 400 (22) | 400 (24) |
| **Livestock and livestock products: Number and (rank by SC County)** | | | |
| **All cattle and calves*** | 15,400 (7) | 16,700 (7) | 15,800 (7) |
| **Cash receipts: dollars and (rank by SC county)** | | | |
| **Crops** | $26,732,000 (18) | $30,141,000 (12) | $24,660,000 (17) |
| **Livestock** | $21,022,000 (21) | $18,052,000 (22) | $16,119,000 (23) |
| **Total** | **$47,754,000 (23)** | **$48,198,000 (20)** | **$40,780,000 (22)** |

*Numbers of cattle reported on January 12, 2012, January 1, 2011 and January 1, 2010

*Source: USDA, National Agriculture Statistics Service*

> Another regional concern that emerged from both the natural resources and economic elements was the wealth of prime agricultural land, the continuing economic importance of the agricultural sector, and the need to protect prime farmland and soil from the impacts of unregulated development.
>
> *2014 Upstate Comprehensive Plan Analysis*

As development sprawls farther out from community centers, farmland is consumed. The US is losing vast acres of farmland annually and at an accelerating rate. In addition to the obvious necessity of farms to produce food, farmland also shelters wildlife, supplies scenic open space and helps filter impurities from air and water.

According to statistics provided by the American Farmland Trust, South Carolina has been losing about 35 acres of farmland per day. The Census of Agriculture reported that there are approximately 5,000,000 farmland acres in the state (2012). Although agriculture plays an important role in the state's economy, recent changes in the tobacco economy, rising land prices, an influx of new residents and other growth pressures threaten the future of South Carolina's productive lands. Since

most land use decisions are local, there is a push by the American Farmland Trust and other advocates to create farm-friendly communities, demonstrate model approaches and enact policies at all levels of government to support family farmers and keep land available and affordable for farming.

*Sources:*

American Farmland Trust: http://www.farmland.org/default.asp

Clemson University City and Regional Planning Program. (2014, Fall). *Upstate Comprehensive Plan Analysis.*

Farmland Information Center: http://www.farmlandinfo.org/statistics/South%20Carolina

USDA, National Agriculture Statistics Service, County Profiles: http://www.nass.usda.gov/Statistics_by_State/South_Carolina/Publications/County_Profiles/index.asp

## V. Soil Quality and Preservation

Because approximately 20% of land in Spartanburg County is farmland, soil quality is important. As communities favor sustainability and locally grown food, maintaining soil quality becomes even more important. In addition, soil quality dictates building practices. According to the county's current Comprehensive Plan, there are approximately 22 different types of soil in Spartanburg County, 13 of which pose severe constraints to development. Many of these soils cannot support roads or structures because of very low load bearing capacity, erodibility and steep slopes, and many cannot be used for septic tanks because of slow percolation rates, slopes, high water table, flooding, and hard rock at shallow depths. As the county is developed, therefore, it is generally the farmland that is used up.

A number of variables impact the quality of soil, including weather, development, geology, agricultural practices, pollution, insect population and changes over time. Development practices greatly influence soil preservation and soil quality. Building practices and harvesting of timber, for example, can cause significant erosion, pollution and silting of waterways. In Spartanburg County, past agricultural practices caused soil damage and erosion of topsoil, but environmentalists, planners and others have taken steps to mitigate damage by planting trees, establishing riparian boundaries and enacting land use policies.

Soil data are highly technical. Further information can be found in the USDA's Spartanburg County Soil Survey referenced below.

*Sources:*

*Spartanburg County Comprehensive Plan*: www.spartanburgcounty.org/govt/depts/pln/compplan/TOC.htm

US Department of Agriculture, Soil Conservation service in cooperation with SC Agricultural Experiment Station, Spartanburg County South Carolina Soil Survey. (2013, July). http://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/

# VI. Population Growth and Density

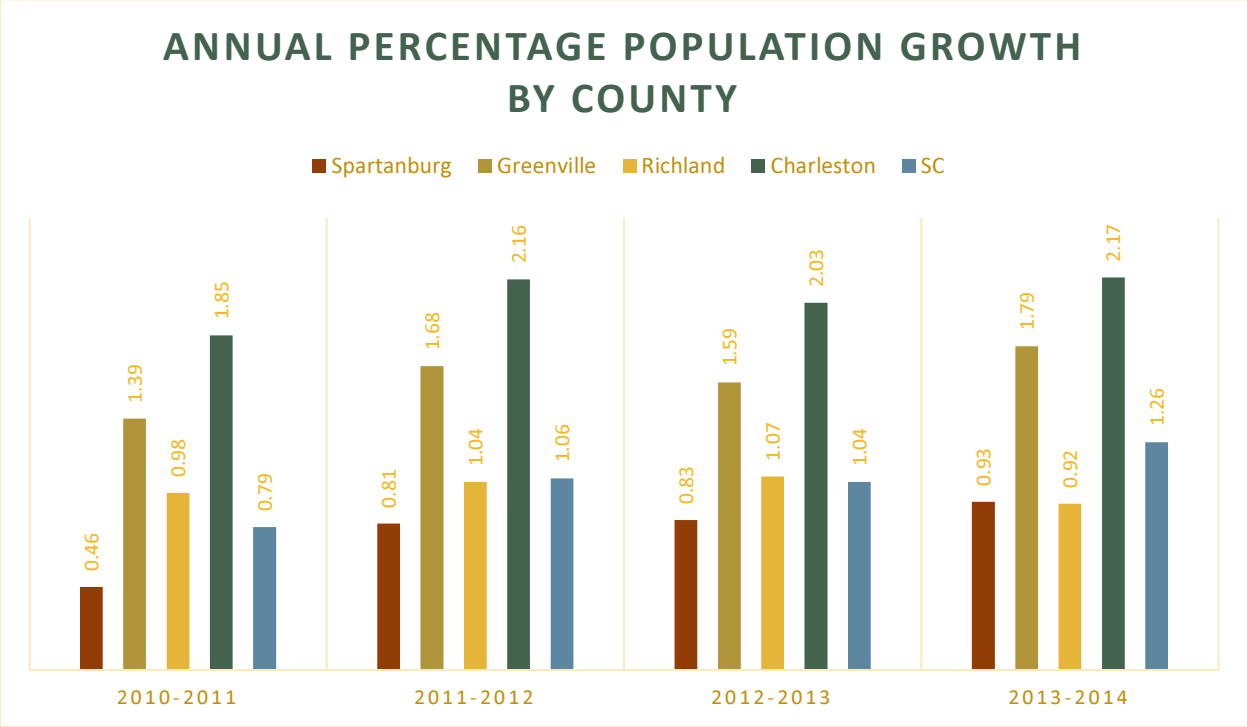
Population growth and density impact most environmental issues, including air and water quality, energy consumption and land use. Spartanburg, peer counties, and the state as a whole have demonstrated annual population increases over the last five years.

