City of Richmond

RVAgreen

A Roadmap to Sustainability

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Document consultation and design by VHB/Vanasse Hangen Brustlin, Inc.

Acknowledgements

RVAgreen: A Roadmap to Sustainability would not have been possible without the commitment and support of the City of Richmond and the Sustainability Advisory Committee.

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The efforts and input of the members of the RVAgreen Stakeholder Group, and participants in community workshops were also invaluable to the development of RVAgreen.

Message from the Mayor

Dwight C. Jones
Mayor

Dear Richmond Community:

In April 2011, I announced the launch of the RVAgreen planning process with a desired outcome of achieving triple bottom line goals of sustainability: an improved quality of life for residents, a healthy environment, and enhanced economic development and job creation opportunities. It is with great enthusiasm that I now present to you ***RVAgreen: A Roadmap to Sustainability***, our plan to create a more sustainable Richmond.

By taking action to enhance Richmond's energy resilience, to create a healthy urban environment with cleaner air and cleaner water, to develop a thriving cityscape that connects people to natural spaces, to support a vibrant and sustainable economy, and to transform Richmond into a multi modal city, we are Building a Better Richmond. Achieving sustainability within and across the five focus areas laid out in this plan—economic development, energy, environment, open space and land use, and transportation—is essential to a vibrant and successful Richmond.

I would like to thank all those who participated in the RVAgreen planning process, especially those members of the community who provided invaluable feedback on their vision and priorities through participation in the Advisory Committee, Stakeholder Group or through attendance at the community workshops.

The creation of RVAgreen was only the beginning. Now, the hard work of implementation begins. I hope that you will join us as we strive to move forward with the initiatives in RVAgreen to support Richmond's vision of becoming a Tier One city.

Sincerely,

Dwight C. Jones
Mayor
City of Richmond, VA

Acronyms

ARRA	American Recovery and Reinvestment Act
BMP	Best Management Practice
CIP	The City of Richmond's Capital Improvement Plan
CMAQ	Congestion Mitigation and Air Quality
CNG	Compressed Natural Gas
DEQ	Virginia Department of Environmental Quality
DHCD	Virginia Department of Housing and Community Development
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DRPT	Virginia Department of Rail and Public Transportation
EPA	U.S. Environmental Protection Agency
EPP	Environmentally Preferable Purchasing
EV	Electric Vehicle
FHA	Federal Highway Administration
GHG	Greenhouse Gas
GRTC	Greater Richmond Transit Company
HVAC	Heating, Ventilation, and Air Conditioning
LED	Light Emitting Diode
LEED	Leadership in Energy and Environmental Design
LID	Low-Impact Development
NAAQS	National Ambient Air Quality Standards
O&M	Operations & Maintenance
PACE	Property Assessed Clean Energy
PV	Photovoltaic
RPS	Richmond Public Schools
RREA	Richmond Region Energy Alliance
RRHA	Richmond Redevelopment and Housing Authority
RRPDC	Richmond Regional Planning District Commission
TOD	Transit-Oriented Development
USGBC	U.S. Green Building Council
VCU	Virginia Commonwealth University
VHDA	Virginia Housing Development Authority
VMT	Vehicle Miles Traveled

Introduction

RVAgreen is designed to be a sustainability plan for the entire Richmond community. While the City government facilitated the process, the community was deeply involved in the development of the plan and recognizes its role in the implementation of it. Richmond has an active community of groups and individuals already working hard to achieve the goals laid out in this plan. They will all play a vital role in working with the City toward implementing Richmond's vision for a sustainable Tier One city.

- Economic Development
- Energy
- Environment
- Open Space & Land Use
- Transportation

Timeline of City of Richmond's Sustainability Efforts

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2008

2008
Department of Public Utilities (DPU) implements a cost of service rate structure to promote water conservation.

2009

Jan. 2009
City of Richmond becomes a member of the US Green Building Council.

Jan. 2009
City of Richmond adopts a resolution to apply LEED standards to eligible new and existing city facilities.

Oct. 2009
City of Richmond joins ICLEI and Richmond City Council establishes the Green City Commission.

May 2009
City of Richmond joins partners to establish the James River Park Conservation Easement to protect 280 acres in the James River Park System from future development.

Dec. 2009
As part of the 55-mile Virginia Capital Trail, connecting Richmond to Williamsburg, Richmond completes its first segment of the trail.

2010

2010
Richmond Awarded Energy Efficiency Conservation Block Grant (EECBG) for multiple energy conservation and sustainability projects.

Richmond begins work on Richmond Connects, a long-range strategic multi-modal transportation plan.

City of Richmond begins converting existing incandescent traffic signals to LED lights.

City of Richmond reaches Milestone One of ICLEI's Five Milestone process for completing the GHG Inventory.

Feb. 2010
City of Richmond partners with the Green Infrastructure Center, Inc. to assess the city's green infrastructure.

April 2010
Mayor Jones launches Green Richmond Initiative to further the Mayor's triple bottom line goals of sustainability.

Oct. 2010
City of Richmond receives silver award in the Virginia Municipal League's (VML) Green Government Challenge.

Mar. 2010
City of Richmond appoints first Sustainability Manager.

City of Richmond issues Greenhouse Gas 2008 Emissions Inventory Report.

June 2010
Mayor Jones establishes the Bicycle, Pedestrian and Trails Planning Commission.

2011

2011
City of Richmond conducts energy efficiency retrofits in City facilities.

Dec. 2010
DPU installs the first green roof on a City facility at one of its wastewater treatment facilities.

Jan. 2011
City of Richmond converts its refuse truck fleet from diesel to CNG and builds the first CNG fueling station in Virginia dedicated to a fleet.

Mar. 2011
Council adopts Mayor Jones' Community Garden ordinance allowing certain City-owned parcels to be developed for community gardens.

Sept. 2011
City of Richmond selected to host the 2015 UCI Road World Championships, a world renowned cycling competition.

Nov. 2011
City of Richmond begins installing miles of sharrows – shared bike lane pavement markings.

Nov. 2010
DPU's Conservation Program offers retrofits and energy audits to reduce residents energy costs.

Feb. 2011
Council Resolution supports Mayor's Bicycle, Pedestrian and Trails Planning Commission recommendations.

April 2011
Mayor Jones Issues Green Government Order and launches RVAgreen Sustainability Plan.

Oct. 2011
City of Richmond receives gold award in the VML Green Government Challenge.

Dec. 2011
City of Richmond installs 44 side by side Big Belly solar compactors and recycling units in the downtown area as part of a pilot program.

Overview of Richmond's Achievements to Date

The City of Richmond has taken significant strides to become more energy efficient in its own operations and to create a more sustainable community overall. From the creation of the Sustainability Office and the implementation of various energy efficiency upgrades to requiring green building standards on new municipal buildings to the implementation of the Mayor's Green Government Order, the City has laid excellent groundwork to lead by example for the implementation of this plan and all other future sustainability work in Richmond.

The members of the Richmond community have also played an active role in becoming more sustainable. Virginia Commonwealth University, University of Richmond and other academic leaders have displayed their commitment to sustainability through the installation of renewable energy technologies on campus, the utilization of green cleaning supplies, the implementation of energy efficiency measures in buildings, and the adoption of multi-modal transportation options for students and faculty.

In the commercial sector, MeadWestVaco's corporate headquarters achieved a Green Globes certification for reusing construction materials such as glass and rubber and reducing energy consumption by 21 percent. Dominion Resources is also playing a role towards becoming more sustainable. Dominion Resources emitted almost one-third less carbon per unit of energy than the median of the nation's 100 largest power produces. It is also expanding its renewable energy sources with a new wind energy facility and through the utilization of biomass (wood waste). In the non-profit sector, Richmond Region Energy Alliance (RREA) is working to bring energy efficiency retrofits to scale in the Richmond region by creating a one-stop shop resource for homeowners. Also, Tree Stewards has created an 'adopt-a-tree' program where residents can purchase trees for planting.

Members of the Richmond community participated in facilitated discussions at a Community Workshop on June 9, 2011.

Sustainability Planning Process

Development of RVAgreen, Richmond's sustainability plan, involved multiple phases of research, assessment, stakeholder engagement, prioritization, and synthesis of information. The goal was to develop the content for this plan through a transparent and collaborative effort with representatives of the City government, relevant stakeholders, experts, and the community as a whole. It was essential to determine past and current sustainability efforts throughout Richmond, identify key issues for the community, and develop goals and objectives for Richmond moving forward.

Stakeholders

The City selected four groups of individuals to assist with the development of the plan (Sustainability Advisory Committee, Stakeholders, Executive Team, and the community). The City selected a Sustainability Advisory Committee (SAC) for their individual expertise in various areas of sustainability and for their knowledge of Richmond. The City invited a total of 40 representatives to participate in the process, as a member of the SAC. The SAC met in March, May, June, and September 2011 and the group was engaged intermittently via e-mail and phone communication throughout the process.

The City also selected a Stakeholder Group to represent a variety of organizations throughout Richmond, all of whom have a stake in shaping Richmond's future and contributing to efforts to achieve social, economic, and environmental sustainability. The City invited a total of 75 organizations that are active in the community to participate and a total of 34 different agencies and organizations participated in two meetings throughout the process, one in June and the other in September.

The Executive Team, composed of the City of Richmond's department heads, also participated in the process; 38 department representatives were invited to two meetings. Approximately 30 attended the first meeting in August and 21 attended the second meeting in September. These individuals were brought into the planning process to ensure that objectives and initiatives aligned with efforts already underway by the City and to speak to consistency with department objectives and efforts. They were also invaluable in the prioritization of initiatives and in gaining insight regarding the feasibility of implementation.

Finally, the community at large was engaged through two community workshops. One was held in June 2011 and was focused on the identification of initiatives to achieve the goals of RVAgreen. The other, held in February 2012, was to present the draft plan and to solicit input on how the entire Richmond community could assist with implementation.

Defining the Framework

The consultant team worked with the City's Office of Sustainability to develop an overall framework for the plan. It was determined that the plan would be divided into five focus areas, each with an established goal, objectives, initiatives, and reporting indicators. The five focus areas are:

Economic Development

Energy

Environment

Open Space & Land Use

Transportation

The five focus areas were identified based on existing priorities for the City and local government best practices from around the country. The focus areas provided a way to organize the planning process, group ideas, and structure the final plan. The following are the definitions used by the City, consultant team, and stakeholders in the process of developing the components of this plan.

- **Goal:** An observable and measurable end result having one or more objectives to be achieved within a fixed timeframe.
- **Objective:** A specific, measurable target that initiatives are intended to attain.
- **Initiative:** The specific action that has been identified to achieve the objective.
- **Indicator:** A metric by which progress towards a specific objective and goal is tracked over time.

Baseline Assessment

Where is city starting from? What's been done?

- Engaged City staff and SAC at March meeting.

Set Goals and Objectives

Identify goals in each Focus Area and Objectives for each Goal.

- Engaged SAC at a meeting in May.

Identify Initiatives

What are the actions needed to achieve goals and objectives?

- Engaged SAC, Stakeholder Group, and Community at June meetings.
- Executive Team engaged at August meeting.

Evaluate Initiatives

How feasible are the recommended initiatives? What are the benefits? Is there overlap? What will it take to implement?

- Consultant team consolidated, evaluated, scored, and ranked initiatives between the June and September meetings.

Prioritize Initiatives

Which initiatives are the greatest priority and/or which can and should be done first?

- SAC, Stakeholder Group, and Executive Team participated in prioritization exercise at September meetings.

Planning Process

A detailed description of the RVAgreen planning process is included in **Appendix B**. The flowchart above demonstrates the overall process for identifying the goals, objectives, and initiatives for the plan, as well as the evaluation and prioritization of initiatives, and who was engaged at each step in the process. The early stages of the planning process included the development of a baseline assessment, which was an effort to capture an overall profile existing condition in Richmond, and an investigation of sustainability "best practices" of other local governments to use as guidelines and examples for the process of identifying goals, objectives, and initiatives for the plan.

The RVAgreen planning process incorporated several opportunities for the community to provide input on the plan including two community workshops for the public, discussing the plan at numerous community meetings, a webpage dedicated to the planning process and an on-line survey to gather citizen input on the plan. In total, more than 350 people provided direct feedback and participated in the planning process.

The Sustainability Advisory Committee, Stakeholder Group, and the Executive Team convened in a series of meetings to develop and recommend initiatives for the plan and, later in the process, to review and prioritize the initiatives. The results of the prioritization exercise, including keypad polling

results, can be found in **Appendix C**. The results showed remarkable consistency in voting for the top three initiatives among all groups. These results were then provided to the City's Chief Administrative Officer and the Mayor for final approval. The approval was provided in November 2011.

Overall, the City of Richmond undertook a fairly extensive public process to develop the RVAgreen Sustainability Plan. Given that there was an overwhelming consistency in the results of the prioritization exercise among the Sustainability Advisory Committee, the Stakeholder Group, and the Executive Team, the City can feel confident that there is broad support for the initiatives identified in the Plan.

Overview of the Plan

This Sustainability Plan builds on the existing sustainability efforts and priorities of the Richmond community. The Plan is organized around five sustainability focus areas:

Economic Development

Energy

Environment

Open Space & Land Use

Transportation

Each sustainability focus area has a specific goal and three to four primary objectives that the community has identified as most important to meeting these goals. Each focus area is organized by the existing conditions and current achievements related to the stated goal, a set of objectives associated with the goal; specific sustainability initiatives aimed at meeting each objective, implementation strategy for each initiative, and overall performance indicators for each objective.

All goals, objectives, and initiatives are provided in a summary matrix in the next section of this plan. The summary matrix includes some implementation details and a co-benefits summary. Because the benefits of most initiatives are not limited to one focus area, the matrix shows all of the cross-cutting benefits of each initiative. The benefits and implementation details are also provided in tables throughout each chapter for each initiative. Included as an appendix to this plan is a recommended **Report Card Template** which the City can adapt and use as a tool for tracking performance of the initiatives over time.

Where are we now?

This section presents a snapshot of the community's status related to the objective and provides an overview of current or completed sustainability initiatives the City or other organizations have already planned or implemented to date that help to meet this objective.

How will we reach our goals?

This section outlines the initiatives that would be implemented in the short- or long-term to achieve the identified goals and objectives. Each initiative is fully described and assessed for its performance in achieving the stated objective. In addition to identifying the organization(s)/department responsible for implementation and potential funding sources, each initiative is evaluated by the following criteria:

- Cost of implementation
- Greenhouse gas reduction potential
- Energy/fuel use savings potential
- Public health benefits potential
- Potential for job creation
- Funding feasibility
- Payback period
- Time to implement

Indicators

Finally, each focus area has a series of suggested indicators that can be tracked annually, or as appropriate, that will show progress toward meeting the plan's objectives. Each indicator identified also has a recommended target to strive for through the ongoing implementation of the Sustainability Plan.

