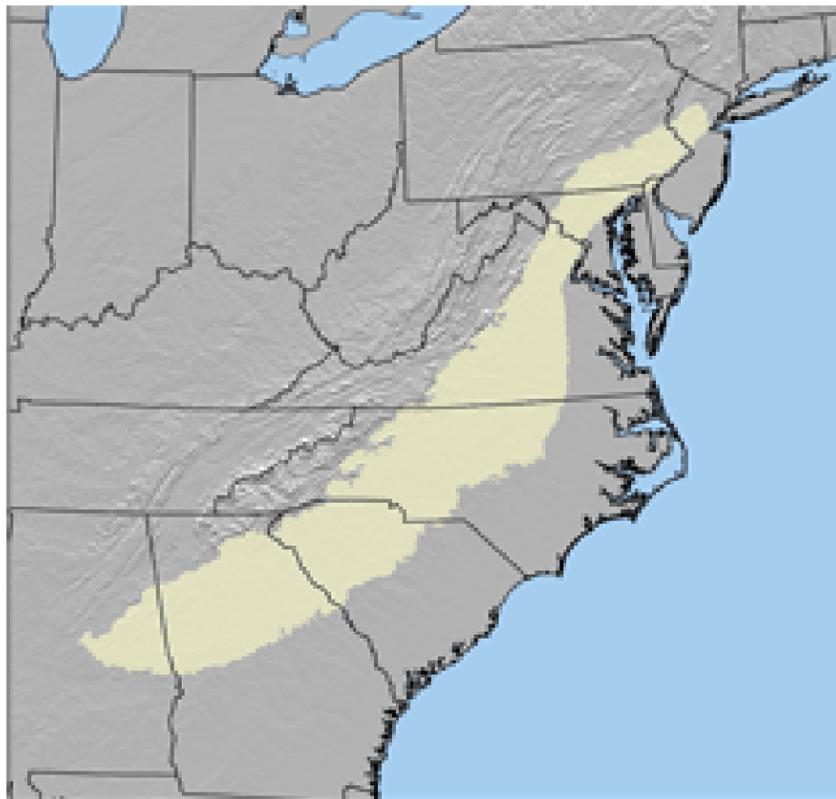


Mauldin’s growth has followed a relatively typical suburban pattern. Subdivisions have replaced farms and pastures in a random pattern, leaving behind scattered remnants of the area’s agricultural landscape. Cows, horses, and goats graze pastures along some of the city’s busiest streets. Weathered barns share road frontage with fast food restaurants. Century-old oaks shade historic farmhouses that adjoin convenience stores.

This mixture of agricultural lands with suburban development has produced an interesting and diverse suburban landscape. City residents enjoy an extensive and generally healthy urban forest, and a careful observer will find a wide variety of wildlife, particularly along Gilder Creek and Laurel Creek and their



Map 4-1: The Piedmont province of the Appalachian Highlands region stretches across Upstate South Carolina

tributaries, which provide quiet natural refuges and important wildlife habitat.

### Existing Conditions

#### Topography and Soils

Mauldin is located in the upper Piedmont province of the Appalachian Highlands physiographic region. The Piedmont province is bordered by the Coastal Plain province to the southeast and the Blue Ridge province to the northwest, although only the extreme northwestern corner of the state is within the Blue Ridge province. The Piedmont meets the Coastal Plain at the “fall line”, so named because streams and rivers form rapids or waterfalls where the rocky soil of the Piedmont meets the sandy soil of the Coastal Plain. As shown in Map 4-1 (below left), the Piedmont province stretches from Delaware to Alabama.

The Piedmont area is characterized by rolling hills, with elevations typically between 200 to 1000 feet above sea level, and moderately fertile clay soils. The Mauldin area is one of many parts of the Piedmont province that has been damaged by soil erosion associated with intensive cotton farming; soil erosion continues to be a persistent problem, evidenced by the coffee-colored runoff that fills creeks and roadside ditches following heavy rains, as poorly-stabilized slopes and cleared lands readily erode.

Soils in the Mauldin Area are useful for agriculture and are generally suitable for residential, commercial and industrial development in areas outside of the floodplains of Gilder Creek and Laurel Creek. Very little prime farmlands remain within the Mauldin Planning Area, as most of the area’s prime agricultural lands have been converted to urban use.

Map 4-2 depicts general soil suitability for urban uses, and Map 4-3 depicts prime farmlands. Available data on prime farmlands is not current; most of the areas characterized as

“cultivated prime lands” – concentrated along Holland Road and Tanner Road in the northeastern part of the planning area -- have been converted to residential use.

