

Charlottesville: Environmental Programs and Initiatives Update

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City of Charlottesville, Virginia
RCS Brown Bag Lunch Series (July 19, 2012)

www.charlottesville.org/greencity

Charlottesville, VA: Quick Intro



- Established in 1762; independent City since 1888.
- 10.4 square miles; nestled in Albemarle County (726 square miles)
- Home to UVA
- ~40,000 residents
- The main “urban area” in the Rivanna River Watershed, part of the James River watershed and the Chesapeake Bay

City Council 2025 Vision Statement “A Green City”



Charlottesville citizens live in a community with a vibrant urban forest, tree-lined streets, and lush green neighborhoods.

We have an extensive natural trail system along with healthy rivers and streams.

We have clean air and water, we emphasize recycling and reuse, and we minimize stormwater runoff.

Our homes and buildings are sustainably designed and energy efficient.



Green City Initiatives

Compliance / P2 / Continual Improvement

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- High Performance “Green” Buildings
- Stream/Watershed Protection
- Stream Restoration
- Stormwater Management
- “Greening” the Fleet
- Land Use/Zoning
- Public Transit + Bike/Ped Improvements
- Waste Reduction and Recycling
- Urban Forest Management
- Energy Efficiency, Renewables, Resource Reduction
- Emissions Baseline and Emission Reduction Goals (aka Local-based Climate Protection efforts)



Land – Forest – Connectivity



Charlottesville's canopy coverage = ~ 47%
It's is not just quantity, but quality.

Good maintenance and management is key, including ongoing invasive species management (unexpected strategies)



- Ongoing tree plantings and riparian buffer enhancement
- Acquisition of new parkland (nearly 50 acres in the last decade); now nearly 10% of the city is parkland with significant forested areas
- Bike and pedestrian trails increasing connecting parks, schools and other public spaces
- Community gardens and increasing numbers of Farmers Markets

Greening our Fleet



Anti-Idling Policy

Alternatively fueled and efficient vehicles
(~42 hybrids, 2 compressed natural gas buses,
4 all-electric low-speed truck)

Hybrid-electric buses –2 in service;
plans to convert the fleet over next 10 years.

Seasonal biodiesel used
(transit buses, school buses and others)

Participating in a R&D project related to
electric vehicles and fast-charge technology



Greening our Buildings

2008: LEED-GOLD certification for Downtown Transit Station

2011: LEED-PLATINUM certification for Smith Aquatic Center

PLUS...



Smith Aquatic Center



Transit Base



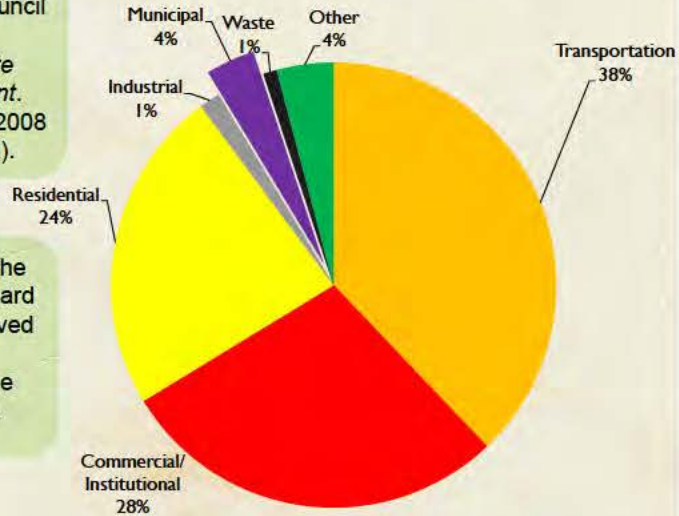
Fontaine Fire Station (under construction)

Community 2000 CO₂e Baseline

In July 2006, Charlottesville City Council endorsed the *U.S. Mayors Climate Protection Agreement*. Baseline published in 2008 (including UVA data).

In December 2007, the Albemarle County Board of Supervisors approved a Cool County Resolution. Baseline published in 2009.