Summary Matrix of Initiatives

- Economic Development
- Energy
- Environment
- Open Space & Land Use
- Transportation

Economic Development

Goal: Support a vibrant and sustainable economy

Initiative	Summary	Implementer	Cost*					
Objective 1: Create opportunities for Richmond businesses to enhance their overall sustainability								
Create a green business support and recognition program	A program to provide resources and recognition for businesses to improve their overall energy use and environmental footprint	Sustainability Office; community partners	$	☑	☑	☑	☐	☑
Create a one-stop resource center	An online clearinghouse for information, resources, and best practices on energy efficiency, clean energy, and other sustainable practices	Sustainability Office; community partners	$	☑	☑	☑	☐	☑
Educate landlords on the benefits associated with green leases for both residential and commercial buildings	Create a training or marketing program informing tenants and landlords of the opportunities a green lease can offer	Property Management Agencies; Non-profit partner	$	☑	☑	☑	☐	☐
Objective 2: Create more green jobs								
Provide a tax credit to encourage existing businesses to be more sustainable and to attract new businesses to the city	Tax incentives that target the creation or increase of specific occupations that support a transition into the new economy	City Council; Economic and Community Development	$$	☑	☐	☐	☑	☐
Develop a Green Jobs Training program	Green jobs training prepares the workforce with new skills so they can transition effectively into industries that are part of the new economy	Non-profit partner; Economic and Community Development	$$	☑	☑	☑	☐	☑
Designate a Green Business District/ Enterprise Zone	Enhance existing enterprise zone regulatory incentive packages to focus development on emerging low carbon industries with high paying jobs.	Economic and Community Development; City Council	$$	☑	☑	☐	☑	☐

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

Economic Development (continued)

Initiative	Summary	Implementer	Cost*					
Objective 3: Make local, healthy, and sustainable food accessible and affordable								
Support an expanded network of farmers markets throughout the city	Farmers markets provide a unique and important opportunity to create a robust regional food economy and keep that money in the region	Food Policy Task Force; Economic and Community Development; community partners	$	☑	☐	☑	☑	☑
Repurpose appropriate vacant lots for urban agriculture	Urban agriculture is a productive use of vacant land that can improve blighted areas	Economic and Community Development; Planning and Development Review	$	☑	☐	☐	☑	☐
Conduct an assessment of distances to grocery stores to eliminate food deserts	Food deserts are areas that lack access to affordable fruits, vegetables, whole grains, low-fat milk, and other foods that make up the full range of a healthy diet	Institutional or Non-profit partner; Food Policy Task Force	$	☑	☐	☐	☑	☐
Objective 4: Improve the state of good repair and efficiency of city infrastructure								
Restore the trolley system	Streetcar systems create transit options for tourists and have been shown to have economic development benefits	Economic and Community Development; GRTC; DRPT	$$$	☑	☐	☑	☑	☑
Initiate a citywide beautification program	Addressing litter, road and sidewalk repairs and general maintenance of Richmond's streets, parks, and public spaces to create a safer and more welcoming environment	Clean City Commission; Public Works; Economic and Community Development	$$	☑	☐	☐	☑	☐
Require life cycle cost analysis for all capital improvement projects	This will allow the City to understand how much it will cost to build and operate something over its entire lifetime, enabling better decision making regarding spending additional dollars up-front for long-term savings	Budget and Strategic Planning; City Council	$$$	☑	☑	☑	☑	☑

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

Energy

Goal: Enhance Richmond's energy resilience

Initiative	Summary	Implementer	Cost*					
Objective 1: Reduce energy consumption in City government operations								
Adopt a green fleet policy	Adopt a policy that increases use of alternative/electric vehicles in City fleet	Public Works - Fleet Mgmt. Div.	$	☑	☑	☑	☐	☑
Enter into a performance contract for all City buildings	Hire a contractor to bear the upfront capital costs of efficiency improvements	Public Works - Facilities Mgmt. Div.; Procurement Services	$$	☑	☑	☑	☐	☐
Adopt an energy efficiency procurement policy	Ensure purchases are made with energy efficiency in mind	Procurement Services; Sustainability Office	$	☑	☑	☑	☐	☐
Adopt an energy efficiency policy or O&M standards for all City buildings	Create policy that promotes standards and guidelines for increased efficiency and reduced energy consumption in City buildings	Public Works - Facilities Mgmt. Div.	$	☑	☑	☑	☐	☐
Objective 2: Lower building energy consumption citywide								
Establish tax breaks for energy efficiency	Tax breaks for building owners based on implementation of energy saving measures	Assessor of Real Estate; Planning and Development Review	$	☑	☑	☑	☑	☐
Establish a residential weatherization program	Promote community weatherization of buildings through a new program	Non-profits and community partners	$$	☑	☑	☑	☑	☐
Establish a fund to assist businesses with energy efficiency improvements	Set up a revolving loan fund to finance the cost of business-related energy efficiency upgrades	Economic and Community Development; community partners	$$$	☑	☑	☑	☐	☐
Objective 3: Increase the use of alternative energy sources								
Provide low-interest loans for renewable energy projects	Provide easy financing for renewable energy installations that meet certain standards	Dept. of Finance; community partners	$$$	☑	☑	☑	☑	☐
Lower permit fees for alternative energy installations	Lower permit fees for renewable energy projects and installations	Planning and Development Review – Permits and Inspections Div.; City Council	$	☑	☑	☑	☑	☐
Promote electric vehicle use and charging stations	Encourage electric vehicle use and incorporate renewable energy at charging stations	City Departments, State Agencies, Institutions, Large Corporations	$$	☑	☑	☑	☐	☑

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

Environment

Goal: Create a healthy urban environment

Initiative	Summary	Implementer	Cost*					
Objective 1: Protect and enhance Richmond's water resources								
Use stormwater BMPs in new construction and maintenance	Use stormwater best management practices in all construction and maintenance activity	Public Works; Public Utilities; Parks and Recreation; Local Institutions; Commercial Developers and Property Managers	$$	☐	☐	☑	☑	☑
Adopt an organic pesticide and fertilizer policy	Adopt a policy to reduce amount of non-organic chemicals entering watershed through stormwater runoff	Public Works; Parks and Recreation; Procurement; Residential and Commercial Property Managers	$	☐	☐	☑	☑	☐
Reduce the % of impermeable surface area	Use land use regulations to reduce % of impermeable surface area	Planning and Development Review; community partners	$	☐	☐	☑	☑	☑
Objective 2: Enable the Richmond community to use water wisely								
Install low-flow fixtures in City buildings	Install water-efficient fixtures in all City buildings	Public Works - Facilities Mgmt. Div.	$	☐	☑	☑	☐	☐
Create a rebate program for water-efficient fixtures and appliances	Create a rebate program for residents to purchase water-efficient fixtures and appliances	Public Utilities	$	☐	☑	☑	☐	☐
Promote rainwater collection systems	Promote rainwater collection systems for use in homes and businesses	Public Utilities; Planning and Development Review; Redevelopment and Housing Authority	$	☐	☑	☑	☐	☐
Objective 3: Improve the City's solid waste system								
Expand recycling service to commercial and multi-family sectors	Expand recycling service to commercial and multi-family buildings	Public Works; Budget and Strategic Planning; Procurement Services	$	☐	☐	☑	☐	☐
Adopt a material reduction procurement policy	Adopt a procurement policy that emphasizes materials reduction	Procurement Services; Institutions; State Agencies; Corporations	$	☑	☑	☑	☐	☑
Implement a Pay As You Throw program	Adopt a Pay As You Throw program to incentivize increased recycling	Public Works; Budget and Strategic Planning	$$	☐	☐	☑	☐	☐
Objective 4: Strive to continuously improve the quality of Richmond's indoor and outdoor air								
Adopt a green IAQ policy and/or O&M practices in City buildings	Adopt a green Indoor Air Quality policy and/or Operations & Maintenance standards for City buildings	Public Works; Procurement	$	☐	☐	☑	☑	☐
Develop a Traffic Management Plan to reduce congestion	Conduct a traffic management plan to identify strategies for reducing congestions	Public Works; Planning and Development Review	$	☐	☐	☑	☑	☑
Participate in the Green and Healthy Homes Initiative	Participate in the Green and Healthy Homes Initiative to improve housing and promote sustainability	Health Department; Redevelopment and Housing Authority; community partners	$	☑	☑	☑	☑	☐

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

Open Space & Land Use

Goal: Develop a thriving cityscape that connects people to natural spaces

Initiative	Summary	Implementer	Cost*					
Objective 1: Encourage 24/7 communities with more sustainable and affordable housing options throughout the City								
Zoning changes to promote higher density and mixed use	Implement zoning changes that promote higher density and mixed-use development	Planning and Development Review; City Council	$	☑	☑	☐	☑	☑
Adopt an energy efficient housing policy	Adopt a policy that new housing be built to green and/or energy efficiency standards	Planning and Development Review; City Council;	$	☑	☑	☑	☑	☐
Establish an affordable housing requirement	Require a percentage of new housing developments to be affordable	Planning Department; City Council	$	☑	☐	☐	☑	☐
Objective 2: Increase accessibility, quantity, and quality of public space								
Riverfront Plan	Create a riverfront plan for open space and recreation	Planning and Development Review; Parks and Recreation; community partners	$	☑	☐	☑	☑	☑
Improve accessibility of bike and pedestrian paths	Improve lighting, safety, and comfort of bike/ped pathways between public spaces	Planning and Development Review; Parks and Recreation; community partners	$$	☐	☐	☐	☑	☑
Parks maintenance program	Invest in an expanded parks maintenance program	Parks and Recreation; community partners	$	☐	☐	☑	☑	☐
Objective 3: Increase Richmond's tree canopy								
Adopt a tree replacement policy	Implement a one-to-one tree replacement policy	Public Works - Urban Forestry	$	☐	☐	☑	☑	☐
Encourage residents to plant trees in empty tree wells on public property	Encourage residents to utilize the existing policy that permits them to plant trees in empty tree wells on public property	Public Works -Urban Forestry; City Council; community partners	$	☐	☐	☑	☑	☐
Create and disseminate a tree species list	Develop and disseminate a list of appropriate tree species for planting within the city	Public Works - Urban Forestry	$	☐	☐	☑	☑	☐
Objective 4: Protect historic building stock and promote the use of vacant and blighted property								
Adopt transfer of ownership legislation for vacant property	Adopt legislation that allows transfer of ownership of abandoned/ vacant property	Planning and Development Review; City Council; Law Dept	$	☑	☐	☑	☑	☐
Brownfield Redevelopment	Redevelop contaminated brownfield sites for productive use	Planning Department; Economic and Community Development; community partners	$$$	☑	☐	☑	☑	☐
Adopt policy to promote redevelopment of vacant property for urban agriculture	Adopt policy/zoning that promotes use of vacant properties for community gardens and urban agriculture	Planning and Development Review; City Council	$	☑	☐	☑	☑	☐

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

Transportation

Goal: Transform Richmond into a multi-modal city

Initiative	Summary	Implementer	Cost*					
Objective 1: Reduce citywide vehicle-miles-traveled (VMT) per capita								
Support Bus Rapid Transit (BRT)	Continue to identify opportunities to support Bus Rapid Transit in the city	GRTC; Planning and Development Review; VDOT; Public Works	$$$	☑	☑	☑	☐	☑
GRTC Enhancement Program	Invest in and support a GRTC Enhancement Program	GRTC and MPO; Planning and Development Review; Public Works; VDOT; Federal Transit Administration	$$$	☑	☑	☑	☑	☑
Convert one-way streets to two-way streets	Convert existing one way streets to two way streets to reduce congestion and improve traffic flow	Planning and Development Review; Public Works; City Council	$$	☑	☑	☑	☐	☑
Objective 2: Manage parking supply to encourage alternate modes of transportation								
Require bicycle parking and ride-share preferred parking	Require new and encourage existing parking lots and facilities to provide bicycle parking and ride-share (including private companies like ZipCar/alt fuel/hybrid preferred parking	City Pedestrian, Bicycle and Trails Coordinator; Planning and Development Review; businesses; Commercial and Residential Property Owners; City Council	$	☑	☐	☑	☑	☑
Replace parking minimums with maximums	Replace parking minimums in city code with parking maximums	Planning and Development Review; City Council	$	☐	☐	☑	☑	☑
Visible Park and Ride lots	Establish visible park and ride lots for commuters	GRTC; Public Works	$$	☐	☐	☑	☑	☑
Objective 3: Make Richmond a bike and pedestrian friendly city								
Adopt a Complete Streets policy	Adopt a formal complete streets policy	City PBT Coordinator; Planning and Development Review; Public Works; City Council	$	☑	☐	☑	☑	☑
Assess bike/ped infrastructure	Conduct an assessment of the city's bike and pedestrian infrastructure	City PBT Coordinator; Planning and Development Review; community partners	$	☑	☑	☑	☐	☑
Bike Share program	Implement a bike share program in the city	City PBT Coordinator; Planning and Development Review; Public Works; community partners	$$	☑	☐	☐	☑	☑

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

1. Economic Development

Richmond's economic future will benefit from strategic approaches to creating new jobs and retaining a vibrant business community within the city. A sustainable economy will foster a diversity of industries that minimize their environmental impact, while providing jobs that match the skill sets of existing Richmond citizens. To support a vibrant and sustainable economy, Richmond can create opportunities for existing businesses to invest in their operations to be more energy efficient, focus on attracting new green businesses that capitalize on current trends in renewable energy, energy efficiency, solid waste systems, and healthy, local food, and ensure that a solid infrastructure system is in place and funded appropriately to support new growth.

Goal

Support a vibrant and sustainable economy

Objectives

1. Create opportunities for Richmond businesses to enhance their overall sustainability
2. Create more green jobs
3. Make local, healthy, and sustainable food accessible and affordable
4. Improve the state of good repair and efficiency of city infrastructure

In 2010, the City of Richmond commissioned a Comprehensive Economic Development Strategy which provides a detailed analysis of the local economy . The analysis illustrated the following key elements related to the current economic conditions:

- Over the past 30 years population decline within the city was dramatic, a reduction by approximately 20 percent, however the city's population has started to rebound and is projected to grow approximately 24 percent over the next 20 years.
- When compared to its nearby suburban communities, the urban lifestyle of Richmond is becoming more attractive for young adult and senior population sectors.
- Richmond suffered typical job losses as seen nationwide, losing approximately 8,000 jobs in 2009, while the region lost approximately 22,000 jobs.
- While the forecast for job recovery was projected to be slow, it was estimated that the healthcare sector would see the greatest job gains between 2009-2015

Objective 1: Create opportunities for Richmond businesses to enhance their overall sustainability

Richmond currently boasts a diverse mix of industries, with a strong base of financial and healthcare businesses as well as corporate headquarters for a range of industries. While the City is eager to attract new businesses and industries to Richmond, it is also committed to working with existing businesses to ensure that they have the resources they need to operate as efficiently and sustainably as feasible. The top ten employers[1] in Richmond in 2011, based on number of employees are:

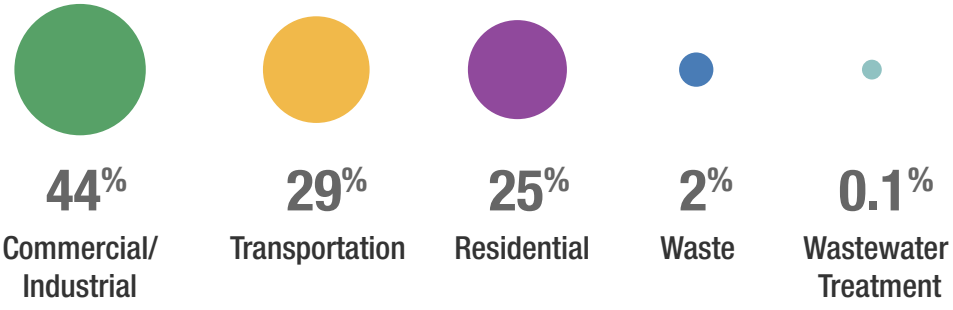
- Capital One
- Virginia Commonwealth University Health System
- HCA Virginia Health System
- Bon Secours Richmond Health System
- Dominion Resources Inc.
- Altria Group Inc.
- Sun Trust Banks Inc.
- Wells Fargo & Co.
- Bank of America
- WellPoint Inc.

1 Top 50 Richmond-Area Employers. Richmond-Times Dispatch. Accessed November 2011. **http://www2.timesdispatch.com/business/local/companies/top-50-employers-2011**

Where are we now?

Working with businesses to help them become more sustainable through improving energy efficiency, enhancing transit options for employees, and minimizing their waste stream is essential for Richmond to become a more sustainable community. For example, the 2008 greenhouse gas (GHG) emissions inventory indicated that energy use from the commercial and industrial sectors accounted for 44 percent of total GHG emissions in the city. Initiatives to reduce the energy use in these sectors will support Richmond's GHG reduction effort, while also providing opportunities to reduce energy consumption and associated costs and emissions from Richmond's commercial and industrial community.