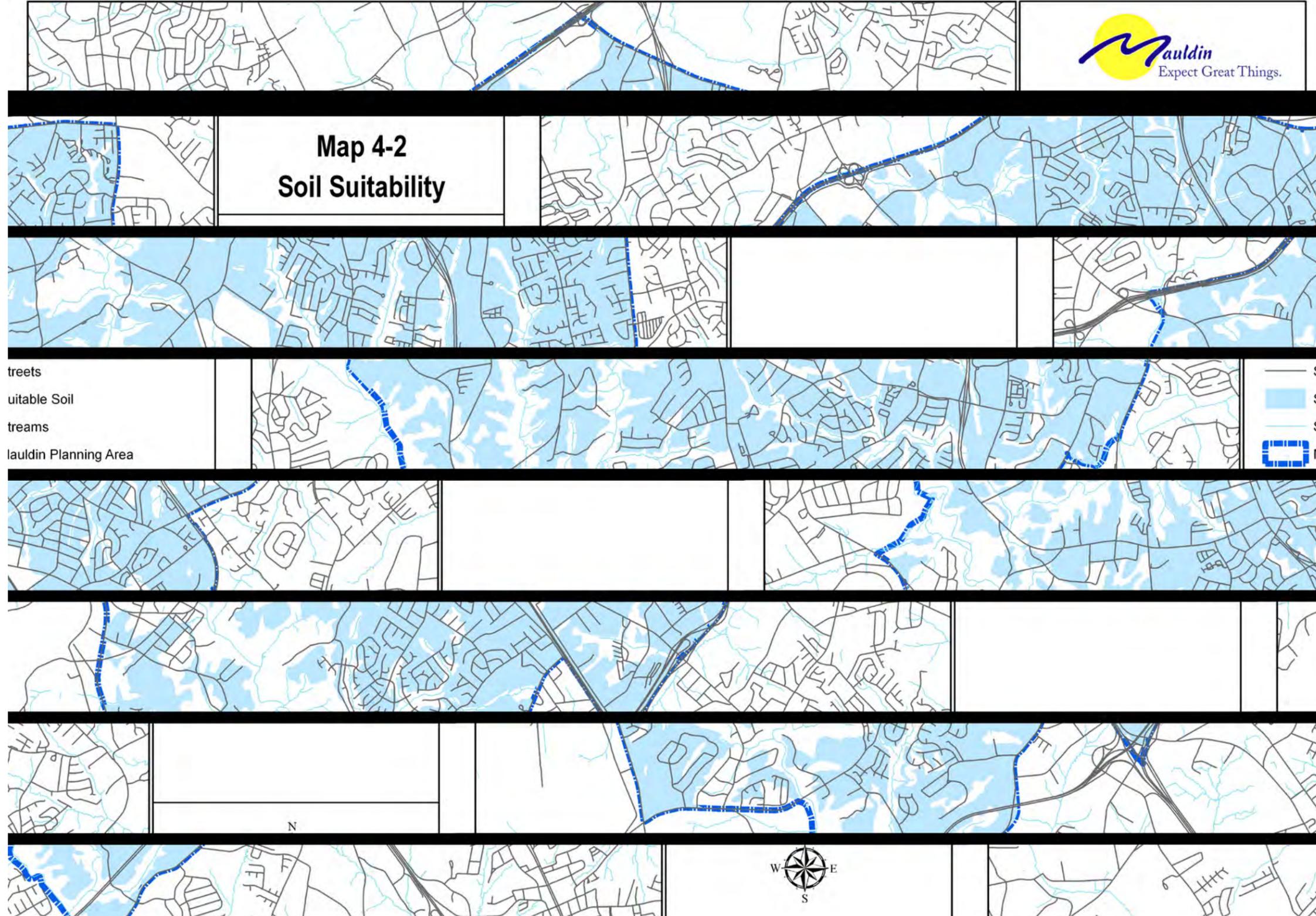
#### Water Resources

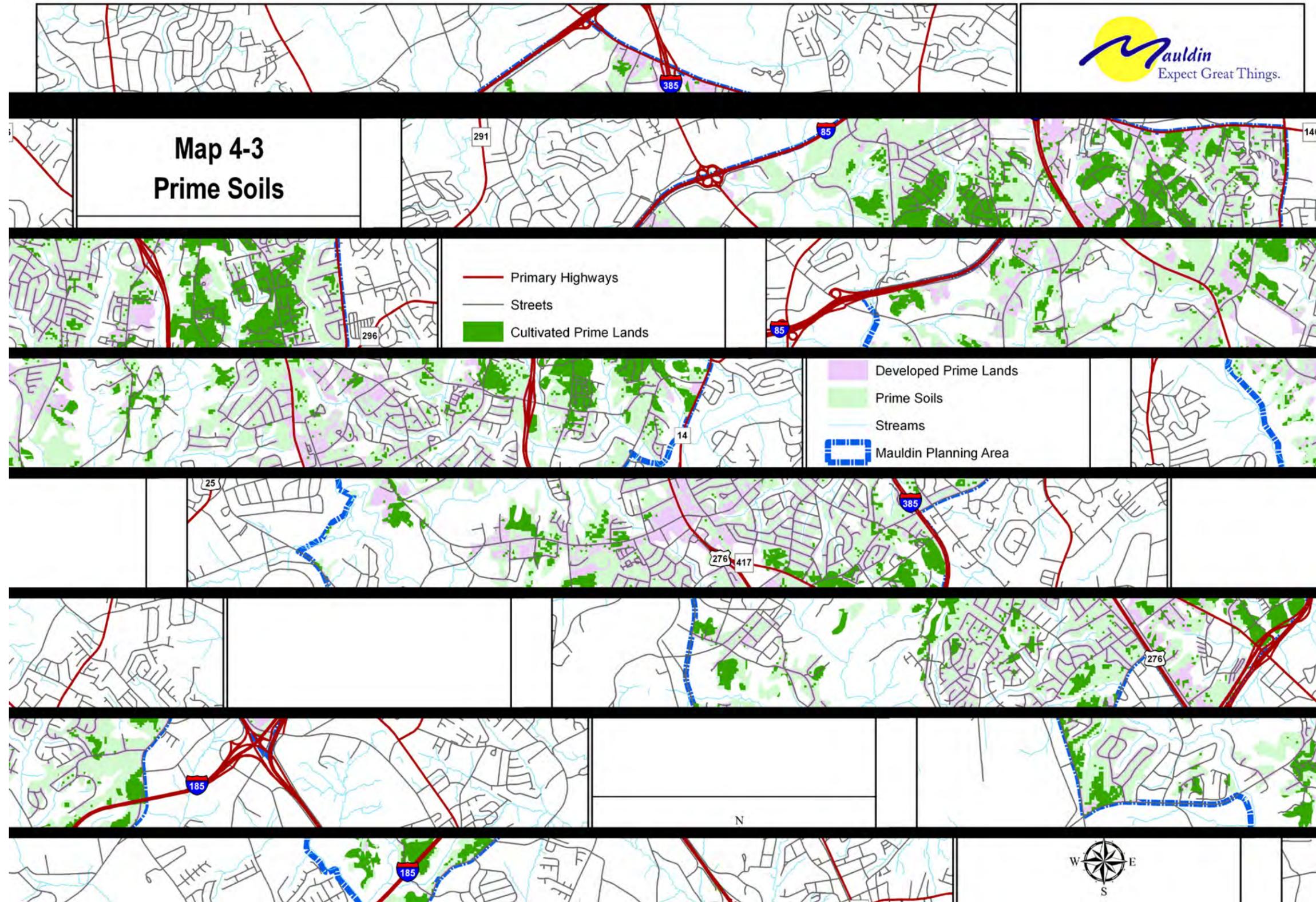
Mauldin is located along the ridge line that separates the Reedy River basin from the Enoree River basin. US Highway 276 generally follows the ridge between the Reedy and Enoree river basins through Mauldin.