Regional (City/County) Summary



Utilities Management & Efficient Infrastructure



Focused & consistent utility management = tracking, auditing, efficiency retrofits, and upgrades

2008 – conducted a \$1.8M Energy Performance Contract

- Involved 31 buildings
- upgraded 7,430 lighting fixtures and 937 water fixtures
- installed 1,709 occupancy sensors
- Installed 1st solar thermal system at Central Fire Station



2008 Traffic Signal Conversion – Incandescent to LED

- Involved about 500 lights at 48 signalized intersections
- ~80% energy reduction per intersection
- Simple Payback Period: ~ 2 Years



Over \$1M saved in the last 5 years through EE initiatives in existing City and School buildings

Infrastructure Improvements: City Hall

What was done & sequence?

- Boiler replacement
- Chiller replacement
- BAS upgrade
- Roof replacement w/ green roof component
- Improved insulation
- Window replacement



Headache building becomes high performing example

Dec 2007: EnergyStar score = 41
June 2011: EnergyStar score = 82!

CHS - Pursue Maximum Energy Efficiency

CHS Low Cost Infrastructure Improvements

- Replacement of 70's era VAV Boxes
- Insulation and exterior sealing
- Load shedding thru BAS controls
- Total cost of \$281K
- Resulted in increased comfort levels, reduced complaints and cut energy consumption by 20%
- Drop in peak energy usage qualifies for billing at lower rate
- And then...



CHS - Integrate Renewable Energy Strategies

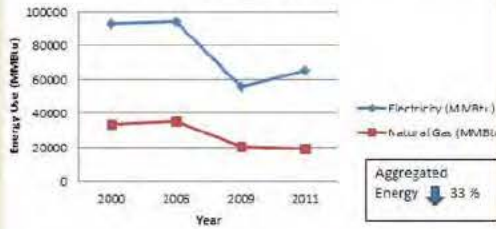


- 108 kW PV system
- In-house install; staff recently certified and trained; positioned for future expansion of muni solar projects
- Educational curriculum and displays



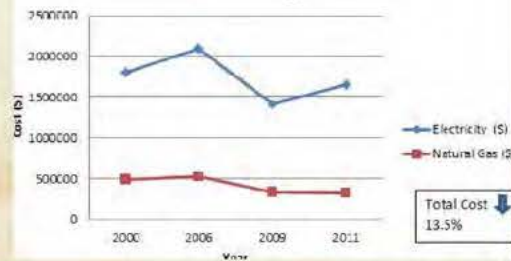
Improving the Municipal Energy Profile

Energy Consumption - Buildings & Facilities



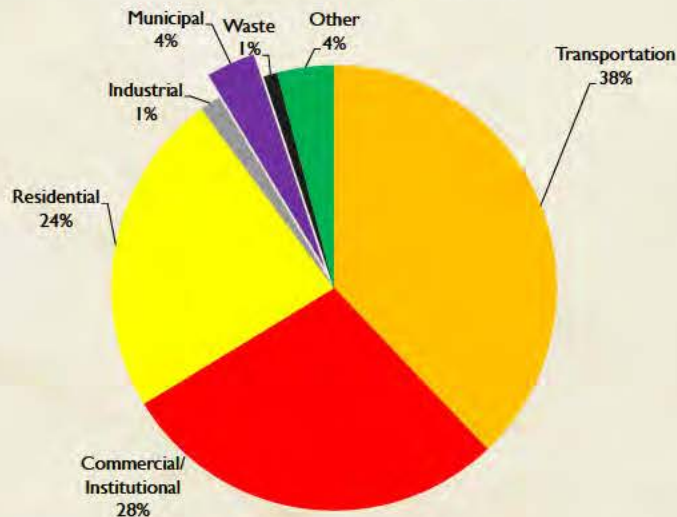
- Updating the emissions inventory
- 33% decrease in aggregated energy consumption
- 13.5% decrease in total costs

Total Cost - Buildings & Facilities



Challenge → Improving the Community Energy Profile

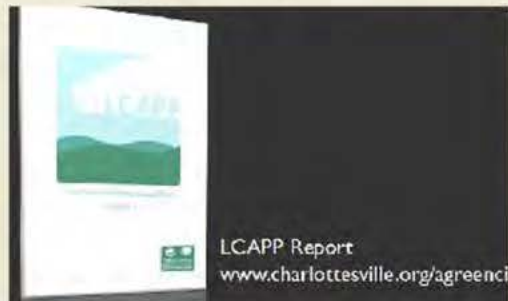
Regional (City/County) Summary



Local Climate Action Planning Process



- Steering Committee of key community representatives (local government, local businesses, local NGOs, local institutions)
- Working Groups: network of ~50 subject experts, interested parties, and staff
- Staff-facilitated meetings