Figure 1-1: Richmond Community Greenhouse Gas Emissions, by Sector (2008)

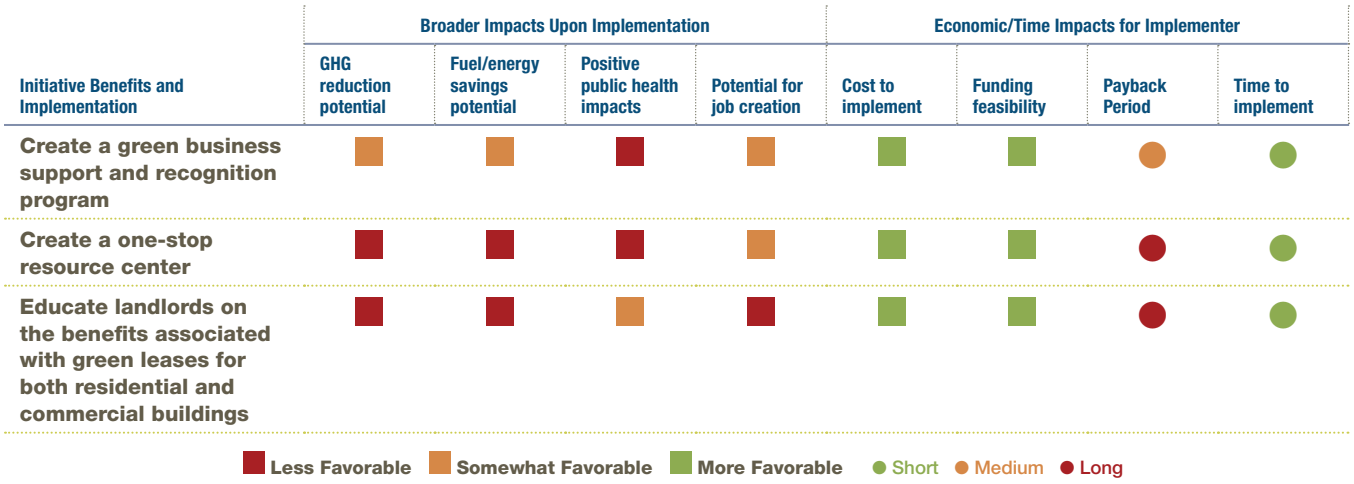


Commercial/Industrial and Residential sectors include emissions associated with energy used in those sectors. Transportation includes emissions associated with mobile combustion of fuel within city boundaries. Waste includes emissions associated with landfilled and/or incinerated waste within the community, and Wastewater Treatment includes process emissions associated with the treatment of community wastewater.

Table 1-1 Objective 1: Create Opportunities for Richmond Businesses to Enhance Their Overall Sustainability

Initiative	Summary	Implementer	Cost*	Funding Source
Create a green business support and recognition program	A program to provide resources and recognition for businesses to improve their overall energy use and environmental footprint	Sustainability Office; community partners	$	U.S. Department of Energy- Energy Efficiency and Conservation Block Grant Program, Utilities, Membership Dues
Create a one-stop resource center	An online clearinghouse for information, resources, and best practices on energy efficiency, clean energy, and other sustainable practices	Sustainability Office; community partners	$	U.S. Department of Energy, U.S. Department of Housing and Urban Development, Utilities, Private Foundations
Educate landlords on the benefits associated with green leases for both residential and commercial buildings	Create a training or marketing program informing tenants and landlords of the opportunities a green lease can offer	Property Management Agencies; Non-profit partner	$	Training fees

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.



For more information, please refer to Appendix A: Initiative Evaluation Criteria

How will we reach our goal?

Through the planning process, the following initiatives were identified to enhance sustainability efforts within Richmond businesses.

Create a green business support and recognition program

Green business programs have become very popular among municipalities that are actively trying to reduce greenhouse gas emissions and create more sustainable communities. A green business program provides local businesses resources and recognition for reducing energy use, waste generation, water consumption, and GHG emissions from their operations as well as making general improvements towards becoming more sustainable.

The City of Richmond is in the process of developing a Green Business program through a partnership with the Dominion Resources and other community partners. This Program is designed to provide resources and recognition to Richmond area businesses that are interested in engaging in energy efficiency, water conservation, recycling, alternative

transportation options, and other sustainable practices. When a business engages in the Program there is a commitment to improve the overall sustainability of the business and to inform the public of these actions through a web-based interface. The Program will be voluntary and is expected to launch by the end of 2012.

Create a one stop resource center

A sustainability resource center could be anything from a staffed organization, to a website of resources. It would provide businesses with all of the resources, information, and funding opportunities to become more sustainable – all in one place. Sectors that could be serviced by such a center include education, retail, healthcare, office, manufacturing and restaurants. In general, the resources provided to users could be focused on solid waste management, energy efficiency and outreach to employees. As a website, the resource center could include valuable tips and fact sheets for users to share within their company about measures they are considering to make their workplace more sustainable. The non-profit and institutional sectors could be leveraged to support such an initiative.

Educate landlords on the benefits associated with Green Leases for both residential and commercial buildings

Green lease requirements assure that tenants, especially those who pay energy bills directly, are able to make energy efficiency upgrades and improvements during their lease. There are two major types of green leases, both with similar benefits: the Net Lease and the Gross Lease. The Net lease directs savings and incentives toward tenants. The Gross lease directs savings and incentives towards owners.

Many Richmond businesses do not own the building out of which they operate. However, more often than not businesses pay their own utility bills. This is the disconnect that many have struggled with: tenants pay the utility bills but have no authorization to make any capital improvements; landlords do not pay the utility bills so have no incentive to implement energy efficiency capital improvements or upgrades such as improving insulation, installing new windows, or upgrading lighting fixtures. This situation is particularly problematic in large downtown office buildings due to the fact that energy costs are generally a smaller percentage of the cost of doing business. In tough economic times, since employee salaries are usually the largest fraction of business expenses, companies may lay off workers or cut wages before thinking about how and where to save energy.

According to Environmental Design and Construction, a green lease should have the following features that will maximize a landlord's return on investment while ensuring that tenants receive a high-performance workspace at a competitive price:

- An escalation clause and expense stop clause to reward the landlord for operating a high-performance building. An appropriate clause to charge tenants for after hours/excessive energy usage.
- A comprehensive description of building operating costs to protect the interest of both the landlord and tenant.
- Language that allows the landlord to treat the upfront project cost as operating costs, as long as they do not exceed savings.
- A "Right to Audit" clause, which defines the audit process that will protect the landlord from frivolous audits and protect the tenant from overcharges.
- Tenant guidelines that detail the building's sustainable features and benefits, as well as any special operating procedures for maximizing the building's features to create a sustainable workplace.[2]

Green leases for Richmond buildings would give owners incentives to upgrade their buildings and provide tenants with better workplaces. Unfortunately, not many local businesses, tenants, or building owners are experienced in negotiating such a lease. An appropriate non-profit or a property management organization could be identified to provide training for local businesses and building owners who are interested in negotiating green leases.

2 Whitson, Alan. (2006). Green Lease. Environmental Design and Construction.; Accessed September 2011. **http://www.edcmag.com/articles/green-lease-1**

Objective 2: Create more green jobs

The U.S. Bureau of Labor Statistics (BLS), through its Green Job Initiative, defines green jobs as either:

- Jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources; or
- Jobs in which workers' duties involve making their establishment's production processes more environmentally friendly or use fewer natural resources.[3]

In 2010, the City commissioned the development of a Comprehensive Economic Development Strategy (CEDS). The CEDS summarized results of an analysis of the local economy and development opportunities, identified development strategies and actions, and offered program evaluation measures. One of the outcomes of this analysis was the determination that Richmond was in a better position to compete in sectors like healthcare, corporate headquarters, and professional services, due to the less intensive need for land.

Where are we now?

According to the U.S. Bureau of Labor Statistics, Richmond's unemployment rate dropped from 10 percent in September 2010 to 9.5 percent in September 2011. The rate for the country dropped from 9.2 percent to 8.8 percent during that same period. Clearly, Richmond must address unemployment in the city to attain its goal of becoming a Tier One sustainable community. In fact, Mayor Jones has already indicated this as a priority for the City of Richmond, through the Biennial Fiscal Plan, in which he refers to workforce development as "integral" to Richmond's growth and its future.[4] Examples of programs that have already been initiated to address unemployment and job training in general include:

- The Mayor's Youth Academy brings representatives from government, the non-profit, faith-based and private sectors to provide job training for youth, develop youth employability skills, expose youth to educational and vocational opportunities, provide professional mentors and encourage continued school enrollment.
- One Stop Resource & Missions Center, a new workforce development center that opened in October 2011, offers services and resources to city residents to better prepare and search for jobs. The center will partner with RESOURCE, the Capital Region Workforce Investment Board, to teach classes on résumé writing, interview skills, and networking. Trained volunteers will staff the center and serve as career agents and job coaches for interested residents looking for work.
- The City established a revolving loan fund of $2 million which is available to stimulate the revitalization of Richmond's neighborhoods and promote permanent job creation for low and moderate income residents by helping to bridge the credit gap for independent real estate developers and smaller employers.

In 2011, the Mid-Atlantic Regional Collaborative commissioned a labor market research analysis for green jobs in the District of Columbia, Maryland and Virginia. One of the core findings of this report, *GreenData for a Growing Green Economy,* was that in Virginia, several occupations that only required on the job training did not have enough workers currently. Specifically, these jobs included telemarketers and small engine mechanics, like those for outdoor power equipment. This report also indicated that 63 percent of the green jobs in Virginia require less than a bachelor's degree- meaning that a green job is not out of reach of the nearly 70 percent of Richmond residents 18 years and older that do not possess a bachelor's degree.[5] Below are two figures from the above referenced report, the first is a bar graph depicting the top green jobs by education level. The second graphic represents the green job openings by educational level. Both are taken from the above referenced report.

3 U.S. Department of Labor, Bureau of Labor Statistics (BLR). Green Jobs. Accessed December 2011. http://www.bls.gov/green/home.htm.

4 Office of the Mayor, City of Richmond; Richmond Biennial Fiscal Plan 2012-2013; Mayor's Message, p. V.

5 U.S. Census Bureau, (2000). Accessed May 19, 2011. **www.census.gov**

Figure 1-2: Top Green Jobs by Education Level (2010, Virginia)
Source: Mid-Atlantic Regional Collaborative. Green Data for a Growing Green Economy, May 2011.

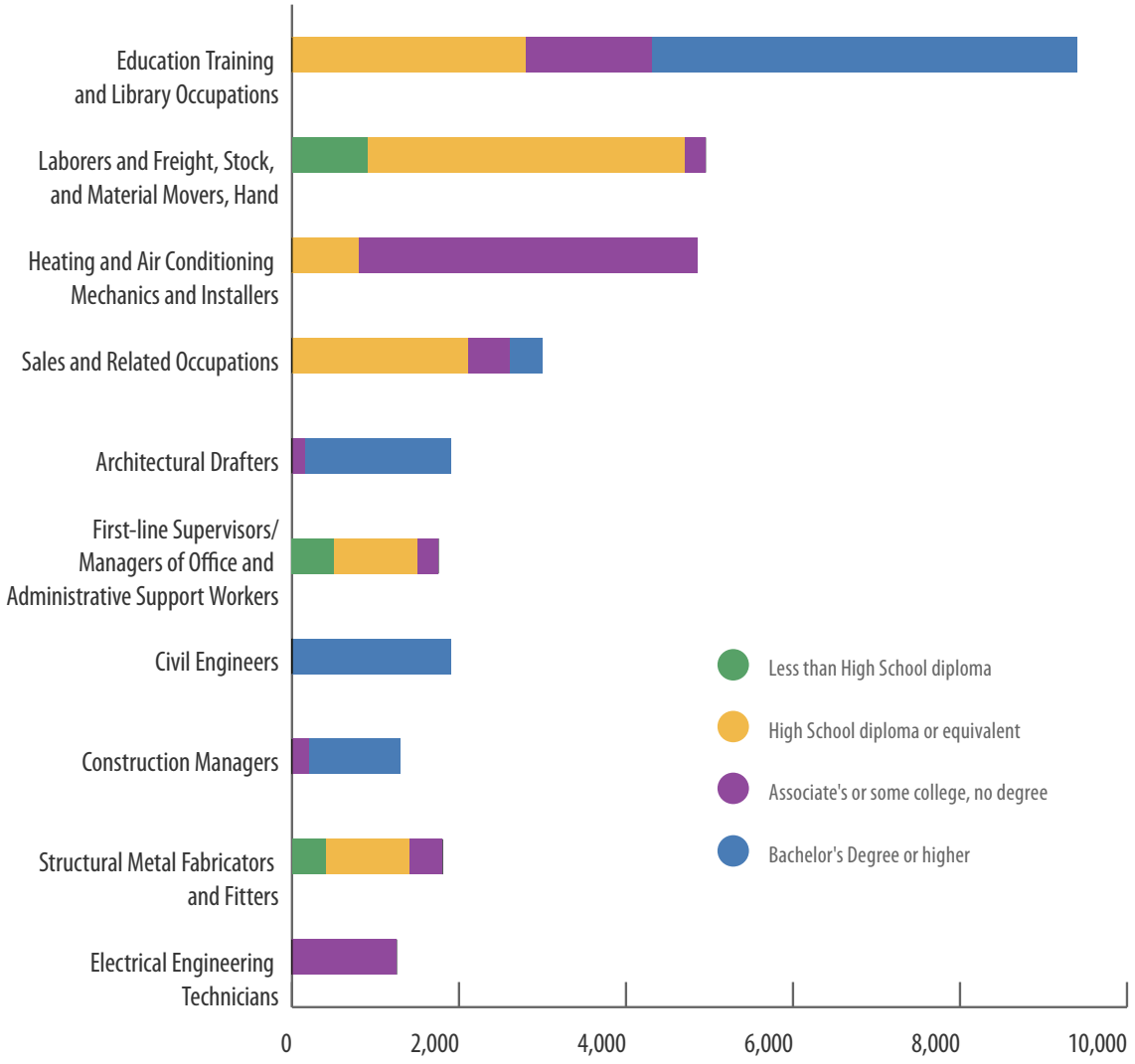
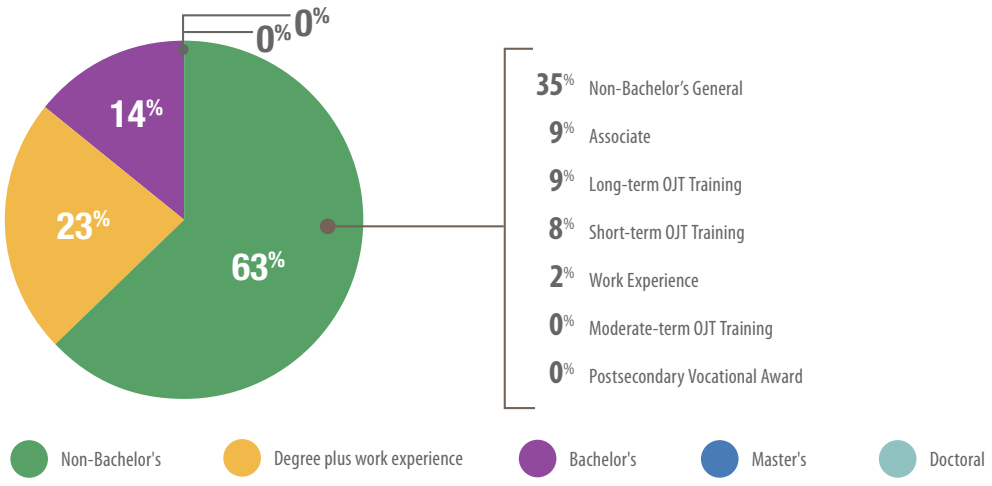


Figure 1-3: Green Job Openings by Educational Level (2010 Virginia)
Source: Mid-Atlantic Regional Collaborative. Green Data for a Growing Green Economy, May 2011.



The City of Richmond already offers a number of financial tools and tax incentives for businesses willing to relocate or expand within the city. In fact, Mayor Jones has indicated this as a top priority in the 2012-2013 Biennial Fiscal Plan and has budgeted $450,000 to programs like the Enterprise Zone and Commercial Area Revitalization programs. The current programs include:

- A citywide revolving loan program which provides small businesses, entrepreneurs, and others capital to promote permanent job creation for low to moderate income citizens.
- The Commercial Area Revitalization Effort (CARE) focuses on enhancing economic vitality in 13 mature neighborhoods in the city through loans and rebates for rehabilitation of existing facilities.
- The City's Enterprise Zone (EZ) Incentive Program offers a range of financial tools to qualified users within the specific EZ areas, including grants and rebates.
- Partial exemption from real estate taxes is available for qualifying structures that are rehabilitated or replaced.

Each of these programs could be enhanced through the addition of sustainability requirements, such as meeting an energy efficiency standard or utilizing renewable energy technologies.