In the Enoree River basin, the major creek systems within the Mauldin area are Gilder Creek and Little Gilder Creek, which drain the northeastern part of the planning area, and Bridge Fork Creek, which drains the east central part of the planning area. Significant wetland areas along Bridge Fork Creek north of SC 417 are visible from I-385. The Gilder Creek system is highly impacted by urban runoff and flooding problems are significant. The remaining wetlands provide important floodwater storage and filter sediments, improving water quality downstream. Wetland areas were much more extensive throughout the upstate before the era of large-scale farming; soil erosion has filled many of the region’s natural wetlands over the past 150 years or so.



Gilder Creek near East Butler Road and Bethel Road





Major creeks in the Reedy River basin are Laurel Creek, which drains the northwestern part of Mauldin, and Ranch Creek, which roughly parallels Ashmore Bridge Road and drains the south central portion of the planning area. Tar Creek and Marrowbone Creek drain areas west of the Reedy River. Map 4-4 illustrates the river basins that divide the Mauldin Area.

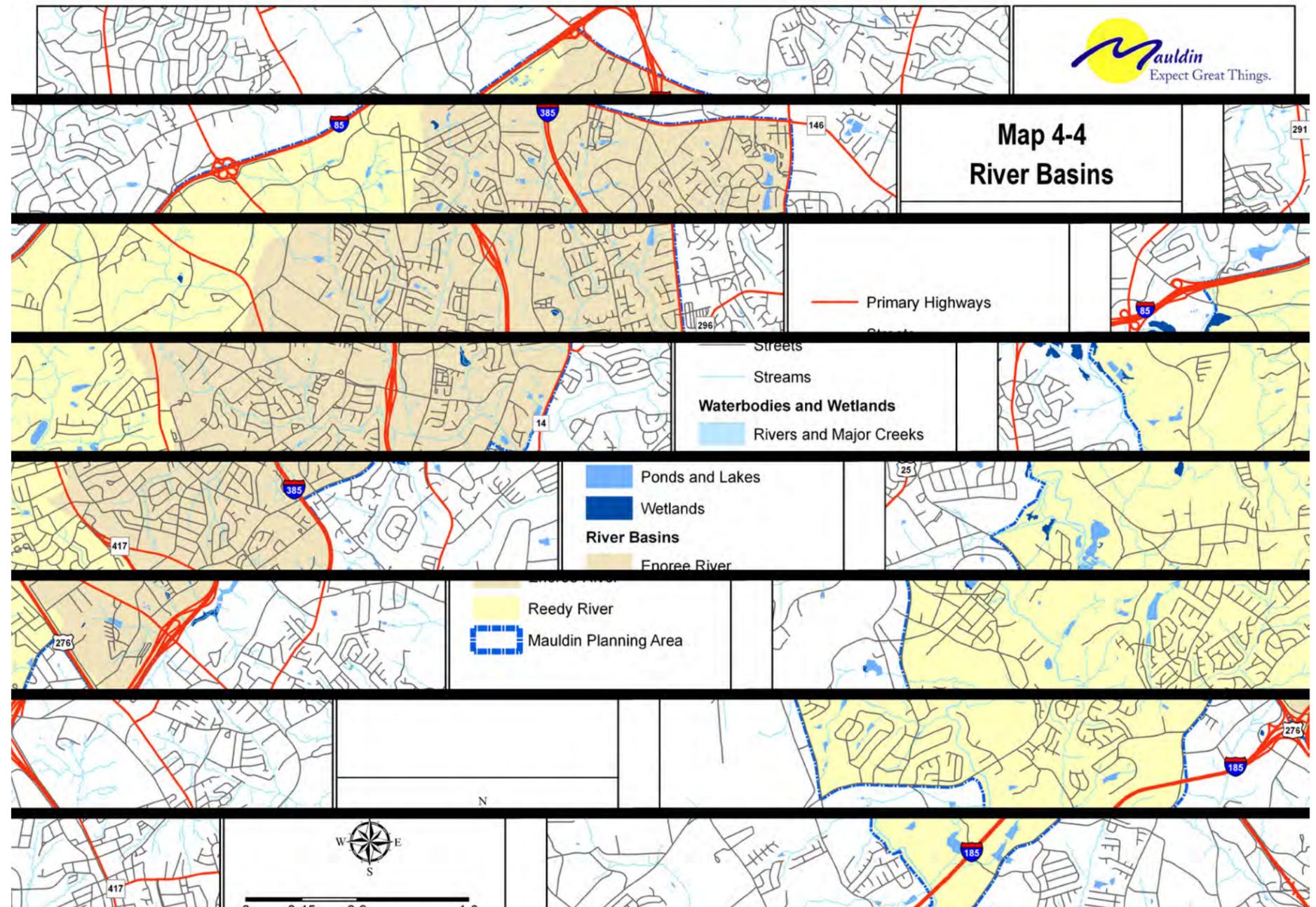
Floodplains are illustrated in Map 4-5, and extend along most of the main branches and tributaries of Laurel Creek, Ranch Creek, Gilder Creek and the Reedy River. Most of Laurel Creek within the Mauldin planning area is bordered by undeveloped or semi-rural areas, and few buildings have encroached on the floodplain. Ranch Creek is bordered by subdivisions, but floodplain protection ordinances were in place when these subdivisions were built and development generally has not encroached on the floodplain.

