



Floodplain Restoration Bank
New Partners for Smart Growth
February 3, 2011

Funding: EPA Targeted Watershed Grant

Partners:



Furman University



City of Greenville

Goal: Create market based incentive program to encourage development less impactful on water resources



Floodplain Restoration Bank



RiverPlace - Greenville, South Carolina

Skyline 201



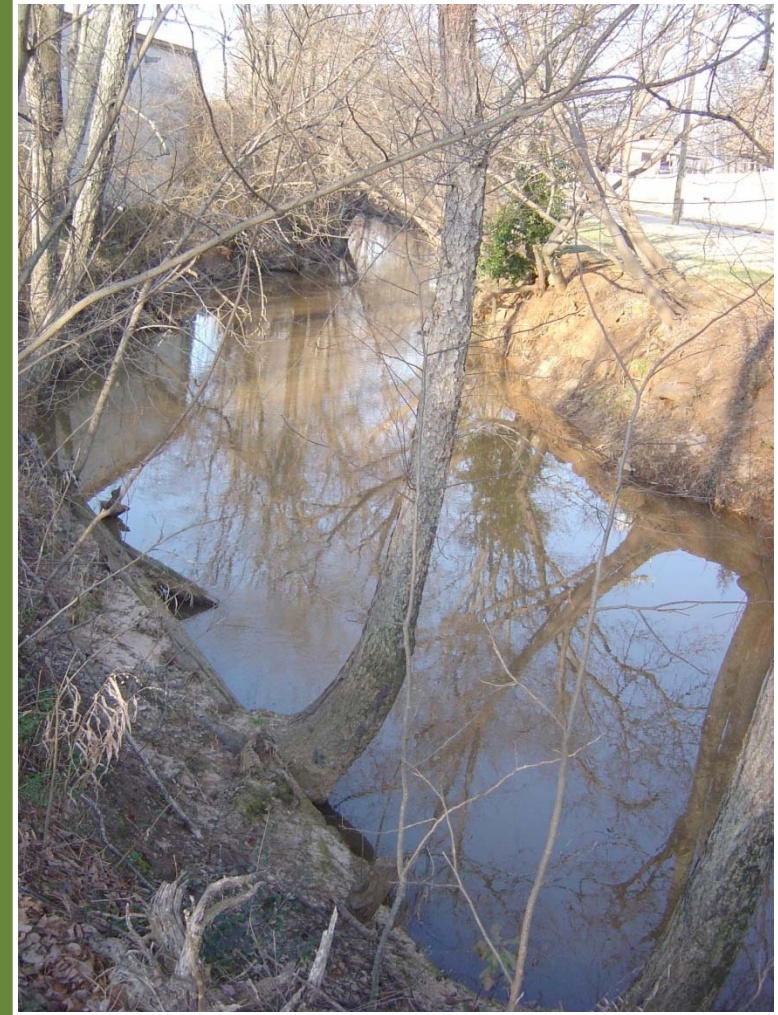
Project Background - Downtown Greenville