**RESIDENT POPULATION BY COUNTY, 2011-2014 ANNUAL**

| | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|
| **Spartanburg** | 284,767 | 286,092 | 288,421 | 290,818 | 293,542 |
| **Greenville** | 452,695 | 459,009 | 466,758 | 474,223 | 482,752 |
| **Richland** | 385,800 | 389,600 | 393,677 | 397,893 | 401,566 |
| **Charleston** | 351,235 | 357,737 | 365,472 | 372,913 | 381,015 |
| **SC** | 4,636,290 | 4,673,054 | 4,722,621 | 4,771,929 | 4,832,482 |

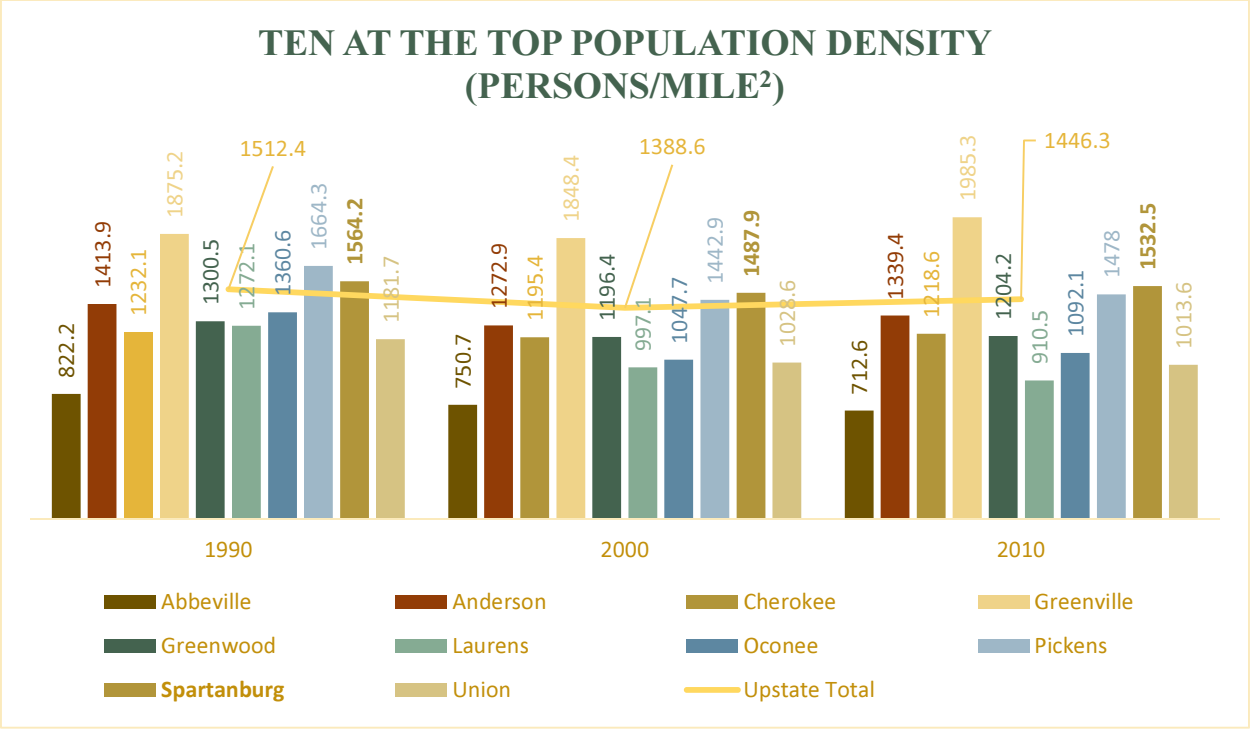
*Source: US Census*

However, Spartanburg County has experienced the smallest percentage increase each year, except in 2013 to 2014 when Richland County's rate was slightly lower.