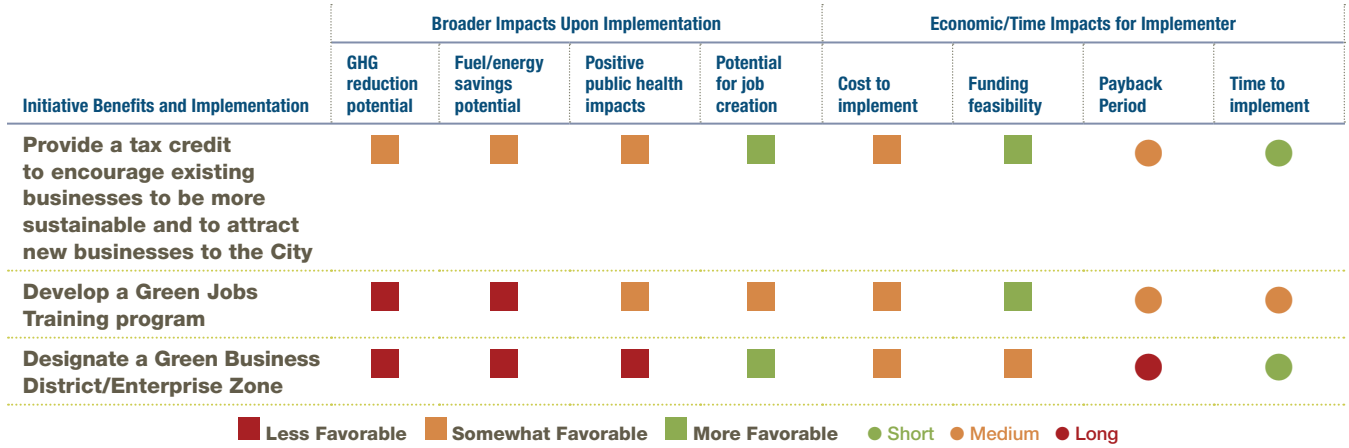
How will we reach our goal?

The following initiatives were identified to help create more green jobs in Richmond.

Table 1-2 Objective 2: Create more Green Jobs

Initiative	Summary	Implementer	Cost*	Funding Source
Provide a tax credit to encourage existing businesses to be more sustainable and to attract new businesses to the city	Tax incentives that target the creation or increase of specific occupations that support a transition into the new economy	City Council; Economic and Community Development	$$	General Fund
Develop a Green Jobs Training program	Green jobs training prepares the workforce with new skills so they can transition effectively into industries that are part of the new economy	Non-profit partner; Economic and Community Development	$$	U.S. Department of Labor, U.S. Department of Energy
Designate a Green Business District/ Enterprise Zone	Enhance existing enterprise zone regulatory incentive packages to focus development on emerging low carbon industries with high paying jobs.	Economic and Community Development; City Council	$$	General Fund

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.



For more information, please refer to Appendix A: Initiative Evaluation Criteria

Provide a tax credit to encourage existing businesses to be more sustainable and to attract new businesses to the city

In order to promote new economic growth in Richmond, efforts should be made to support and retain successful and thriving businesses that seek to expand in the city. Tax financing tools are considered by corporations to be a differentiator when making decisions about relocating and expanding operations. The City of Richmond offers tremendous advantages to prospective businesses by continuing to invest in workforce training efforts and capitalizing on current industry clusters, such as biotechnology. The City already has established tax incentive programs so is familiar with this financing tool. A tax credit actually reduces the total amount of tax to be paid. The City could examine opportunities to introduce a tax credit and supplement their existing incentive programs with sustainability requirements for either the type of industry (i.e. clean technology) or the incorporation of sustainability measures into facilities and operations (i.e. incorporating green building standards or clean energy technologies).

Develop a Green Jobs Training program

As previously stated, for the purposes of their analysis, the U.S. Bureau of Labor Statistics defines green jobs as either jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources, or jobs in which workers' duties involve making their establishment's production processes more environmentally friendly or use fewer natural resources. [6]

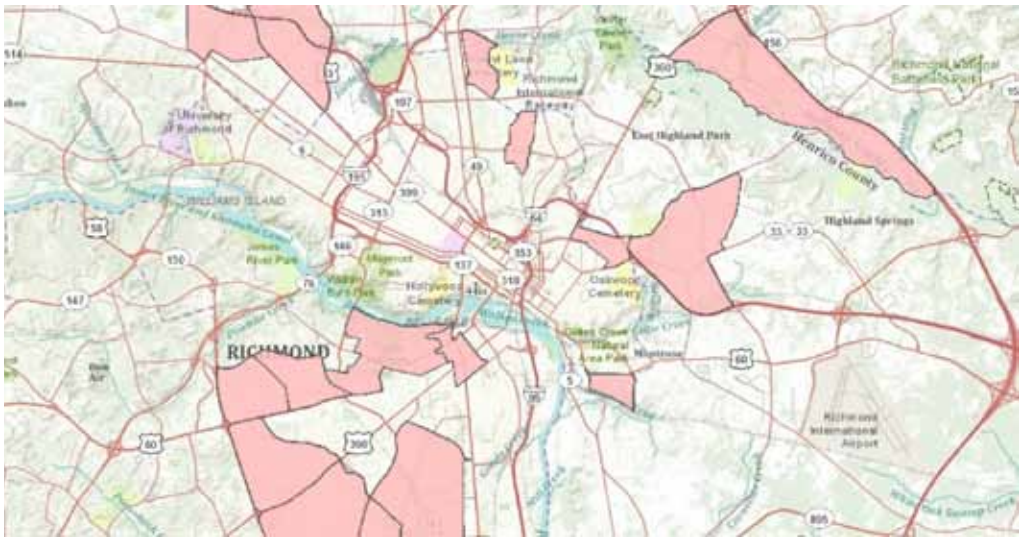
Green jobs training prepares the workforce for new clean technologies so they can transition away from older technologies which will be phased out in the future, or stagnate. A green job training program can provide valuable skills in building sciences, health and safety, energy efficiency, utility programs for residential and commercial buildings, and renewable energy. The program could be administered by a non-profit or community partner with support from the Department of Economic and Community Development and focus on organizing workshops, conferences, on-site training with professionals, and webinars. The program could also offer opportunities for professionals to maintain certifications in building performance and LEED, and allow trainees to interact and network with current professionals.

Designate a Green Business District/ Enterprise Zone

Many cities, including Richmond, have created enterprise zone regulatory incentive packages. Richmond can enhance its Enterprise Zone Incentive Program to focus development on emerging low carbon industries with high paying clean jobs- creating a Green Enterprise Zone. Previous economic analysis and study of the City of Richmond economic opportunity sectors have highlighted areas within the city suitable for redevelopment and revitalization, which may present opportunities for green business districts or green enterprise zones. The Green Enterprise Zone concept can also be used to encourage industries to incorporate sustainability into their current operations. A Green Enterprise Zone may utilize distributed generation or renewable energy to power the entire district or business improvement district funds could be used for energy efficiency measures and recycling or composting programs. Working within an existing framework will make this effort for Richmond significantly more streamlined.

6 U.S. Department of Labor, Bureau of Labor Statistics. Accessed August 2011. **http://www.bls.gov/green/**

Objective 3: Make local, healthy, and sustainable food accessible and affordable



Map of food deserts in the Greater Richmond area.

Source: U.S. Department of Agriculture. Food Desert Locator. Accessed December 14, 2011 from **http://www.ers.usda.gov/data/fooddesert/fooddesert.html**

Where are we now?

Agriculture is the largest industry in the Commonwealth of Virginia, generating an annual $55 million and providing over 350,000 jobs.[7] Virginia is home to over 47,000 farms which comprise 32 percent of the land area in the Commonwealth.[8] Despite a strong agricultural presence in the Commonwealth, many Richmond citizens do not have adequate access to affordable, healthy food. According to the U.S. Department of Agriculture (USDA), approximately 11.4 percent of the city's population has limited access to a supermarket or large grocery store.[9] The map above shows locations of "food deserts" in the Greater Richmond area. Area food deserts are defined as census tracts where the poverty rate is at least 20 percent and a large portion of the population lives more than a mile from a supermarket or large grocery store.[10]

The City of Richmond has a number of initiatives in place to increase access to healthy, local, affordable and sustainable food. The following highlights efforts in the public and private sector to make healthy and sustainable food more available in Richmond:

- **Food Policy Task Force.** The City created a Food Policy Task Force, a broad-based group of professionals and community members, to further its urban agriculture efforts. Among other initiatives, the Task Force will conduct a food assessment of the community.
- **Community Gardens.** The City created Richmond Grows Gardens, a community garden program, to enable the public to use vacant City-owned parcels for the development of community gardens.
- **School and Children's Gardens.** A number of Richmond public schools have gardens including Mary Scott Elementary School, Southampton Elementary School, G.H. Reid Elementary School, and the Linwood Holton Elementary School, which also has a Farm to School program. The 17th Street Farmer's Market sponsors the Little Sprouts Garden which works with volunteers and children from several Richmond Redevelopment Housing Authority communities to provide education on local food and work ethics.

7 Virginia Department of Agriculture and Consumer Services. (2011).Virginia Agriculture - Facts and Figures. Accessed December 15. 2011. **http://www.vdacs.virginia.gov/agfacts/index.shtml**

8 Ibid.

9 U.S. Department of Agriculture. Food Desert Locator. Accessed December 15, 2011. **http://www.ers.usda.gov/data/fooddesert/fooddesert.html** and U.S. Census Bureau. 2010 Census Home. Accessed December 15, 2011. **http://2010.census.gov/2010census/**

10 U.S. Department of Agriculture. Food Desert Locator Documentation. Accessed December 15, 2011. **http://www.ers.usda.gov/data/fooddesert/documentation.html**

- **Farm to School Week.** All 42 of Richmond's public schools participate in Farm to School Week, where local farmers and educators work together to bring fresh, local produce to schools.[11] Many schools also host events to teach students about nutrition, food systems, and the importance of local agriculture.
- **Farmers Markets.** The City supports farmers markets including the 17th Street Farmers Market and the South of the James Market. According to the Virginia Association for Biological Farming, there are currently 16 farmers markets serving the Richmond area.[12]

11 Roberson, Susan. Director, Nutrition Services, Richmond Public Schools December 14, 2011

12 Virginia Association for Biological Farming. Farmer's Markets in Virginia. Accessed December 15, 2011 from **http://www.vabf.org/farmers-market/list-of-farmers-markets-in-virginia**

How will we reach our goal?

Through the sustainability planning process, the following initiatives were identified to expand access to and increase the affordability of local, healthy, and sustainable food.

Table 1-3 Objective 3: Make Local, Healthy, and Sustainable Food Accessible and Affordable

Initiative	Summary	Implementer	Cost*	Funding Source
Support an expanded network of farmers markets throughout the city	Farmers markets provide a unique and important opportunity to create a robust regional food economy and keep that money in the region	Food Policy Task Force; Economic and Community Development; community partners	$	Local farmers, General Fund
Repurpose appropriate vacant lots for urban agriculture	Urban agriculture is a productive use of vacant land that can improve blighted areas	Economic and Community Development; Planning and Development Review	$	General Fund, private developers
Conduct an assessment of distances to grocery stores to eliminate food deserts	Food deserts are areas that lack access to affordable fruits, vegetables, whole grains, low-fat milk, and other foods that make up the full range of a healthy diet	Institutional or Non-profit partner; Food Policy Task Force	$	Private foundations

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

	Broader Impacts Upon Implementation				Economic/Time Impacts for Implementer			
Initiative Benefits and Implementation	GHG reduction potential	Fuel/energy savings potential	Positive public health impacts	Potential for job creation	Cost to implement	Funding feasibility	Payback Period	Time to implement
Support an expanded network of farmers markets throughout the City	■	■	■	■	■	■	●	●
Repurpose appropriate vacant lots for urban agriculture	■	■	■	■	■	■	●	●
Conduct an assessment of distances to grocery stores to eliminate food deserts	■	■	■	■	■	■	●	●

■ Less Favorable ■ Somewhat Favorable ■ More Favorable ● Short ● Medium ● Long

For more information, please refer to Appendix A: Initiative Evaluation Criteria

Support an expanded network of farmers markets throughout the city

Farmers markets provide a unique and important opportunity to create a robust regional food economy. By increasing the network of farmers markets within Richmond, residents can enjoy the benefits of local healthy and fresh foods, such as fruits and vegetables. With more than 11 percent of Richmond's population living in food deserts,[13] or areas of the city with inadequate access to supermarkets, many citizens are forced to purchase their food at corner markets and convenience stores where food is typically more expensive and less nutritious than at full service grocery stores. Expanding the network of farmers markets, particularly in those areas that are located in a food desert, in Richmond would provide residents with better access to fresh produce, lower the environmental impact of importing food from distant locations, and help support the local economy. Farmers markets also serve as a gathering area for residents and businesses, which can help improve the quality of life and sense of community in Richmond neighborhoods.

Repurpose appropriate vacant lots for urban agriculture

Urban agriculture is a productive and attractive use for vacant lots. Produce from urban gardens can help feed local residents, while trees and flowers can help beautify the neighborhood. The City of Richmond can build on its existing community garden and school garden initiatives by exploring the use of additional vacant City-owned properties and investigating the feasibility of repurposing those properties for agricultural use. Additionally, the City could broaden this opportunity by reducing potential barriers – such as zoning regulations, irrigation challenges, or liability issues – for community members seeking to use non-City owned vacant lots for agricultural use.

13 U.S. Department of Agriculture. Food Desert Locator. Accessed December 15, 2011. **http://www.ers.usda.gov/data/fooddesert/fooddesert.html** and U.S. Census Bureau. 2010 Census Home. Accessed December 15, 2011. **http://2010.census.gov/2010census**

The Historic 17th Street Market has been providing city residents with farm fresh items since 1737.

In 2007, the City of Cleveland, OH created an "Urban Garden District" zoning category to help promote urban gardens and farmers markets.[1] As of June 2011, the number of community gardens in Cleveland had grown by more than 200, many of which evolved into for-profit market gardens.[2] The City is using urban agriculture to revitalize large tracts of vacant industrial and residential property, and has converted over 120 land bank lots into productive growing spaces.[3] Community groups also play a large role in addressing food related issues in Cleveland. For example, Cleveland's City Fresh initiative, which was awarded a Community Food Project grant from the U.S. Department of Agriculture in 2005, works to mitigate urban food deserts by training new urban farmers, converting vacant lots into garden and market space, and using vacant grocery stores as community food distribution centers.[4] City Fresh has provided more than 800 low income families with fresh produce, and has generated more than $150,000 in local income.[5]

1 Goldstein, M., Bellis, J., Morse, S., Myers, A., Ura, E.,. (2011). Urban Agriculture: A Sixteen City Survey of Urban Agriculture Practices Across the Country. Accessed November 2011. **http://www.georgiaorganics.org/Advocacy/urbanagreport.pdf**

2 Ibid.

3 Ibid.

4 Ibid.

5 Ibid.

Conduct an assessment of distances to grocery stores to eliminate food deserts

Food deserts are areas that lack access to affordable fruits, vegetables, whole grains, low-fat milk, and other foods that make up the full range of a healthy diet. Grocery stores that offer moderately priced food and healthy options are non-existent in some portions of Richmond, particularly within the South Side, Blackwell, Fulton Hill and Montrose Heights neighborhoods. While corner convenient stores are present, they often sell only processed foods that are expensive and high in calories. An assessment of actual distances to grocery stores and proximity to population clusters and transit would help the City better understand where food deserts are most problematic. In addition, such an assessment could identify developable land and real estate development opportunities to entice a grocery store chain to locate in the city's food deserts. The assessment may also evaluate temporary innovative solutions, such as farmers markets and food trucks.

Objective 4: Improve the state of good repair and efficiency of City infrastructure

Where are we now?

In May 2011, the Richmond City Council adopted the Capital Improvement Plan (CIP) 2012-2016 which focuses on continued investments in the City's infrastructure over a five-year span. The five-year capital plan proposes approximately $807 million in spending on a variety of projects addressing infrastructure, paving programs, neighborhood revitalization, and education. Priorities of the CIP include spending on demolition and blight abatement, roadway improvements, four new schools and the new justice center, and an equipment replacement strategy. Like many local governments, the CIP is the City's "living" document that helps to focus municipal spending strategies and methods to build and improve Richmond. The CIP also supports Mayor Dwight Jones' goal for Richmond to become a Tier One city.

How will we reach our goal?

RVAgreen focuses on three objectives described below, that will further improve the state of good repair and efficiency of city infrastructure.