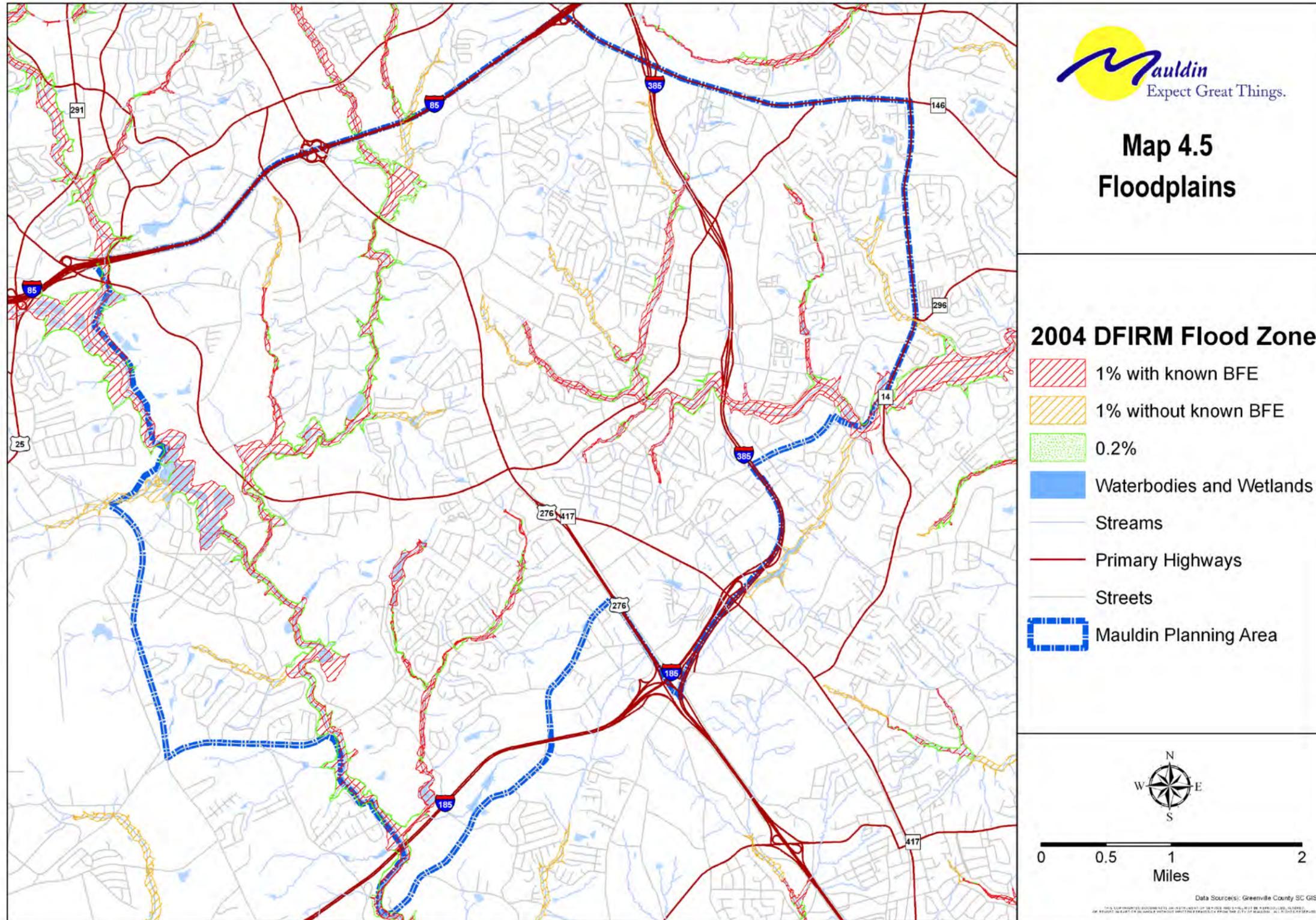
Flooding is a significant problem along Gilder Creek in several subdivisions that were built in the 1960s and early 1970s. Libby Lane, Brookbend Court, and Shadecrest Drive are examples of areas where flooding has been an issue for residents.

Stream buffers are one tool that can be used to control surface water runoff and improve water quality. Also known as riparian buffers, undisturbed natural forested areas along streams have been shown to be effective in controlling nonpoint source pollution by removing nitrogen and sediment from urban stormwater runoff.

Greenway trails can be incorporated into stream buffers, and combine active recreational benefits with water quality benefits.

Soil erosion persists as a significant water quality problem in Mauldin. Much of the current erosion problems arise from landscape maintenance practices. Attempts to establish lawns on steep slopes generally fail due to the erodibility of many of the area's soils. Weekly mowing with riding lawn mowers worsens this problem. Some of the worst soil erosion





problems exist on public rights-of-way and, where steep slopes have been graded to avoid impacts on adjacent property. Some slopes on school grounds and some other public facilities are generating significant erosion problems as well, and should be corrected as one of the priority action items for this plan.

### Natural Areas and Open Space

Map 4-6 illustrates lands that are protected from development as public parks or have been protected with conservation easements.

Conservation easements are voluntary agreements between a landowner and (usually) a private land trust, which permanently limit the type and amount of development on a parcel of land. The property remains in private ownership, and a limited range of uses are permitted, typically including agriculture, forestry, recreation, or other open space uses. Industrial, commercial, and residential development is prohibited, although one or very few residences may be permitted on the property in many cases. Many properties have been preserved in the Upstate through efforts of Upstate Forever in cooperation with other conservation organizations.