*Source: US Census*

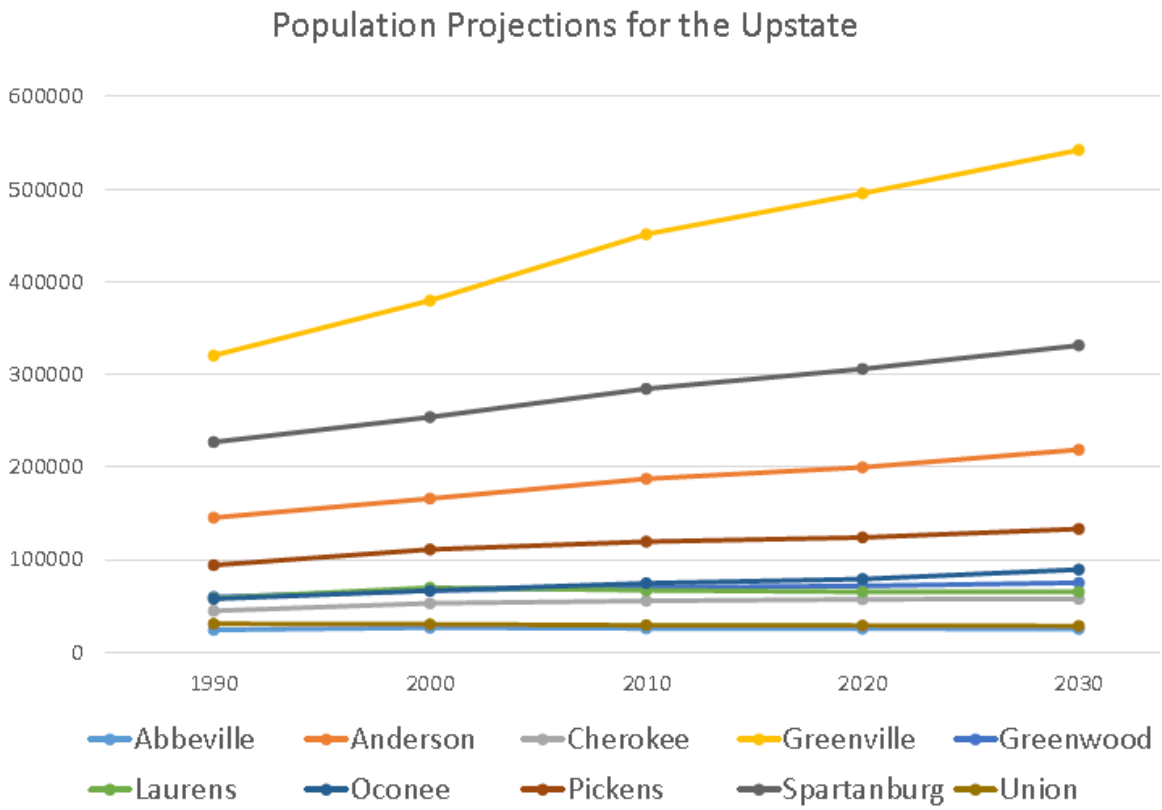
Overall population density decreased in the 10-county Upstate from 1,512.4 persons per square mile in 1990 to 1,388.6 persons per square mile in 2000. However, density increased to 1,446.3 persons per square mile in 2010. Population density in Spartanburg County followed the same pattern.




*Source: 2014 Upstate Comprehensive Plan Analysis*

In 1992, there were 2,091 people residing per urban square mile in the Upstate; however, by 2010, density had declined to 1,201 per urban square mile. Although overall population density increased in Greenville and Spartanburg Counties, urban population density dropped by 34% during this time period. These data indicate that the Upstate is experiencing significant sprawl as a consequence of development spreading out across previously undeveloped areas, rather than in-filling partially developed areas.

The population is projected to increase in the Upstate through 2030, primarily in the larger counties, with Greenville County and Spartanburg County experiencing the greatest growth.




*Source: 2014 Upstate Comprehensive Plan Analysis*

*Sources:*

Clemson University City and Regional Planning Program. (2014, Fall). *Upstate Comprehensive Plan Analysis.*

US Census, American Fact Finder: http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

## VII. Waste Management and Recycling

The South Carolina Solid Waste Policy and Management Act of 1991 establishes a comprehensive framework for the proper management of solid waste, including statewide recycling and waste reduction goals. The Act requires South Carolina Department of Health and Environmental Control (DHEC) to develop a state solid waste management plan for the state. County governments or regions are also required to develop plans that are consistent with the state plan.

Waste is categorized broadly as either hazardous or nonhazardous. Nonhazardous waste is further categorized as total solid waste (TSW) or municipal solid waste (MSW), a subset of TSW. Overall, the amount of TSW generated decreased from more 15 million tons in FY13 to 13.9 million tons in 2014. The TSW per capita disposal rate remained the same at 3.5 pounds per person per day (p/p/d) in FY14. The amount of MSW disposed of jumped more than 82,000 tons from 2,985,852 tons in FY13 to 3,067,942 tons in FY14 – a 2.7% increase. The overall amount of MSW recycled decreased 108,465 tons (8%) in FY14. Residential recycling, however, increased 5% from 478,426 tons in FY13 to 502,535 tons in FY14.

| EXAMPLES OF MUNICIPAL SOLID WASTE (MSW) | EXAMPLES OF TOTAL SOLID WASTE (TSW) |
|---|---|
| MSW is defined as paper, cans, bottles, food scraps, yard trimmings, packaging and other items. MSW may be generated by residential, commercial, institutional and industrial sources. South Carolina expanded its MSW definition (beyond EPA's definition) to include tire-derived fuel, yard trimmings used as boiler fuel and used motor oil from do-it-yourselfers. | TSW includes MSW as well as industrial process waste (e.g., scraps and by-products from the manufacturing process), construction and demolition (C&D) debris, land-clearing debris, automobile bodies, combustion ash and other items. |

*Source: SC DHEC*

The Spartanburg County Solid Waste Management Fund is supported by service fees collected from commercial garbage depositors and an annual charge to each residence. Currently, there are two Class 3 landfills (permitted for MSW, construction and demolition debris and industrial solid waste) in operation in Spartanburg County: the Wellford Landfill and the Palmetto Landfill. Upstate Regional Landfill is in Union County near the Spartanburg County line. As demonstrated in the table below, the Palmetto Landfill is quickly reaching its capacity and will have to close soon; however, a relocation site has not been found. Once the landfill closes, it must be grassed over and the land cannot be used for any other purpose.