Sewer pipes crossing rivers



Reedy Falls downtown - 2006



Severely Eroded Stream Banks

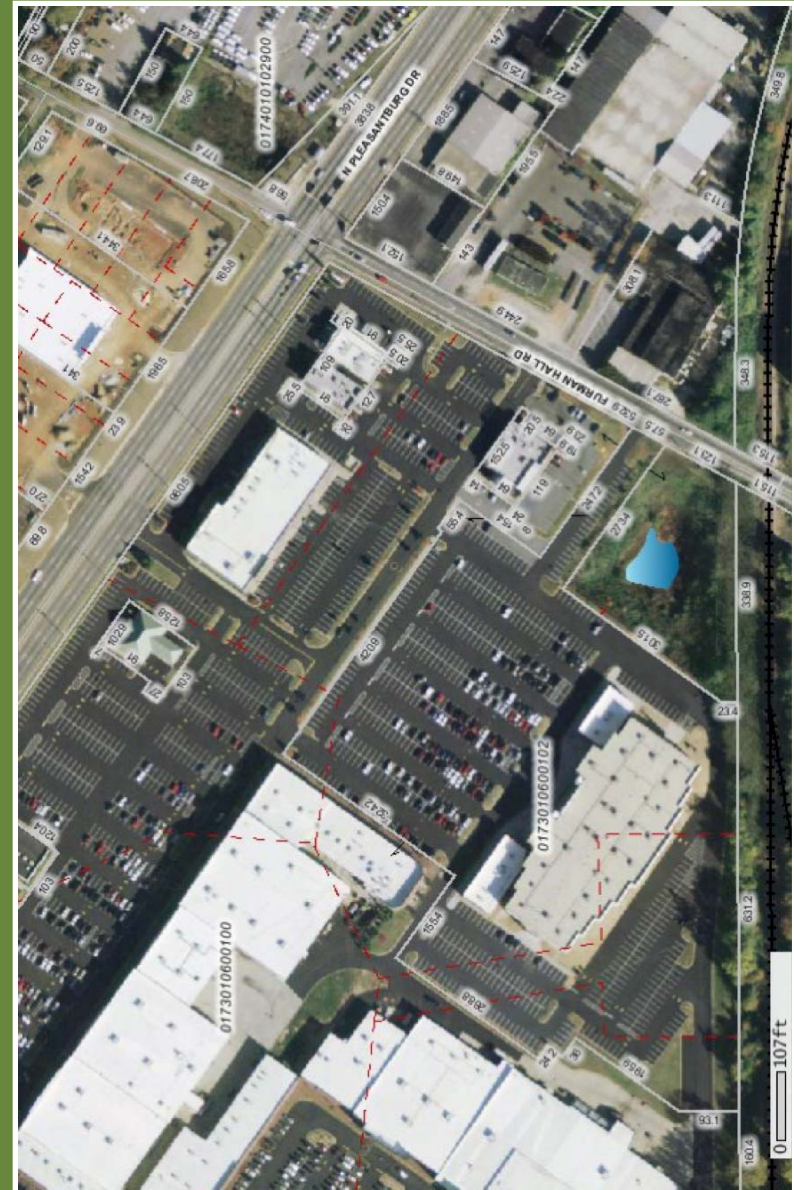


Project Background

Nationally:

- Impervious surfaces cover 43,000 sq mi (equivalent to size of Ohio)
- 65% of total impervious cover is transportation related
- Parking lots represent the 3rd largest category of impervious cover (24.8%)

(Sources: Frazer, L., 2005, USGS, 2007)



Impervious Surfaces

- **Convey pollutants:**
 - **Chemical - predominant source of PAHs in urban streams**
 - **Biological - bacteria**
 - **Thermal - increase stream temperatures dramatically (10°)**
- **Alter stream morphology:**
 - **Increase in volume and velocity of flow**
- **Decline in stream biodiversity:**
 - **Relationship between increase in impervious and decrease in biodiversity**

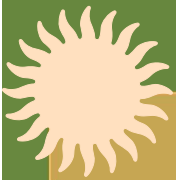
(Sources: USGS, 2007; Mahler et al., 2005)