Table 1-4 Objective 4: Improve the State of Good Repair and Efficiency of City Infrastructure

Initiative	Summary	Implementer	Cost*	Funding Source
Restore the trolley system	Streetcar systems create transit options for tourists and have been shown to have economic development benefits	Economic and Community Development; GRTC; DRPT	$$$	U.S. Department of Transportation, General Fund
Initiate a citywide beautification program	Addressing litter, road and sidewalk repairs and general maintenance of Richmond's streets, parks, and public spaces to create a safer and more welcoming environment	Clean City Commission; Public Works; Economic and Community Development	$$	General Fund
Require life cycle cost analysis for all capital improvement projects	This will allow the City to understand how much it will cost to build and operate something over its entire lifetime, enabling better decision making regarding spending additional dollars up-front for long-term savings	Budget and Strategic Planning; City Council	$$$	General Fund

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

Initiative Benefits and Implementation	Broader Impacts Upon Implementation				Economic/Time Impacts for Implementer			
	GHG reduction potential	Fuel/energy savings potential	Positive public health impacts	Potential for job creation	Cost to implement	Funding feasibility	Payback Period	Time to implement
Restore the trolley system	Somewhat Favorable	Somewhat Favorable	More Favorable	Somewhat Favorable	Less Favorable	Somewhat Favorable	Long	Long
Initiate a citywide beautification program	Less Favorable	Less Favorable	Somewhat Favorable	Somewhat Favorable	Somewhat Favorable	More Favorable	Medium	Medium
Require life cycle cost analysis for all capital improvement projects	Less Favorable	Less Favorable	Less Favorable	Somewhat Favorable	Less Favorable	Somewhat Favorable	Medium	Short

Less Favorable Somewhat Favorable More Favorable Short Medium Long

For more information, please refer to Appendix A: Initiative Evaluation Criteria

Restore the trolley system

As an early pioneer of the streetcar trolley, Richmond is poised to reinvent corridors within the city to accommodate greater transit use, reduce travel times and create development opportunities. The development patterns surrounding streetcars are typically very sustainable. Potential heritage trolley routes could offer some of the mobility benefits of a rail network and link tourist destinations while bringing back the trolley to Richmond. The creation of a trolley route may provide significant transit-oriented development opportunities to capture riders that seek convenience between home and work destinations while providing the health benefits associated with reduced vehicle use. Efforts to secure matching funds from the federal and state government (DRPT) could be expanded to include programs such as TEA-21, SAFETEA-LU, or CMAQ. Furthermore, proposed investment in the Main Street multi-modal transportation center illustrates the interest and benefit of increasing mobility for Richmond citizens. A new trolley system could help further those mobility goals and create private investment opportunities along trolley corridors, particularly around tourist destinations such as the Department of Rail and Public Transit. The long-term feasibility of adding trolley routes to the transit network is recommended for study and evaluation.

Beautification of home in Forest Hill Neighborhood.

Initiate a citywide beautification program

Economic development is tied to visual impressions – for new businesses, new citizens, and tourists alike. The City's CIP proposes several blight abatement, gateway improvement and neighborhood revitalization projects which will enhance distinct areas of Richmond. Projects such as the Carytown Gateway improvement project, Dove Street Redevelopment initiative, and the Eastview Initiative represent a sample of the City's commitment to redevelop the urban environment and create a more livable city. Such revitalization projects should be proposed in additional areas of Richmond to help knit the community together. In addition to blight abatement and demolition of dilapidated structures, a Richmond beautification program could include the planting and maintenance of trees, shrubs, evergreens and flowering plants, and the installation of paved walkways and crosswalks, decorative steel fencing, flag and banner poles, and lighting. The program could be designed not only to

enhance the appearance of the city, but also to make the city safer. Additional program elements could include partnerships with community groups, Adopt-A-Street (or Garden, Tree or Park) efforts, and dedicated resources towards graffiti removal.

Require life cycle cost analysis for all capital improvement projects

When developing capital budget requests, the City of Richmond should require a life cycle cost analysis for proposed projects. Life cycle costing analysis enhances decision-making and financial planning and helps decision-makers to select the most cost-effective projects based on the lifetime of costs benefits rather than strictly looking at upfront costs. This will enable the City to understand how much it will cost to build and operate something over its entire lifetime, facilitating better decision making regarding spending additional dollars up-front for long-term savings. Within the current CIP, a life cycle cost analysis for each proposed project is not provided and does not appear to be a distinct factor in spending proposals. The operating impact associated with a proposed project is provided in the CIP in a qualitative manner. In order to implement a successful strategy to conduct life cycle cost analysis, the effort would begin during the capital improvement planning process. City departments would incorporate life cycle costs in their proposals in order to give City fiscal planners a sound understanding of the long term costs of spending on buildings, equipment, vehicles, replacement or improvement of utilities, roadways, etc. Review of the life cycle cost analysis would then be a factor when the City decides to include a project within its CIP.

Table 1-5: Recommended Sustainability Reporting Indicators and Targets for Economic Development

Objective	Suggested Indicators	Suggested Targets
Create opportunities for Richmond businesses to enhance their overall sustainability	Number of businesses participating in Green Business Program	10 businesses to join during inaugural year
	Electricity and Natural gas consumption from the commercial and industrial sector	Downward trend
	Waste tonnage from the commercial and industrial sector	Downward trend
	Participation rates in utility energy efficiency programs	Upward trend
	Transit ridership	Upward trend
	Number of attendees at a green lease educational session	10% of the commercial building owners/ property managers in the City
Create more green jobs	Unemployment rate	Downward trend
	Number of new "green" businesses locating to Richmond	Upward trend
	Number of participants at green job training programs	Upward trend
	Interest expressed by developers and businesses in the existing Local Technology Zone or a Green Business District	Upward trend
Make local, healthy, and sustainable food accessible and affordable	Number of food deserts	0 within Richmond by 2015
	Number of farmers' markets in the City	Upward trend
	Number of new, local farmers engaged in the network	Upward trend
	Number of vacant lands converted to community gardens	Upward trend
Improve the state of good repair and efficiency of City infrastructure	Number of capital improvement projects utilizing a life cycle cost analysis	100% by 2013
	Number of calls to City regarding litter	Downward trend
	BRT ridership numbers	Upward trend

2. Energy

Energy and its cost, availability and security are closely tied to the prosperity of a city. These are recognized realities in Richmond, and as such, the City of Richmond and the Richmond community are taking steps to increase the city's energy resilience. The challenge for Richmond will be to reduce overall energy consumption through conservation and increased efficiency, while increasing the use of renewable energy. Ideally this will be done through methods that engage the broader community, leverage economic competitive advantage, and respect social equity. The following section outlines Richmond's existing efforts and recommends future initiatives that will help increase Richmond's energy resilience. These include measures that address energy price fluctuations, energy infrastructure, and diversity of energy sources.

Goal

Enhance Richmond's Energy Resilience

Objectives

1. Reduce energy consumption in City government operations
2. Lower building energy consumption citywide
3. Increase the use of alternative energy sources

Objective 1: Reduce energy consumption in City government operations

In order to begin moving RVAgreen forward, the City of Richmond can lead by example by addressing energy use in its own municipal facilities. By implementing energy conservation measures (ECMs) and policies within municipal facilities and operations, the City can demonstrate how ECMs can be implemented effectively and demonstrate the cost and energy savings associated with each ECM.

Where are we now?

In 2008, a comprehensive greenhouse gas (GHG) inventory was completed for the City of Richmond. This inventory shows that government operations resulted in the emission of 173,660 metric tons of carbon dioxide (CO_2) equivalent. This quantity of emissions is equivalent to the emissions from annual energy use in more than 15,000 homes or to the annual emissions of more than 34,000 passenger vehicles.[1] **Figure 2-1**[2] demonstrates that electricity and gasoline combined represent 75 percent of total GHG emissions for the government operations. Efficiencies in these areas could signify a substantial opportunity for reducing energy use, costs, and associated GHG emissions in City operations.

Figure 2-2[3] summarizes the City's operational greenhouse gas emissions by sector. As is common for local government GHG profiles, municipal buildings and facilities represent the largest portion of GHG emissions. Addressing energy use in buildings is a sound strategy to reduce GHG emissions. Additionally, efforts should be made to tackle energy consumption from the water delivery and treatment facilities and the vehicle fleet. These sectors are commonly addressed by local governments and offer a significant opportunity to reduce energy consumption in City government operations.

Figure 2-1: Richmond Government Operations GHG Emissions by Source (2008)

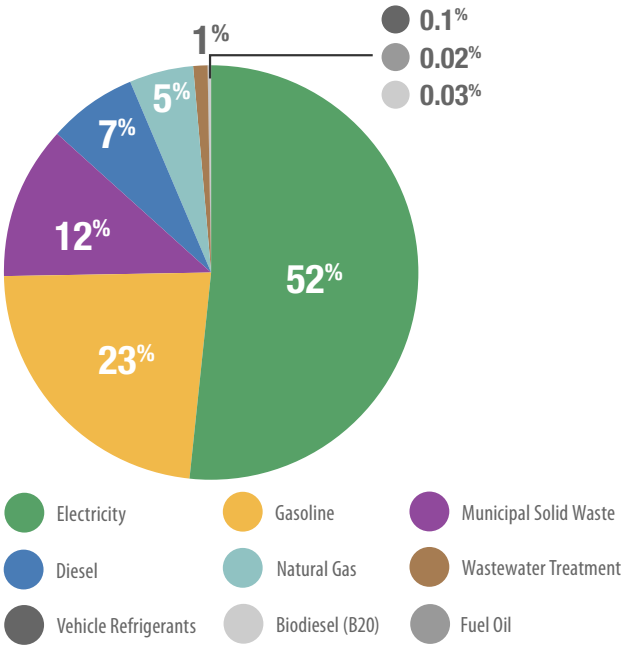
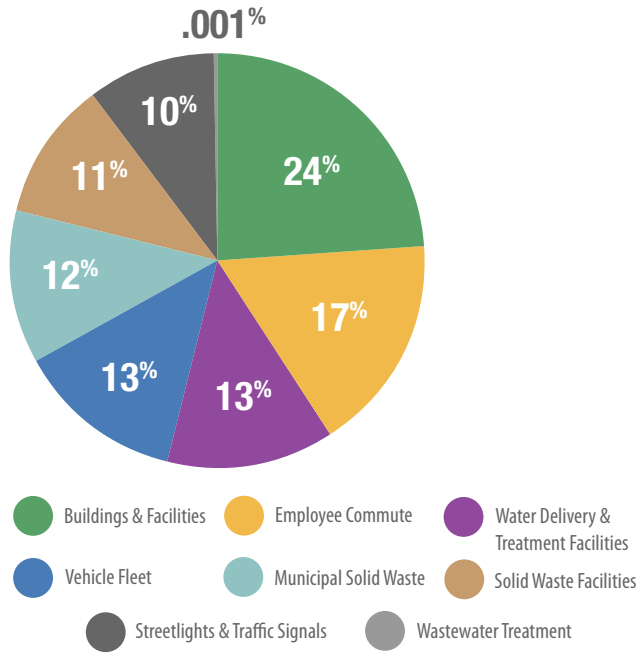


Figure 2-2: Richmond Government Operations GHG Emissions by Sector (2008)



1 U.S. Environmental Protection Agency (EPA). EPA Greenhouse Gas Equivalencies Calculator. Accessed December 2011. **http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results**

2 City of Richmond. (2008). Greenhouse Gas Emissions Inventory, Figure 3.2.

3 City of Richmond. (2008). Greenhouse Gas Emissions Inventory, pages 18-19.

Leading By Example

The Department of Public Utilities installed the City government's first green roof at the Wastewater Treatment Plant in 2010.

http://cordpu.blogspot.com/2011/06/citys-green-roof.html

The City of Richmond has recognized the importance of energy resiliency and has made efforts over the past several years to become a leader in energy efficiency and reduce its carbon footprint. The City has already initiated progressive measures, including building all new facilities greater than 10,000 square feet to a minimum LEED Silver standard, hiring an Energy Manager, installing energy efficient software on City computers, and integrating alternative fuel vehicles into the municipal fleet. The City also replaced its fleet of 37 diesel refuse trucks with 25 CNG trucks and built the first fleet dedicated CNG fueling station in Virginia. Most recently, the City has developed a Well-Managed Energy Program (WMEP), which is an energy management program that prioritizes energy consumption in government operations for effective management and to control costs. Additionally, the Green Government Order, issued by Mayor Jones in April 2011, calls for a minimum one percent annual energy use reduction in government operations.

How will we reach our goal?

In addition to the initiatives mentioned above, the City of Richmond plans to explore implementation of the following new initiatives to promote an overall energy reduction in City government operations.

Table 2-1: Objective 1: Reduce Energy Consumption in City Government Operations

Initiative	Summary	Implementer	Cost*	Potential Funding Source
Adopt a green fleet policy	Adopt a policy that increases use of alternative/electric vehicles in City fleet	Public Works - Fleet Mgmt. Div.	$	Virginia Clean Cities Coalition; U.S. Department of Energy
Enter into a performance contract for all City buildings	Hire a contractor to bear the upfront capital costs of efficiency improvements	Public Works - Facilities Mgmt. Div.; Procurement Services	$$	General Fund
Adopt an energy efficiency procurement policy	Ensure purchases are made with energy efficiency in mind	Procurement Services; Sustainability Office	$	General Fund
Adopt an energy efficiency policy or O&M standards for all City buildings	Create policy that promotes standards and guidelines for increased efficiency and reduced energy consumption in City buildings	Public Works - Facilities Mgmt Div.	$	General Fund

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

Initiative Benefits and Implementation	Broader Impacts Upon Implementation				Economic/Time Impacts for Implementer			
	GHG reduction potential	Fuel/energy savings potential	Positive public health impacts	Potential for job creation	Cost to implement	Funding feasibility	Payback Period	Time to implement
Adopt a green fleet policy	More Favorable	More Favorable	More Favorable	Somewhat Favorable	More Favorable	More Favorable	Long	Short
Performance contract for City buildings	More Favorable	More Favorable	Somewhat Favorable	More Favorable	Somewhat Favorable	More Favorable	Short	Short
Energy efficiency procurement policy	Somewhat Favorable	Somewhat Favorable	Somewhat Favorable	Somewhat Favorable	More Favorable	More Favorable	Short	Short
O&M efficiency standards in all City buildings	Somewhat Favorable	Somewhat Favorable	Somewhat Favorable	Less Favorable	More Favorable	More Favorable	Short	Short

Less Favorable Somewhat Favorable More Favorable Short Medium Long

For more information, please refer to Appendix A: Initiative Evaluation Criteria

Adopt a green fleet policy – The City should adopt a policy that leads to increased use of alternative fueled vehicles, such as electric vehicles or compressed natural gas (CNG) vehicles.[4] Converting the City's existing gasoline-powered vehicles to cleaner and more efficient alternatives will directly contribute to an overall reduction in greenhouse gas emissions and non-point source air pollution. In addition to promoting a cleaner environment and contributing to RVAgreen's transportation and environmental goals, this initiative will set a positive example for the greater Richmond community to follow. In addition, implementation of this measure will lead to promotion of alternative fueled vehicles and associated infrastructure driving sustainable economic growth for the region.

Developing the green fleet policy itself will not be costly; however implementing it will likely require significant financial investment depending on the extent and type of fleet upgrade. The City can access funding to implement this action from municipal funding sources currently being used, such as funds for the Electric Vehicle Pilot for City Fleet and resources for transitioning its fleet of diesel garbage trucks to CNG trucks. There will be a long-term payback on this initiative for the City from fuel savings. To measure and validate the performance of this initiative the City can track indicators such as number of alternate powered vehicles and hybrids and vehicle fuel usage.

Enter into a performance contract for all City buildings – Energy efficiency improvements to existing buildings represent one of the easiest and most cost effective ways to begin reducing overall energy use and associated greenhouse gas emissions. One of the main hurdles for making these improvements are the upfront costs associated with remodeling and retrofitting existing buildings. Entering into a performance contract allows these upfront costs to be financed at a lower capital cost or be diverted to a third-party contractor who is then repaid for the installation of the improvements and capital cost, if applicable, by the

The City replaced its fleet of 37 diesel refuse trucks with 25 CNG trucks and built the first fleet dedicated CNG fueling station in Virginia.

4 The City of Seattle's Clean and Green Fleet Action Plan defines a green fleet as using clean fuels and vehicles that are the most fuel-efficient, low-emission vehicles and equipment available that meet the business needs of the City. City of Seattle, Office of Sustainability and Environment Fleets and Facilities Department. (2003). A Clean and Green Fleet: An Action Plan for the City of Seattle. Accessed November 2011. **http://www.seattle.gov/environment/Documents/CleanGreenFleetAP.pdf**

subsequent energy savings. This initiative would set an example for the overall Richmond community, raise awareness of energy efficient practices and upgrades, and promote job creation and economic development in related sectors.