**SPARTANBURG AREA LANDFILLS, 2014**

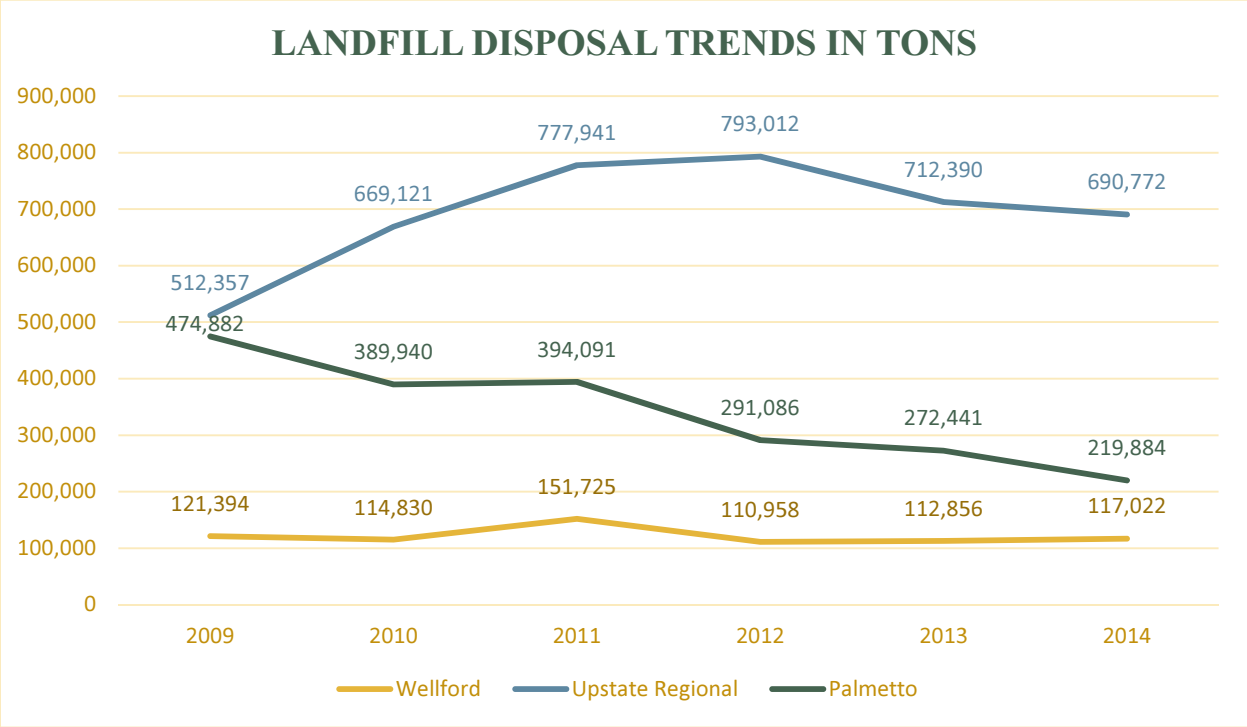
| *Facility* | County | Ownership | Permitted Annual Rate of Disposal | FY14 Disposal | Estimated Remaining Capacity of Facility | Estimated Remaining Life of Facility Based On: | |
|---|---|---|---|---|---|---|---|
| | | | | | | Permitted Disposal Rate in Years | Current Disposal Rate in Years |
| *Palmetto Landfill* | Spartanburg | Private | 1,200,000 | 219,884 | 179,849 | 0.1 | 0.8 |
| *Wellford Landfill* | Spartanburg | Public | 260,000 | 117,022 | 581,452 | 2.2 | 5.0 |
| *Upstate Regional Landfill* | Union | Private | 730,000 | 690,772 | 3,724,807 | 5.1 | 5.4 |

*Source: SC DHEC*

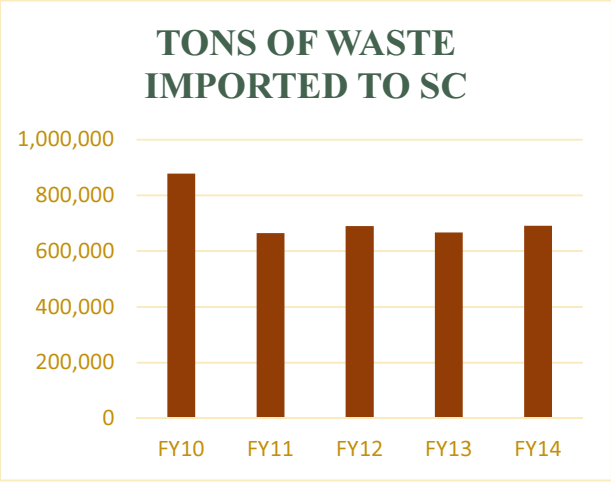
Landfills are not a sustainable approach to waste management. Sources of significant pollution themselves, they are the largest generator of human-caused methane, a primary greenhouse gas. Further, according to the EPA, all landfill liners will eventually leak and their toxic leachate can contaminate soil and groundwater. Because Spartanburg County is situated near the top of the Broad River watershed, it is difficult to site a landfill in the county without impacting major water bodies throughout the rest of the state. The Tyger, Enoree and Pacolet rivers in Spartanburg County ultimately flow into the Broad River in the Midlands, the Cooper River in the Lowcountry and finally into the Atlantic Ocean. Any landfill contamination of these county rivers widely threatens water quality, so extending the life of the existing Spartanburg County MSW landfill is viewed by subject matter experts as being extremely important.

As of FY14, there are 402 permitted solid waste facilities operating in South Carolina. Of these, 169 are landfills. Fifty-two are Class 1 Landfills (accepting land-clearing debris), 91 are Class 2 landfills (accepting construction and demolition debris) and 26 are Class 3 landfills (accepting MSW, land-clearing debris and industrial solid waste).

The rate of disposal at Upstate Regional Landfill and Palmetto Landfill has declined and the rate at Wellford landfill has remained fairly steady over the last few years.