LOCAL GOVERNMENT

David Brown, City Council
Ann Mallek, Board of Supervisors
Mike Osteen, Charlottesville Planning Commission
Tom Frederick, Rivanna Water and Sewer and Solid Waste Authorities

LOCAL BUSINESSES

Chris Lee, Piedmont Virginia Companies, Inc.
Jay Willer, formerly with Blue Ridge Home Builders Association
Tim Hulbert, Chamber of Commerce

LOCAL NGOs

Bill Edgerton
 The Oak Hill Fund
John Cruickshank
 Sierra Club, Piedmont Group
Bill Greenleaf
 Richmond Regional Energy Alliance
Cynthia Adams
 LEAP

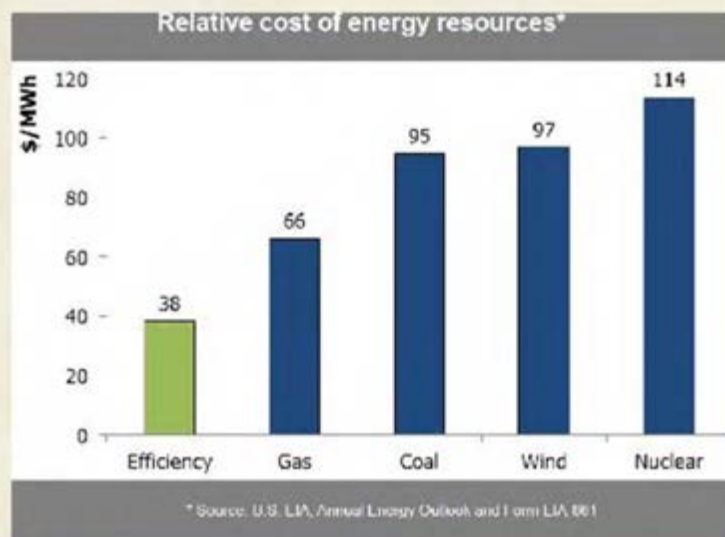
LOCAL INSTITUTIONS

Hank Shugart, University of Virginia, Department of Environmental Sciences
David Neuman, University of Virginia, Office of the Architect
Buck Kline, Virginia Department of Forestry

5 Five-Part Framework for Our Community Energy Profile

- 1 Energy & the Built Environment**
 - Reduce Energy Demand in Existing Buildings
 - Increase Energy Efficiency Performance of New Buildings
 - Enable Building to Green Building Standards and Practices
- 2 Energy & Mobility**
 - Focus Land Use and Transportation Planning on Density and Infill
 - Improve Travel Efficiency
 - Encourage Alternatives to Single Occupancy Vehicle Use
- 3 Energy Sourcing**
 - Promote Adoption of Cleaner Sources of Electrical Energy
 - Promote Adoption of Cleaner Sources of Energy for Heating and Cooling
 - Promote Adoption of Hybrid, Electric and Biodiesel Vehicles and Fuels
- 4 Energy & Materials**
 - Promote Zero Waste Principles of Waste Reduction and Minimization
 - Consider Impacts of Purchasing Decisions; Prioritize Local Procurement
 - Reuse and/or Repurpose Existing Buildings
- 5 Energy & the Landscape**
 - Maintain Existing Tree Canopy and Forestland Base
 - Expand Forest Cover
 - Manage Existing Tree Canopy and Forests to Promote Health and Diversity

Community and Energy



Community and Energy - LEAP



local energy alliance program www.leap-va.org

- Locally-based nonprofit launched in 2009; serves all sectors of our region
- Focused of facilitating energy efficiency and upgrades in existing building stock
- EPA Home Performance with Energy Star sponsor
- Strong education and outreach component
- Opportunity for economic and workforce development
- Supports our healthy living and affordable housing efforts
- Reducing our community's CO2 emissions



Community and Energy

www.cvillebetterbiz.org




- Helping businesses save money, save resources, have fun
- Monthly newsletter went out to 280 business contacts
- 106 businesses participated
- Great media coverage
- Website has had 2,064 visits in initial 6 months
- Numerous outreach events including lunch 'n learn sessions
- Over 200 attendees at Awards Event!