Stormwater and Parking Lots



Haywood Mall – 3.17.10



Excessive Parking Requirements

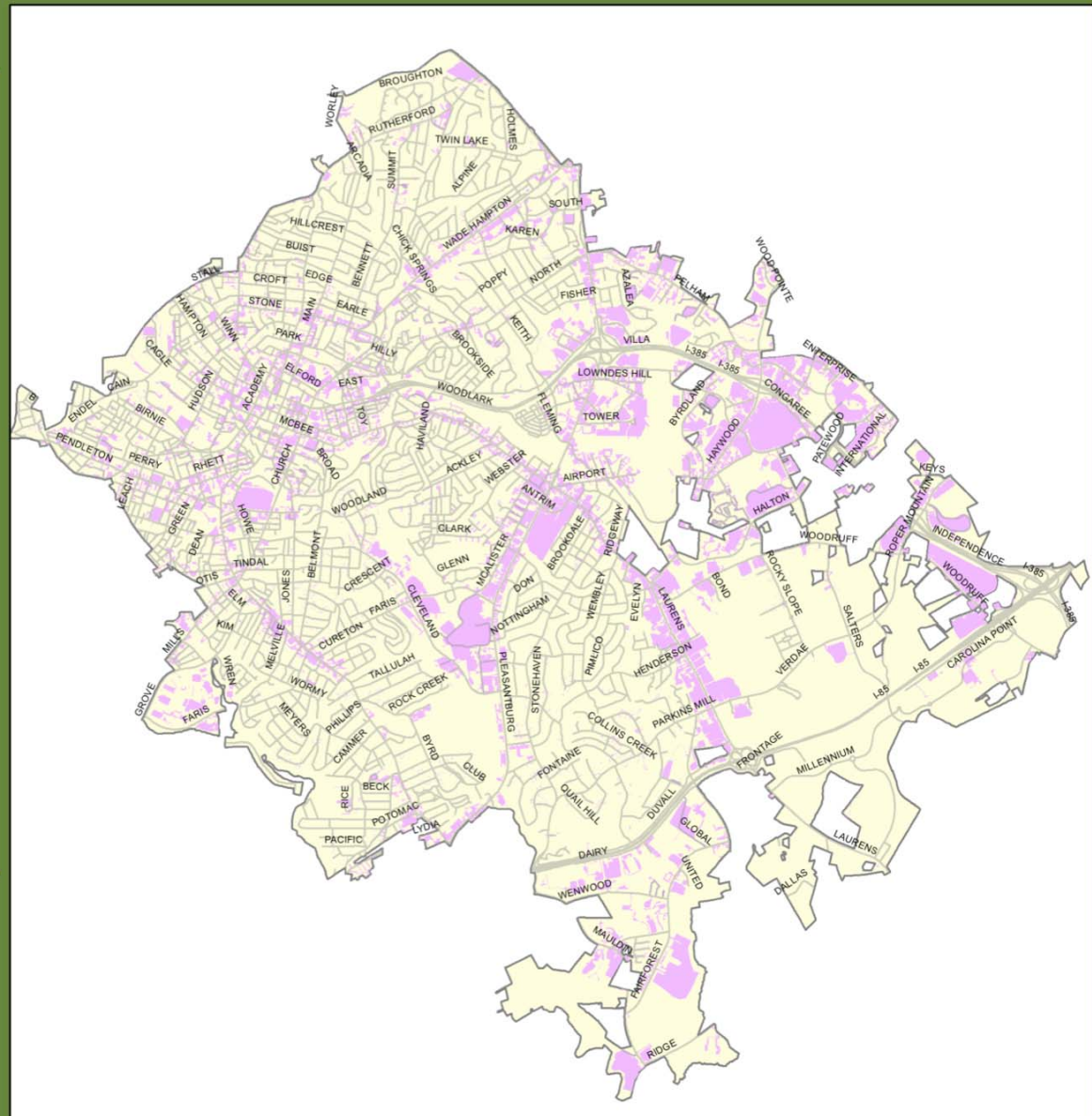
City of Greenville

City limits = 18123 acres

Total impervious area =
10,784 acres

Impervious parking area =
2325 acres

City surface parking =
• 21.5% of impervious cover
• 12.8% of city acreage



City of Greenville Parking Areas

- Revised Off-Street Parking Code
 - Minimum
 - Maximum
- Reasons for the revision
- What information was used to set current code



Charge fee per space for each additional space



Parking Variance Program

MIN

MAX

Impervious:
Free



Impervious:
\$\$



Impervious:
\$\$



Pervious:
Free

Pervious:
Reduced \$\$



Parking Variance Program

Pervious paving materials = No/lower fee for additional spaces



Interlocking pavers



Interlocking pavers



Pervious concrete



Grasscrete



Pervious Pavement Options

- 115 Parking Lots Surveyed
- Land Uses:
 - Retail & Sales (Big box, shopping centers, discount stores)
 - Office (General office, medical office)
 - Restaurants (sit down, drive through)
 - Financial Institutions (banks with and without drive through)
- Types of Surveys:
 - Aerial Surveys: Peak (Black Friday), Non-peak
 - On-the-ground: 3x during peak usage period