*Source: SC DHEC*




*Source: SC DHEC*

South Carolina imports a significant amount of solid waste from out of state. In fact, the state imported 691,557 tons in FY14, an increase of nearly 4% from FY13. Palmetto Landfill imported 124,736 tons of solid waste from North Carolina and Upstate Regional Landfill imported 115,603 tons from North Carolina. North Carolina and New York provide 84% of the solid waste imported to South Carolina. Many of the state's landfills make money by importing waste.

## Recycling

South Carolinians disposed of 3,067,942 tons of MSW in FY14 – an increase of more than 82,000 tons (2.7%) from FY13's total. The overall amount of MSW recycled decreased 108,465 tons (8%) in FY14. Residential recycling, however, increased 5% from 478,426 tons in FY13 to 502,535 tons in FY14.

Recycling reduces and reuses the waste individuals and businesses generate and conserves natural resources. When recycled materials are used in place of virgin materials during manufacturing, there is less environmental damage and fewer trees are harvested. Recycling saves landfill space, conserves energy and reduces water pollution, air pollution and the greenhouse gas emissions that cause global warming. Recycling is also a significant industry, providing jobs and revenue to communities.

### RECYCLING RATE EQUATION

The equation below is used for calculating the MSW and TSW recycling rates.

$$\text{Recycling Rate (\%)} = \frac{\text{Amount Recycled}}{\text{Amount Generated*}} \times 100$$

*Generated = Recycled + Disposed Of

*Source: SC DHEC*

In 2011, DHEC set the goal to recycle 40% of South Carolina's MSW and to reduce disposal to 3.25 pounds per person per day. County governments, state agencies and state-supported colleges and universities are required to report annually to DHEC on their recycling efforts. Permitted solid waste facilities are required to submit annual reports to DHEC on their disposal activities. Although recycling data are collected from municipalities, businesses and the recycling industry, these entities are not required to report; therefore, data collection from these sources is inconsistent from year to year. The data collected are allocated to the counties where the material was generated.

Of the 4,357,812 tons of MSW generated in South Carolina in FY13, more than 1.3 million tons were recycled – the most since FY07 – constituting a recycling rate of 31.5%. However, the state's MSW recycling rate decreased in FY14 to 29.2%. In FY13, three counties had a recycling rate greater than 40% - Horry, Kershaw and Oconee. In FY14 only Lexington County had a recycling rate greater than 40%.

When compared to peer counties and the state average, Spartanburg County had the lowest MSW recycling rate in FY14. In FY13, the county had a higher rate than the state average and Richland County. The chart below provides data on MSW generated, disposed and recycled in pounds per person per day and in tons for Spartanburg County, peer counties and the state.

### MSW RECYCLING, DISPOSAL AND GENERATION RATES (P/P/D), 2014

| *County* | **Population** | **Recycling rate** | **Recycled (PPD)** | **Recycled (tons)** | **Disposed (PPD)** | **Disposed (tons)** |
|---|---|---|---|---|---|---|
| *Spartanburg* | 290,969 | 22.72 | 1.49 | 79,001.65 | 5.06 | 268,641.40 |
| *Greenville* | 474,266 | 35.24 | 1.77 | 152,966.32 | 3.25 | 281,105.62 |
| *Richland* | 399,256 | 30.74 | 1.57 | 114,739.64 | 3.55 | 258,569.27 |
| *Charleston* | 372,803 | 35.03 | 2.23 | 151,802.24 | 4.414 | 281,491.90 |
| *SC* | 4,774,839 | 29.17 | 1.4 | 1,263,494.87 | 3.5 2 | 3,067.06 |

*Source: SC DHEC*

There are 22 recycling drop-off centers in Spartanburg County (FY13) and 2 curbside recycling programs.

From the table below, it is clear that the amount of waste recycling varies widely by peer county and by type of waste.

### RECYCLED MUNICIPAL SOLID WASTE BY PEER COUNTY FY2010 & FY2014 (IN TONS)

| **Type of Waste** | **Spartanburg** | | **Greenville** | | **Richland** | | **Charleston** | |
|---|---|---|---|---|---|---|---|---|
| | **2010** | **2014** | **2010** | **2014** | **2010** | **2014** | **2010** | **2014** |
| Total Glass | 83.9 | 45.81 | 3,919.8 | 25.28 | 1,423.0 | 289.50 | 3,153.3 | 11.32 |
| Total Metal | 21,891.2 | 27,776.29 | 43,732.7 | 45,872.11 | 27,628.7 | 50,073.35 | 27,510.1 | 22,841.68 |
| Total Paper | 28,381.8 | 30,673.30 | 57,95.7 | 38,538.95 | 23,310.8 | 30,107.20 | 31,333.8 | 16,625.79 |
| Total Plastic | 1,860.8 | 2,202.88 | 5,010.0 | 679.07 | 726.5 | 2,959.02 | 1,509.6 | 276.29 |
| Banned Items* | 16,542.0 | 3,770.06 | 74,998.1 | 12,296.27 | 7,807.4 | 5,085.66 | 60,763.0 | 5,943.51 |
| Commingled Recyclables** | 1,961.1 | 3,839.09 | 104.0 | 14,895.24 | 7,988.8 | 12,467.13 | 4,546.0 | 31,552.07 |

**appliances, DIY used motor oil, lead-acid batteries, tires, (yard trimmings included in 2010 but not 2014)*
*** recyclables that are not collected separately*

The tables below provide a summary and detailed information on MSW recycling in Spartanburg County by residential, commercial/institutional and industrial recycling data with commodity details.