The City's cost will vary depending on who finances the project's capital costs. The financing decision will be based on the City's availability of capital and its carrying cost versus third party financing. Regardless of who carries the capital costs, an energy services company will install and implement the energy improvements and guarantee the savings. The return on investment will depend on the type and number of ECMs identified. The performance of this initiative can be measured by the number of performance upgrades, and especially through energy consumption of buildings and cost of energy. The City can increase the likelihood of stimulating economic growth by requiring the energy service company to hire local contractors and supplies.

Adopt an energy efficiency procurement policy – The City of Richmond can set a positive example and reduce its energy use by incorporating energy efficiency standards into all municipal equipment and product purchases. An energy efficiency procurement policy would require that the City purchases the most energy efficient option of a product or piece of equipment without compromising the ability of that product to deliver what is needed for the City. In many cases, such as with copiers and computers, every option available meets high energy efficiency standards and is recognized by the Energy Star Program. Though sometimes these options are more expensive, such purchases will contribute to RVAgreen's overall goals, while promoting economic development around energy efficient products.

The City could implement an energy efficient procurement policy at a low cost or no cost by purchasing energy efficient products on the same replacement schedule as conventional replacement projects. The funding for efficient procurement would come out of the City's General Fund. Some products will not have cost premiums requiring no additional investment for the City. If there is a cost premium the products will tend to pay for their added cost over a short timeframe. The City can also promote social equity and economic development through its purchasing policies. The purchase of local green products will stimulate the local economy and encourage development of energy efficiency service and product markets. According to the U.S. Department of Energy (DOE), approximately 60 percent of the cost of efficiency investments goes to labor and half of all energy efficient equipment is purchased from local suppliers. Spending an additional dollar on energy efficiency in local economies generates $.55 to $.85 more economic activity than spending a dollar on energy bills.[5] The performance of this initiative can be measured easily by tracking energy efficient products bought, changes in energy consumption, and cost savings.

Adopt an energy efficiency policy or standards for Operations and Maintenance to implement in all City buildings – By adopting this policy the City will create streamlined policies and standards for Operations and Maintenance (O&M) of municipal facilities. Such standards could better guide the O&M of buildings and lead to more efficient procedures. More efficient procedures and operations would in turn lead to a reduction in energy use and greenhouse gas emissions, while allowing the City to realize the savings associated with these improvements. The City has already adopted a LEED Sliver policy for newly constructed buildings. It could take a further step in its green building efforts by adopting a policy that requires existing City buildings to meet LEED for Existing Buildings Operations & Maintenance standards. As with the new construction policy, the City need not require the actual certification of buildings, which can be cost-prohibitive, but could instead use the LEED standards as guidance for their internal O&M policies.

This should be a relatively low cost initiative and City will be paid back quickly through energy and operational cost savings. Estimated energy savings from O&M programs targeting energy efficiency typically average around 15 percent. Using that figure and based on the City's 2008 GHG inventory, the City could potentially reduce emissions by 6,284 metric tons CO_2 equivalent with a cost savings potential of over $1 million per year.[6] In addition to energy

5 U.S. Department of Energy. Clean Energy Strategies for Local Government. Chapter 6.6: Energy-Efficient Product Procurement. Accessed December 2011. **http://www.epa.gov/statelocalclimate/documents/pdf/section_6_6_procurement_2-22.pdf**

6 Federal Energy Management Program, US DOE, "Operations & Maintenance Best Practices: A Guide to Achieving Operational Efficiency," Release 3.0, August 2010. **http://www1.eere.energy.gov/femp/pdfs/omguide_complete.pdf**

savings, the City will achieve savings through reduced materials costs, reduced equipment downtime, and improved productivity. Richmond can implement this policy through a minimal investment of municipal resources. To follow progress on implementing this initiative the City can track changes in energy consumption, cost savings, and number of work orders filed.

Objective 2: Lower building energy consumption citywide

In order to promote a truly sustainable city, the entire Richmond community must be engaged in citywide energy conservation initiatives. Within the city, commercial/industrial and residential buildings and facilities consume energy and contribute heavily to Richmond's community-wide greenhouse gas emissions. Upgrades in building energy efficiency represent a way to reduce overall energy use and reliance on energy infrastructure, while also greatly reducing greenhouse gas emissions and saving the consumer money on utility costs. These upgrades often require an upfront investment that can sometimes deter potential projects, but often have short-term simple paybacks.

Where are we now?

Data from the 2008 Richmond Greenhouse Gas Inventory indicates government operations account for less than six percent of Richmond's total community generated GHG emissions. **Figure 2-3** from Richmond's GHG Inventory[7] shows the breakdown of emissions from the Richmond community by source. Similarly to government operations, electricity and other energy sources comprise the largest contributors to greenhouse gas emissions. In this case, the top five sources (electricity, fuel oil, gasoline, natural gas, and diesel) account for 97 percent of community GHG emissions. Of those five sources, electricity, fuel oil and natural gas are used primarily in buildings.

The breakdown of these greenhouse gas emissions by sector, as shown in **Figure 2-4,** will help one understand which sectors tend to be consuming the most energy within the Richmond community. According to this table and figure, the commercial and industrial sector contributes significantly more greenhouse gas emissions and thus likely uses more energy than any other sector. As such, this sector as well as the residential sector should represent the target sectors for reductions in building energy use and increasing energy resiliency.

7 City of Richmond. (2008). Greenhouse Gas Emissions Inventory, Figure 4.4.

Figure 2-3: Richmond Community GHG Emissions by Source

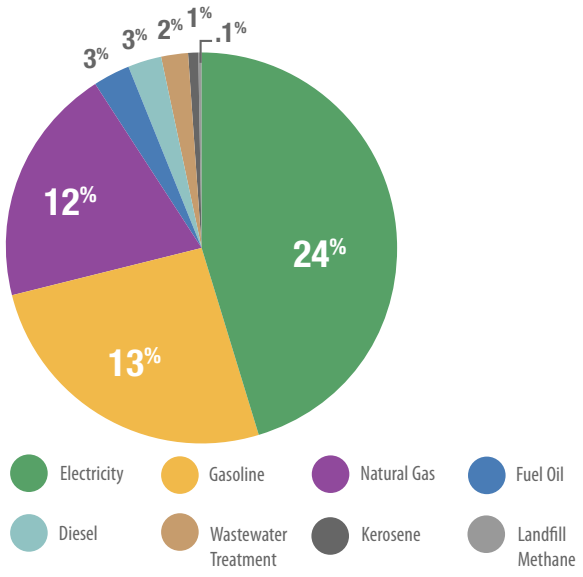
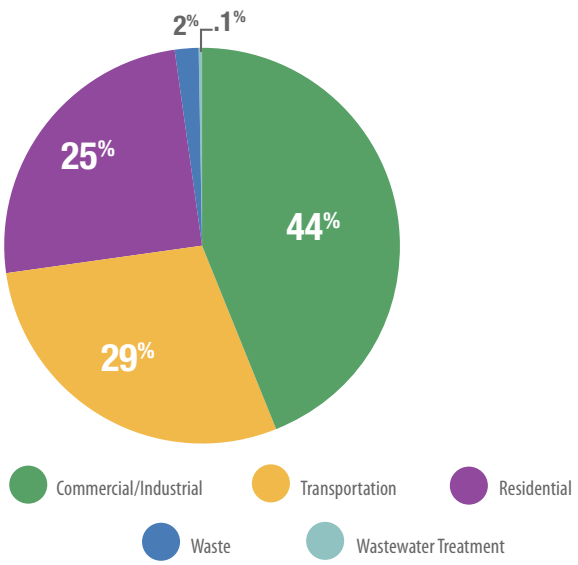


Figure 2-4: Richmond Community GHG Emissions by Sector



While there is still a lot of work to be done, the greater Richmond community has already begun moving in the right direction. Already, Richmond can boast about several LEED certified buildings within the city limits, including the first LEED Platinum certified building in Virginia. Energy efficiency efforts have been increasing throughout the community, from utilizing energy service company (ESCO) services to achieve 36 percent energy savings in Richmond Public Schools to using historic tax credits to encourage green upgrades of Richmond's historic buildings. The community is clearly beginning to recognize the benefits of energy efficiency, and RVAgreen will help to ensure this momentum continues.

How will we reach our goal?

As indicated earlier, the greater Richmond community has already shown an interest in reducing overall building energy consumption. In order to promote an even greater awareness of building energy efficiency and reduction in energy consumption, the following initiatives have been prioritized.

Institutions like Virginia Commonwealth University are leading the state in innovative energy efficiency.

Table 2-2: Objective 2: Lower Building Energ Consumption Citywide

Initiative	Summary	Implementer	Cost*	Potential Funding Source
Establish tax breaks for energy efficiency	Tax breaks for building owners based on implementation of energy saving measures	Assessor of Real Estate; Planning and Development Review	$	General Fund
Establish a residential weatherization program	Promote community weatherization of buildings through a new program	Non-profits and community partners	$$	U.S. DOE Weatherization Assistance Program[i]; LIHEAP[ii]
Establish a fund to assist business with energy efficiency improvements	Set up a revolving loan fund to finance the cost of business-related energy efficiency upgrades	Economic and Community Development; community partners	$$$	Potential seed money from Dept of Energy or EPA energy grants

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.
i These funds are administered through the VA Dept of Housing and Community Development.
ii Low-Income Home Energy Assistance Program Weatherization Component, administered by VA Dept of Social Services.

	Broader Impacts Upon Implementation				Economic/Time Impacts for Implementer			
Initiative Benefits and Implementation	GHG reduction potential	Fuel/energy savings potential	Positive public health impacts	Potential for job creation	Cost to implement	Funding feasibility	Payback Period	Time to implement
Energy efficiency tax breaks	More Favorable	More Favorable	Somewhat Favorable	Somewhat Favorable	More Favorable	Somewhat Favorable	Long	Short
Residential weatherization program	More Favorable	More Favorable	More Favorable	More Favorable	Somewhat Favorable	More Favorable	Short	Short
Business fund for energy efficiency improvements	Somewhat Favorable	Somewhat Favorable	Somewhat Favorable	Somewhat Favorable	Less Favorable	Somewhat Favorable	Medium	Medium

Less Favorable · Somewhat Favorable · More Favorable · Short · Medium · Long

For more information, please refer to Appendix A: Initiative Evaluation Criteria

Residential weatherization programs have been popping up everywhere from large cities like Philadelphia and Baltimore to Richmond's smaller neighbor, Charlottesville. These programs have successfully increased the energy resilience of the housing stock in these cities, while increasing community awareness.

Establish tax breaks for energy efficiency – Providing tax breaks is a proven method for incentivizing new practices. By offering tax breaks, the City will make it easier for building owners to implement energy saving measures, which often have significant upfront costs. In addition to reducing overall energy consumption, this measure would promote long-term cost savings for building owners and increase energy efficiency awareness in the community.

Upfront costs to set up and administer this program will be small. The City can locate possible funding for administering this program through municipal funds. Progress on this initiative can be measured by tracking citywide energy use. This initiative will drive consumers to hire energy efficiency contractors and auditors and purchasing new equipment, thus promoting economic development and workforce development.

Establish a residential weatherization program – Weatherizing Richmond's housing stock could significantly reduce overall energy consumption and associated greenhouse gases while providing homeowners with long-term cost savings. Many homeowners are not aware of the benefits of weatherization (cost savings, reduced energy consumption, increased thermal comfort, better indoor air quality) or cannot afford the upfront cost to implement. A residential weatherization program can help citizens overcome these obstacles while also promoting significant economic development and job creation in the community for energy contractors and weatherization professionals.

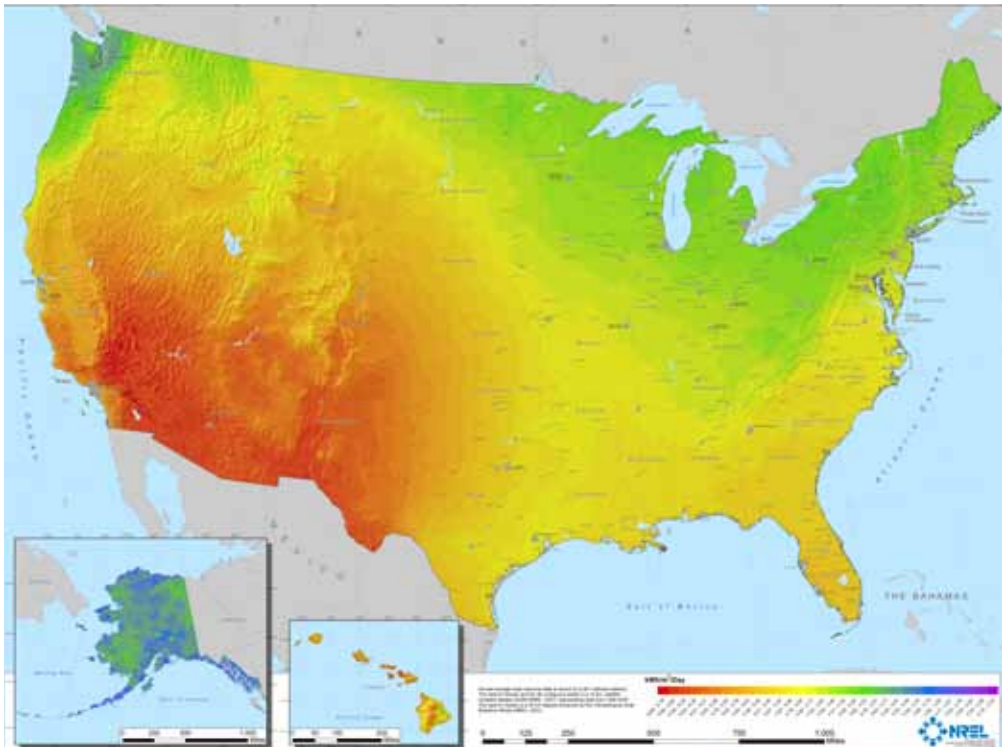
Non-profit organizations are typically established to develop and administer weatherization programs. The administrator of this program will likely incur considerable start-up costs and some ongoing administrative costs. It may be possible to utilize DOE grants or grants from the Virginia Department of Housing and Community Development (DHCD)[8] to fund this program. Energy efficiency partnerships and funds, sustainable energy authorities and revolving loan funds could also be utilized. Additionally, programs can be established that allow homeowners to use energy utility savings to pay for the initial investment/upgrades and see moderate payback. The effort, which would include things such as improved insulation and air sealing could have a payback of two to three years. Under this scenario, homeowners would have no out-of-pocket costs for the improvements and could use their energy savings to pay back the program administrator. As loans are repaid, the entity could finance additional projects. The progress of this initiative can be measured by tracking the number of buildings retrofitted and energy consumption after weatherization. The measure is likely to bolster a workforce including energy auditors, local heating, ventilation, and cooling (HVAC) and insulation contractors. It could also address social equity if priority is given to low-income and public housing structures.

Develop a fund to assist businesses in implementing energy efficiency improvements – By setting up a fund (such as a revolving loan fund) specifically to aid local businesses in identifying and implementing energy efficient upgrades, the administering entity can incentivize energy efficiency and allow businesses to cost-effectively invest in efficient and cost-saving practices. A revolving loan fund becomes self sustaining if established in a way to allow businesses to receive the loan

8 Virginia Department of Housing and Community Development. Weatherization Assistance. Accessed November 2011. **http://www.dhcd.virginia.gov/HousingPreservationRehabilitation/Weatherization_Assistance.htm**

to pay for the upgrades and then the businesses pay back the loan out of their energy savings. This is a high cost initiative at start-up. Eugene, OR estimates a similar initiative to cost more than a million dollars. The fund administrator would need to leverage state or federal funding for start-up, and then set up a revolving loan fund to finance ongoing assistance. The administering entity would see payback over a moderate timeframe if it works with participating businesses to be paid back through energy savings. Success of this initiative can be measured by tracking the number of businesses assisted as well as changes in energy consumption of businesses. As a result of this effort, consumers will hire energy efficiency and weatherization contractors and auditors, thus promoting economic development and workforce development.

Objective 3: Increase the use of alternative energy sources



United States Photovoltaic Solar Resource: Flat Plate Tilted at Latitude

Source: National Renewable Energy Laboratory (NREL). Dynamic Maps, GIS Data, & Analysis Tools, U.S Solar Resource Map. 2008. **http://www.nrel.gov/gis/solar.html**

Solar installations much like this one, are part of Richmond's alternative energy-integrated future.