*Mallard ducks on the water on a summer evening at the stormwater retention pond at C&S Wholesale*



*This Green Heron is a regular visitor to the pond in the Forrester Woods subdivision in Mauldin*

Small, informal open space areas may also be valuable. The picture (below left) of the stormwater retention pond at the C&S Wholesale facility shows how these features can provide good habitat for birds while protecting water quality. A careful approach will find a green heron waiting in the shallows in this pond for frogs and fish.

The largest and potentially most significant natural area is at Lake Conestee Nature Park. The Conestee Foundation manages the lake and has acquired nearly 600 acres centered on the lake to create a regional park and an environmental education center. The Swamp Rabbit Trail, which generally follows the Reedy River from Travelers Rest southward, will terminate at Lake Conestee Nature Park and create a bicycle and pedestrian spine through Greenville County.



*Wetlands on this City-owned open space on East Butler Road at East Creek Townes (above) help store floodwaters, filter runoff, and provide habitat for birds like the Cedar Waxwings pictured below*





### Environmental Hazards

Map 4-7 identifies the three federal Superfund sites in the Mauldin area. None are in the city limits of Mauldin. Remediation of the Fiber Industries (later Hoescht Celanese) site near I-85 and Woodruff Road is nearly complete. Production of polyester fibers and wastewater treatment in open lagoons on the site led to solvent contamination of groundwater.

The lake bed of Lake Conestee has nearly filled with sediment which accumulated over a century. Prior to passage of the Clean Water Act in 1970, wastewater discharged from textile and metal production operations upstream carried solvents, heavy metals, polychlorinated biphenyls (PCBs), and other hazardous waste. As noted by the executive director of the Conestee Foundation, the lake bed is essentially a chemical history of the industrial revolution in Greenville. EPA has determined that the best remediation action for the lake is to maintain the contaminated sediments in place and prevent human contact with contaminated lower sediment layers.

Other common environmental issues include groundwater contamination near old gas stations, as many underground storage tanks (USTs) leaked fuel. Dry cleaners generally stored perchloroethylene in USTs as well, and this is another common source of urban groundwater contamination. Several groundwater monitoring wells are located at service stations along U.S. 276, as part of S.C. DHEC's program for monitoring and remediating groundwater contamination.

### Plant and Animal Habitat

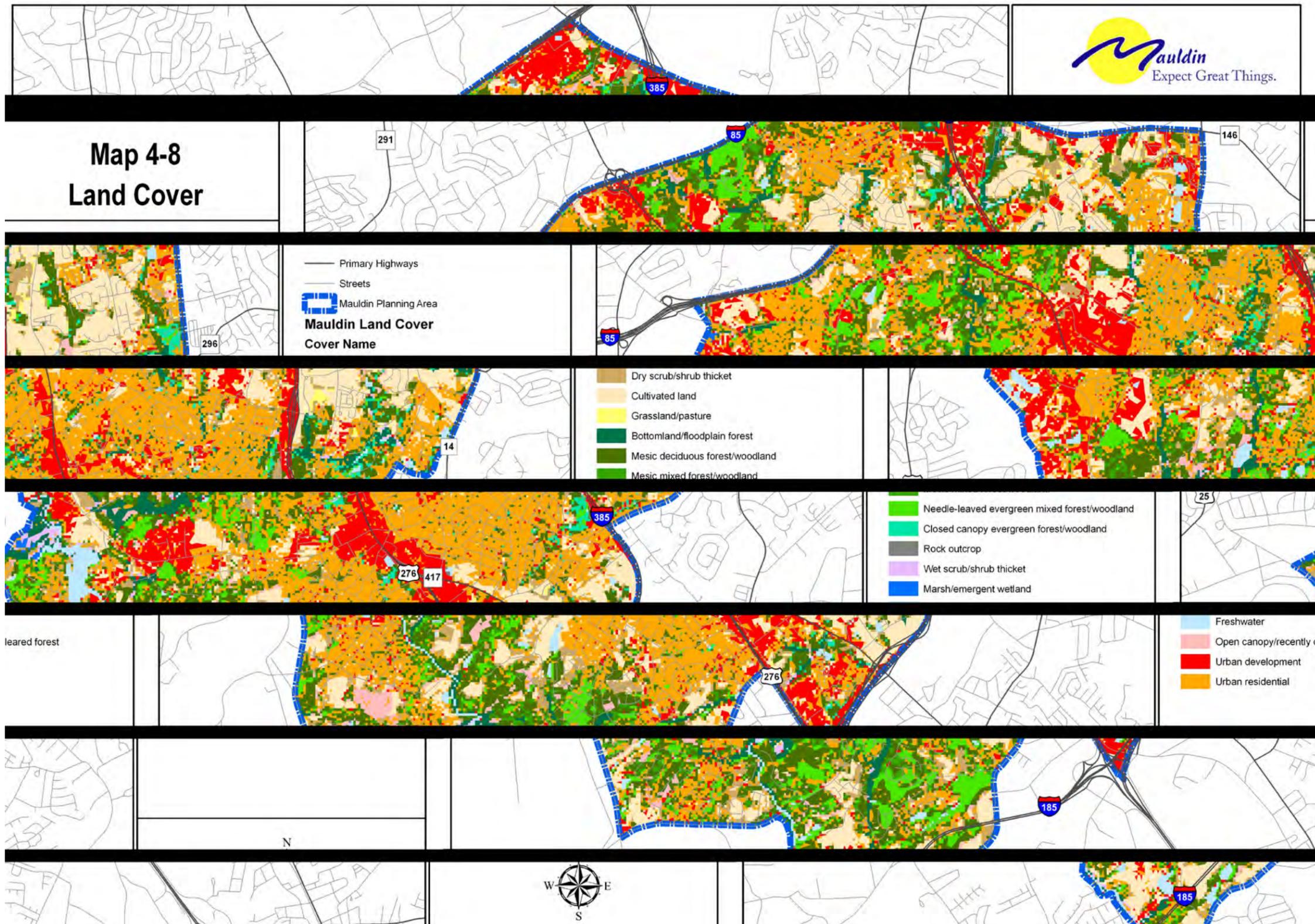
A few threatened plant and animal species occur in Greenville County; none are known in the Mauldin planning area.