Parking Study – City of Greenville



Flights courtesy of SouthWings, Asheville, NC



Aerial Surveys

Data Collection

Two Flyovers:

- Peak usage – 11.27.09 – Black Friday
- Average usage – 3.17.10

Sites:

- Big Box Retailers –
i.e. Walmart, Kohls, Target, Costco, Best Buy, etc.
- Shopping Centers –
Haywood Mall, Greenridge Shopping Mall, strip malls



Aerial Surveys

Data Collection

- Total parking spaces
- Occupied spaces
- Time
- Date
- Building size (sq ft) – based on preliminary research
- Building vacancies – based on preliminary research



Aerial Surveys

6004 Total Parking Spaces



5227 occupied spaces = 87% occupancy rate



Haywood Mall 11.27.09 – Black Friday

6004 Total Parking Spaces



1525 occupied spaces = 25% occupancy



Haywood Mall 3.17.10

2940 Total Parking Spaces



1525 Occupied = 52% Occupancy



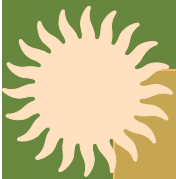
Greenridge Mall 11.27.09

2940 Total Parking Spaces



1051 Occupied = 36% Occupancy

Greenridge Mall 3.17.10



582 Total Parking Spaces



407 Occupied = 70% Occupancy



Kohls 11.27.09

582 Total Parking Spaces



90 Occupied = 15 % Occupancy



Kohls 3.17.10

668 Total Parking Spaces



461 Occupied = 69% Occupancy



Target 11.27.09

668 Total Parking Spaces



148 Occupied = 22 % Occupancy



Target 3.17.10

Land Use Category	Current Minimum Required (1/sq ft)	Current Maximum Required (1/sq ft)	Peak Percent Occupancy	Optimal Maximum Parking Ratio
Retail/Shopping Centers - Discount	500	250	52%	1/522 sq ft

Freestanding buildings vs. attached stores:

- Freestanding buildings (Walmart, Kohls, etc.) : 41%
- Attached buildings (strip malls, mall) : 66%



Parking Study Preliminary Results

3 Measurements for each lot :

- Peak usage time

Sites:

- Banks (8)
- Restaurants (19)
 - Drive-thru
 - Without drive-thru
- Medical offices (12)
- Offices (16)
- Personal Service (7)
 - Salons
 - Veterinary Clinics
 - Health Clubs



On-the-ground Surveys

Land Use Category	Current Minimum Required (1/sq ft)	Current Maximum Required (1/sq ft)	Ave Peak Percent Occupancy	Optimal Maximum Parking Ratio
Banks	200	150	39%	1/350 sq ft
Grocery	500	250	35%	1/611 sq ft
Medical Offices	200	100	52%	1/300 sq ft
Offices	500	150	58%	1/360 sq ft
Personal Service	500	250	68%	1/342 sq ft
Pharmacy	500	250	45%	1/463 sq ft
Drive Thru Restaurants	150	75	55%	1/180 sq ft
Restaurants	100	60	39%	1/120 sq ft



Parking Study Preliminary Results

- Continue with data analysis
- Prepare to take to Council
- Conduct public outreach
- Implement Banking Program in City of Greenville
- Take FRB to other municipalities



Next steps

Could you envision a program like
this working in your county or
municipality?

A. Yes

B. No

C. Maybe



Upstate Forever
Decision Making Tool

On a scale of 1 to 5, how would you rate the complexity of this program, with 5 being the most complex?

A. 1

B. 2

C. 3

D. 4

E. 5



Upstate Forever
Decision Making Tool

Did you feel that this information
was useful to you?

A. Yes

B. No

C. Not sure



Upstate Forever
Decision Making Tool

A vertical decorative bar on the left side of the slide, featuring a light green background with various nature-themed icons in white and light green, including birds, leaves, a fish, a dragonfly, and a birdhouse.

Questions:

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Or

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