Community and Energy




Energize! 250


Charlottesville

250 Homes in 250 Days



CITY OF CHARLOTTESVILLE RESIDENTS
Here's your opportunity to lower your utility bills, improve your home, and improve your community.









PowerSaver
LOANS

Saving Energy. Saving Money. Improving Homes.

www.energize250.com

Community & Watersheds





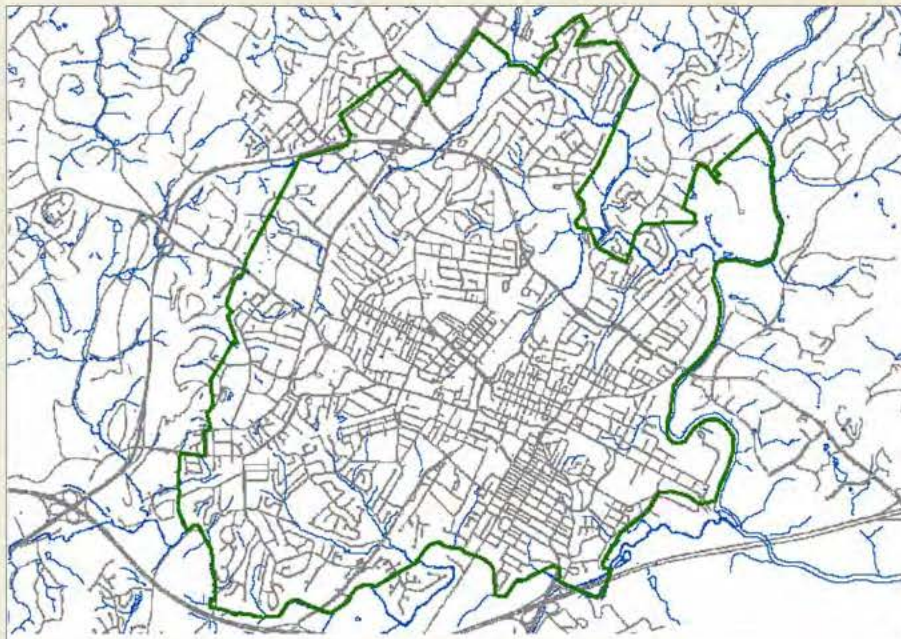
Water Resources Protection Program

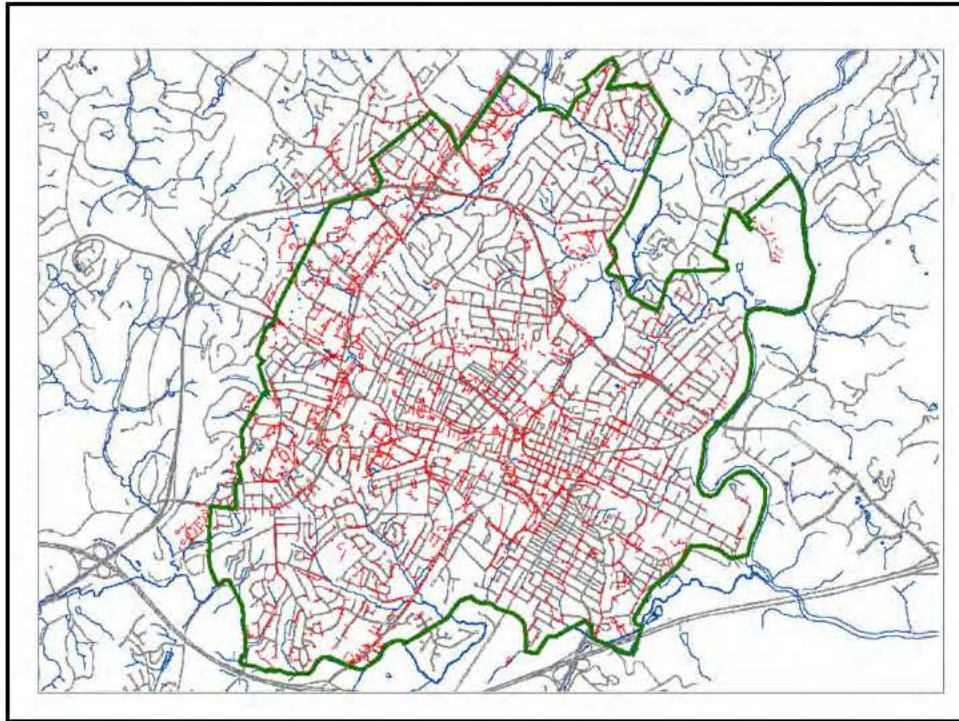
WRPP - Drivers



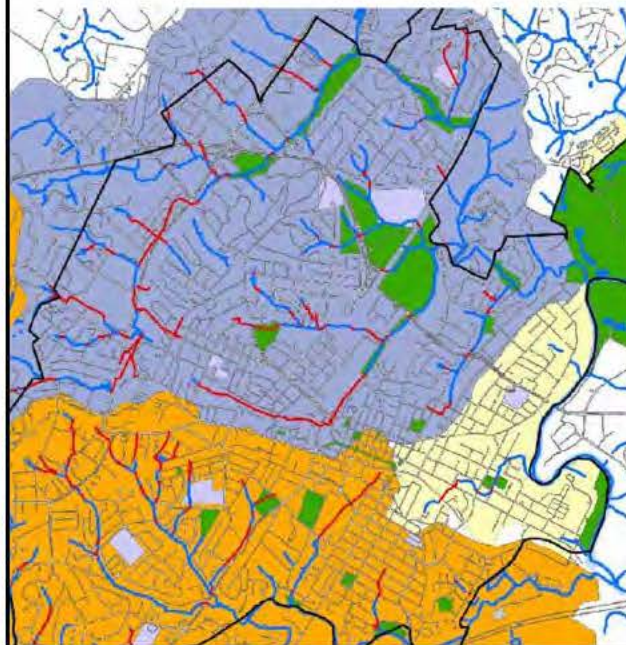
- Regulatory Requirements
 - Virginia Stormwater Management Regulations (newly revised)
 - Municipal Separate Storm Sewer System (MS4) Discharge Permit
 - Section 303(d) impaired waters and TMDLs (local and Chesapeake Bay)
- Historic Conditions & Realities
 - A built-out community served by aging infrastructure
 - Lack of stormwater management and resulting stream impacts
- Environmental Stewardship Goals and Commitments
 - Comprehensive Plan
 - A Green City Vision

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Our Urban Stream Network



- ❖ ~35 miles of open/natural stream channels
- ❖ ~14 miles (39%) of natural streams are on public lands (parks /schools)
- ❖ ~13 additional miles of stream are underground in the stormwater system



Final Report



Charlottesville Stormwater Stewardship on Public Lands



March, 2008

City of Charlottesville
Watershed Protection

Stormwater Stewardship on Public Lands... aka Retrofits



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Greenleaf Park Rain Garden - Before



Greenleaf Park Rain Garden – After (2005)