Inventories of common plant and animal species that are observed in the Mauldin area are included as an appendix.

Much of the Mauldin area is urbanized, and habitat loss and fragmentation due to roads and suburban development is a difficult issue to address. Suburban sprawl, wetlands filling, forest fire suppression, forestry practices, and habitat

degradation from urban activity (water quality and sedimentation issues) are cited by S.C. Department of Natural Resources as the main threats to birds and mammals statewide.







## Chapter 4: Natural Resources

Invasive non-native species such as fire ants and a number of invasive plant species are other areas of concern.

Map 4-8 illustrates land cover in the Mauldin area. The most significant plant and animal habitat areas are generally the green areas of the map, while reds depict intense urban (mostly paved) areas, and orange identifies suburban residential areas. The large areas shown as cultivated land in the northeastern part of the map have now mostly been developed as subdivisions, schools, and light industrial use.

The map of land cover clearly illustrates that most of the remaining natural, undeveloped land lies in a swath along Laurel Creek and the Reedy River in the western part of the Mauldin planning area.

### Key Issues

#### Urban Forest Management

Trees are among the most important quality of life features in Mauldin. Subdivisions built in Mauldin in the 1960s and 1970s were generally not “mass graded,” and many trees were retained on the house lots as development progressed on a house-by-house basis. The saplings preserved in the 1960s and 1970s are now large, mature canopy trees, forming a relatively healthy and diverse urban forest.

It will continue to be difficult to protect significant trees if new residential and commercial development sites continue to be mass-graded. Policies that encourage, reward or require more careful placement of buildings and site and preserve natural contours of the land would be ideal if more mature trees are to be preserved and incorporated in new development.

Forest succession – ensuring a healthy mix of tree ages – will be important to ensure the long term health of the urban forest in Mauldin.

Urban forestry education programs would be useful to assist homeowners and business owners to understand the benefits of tree preservation and to practice effective management and replacement of urban trees. Effective management of the urban forest that grows in and around residential neighborhoods will have a significant benefit for animal habitat and water quality.

The City’s tree ordinance, which applies to trees on commercial and multi-family properties, has helped preserve a number of “specimen” trees larger than 30” caliper and the City’s landscaping requirements for new development ensures planting of significant numbers of trees.

#### Farmland Preservation

In discussions with the citizens committee, preserving farmlands and agricultural lands emerged as a goal. Preservation of some active farmlands would allow local production of fresh fruits, vegetables, and meats to continue, and would preserve some of the rural character that is rapidly disappearing from the area. However, few opportunities remain to preserve active farms within the Mauldin Planning Area, as illustrated in Map 4-3.

A more realistic strategy to preserve some local agricultural production may be to encourage community gardens and work with local organizations to provide outreach and education on farming and gardening skills.

#### Air Quality

Ground-level ozone is an air pollutant that has been an issue in the Upstate region since 1997. While ozone in the stratosphere shields the earth from ultraviolet radiation, in the biosphere it is harmful to humans, plants and animals. At high concentrations, ozone has been shown to cause respiratory

impairment, lung damage, damages rubber and other materials, harms plants and reduces crop yields.

Ozone is not emitted from automobiles or smokestacks. It is formed in the atmosphere by two “precursor” emissions, nitrogen oxides (NOx) and volatile organic compounds (VOC). In warmer weather, VOCs and NOx combine in the atmosphere to form ozone. Ideal conditions for ozone formation are high temperature, high levels of ultraviolet radiation, and stagnant air, which makes South Carolina summers nearly perfect for producing high ozone levels.

#### Ozone Formation

NOx emissions are produced by any and all combustion processes, such as gas-fired home water heaters, wood fires, lawn equipment, automobiles, industrial boilers, and fossil-fueled power plants. In South Carolina, coal-fired power plants and automobiles are major NOx sources.

In South Carolina, DHEC estimates that man-made sources of VOC account for about half of those emissions. Sources include vapors vented from fuel tanks, painting and finishing processes, and combustion processes; poorly-tuned cars are a significant source.

Natural sources produce the other half of VOC emissions. Oak trees emit isoprenes, pine trees emit turpenes, and other plants produce natural VOCs through transpiration.

#### Stricter Air Quality Standards

In July 1997, the U.S. EPA issued a stricter set of standards for ground-level ozone to protect human health. Prior to 1997, Cherokee County was the only area in South Carolina that had exceeded the standard for ground level ozone and was designated a “nonattainment area” by EPA.