While reduction of energy use plays a huge role in decreasing energy dependence, an increase in percentage of energy produced by alternative sources can also help Richmond enhance its energy resilience and promote local energy production and job creation. These alternative energy installations also tend to require a large initial investment, and as such, financial incentives can help promote such projects.

Where are we now?

Richmond is showing promising progress towards an alternative energy-integrated future. Already, there exist 17 different solar installations on residences within the city, and Virginia's largest electricity provider, Dominion Power, is actively expanding net-metering capabilities (a method of electricity metering that can incentivize even more solar installations). This is a good start, but there is a much greater potential yet to be realized. As can be seen in the map above, Virginia has some of the highest solar potential in the mid-Atlantic. While Richmond is not favorably located for wind power generation, other sources of alternative energy generation are currently being explored, including methane capture from wastewater treatment and landfill operations.

In addition to a growing trend in solar installations, there have been several other exciting renewable energy projects within Richmond. Virginia Commonwealth University is leading the way with a number of solar panel and solar hot water installations as well as a supplemental biomass gasification unit. The City is also exploring the possibility of capturing and using methane for energy at its Wastewater Treatment Plant.

How will we reach our goal?

Several community members and institutions have been taking the lead in pursuing alternative and renewable energy projects. RVAgreen promotes building on these achievements and making renewables a significant source of energy for Richmond. In order to most effectively promote this transition, the following initiatives should be implemented.

Table 2-3: Objective 3: Increase the Use of Alternative Energy Sources

Initiative	Summary	Implementer	Cost*	Potential Funding Sources
Provide low-interest loans for renewable energy projects	Provide easy financing for renewable energy installations that meet certain standards	Dept. of Finance; community partners	$$$	Qualified Energy Conservation Bonds; Voluntary Solar Resource Development Fund
Lower permit fees for alternative energy installations	Lower permit fees for renewable energy projects and installations	Planning and Development Review – Permits and Inspections Div.; City Council	$	General Fund
Promote electric vehicle use and charging stations	Encourage electric vehicle use and incorporate renewable energy at charging stations	City Departments, State Agencies, Institutions, Large Corporations	$$	Virginia Clean Cities Coalition

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

	Broader Impacts Upon Implementation				Economic/Time Impacts for Implementer			
Initiative Benefits and Implementation	GHG reduction potential	Fuel/energy savings potential	Positive public health impacts	Potential for job creation	Cost to implement	Funding feasibility	Payback Period	Time to implement
Low-interest loans for renewable energy projects	■	■	■	■	■	■	●	●
Lower permit fees for alternative energy installations	■	■	■	■	■	■	●	●
Promote electric vehicle use and charging stations	■	■	■	■	■	■	●	●

■ Less Favorable ■ Somewhat Favorable ■ More Favorable ● Short ● Medium ● Long

For more information, please refer to Appendix A: Initiative Evaluation Criteria

Provide low-interest loans for renewable projects contingent upon achieving a specific level of energy efficiency in buildings – Similarly to energy efficiency upgrades, renewable energy projects often require significant upfront investment. Richmond hopes to incentivize these projects and help community members overcome this initial investment by offering low-interest loans. By tying these loans to existing energy efficiency standards (such as Energy Star or LEED), legitimate projects that will reduce energy consumption and/or promote the use of alternative energy production will be prioritized. Such projects will directly reduce greenhouse gas emissions while also promoting economic development and job creation in the alternative and renewable energy sectors.

This effort could be a significant and costly undertaking. If the City were to implement this initiative, it could utilize long-term loans and/or clean energy bonds to fund energy efficiency and renewable energy projects. The property owners that benefit from these projects would repay the City through property assessments. Virginia legislation in 2009 authorized local governments to establish Property Assessed Clean Energy (PACE) financing. Another source of funding could be through HB 2191/SB 975. This establishes the Voluntary Solar Resource Development Fund and requires the Department of Mines, Minerals and Energy to provide an option for voluntary contributions to the fund. The fund would be set up to provide loans to projects that involve the installation and operation of photovoltaic, solar water heating, or solar space heating systems in nonprofit, commercial or residential applications.[9] These projects would be large and require financing over longer time periods of 15 to 20 years. They would also involve longer paybacks because the loans are repaid through savings. Success of this initiative could be measured easily by tracking the megawatt hours (MWh) of renewable energy installed/generated.

Lower permit fees for renewable energy installations – By lowering permit fees, the City will additionally incentivize alternative and renewable energy projects and allow potential investors to save on upfront investment. This initiative will promote more installations as well as the economic development and greenhouse gas reductions associated with new renewable energy projects. This is a low cost measure to implement. No extra funding would be needed; however, the City would experience a loss of revenue from lowering the permit fees. In order to measure the progress of this initiative the City would use indicators such as the number of renewable energy projects and MWh of renewable energy generated. Similar to the prior initiative, this would promote economic development through the development of new renewable energy installation and maintenance businesses.

An electric vehicle charging station.

Promote electric vehicle use and utilize renewable energy systems in electric charging stations – Promoting electrical vehicle use will reduce harmful vehicle-related emissions (such as pollutants and greenhouse gases), but will increase the need to produce electricity for charging. In order to ensure that electricity produced to charge these vehicles doesn't also contribute to additional greenhouse gas emissions and other pollutants, the City can promote the use of alternative energy systems, such as solar photovoltaic, at charging stations. Electric vehicles can be promoted throughout the community by various entities including the City, the Commonwealth, institutions, and corporations. Any of these entities have access to purchasing electric vehicles and electric vehicle supply equipment as both become more readily available and current incentives, such as tax credits, do exist. Additionally, the City could continue its efforts to lead by example in regard to the proliferation of electric vehicles by creating incentives through permitting and zoning codes. The cost of this initiative is dependent on what level of action is taken to promote electric vehicle infrastructure and to what extent that infrastructure is powered by renewable sources. Those investments in electric vehicles and/or infrastructure will payback, albeit over the

9 State of Virginia. Chapter 13. Voluntary Solar Resource Development Fund. Accessed November 2011. **http://lis.virginia.gov/cgi-bin/legp604.exe?111+ful+CHAP0839**

long term, from fuel savings. Progress can be measured by tracking the number of electric vehicle purchases in the city and the MWh of renewable energy at charging stations.

Workforce education and economic development associated with installation and maintenance of charging stations and electric vehicles would occur as a result of this initiative.

Table 2-4: Recommended Indicators and Targets for Energy Focus Area

Objective	Suggested Indicators	Suggested Targets
Reduce energy consumption in City government operations	MMBTU (Million British Thermal Units) consumed	1% annual energy use reduction
	# of alternative fuel vehicles in City fleet	Upward Trend
	# of City-owned LEED or Energy Star buildings	Upward Trend
	Fuel Savings from 25 CNG garbage trucks	1% vehicle fuel use reduction
Lower building energy consumption citywide	MMBTU consumed by sector - commercial, residential, industrial	30% reduction by 2025
	# of Homes Weatherized	Upward Trend
	# of Businesses implementing energy improvements	Upward Trend
Increase the use of alternative energy sources	Number of Electric Vehicle Charging Stations	Upward Trend
	MWh Capacity of Renewable Installations	Upward Trend
	Electric vehicle or CNG ownership	Upward Trend

3. Environment

Whether considering the beauty of its natural surroundings, opportunities for recreation, the value of the James River and other bodies of water, or the health and well-being of its occupants, Richmond has much to offer—and much to protect—in its environment. The community recognizes the importance of sustaining and enhancing its surrounding environment through resource protection and conservation, minimizing waste, and protecting the quality of its air and water. For this reason, the Plan includes a goal to create a healthy urban environment. This goal requires commitment and cooperation to make it a reality.

Goal

Create a healthy urban environment.

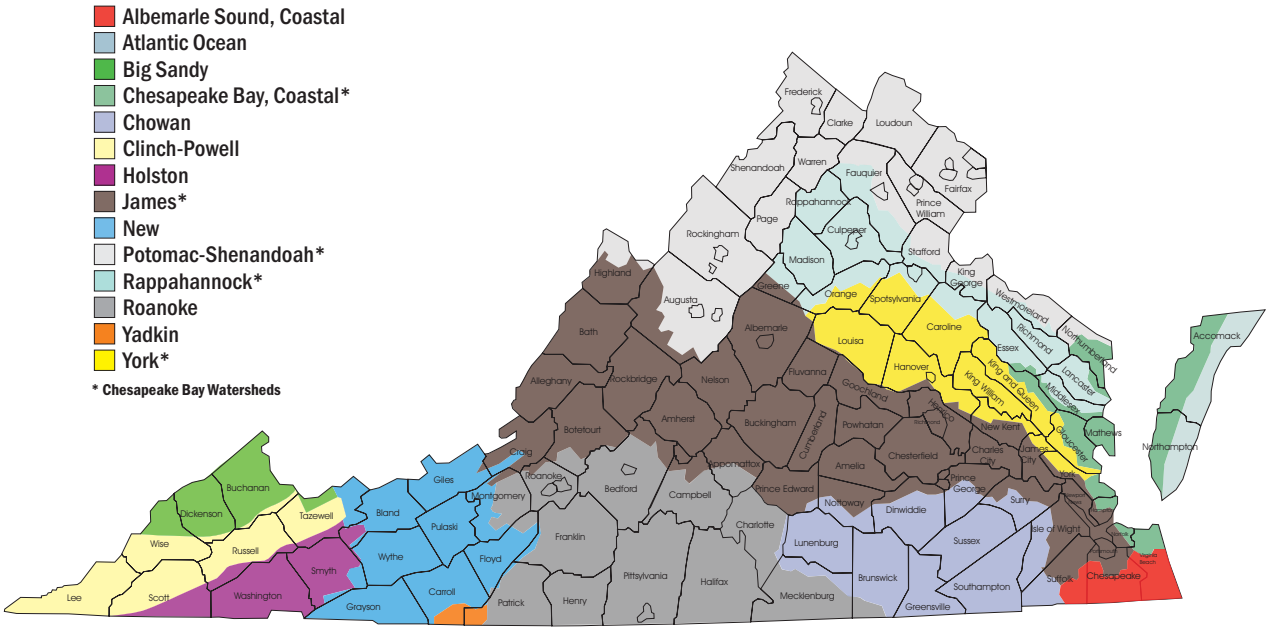
Objectives

1. Protect and enhance Richmond's water resources.
2. Enable the Richmond community to use water wisely.
3. Improve the City's solid waste system.
4. Strive to continuously improve the quality of Richmond's indoor and outdoor air.

Objective 1: Protect and enhance Richmond's water resources.

Richmond is located within the James River Watershed, which is also part of the larger Chesapeake Bay Watershed. The James River is a significant feature of the city's landscape with numerous other streams and creeks that feed into it. The James has played an important role in the city's history and development. The city's location on the river transformed it into a transportation hub and trade center for Virginia and the mid-Atlantic. It gave Richmond opportunities to diversify its economy and to become the capital city that it is today. Today the river provides recreational opportunities, fishing, a drinking water supply, and is home to a variety of wildlife and vegetation. For all of these reasons, the health of the James is essential to the health of Richmond's urban environment. Because all of Richmond is within the James River Watershed, all the water that runs under or over the city leads, either directly or indirectly, to the James. Contaminants and pollution in the city can end up in its water bodies and eventually into the James River if proper pollution prevention measures are not in place. An unhealthy watershed impacts the health of all the life within and connected to the river, including the people working and residing in the city.

Virginia's Major Watersheds



DCR Virginia Department of Conservation and Recreation

Where are we now?

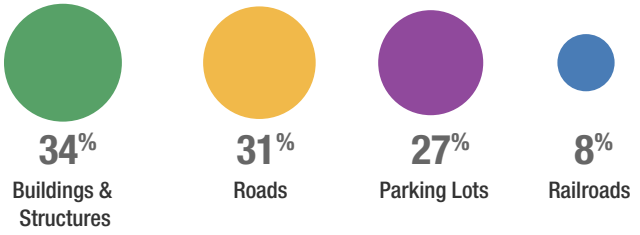
Although the City has made significant strides towards protecting water resources in recent years, all urban settings can be a significant source of non-point source (NPS) pollution[1] and impermeable land cover in the city can be a significant threat to the water quality of the watershed. Impermeable land area does not allow water to penetrate and filtrate into the underlying soil and groundwater.[2] The result is increased stormwater runoff, potentially conveying NPS contaminants and impairing rivers and streams. According to the U.S. Environmental Protection Agency

1 NPS refers to pollution that is from diffuse sources, as opposed to a single source point. It often includes fertilizers, motor oil, grease, sediment, pet waste, and other contaminants that are picked up by rainwater or snowmelt and moved over land.

2 U.S. Environmental Protection Agency. What is Nonpoint Source Pollution? Accessed December 2011. **http://water.epa.gov/polwaste/nps/whatis.cfm**

(EPA), research has indicated that the percentage of impervious cover in a watershed is directly linked to the health of the receiving stream. Scientific consensus is that stream degradation regularly occurs at levels of impermeability as low as 10 to 20 percent.[3] According to the 2010 Richmond Green Infrastructure Assessment, 32 percent of Richmond's land area is impermeable surface. This includes parking lots, roads, railroads, buildings and structures.

Figure 3-1: City of Richmond's Impermeable Surface Area

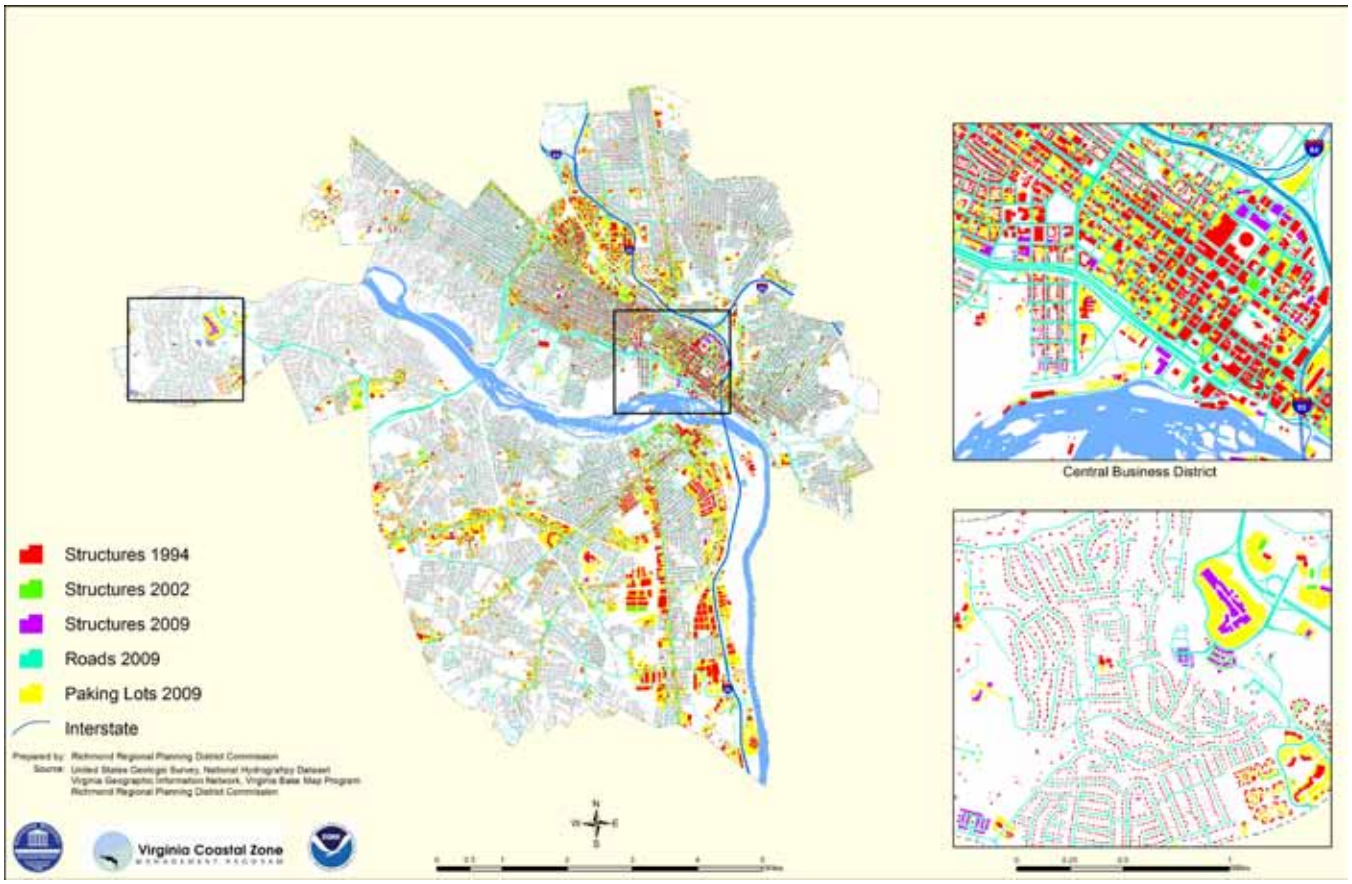


3 U.S. Environmental Protection Agency. Impervious Cover. Accessed October 2011. **http://www.epa.gov/athens/research/impervious**

This is above the level that the EPA has determined to cause degradation in the health of the watershed. While Richmond is not the only community within the watershed responsible for this degradation, and urban settings do typically have higher percentages of impermeable surfaces than non-urban settings, the city is still a significant contributor to watershed degradation. Any reductions that Richmond can make in reducing its overall impermeable surface area within the city will assist in reducing the overall impermeable cover of the entire watershed. A continuous downward trend towards 10-20 percent impermeable cover within the watershed will help minimize the impact of contaminated stormwater runoff and the city can play a leading role in those efforts.