### SPARTANBURG COUNTY MSW SUMMARY

| **Population** | **Drop-off Centers** | **Curbside Programs** | **Recycling Rate (%)** | **Recycled** | | **Disposed** | |
|---|---|---|---|---|---|---|---|
| | | | | P/P/D | Tons | P/P/D | Tons |
| **290,969** | 22 | 2 | 22.72 | 1.49 | 79,001.65 | 5.06 | 268,641.40 |

## SPARTANBURG COUNTY MSW RECYCLING DATA IN TONS

| Commodity | Residential | Commercial/ Institutional | Industrial (Office/ Packaging) | Total |
|---|---|---|---|---|
| **Glass** | | | | |
| Containers & Packaging - Brown | 0.00 | 0.00 | 0.00 | 0.00 |
| Containers & Packaging - Clear | 0.00 | 0.00 | 0.00 | 0.00 |
| Containers & Packaging - Green | 0.00 | 0.00 | 41.00 | 41.00 |
| Containers & Packaging – Mixed | 0.00 | 2.37 | 2.44 | 4.81 |
| **Total Glass** | **0.00** | **2.37** | **43.44** | **45.81** |
| **Metal** | | | | |
| Aluminum Cans | 0.00 | 0.87 | 1.67 | 2.54 |
| Ferrous, Magnetic | 0.00 | 22,806.48 | 110.34 | 22,916.82 |
| Non-ferrous, Non-magnetic | 0.00 | 582.50 | 0.00 | 582.50 |
| Steel Cans | 0.00 | 32.96 | 0.00 | 32.96 |
| Mixed Scrap Metal | 1,002.54 | 3,210.54 | 28.39 | 4,241.47 |
| **Total Metal** | **1,002.54** | **26,633.35** | **140.40** | **27,776.29** |
| **Paper** | | | | |
| Cardboard | 0.00 | 18,033.97 | 1,177.26 | 19,211.23 |
| Magazines | 0.00 | 2.80 | 1.50 | 4.30 |
| Newspapers & Inserts | 0.00 | 764.00 | 0.00 | 764.00 |
| Office Paper | 0.00 | 456.91 | 15.44 | 472.35 |
| Paperboard | 0.00 | 0.00 | 0.00 | 0.00 |
| Phone Books | 0.00 | 3.07 | 0.05 | 3.12 |
| Mixed Paper | 2,893.78 | 1,282.21 | 6,042.32 | 10,218.31 |
| **Total Paper** | **2,893.78** | **20,542.95** | **7,236.57** | **30,673.30** |
| **Plastic** | | | | |
| HDPE | 0.00 | 4.86 | 0.00 | 4.86 |
| LDPE | 0.00 | 75.83 | 0.00 | 75.83 |
| PET | 0.00 | 0.62 | 1.25 | 1.87 |
| PP | 0.00 | 0.00 | 0.00 | 0.00 |
| PS | 0.00 | 9.60 | 0.00 | 9.60 |
| Vinyl | 0.00 | 0.00 | 0.00 | 0.00 |
| Commingled PET & HDPE | 0.00 | 0.00 | 0.00 | 0.00 |
| Mixed Plastic | 0.00 | 1,024.87 | 1,085.85 | 2,110.72 |
| **Total Plastic** | **0.00** | **1,115.78** | **1,087.10** | **2,202.88** |
| **Organics** | | | | |
| Food Waste | 0.00 | 0.16 | 0.00 | 0.16 |
| Yard Trimmings (for use as boiler fuel) | 0.00 | 0.00 | 0.00 | 0.00 |
| Yard Trimmings (recycled into compost) | 0.00 | 35.00 | 0.00 | 35.00 |
| Yard Trimmings (recycled into mulch) | 1,850.61 | 43.32 | 0.00 | 1,893.93 |
| **Total Organics** | **1,850.61** | **78.48** | **0.00** | **1,929.09** |
| **Banned Items** | | | | |
| Appliances | 0.00 | 12.39 | 0.00 | 12.39 |
| Electronics | 465.84 | 12.91 | 19.08 | 497.83 |
| Lead-acid Batteries (autos, trucks, motorcycles – small sealed lead-acid batteries) | 715.04 | 696.80 | 17.05 | 1,428.89 |
| Tires (autos, trucks, motorcycles) | 1,711.26 | 1.09 | 0.00 | 1,712.35 |
| Used Motor Oil (autos, trucks, motorcycles) | 118.59 | 0.00 | 0.00 | 118.59 |
| **Total Banned Items** | **3,010.73** | **723.19** | **36.14** | **3,770.06** |
| **Miscellaneous Items** | | | | |
| Antifreeze | 6.32 | 0.20 | 0.00 | 6.52 |
| Carpet | 0.00 | 0.00 | 0.00 | 0.00 |
| Carpet Padding | 0.00 | 0.00 | 0.00 | 0.00 |
| Cooling Oil/Grease | 11.61 | 366.14 | 0.00 | 377.75 |
| Fluorescent Bulbs | 0.00 | 16.80 | 4.07 | 20.87 |
| Household Hazardous Materials | 45.67 | 0.00 | 0.00 | 45.67 |
| Inkjet/Toner Cartridges | 0.00 | 0.56 | 0.20 | 0.76 |
| Mattresses & Box Springs | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | |
|---|---|---|---|---|
| Paint | 0.00 | 0.07 | 1.96 | 2.03 |
| Rechargeable Batteries | 0.00 | 0.71 | 2.80 | 3.51 |
| Textiles (recycled, not donated for reuse) | 0.00 | 5.49 | 128.37 | 133.86 |
| Used Oil Filters | 4.74 | 0.00 | 0.00 | 4.84 |
| Wood Packaging (pallets, crates, barrels) | 0.00 | 759.38 | 6,310.44 | 7,069.82 |
| Items Not Listed Above | 0.00 | 1,099.50 | - | 1,099.50 |
| **Total Miscellaneous** | **68.44** | **2,248.85** | **6,447.84** | **8,765.13** |
| **Commingled Recyclables** | | | | |
| **Total Commingled Recyclables** | **2,726.21** | **1,112.88** | **0.00** | **3,839.09** |
| **Total For All** | 11,552.31 | 52,457.85 | 14,991.49 | 79,001.65 |