Forest Hills Park Daylighting and Water Quality Swale - Before



Forest Hills Park Daylighting and Water Quality Swale - After

City Yard Cistern – 3,000 gallon system



Before



After



CHS Bioretention – Before



CHS Bioretention – After



CHS Rainwater Harvesting – Before



CHS Rainwater Harvesting – After (40,000 gallon system)



CAT Rainwater Harvesting – (50,000 gallon system)



Greenbrier Elementary School– Rainwater Harvesting



Buford Upper Elementary – Rainwater Harvesting

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City Public Works Yard – Catch Basin Filter Inserts



Urban Stream Restoration



Azalea Park Stream Restoration Project



Before



After (2003)



During (2000)



Recent (2009)

Meadowcreek Golf Course Stream Restoration - Before



Meadowcreek Golf Course Stream Restoration - During



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Meadowcreek Golf Course Stream Restoration - After



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Meadow Creek Restoration

- \$3.95M in approved funding from Virginia Aquatic Resources Trust Fund (VARTF)
- Over 9,000 linear feet of stream involved (~1.7 miles)
- Protection of 72 acres of forest and wetland
- Parkland expansion through land acquisitions (~40 acres)
- Project Goals:
 - Decrease sedimentation
 - Enhance/establish forested riparian buffers
 - Improve in-stream habitat
 - Permanent protection
 - Public Education
- Status: Construction Underway

www.charlottesville.org/meadowcreek

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