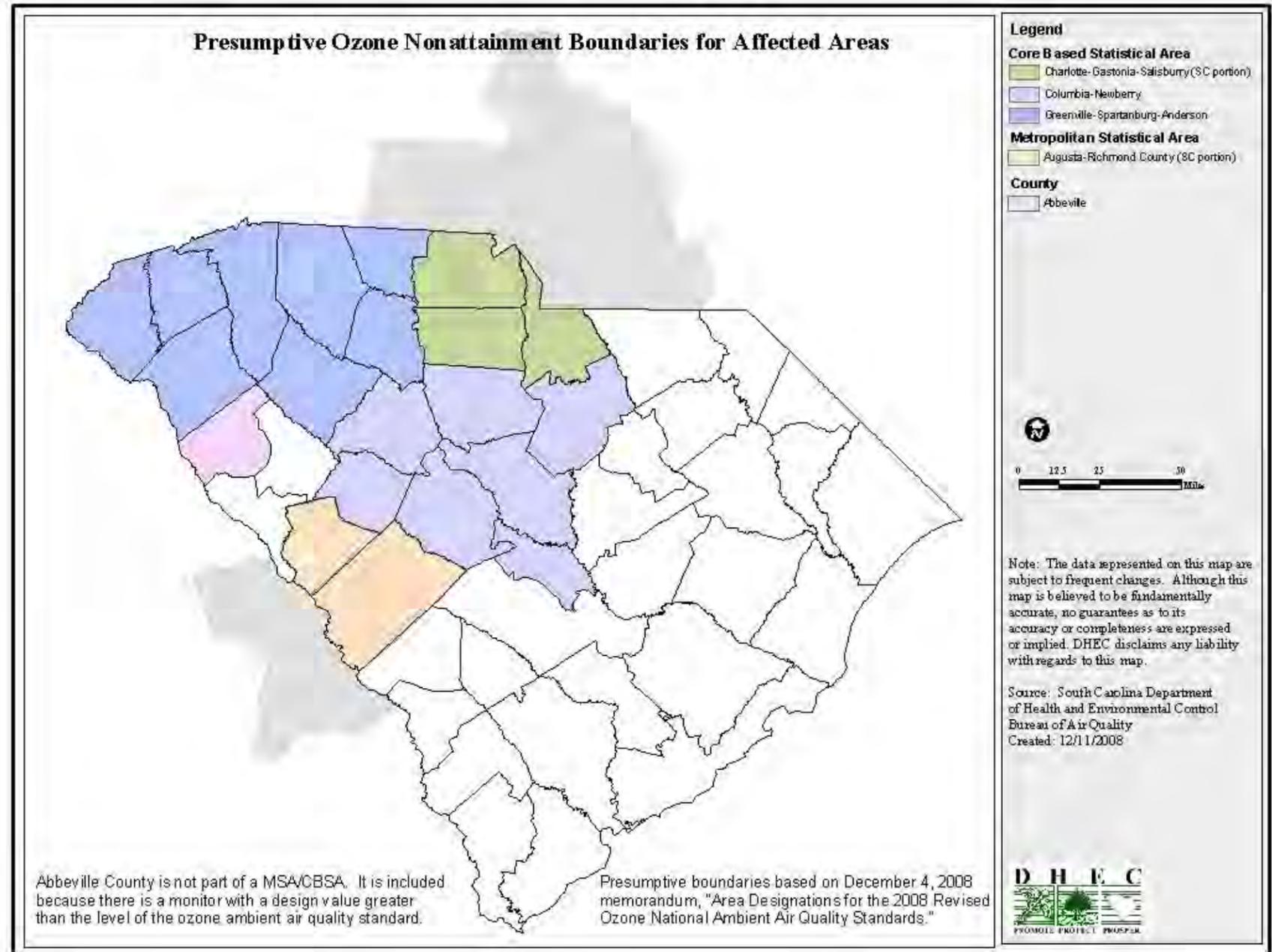
The 1997 National Ambient Air Quality Standards (NAAQS) would have resulted in designation of 10 South Carolina counties as nonattainment areas. Nonattainment designation creates many administrative costs for government agencies and for business and industry. Business and industry are required to invest in equipment and procedures to reduce emissions from production processes, more state regulatory action is required, and extensive analysis of air quality impacts of highway and transit improvements is required.

South Carolina counties entered an “Early Action Compact” with EPA, and through voluntary measures to reduce emissions, combined with national requirements for cleaner automobiles and trucks, the entire state was in compliance with the EPA standards for ground level ozone by 2007.

In 2008, EPA again made the standards stricter, and once again many counties in the state exceeded the new standards that year. Map 4-9 illustrates the potential boundaries of the ozone “Nonattainment Area” that may be designated by EPA in 2010. Colored areas on the map are presumed to become nonattainment areas; boundaries are likely to be set based on census-defined metropolitan areas. Gray areas show the likely Charlotte and Augusta nonattainment areas in adjoining states.

Table 4-1, produced recently by DHEC and available on their website, illustrates the air quality trends in upstate South Carolina. Air quality has steadily and continually improved, but not quite as fast as EPA has lowered the allowable limits.

EPA began phasing in stricter “Tier 2” tailpipe emissions standards for cars and light trucks in 2004. These standards have been fully implemented now, and according to EPA, “Vehicles meeting the Tier 2 emission standards are much cleaner – 77% to 95% cleaner, depending on the size of the vehicle – compared with model year 2003 and earlier.” Most areas that marginally exceed air quality standards are expected to meet the NAAQS as a result of cleaner vehicles.



Map 4-9: Potential Air Quality Nonattainment Areas in South Carolina.  
Map courtesy of SC DHEC

Particulate Matter

Fine particulate matter, known as “PM 2.5,” is also a pollutant of concern for Greenville County. Many of the sources of PM 2.5 are the same as for ozone. Fugitive dust from dirt roads, construction sites, and rock quarries are also an important source. Some monitors in the Greenville area indicate that the PM 2.5 air quality standard is being exceeded at a monitor near downtown Greenville, and a monitor in Taylors is very close to the standard.

Local Actions and Initiative

As is true with many environmental issues, national actions likely are most effective at improving air quality. EPA regulations that reduce emissions from automobiles and power plants are in place and in most areas will result in air quality that meets the new standards. For example, regulations on automobile and truck emissions that went into effect between 2004 and 2007 are expected to reduce per-mile emissions from motor vehicles by 60 to 80 percent. While some of this improvement will be offset by continued growth in vehicle miles of travel, the net result will be significant reductions in the total emissions from vehicles.

However, local actions can have important air quality benefits. Educational campaigns that educate drivers about vehicle maintenance and unnecessary vehicle idling can be effective tools.