*Source: SC DHEC*

## Best Practice

### Upstate Forever Aids Safe Disposal of Toxic Materials and Medications

Spartanburg County hosts an annual Household Hazardous Materials (HHM) Collection Day, providing a legal way to dispose of such dangerous household items as paint thinner, liquid pesticides and fertilizers, varnish, antifreeze and a wide range of other common household chemicals. This program was proposed by Upstate Forever and members of the local gardening community and embraced by Spartanburg County Council and the Spartanburg County Solid Waste Department. Now in its 7th year, the program has resulted in the safe disposal of 21,601 pounds of solid household toxics, 11,935 gallons of liquid household toxics, 84,800 pounds of paint and 11,382 fluorescent tubes and bulbs. The JM Smith Foundation, Spartanburg County, Spartanburg Water and the Spartanburg Soil and Water Conservation District have provided valuable sponsorship support.

Additionally, over the past three years through a partnership with the US Drug Enforcement Agency's nationwide Drug Takeback Day, Upstate Forever and partners have collected over half a ton of leftover pharmaceuticals at multiple sites in Spartanburg County and recycled thousands of plastic medicine bottles and cardboard containers. Law enforcement officers take custody of all collected medicines which are then incinerated at an EPA-approved facility. Partner groups include Spartanburg Water System, Spartanburg Sanitary Sewer District, Spartanburg County Soil and Water Conservation District, Spartanburg Alcohol and Drug Abuse Commission, Spartanburg County Sheriff's Office, Spartanburg City Public Safety, IMPACT Coalition, Spartanburg Housing Authority and JM Smith Foundation.

Upstate Forever created the website www.SafeDisposalUpstate.org in order to keep citizens up to date on their safe disposal options for chemicals and pharmaceuticals.

*Source: Upstate Forever*

*Source:*

SC DHEC Solid Waste Management Division:
http://www.scdhec.gov/HomeAndEnvironment/Recycling/DataReports/

## VIII. Superfund Sites

Under the Federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, the US Environmental Protection Agency (EPA) was authorized to create a list of polluted locations that require a long-term response to clean up hazardous material contaminations. These locations are knows as Superfund sites and are placed on the National Priorities List (NPL). As of February 2014, there were 1,322 Superfund sites on the NPL in the US. An additional 53 sites had been proposed for entry on the list. As of the same date, 375 sites had been cleaned up and removed from the NPL.

In South Carolina there are 280 "active" superfund sites; 28 of these are in Spartanburg County. There are two superfund sites in Spartanburg County still in final NPL status. The rest are non-NPL status. Both sites have completed physical clean-up activities. The two sites are:

- Aqua-Tech Environmental (Groce Labs) in Greer: Groundwater and soil contamination from metals, PCBs, and VOCs
- Elmore Waste Disposal in Greer: Groundwater and soil contamination from metals and VOCs

*Source:*

US EPA Superfund Site Information:
*http://cumulis.epa.gov/supercpad/cursites/srchrslt.cfm?Start=1&sortby=site*

## IX. Comprehensive Planning / Regulatory Implementation

Spartanburg County is required by law to have a Comprehensive Plan that ensures orderly growth and harmonious development of the county. A Comprehensive Plan dictates public policy in terms of transportation, utilities, land use, recreation and housing. The plan falls under the purview of the County's Planning and Development Department and currently encompasses the 1998-2015 period. The new Comprehensive Plan is being completed and due for release in the fall of 2015. An ongoing process, the plan monitors growth and engages stakeholders in long-range planning to accommodate growth in the most balanced manner.

Local governments are on the front lines of mitigating impacts that result from climate change. The greenhouse effect (warming that results when the atmosphere traps heat radiating from Earth toward space) is manifest in extreme heat waves, more frequent severe storms and floods that damage natural resources and infrastructure like bridges, roads, and culverts and overwhelm storm sewers. Planning decisions about land use, infrastructure investment, public transit and municipal service delivery must account for climate impacts.

Key themes from the 1998 Spartanburg County Comprehensive Plan are:

- Reduce congestion by increasing public transportation and bike-pedestrian options
- Increase growth management in unincorporated areas
- Beautify gateway entrances from primary highway access points into downtowns
- Preserve scenic areas and create more greenways and trails

In fall 2014, students and faculty in the City and Regional Planning Master's program at Clemson University did a comparative analysis of the county Comprehensive Plans for all 10 Upstate

counties. Using the county data, the team conducted a series of regional analyses to highlight the strengths, weaknesses, opportunities and threats (SWOT) to the Upstate region by element. The project was designed to highlight regional trends and issues facing the Upstate as a whole. Below are the results of the SWOT analysis for the natural resources element of the combined comprehensive plans.

**NATURAL RESOURCES SWOT ANALYSIS FOR UPSTATE, SC 2014**

| Strengths | Weaknesses |
|---|---|
| • Widespread support for strategies supporting soil quality<br>• Abundance of water for utilities and recreational purposes<br>• Awareness of watershed health and methods for adaptation<br>• Strong presence of regional/local conservation organizations<br>• Awareness and documentation of endangered species | • No comprehensive inventory or point source water pollution outfalls<br>• Need for greater groundwater awareness and preservation<br>• General lack of discussion of storm water management regulations |
| **Opportunities** | **Threats** |
| • Desire for regional air quality improvement strategies<br>• Prospect for regional approaches to watershed health<br>• Joint marketing of opportunities for eco-tourism | • Development pressures on environmentally sensitive and scenic areas<br>• Loss of forest and habitat<br>• Increased runoff and associated water quality concerns<br>• Loss of prime farmland to development |

*Source: 2014 Upstate Comprehensive Plan Analysis*

The Upstate is fortunate to have tremendous assets in its hydrological systems, prime farmland, and scenic beauty, which contribute significantly to the ecological and economic health of the region. The comprehensive plans indicate both the value and vulnerability of these resources, suggesting a need to mitigate the impacts of development in the region through land use controls and coordinated public policy.
*2014 County Comprehensive Plan Analysis*

*Source:*

Clemson University City and Regional Planning Program. (2014, Fall). *Upstate Comprehensive Plan Analysis.*

# Crosscutting Indicators

Crosscutting indicators are Leading or Secondary Indicators from other Indicator Areas that have tangential or predictive impact on the Natural Environment.