Energy Conservation measures by government agencies both set a good example for the public and save tax dollars.

LEED certified buildings, although generally more expensive to construct, are expected to more than offset higher construction costs through energy savings, and also generally create more pleasant living and work spaces.

Table 4-1  
Air Quality Monitoring Results for Ground-Level Ozone in South Carolina

County	Monitoring Site	2006 4th 8-hr Average (ppm)	2007 4th 8-hr Average (ppm)	2008 4th 8-hr Average (ppm)	2009 4th 8-hr Average (ppm)
Abbeville	Due West	0.079	0.083	0.074	0.060
Aiken	Jackson	0.073	0.082	0.075	0.068
Anderson	Big Creek			0.068	0.061
Berkeley	Bushy Park	0.064	0.064	0.066	0.056
Charleston	Cape Romain	0.078	0.069	0.071	0.063
Cherokee	Cowpens	0.076	0.067	0.080	0.057
Chesterfield	Chesterfield	0.074	0.073	0.072	0.064
Colleton	Ashton	0.078	0.071	0.067	0.060
Darlington	Pee Dee	0.076	0.073	0.076	0.065
Edgefield	Trenton	0.068	0.073	0.071	0.063
<b>Greenville</b>	<b>Hillcrest</b>				<b>0.067</b>
<b>Greenville</b>	<b>Famoda Farm</b>			<b>0.065</b>	<b>0.065</b>
Oconee	Long Creek	0.065	0.074	0.072	0.066
<b>Pickens</b>	<b>Clemson</b>	<b>0.081</b>	<b>0.081</b>	<b>0.080</b>	<b>0.066</b>
Richland	Congaree Bluff	0.072	0.070	0.073	0.057
Richland	Parklane	0.082	0.077	0.077	0.064
Richland	Sandhill	0.078	0.084	0.077	0.066
<b>Spartanburg</b>	<b>N. Spartanburg FD</b>	<b>0.085</b>	<b>0.083</b>	<b>0.085</b>	<b>0.066</b>
Union	Delta	0.077	0.076		
Williamsburg	Indiantown	0.073	0.071		
York	York	0.078	0.080	0.075	0.061

Note: Red highlights indicate values that exceed the new NAAQS for ground-level ozone, yellow highlights indicate values that are approaching the NAAQS. In 2008, the standard was lowered from .084 to .076 parts per million.

Source: SC DHEC, Bureau of Air Quality.



Land use planning can also play a significant role in air quality. Vehicle emissions are highest in the first mile of travel before the engine and catalytic converter reach normal operating temperatures. Up to 70 percent of emissions in a typical car trip occur in the first mile. Where land use arrangements and urban design factors -- such as mixed use development with attractive pedestrian facilities and bike lanes – make non-automotive travel a viable choice, significant emissions reductions can be achieved.

A good example of land use planning benefits can be observed at the Bloom grocery store at the intersection of Holland Road and Bridges Road. Many residents of the adjacent Bridges Crossing subdivision adamantly opposed development of a grocery store at that location, citing mostly traffic concerns. Now, residents may be commonly observed walking across Holland Road to the grocery store. While some people scoff at the idea that middle-class car owners will walk to work and shopping, people will choose walking and bicycling when land use planning and transportation facilities make the choice convenient.

### **Other Related and Useful Plans and Reports**

Many other organizations in the region have produced reports and studies that are important to natural resources in Mauldin, including the following.

- Saluda-Reedy Watershed Consortium
- Lake Conestee Nature Park Master Plan
- ReWa (formerly WCRSA) 20 Year Plan
- Greenville Water System plan
- SCDNR Comprehensive Wildlife Strategy
- Governors Climate Change Task Force Report



**Goals and Objectives**

**Goal 1: Work with regional partners to improve water quality.**

*Objective 1.1:* Reduce sediment and pollutants in urban runoff

Implementation Strategies

- a. Provide erosion control education through city publications and distribution of brochures.
- b. Amend land development regulations to provide better natural stream buffers
- c. Evaluate public facilities in the City to identify soil erosion problems related to mowing on steep slopes or inadequate storm water management; implement solutions on City property and recommend actions for other public properties such as schools.

*Objective 1.2:* Work with private landowners to preserve open space along Gilder Creek and Laurel Creek and their tributaries

Implementation Strategies

- a. Apply for grant funds to purchase conservation easements
- b. Provide information to key property owners about the tax benefits of donating conservation easements

**Goal 2: Preserve and manage effectively the urban forest resources in Mauldin**

*Objective 2.1:* Preserve historic trees in Mauldin

Implementation Strategies

- a. Amend the city's tree ordinance to provide additional incentives to protect historic trees and ensure diversity of age and species in urban forest
- b. Educate developers and homeowners about tree protection and values through brochures and information programs at city-sponsored events

**Goal 3: Encourage preservation of remaining agricultural lands and support local crop production.**

*Objective 3.1:* Work with farmland owners to identify options for preserving farmland, including agricultural easements, which provide tax advantages to landowners and allow continued use of land for agricultural production.

Implementation Strategies:

- a: Coordinate with state and local organizations to provide information to landowners.
- b: Include a community garden space in future city park development.

*Objective 3.2:* Encourage development of community gardens

Implementation Strategy

Work with the Mauldin Garden Club, Clemson Extension, and other local non-profit groups to

provide education and support for community gardening.

**Goal 4: Improve storm water management.**

*Objective 4.1:* Identify problem areas where storm water has caused flooding

Implementation Strategy: cooperate and consult with FEMA, SCDHEC, Greenville County and other agencies to develop and implement improvements.

*Objective 4.2:* Evaluate opportunities to collaborate with Greenville County to eliminate duplication of stormwater management services.

Implementation Strategy: Meet and consult with Greenville County officials to identify opportunities to improve service delivery.