## I. Public Health

Today, public health advocates and practitioners are concerned with health problems that have their origins in the built environment – asthma caused by particulates from automobiles, water contaminated from excessive runoff, lead poisoning from contaminated houses and soil, obesity and heart conditions linked to low walkability communities and depression and anxiety exacerbated by stressful living conditions, long commutes and lack of access to fresh food. These public health practitioners and advocates are working to prevent illness, disability and death from interactions between people and the environment. They are especially concerned with safeguarding the health of populations that are particularly vulnerable to certain environmental hazards - children, the elderly and people with disabilities. The data show that promoting a healthy environment can prevent premature death and avoidable illness and disability caused by non-infectious, non-occupational environmental and related factors.

*Source:*

Centers for Disease Control and Prevention, National Center on Environmental Health:
http://www.cdc.gov/nceh/information/about.htm

## II. Economic Development

Compact, diverse and walkable development can increase property values and property tax revenues, encourage job creation, reduce housing and transportation costs and create amenities that improve residents' quality of life. Communities designed by smart growth principles have higher home sale prices, enhanced marketability and faster sales or leases than conventional developments. These communities generate economic benefits to local governments, home owners and businesses through higher property values and correspondingly higher tax assessments.

According to EPA's Office of Sustainable Communities, smart growth strategies at the regional, city and neighborhood level can maximize economic advantages while creating attractive, healthy communities that help protect the environment. The Office of Sustainable Communities makes the following points reports regarding the advantages of smart growth for developers, communities and local governments:

- Compact development can generate more revenue per acre because it uses land more efficiently. It can reduce the costs of land and infrastructure for individual projects and the costs of providing fire and police protection, utilities, schools and other public amenities. By locating companies closer together, compact development can create a density of employment that increases economic productivity and attracts additional investment.
- Walkable neighborhoods have well-connected streets and a mix of land uses near each other, making walking, as well as bicycling and transit, more convenient and appealing. Projects in walkable neighborhoods command a price premium. Improvements to streets and sidewalks

benefit local businesses by attracting more customers. In turn, local governments benefit through additional property and sales tax revenue.

- People and businesses value places that bring together a variety of activities to create vibrant environments. The demand for such places exceeds the supply. People are particularly interested in lively neighborhoods that provide for their daily needs. Communities with access to transit help people reduce their transportation costs, enabling them to save money or spend more on their homes, entertainment or other things they value.

The following table summarizes the strategies and benefits of smart growth.

| Strategy | Potential Benefits to: | | |
|---|---|---|---|
| | **Real Estate Developers and Investors** | **Businesses** | **Local Governments** |
| **Develop compactly, redeveloping land with existing infrastructure when possible** | Reduced costs for land and infrastructure | Increased economic productivity that attracts additional investment | Reduced costs of providing fire and police protection, utilities, schools and other public amenities |
| **Create walkable places** | Increased sales and increased sale prices | Increased economic activity | Higher property and sales tax revenue |
| **Provide a diverse range of choices in land uses, building types, transportation modes, housing, workplace locations and stores** | Increased sales and increased investment value | Increased ability to attract employees and customers | Increased tax base from higher property values and new residents |

*Source: EPA Office of Sustainable Communities*

The economic benefits of open, walkable spaces and compact development should play an important role in policy-makers' decisions about zoning, restrictions on land-uses, government purchase of lands for parks and similar initiatives. Real estate developers and investors, businesses and local governments can use smart growth development as a strategy to maximize their economic advantages while improving the quality of life and creating attractive, healthy communities that help protect the environment.

*Sources:*

City of Spartanburg *Comprehensive Plan* http://www.cityofspartanburg.org/planning-zoning/comprehensive-plan

RPA *Smart Growth and Economic Success: Benefits for Real Estate Developers, Investors, Business, and Local Governments* (2012): http://www2.epa.gov/smart-growth/smart-growth-and-economic-success-benefits-real-estate-developers-investors-business

Physical activity facilities have economic as well as health benefits, *From Economic Benefits of Open Space, Recreation Facilities and Walkable Community Design (March 2010)* American Trails: http://www.americantrails.org/resources/economics/Economic-Benefits-Trails-Open-Space-Walkable-Community.html

spartanburg community indicators project

Inspiring dialogue, strategy and change.
www.strategicspartanburg.org

## VISION

Organizations and individuals across the public, private and non-profit sectors in Spartanburg County actively promote civic prosperity by utilizing the Community Indicators to inform and guide their progress.

## MISSION

To report on data and engage the community in dialogue and strategy that leads to positive change in Spartanburg County, South Carolina

## INDICATOR AREAS

**Civic Health** · **Economy** · **Education**

**Natural Environment** · **Public Health** · **Social Environment**

## SPONSORING PARTNERS

The Spartanburg County Foundation
*Your Community Foundation*

United Way
United Way of the Piedmont

Spartanburg County, SC

UPSTATE
University of South Carolina Upstate

MARY BLACK FOUNDATION

Spartanburg Regional Foundation

424 East Kennedy Street ▪ Spartanburg, SC 29302 ▪ 864-582-0138 ▪ strategicspartanburg.org