According to feedback from stakeholder meetings, there have been mixed public perceptions on the "water quality" of the James River. It should be noted that the City of Richmond's drinking water met all EPA standards for regulated contaminants in 2010. The City's Water Treatment

Richmond Impermeable Surface Area



Plant treats up to 132 million gallons of water a day from the James River to ensure it meets EPA standards and is completely safe for drinking.[4] The Department of Public Utilities serves more than 62,000 water customers in the city and more than 500,000 throughout the region. In 2010, 59 million gallons per day were distributed to the metro area.

Good drinking water quality does not completely eliminate concerns about the overall quality of the James River's water that does not get treated for drinking. While many residents and visitors feel that it is a safe place to fish and swim, there are noteworthy advisories made by the Virginia Department of Environmental Quality (DEQ). According to DEQ's 303(d)[5] report, numerous segments of the James, including those within the city of Richmond, are impaired waters. The causes of these impairments include nutrient levels, presence of E Coli, sediment levels, and fish contaminants. The impacts of such impairments impact aquatic life, recreational activity, and fish consumption. There are numerous fish contaminant advisories, including 4 species "Do Not Eat" advisories and a large number of advisories not to eat species more than twice per month.[6][7] These advisories are due to the levels of polychlorinated biphenyls (PCBs) found.[8] PCBs are known carcinogens and have other non-cancer effects on the endocrine, reproductive, nervous, and immune systems.[9] It is likely that several sources of PCBs and other contaminants are from outside of Richmond. It will be important for the City and its residents, however, not to resign to the idea that the James' water quality is outside of its control. According to the 303(d) report, sources of contaminants include non-point source pollution, combined sewer overflows, agricultural sources, and municipal and industrial discharges. The City can continue to find ways to foster regional partnerships as well as lead by example to ensure that pollution reduction measures are taken within city boundaries and on the regional scale.

Greening Virginia's Capitol

Through the "Greening Virginia's Capitol" stormwater management project, the City of Richmond, Commonwealth, Department of General Services, and Department of Conservation and Recreation aim to make Virginia's Capitol Square one of the greenest in the county and to serve as a model for other mid-Atlantic capitols. Low impact development and stormwater management practices used are expected to reduce runoff by 64% while reducing phosphorus and nitrogen levels in the runoff by 69% and 70% respectively. The project includes porous brick pavers, rainwater harvesting, green streets, and a rain garden.

The City has already been leading by example in numerous efforts to improve its water resources. The City has a dedicated stormwater utility, which has established a commercial and residential Best Management Practices (BMP) credit program to provide financial credit to customers who implement responsible stormwater management measures on their property. The City's Watershed Master Plan and Combined Sewer Overflow Plan as well as its Stormwater Management Plan are also addressing stormwater runoff and helping to protect the watershed and river. The City operates a Combined Sewer System (CSS) for a third of the city in the downtown area,

4 Department of Public Utilities. Water Utility Page. Accessed October 2011. **http://www.richmondgov.com/PublicUtilities/QualityWaterTreatment.aspx**

5 Under Section 303(d) of the Clean Water Act, states are required to develop lists of impaired waters as well as determining Total Maximum Daily Loads (TMDL) for the amount of pollutant a waterbody can safely receive.

6 Virginia Department of Health. James River Basin. Accessed August 2011. **http://www.vdh.virginia.gov/Epidemiology/dee/PublicHealthToxicology/Advisories/JamesRiver.htm**, and Phone conversation with Department of Environmental Quality Water Quality Engineer, July 11, 2011.

7 These pollutants are measured periodically by the Department of Environmental Quality and monitored by the VA Department of Health.

8 PCB source assessments have been conducted for parts of the James and a summary can be found within the following document: Virginia Department of Environmental Quality. Summary of fish and sediment monitoring, source assessment, TMDL and remediation activities by river basin. Accessed October 2011. **http://www.deq.virginia.gov/fishtissue/documents/PCB-Strategy-Appendix-A.pdf**

9 U.S. Environmental Protection Agency. Health Effects of PCBs. Accessed October 2011. **http://www.epa.gov/epawaste/hazard/tsd/pcbs/pubs/effects.htm**

while the rest of the city operates on a municipal separate storm sewer system (MS4). Both systems require multi-year management plans to prevent watershed degradation. DPU has developed guidelines to address stormwater runoff and combined sewer overflows through public education and outreach, construction and post-construction BMPs, pollution prevention and good maintenance practices.

The Greening Virginia's Capitol Initiative is working to green Capitol Square through installation of stormwater BMPs and green infrastructure. And the City's Department of Public Works has also begun implementing a Green Alley initiative to use permeable pavers in two alley locations in the city. Similarly, Virginia Commonwealth University has also implemented numerous stormwater BMPs on its campus to address stormwater runoff, including xeriscaping, rainwater capture, and bioretention areas.[10]

How will we reach our goal?

The sustainability planning process has identified the following initiatives to protect and enhance Richmond's water resources.

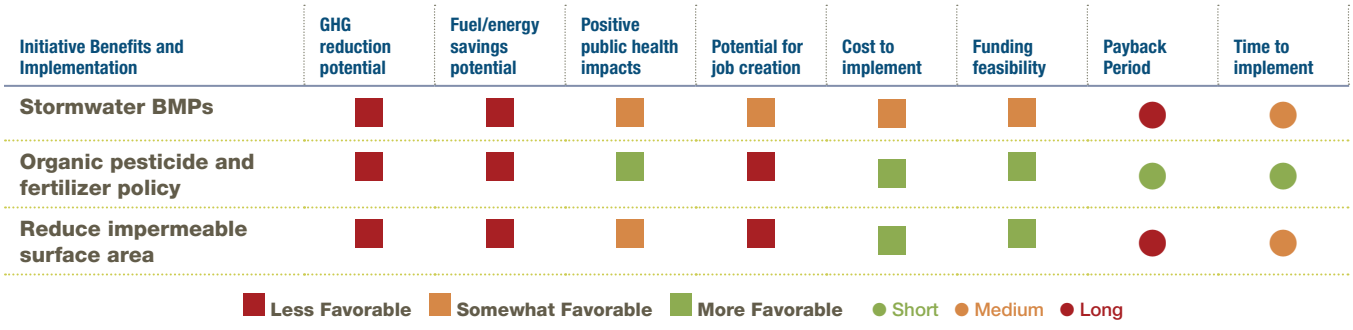
10 Virginia Commonwealth University. "Stormwater Management Plans for Campus," Accessed January 2012. **http://blog.vcu.edu/vcugoesgreen/2010/11/stormwater-management-plans-for-campus.html**

Table 3-1: Objective 1: Protect and Enhance Richmond's Water Resources.

Initiative	Summary	Implementer	Cost*	Potential Funding Source
Use stormwater BMPs in new construction and maintenance	Use stormwater best management practices in all construction and maintenance activity	Public Works; Public Utilities; Parks and Recreation; Local Institutions; Commercial Developers and Property Managers	$$	Clean Water State Revolving Fund; EPA Nonpoint Source-Related Funding Opportunities[i]
Adopt an organic pesticide and fertilizer policy	Adopt a policy to reduce amount of non-organic chemicals entering watershed through stormwater runoff	Public Works; Parks and Recreation; Procurement; Residential and Commercial Property Managers	$	General Fund
Reduce the % of impermeable surface area	Use land use regulations to reduce % of impermeable surface area	Planning and Development Review; community partners	$	General Fund

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

i U.S. Department of Environmental Protection. Nonpoint Source-Related Funding Opportunities. Accessed November 2011. **http://water.epa.gov/polwaste/nps/funding.cfm**



For more information, please refer to Appendix A: Initiative Evaluation Criteria

Use stormwater BMPs in new construction, project work, and maintenance of outdoor environment – While the City and other entities have already recognized the importance of using best management practices to reduce stormwater runoff, the City and other commercial and institutional entities should build on its stormwater management plan to adopt formal policies that require the use of stormwater BMPs (such as Low-Impact Development) in all operations and construction projects, including those done internally and through contracted work. BMPs include such measures as retention ponds, bioswales, filter strips, green roofs, rain gardens, and other measures that improve infiltration and reduce impermeable surface cover. Use of stormwater BMPs is, in fact, a requirement for localities throughout the Chesapeake Bay Watershed. Documentation of stormwater strategies is part of the Phase II Watershed Implementation Plan which requires localities within the Chesapeake Bay states to document how they will address meeting Total Maximum Daily Load (TMDL) goals[11]. It is anticipated that Richmond's strategies will be documented in a report submitted through the RRPDC in February 2012.

Implementing such a policy will require an investment of financial and other resources. However the City and numerous statewide and local institutions are already knowledgeable of and experienced in using stormwater BMPs. There will likely be capital expenditures in the implementation of the BMPs themselves, but construction costs vary depending on the project. The primary benefit associated with implementing stormwater BMPs is the reduction in stormwater runoff and associated pollutants entering water resources, resulting in improved water quality. There is potential for job creation or retention in the labor to implement measures and in the supply of materials. The economic payback for such efforts is indirect and comes in the form of reduced long term maintenance and repair costs and reduced costs for treatment of health problems linked to water pollution.[12]

11 A Phase I and Phase II Watershed Implementation Plan was mandated by the U.S. EPA in accordance with the Clean Water Act. Virginia's Phase I WIP was submitted in November 2010. Virginia Department of Conservation and Recreation. "Bay Total Maximum Daily Load." Accessed January 2012. **http://www.dcr.virginia.gov/vabaytmdl/index.shtml**

12 U.S. Environmental Protection Agency. (1999). Costs and Benefits of Stormwater BMPs. In Preliminary Data Summary of Urban Stormwater Best Management Practices (chap. 7). EPA-821-R-99-012. Accessed October 2011. **http://water.epa.gov/scitech/wastetech/guide/stormwater/upload/2006_10_31_guide_stormwater_usw_d.pdf**

The City can also reach out to the Virginia Municipal Stormwater Association, Water Environment Federation, EPA, DCR, National Association of Clean Water Agencies, and the Virginia Association of Municipal Wastewater Agencies in an effort to collaborate and share resources.

Adopt an organic pesticide and fertilizer policy – The City as well as local institutions, commercial and residential developers and property managers should adopt and implement policies that eliminate the use of toxic chemicals in landscaping. At the state level, Virginia already passed legislation in 2010 eliminating the sale of fertilizer for lawns that contains phosphorus.[13] This law will reduce phosphorus levels in the local watershed while also avoiding the costs of treating/removing phosphorous once it gets into the watershed. A local policy should build on the state law and call for Integrated Pest Management, biopesticides and organic soil amendments and fertilizers.[14] The policy could specify that chemical substances be used only as a last resort and only at levels that meet standards for health and safety. Those implementing such a policy can work with the Virginia Cooperative Extension[15] and the Virginia Tech Pesticide Programs[16] to learn more about best practices applicable to Richmond. The City and other institutions may also want to consider participation in the EPA PestWise program[17], which offers technical assistance and grant opportunities focused on pest management.

Such a policy typically has economic benefits in reduced use of (and therefore purchase of) conventional pesticides and fertilizers as well as in avoided costs to treat and repair waterways impaired by contaminated runoff. Using native, climate-appropriate species further reduces the need for fertilizers. The health benefits include reducing risks to landscape workers and also reducing the amount of excess nutrients and harmful chemicals entering the watershed. For

13 Chesapeake Bay Foundation. Bay Daily. "New Fertilizer Law Will Cut Bay Pollution, Save Money." Accessed January 2012. **http://cbf.typepad.com/bay_daily/2011/02/new-fertilizer-law-will-cut-bay-pollution-save-money.html**

14 U.S. Environmental Protection Agency. Integrated Pest Management. Accessed October 2011. **http://www.epa.gov/agriculture/tipm.html**

15 Virginia Cooperative Extension. Accessed November 2011. **http://www.ext.vt.edu/**

16 Virginia Tech Pesticide Programs. Accessed November 2011. **http://www.vtpp.ext.vt.edu/**

17 U.S. Environmental Protection Agency. PestWise. Accessed October 2011. **http://www.epa.gov/pesp**

implementation of a City policy, Procurement Services, Public Works, Parks and Recreation, Richmond Public Schools' maintenance staff, the Richmond Health District, and perhaps other departments will need to coordinate to develop the specifics of the policy and educate relevant staff on implementation.

Mayor Jones and city officials open the 5th Street Green Alley with a splash.

Reduce the percentage of impermeable surface area within the city through land use regulations – Through this initiative, the City of Richmond would establish requirements for new development in the city, through permitting or other regulations, requiring a certain percentage of surface area be green space or permeable. Permeable surfaces decrease stormwater runoff and associated contaminant entry into nearby waters. Reduced permeable surface area is also beneficial for groundwater recharge. The City's Department of Planning and Development Review should implement a requirement through the Development Review process that requires any new development to include a certain percentage of the surface area be permeable, or alternatively caps the percentage of impermeable surface area.

The regulation of impermeable surface area can be handled in various ways – through both zoning and permitting. Zoning regulations can be updated to change the requirements for parking spaces/parking area, setbacks, size of streets, sidewalk requirements, etc. to minimize the amount of paved land. It will be essential to link any land use requirements to overall planning goals for impermeable cover throughout the city. This should be a low-cost measure for the City. It will require staff time on the part of the Planning Commission and or Planning and Development Review department to evaluate and update regulations, get them adopted formally by the City, and to educate the community on the changes made.

Objective 2: Enable the Richmond community to use water wisely

Recognizing the significance of water as a natural resource also means respecting that it is a finite one. The Richmond community has set an objective of using water wisely so as to conserve water and use it as efficiently as possible. Apart from the importance of water conservation globally, there exists an inextricable link between water use and energy consumption. Water consumption requires energy for pumping, treatment, distribution, and for the heating of hot water.

Where are we now?

On average water consumption is less in Richmond than in much of the U.S. The following table shows water consumption in Richmond for Fiscal Year 2011[18].

18 Provided by Richmond Department of Public Utilities, via email communication, January 2012.

Table 3-2: Water Consumption, Richmond VA, FY2011

	Annual Gallons per Customer	Gallons per Customer per Day	Gallons per Capita per Day
Residential	66,198	181	82
Commercial	480,141	NA	NA
Municipal	624,356	NA	NA
Industrial	3,739,177	NA	NA

According to the EPA's WaterSense program, the average American uses 100 gallons of water per day, so Richmond's residents are consuming less on average. However, through more efficient water use, using efficient appliances, low-flow fixtures, collecting rainwater, and re-using water where possible, these numbers can be easily improved.

Richmond has already begun to recognize the benefits of wise water use and has been implementing a number of measures. The Department of Public Utilities (DPU) incorporated the EPA WaterSense concepts into its 2008 Water Supply Plan and instituted a Cost of Service rate structure to promote water conservation. To further promote water conservation, some City fire stations have started using captured rainwater to wash fire trucks. The DPU also has a program to provide free low-flow showerheads and fixtures to interested residents.

Additionally, the City, Virginia Commonwealth University, and the University of Richmond have all actively engaged community members in education about water and resource conservation. Each has taken steps to reduce water consumption by using water-efficient fixtures in all new construction.

How will we reach our goal?

To meet the objective of enabling the Richmond community to use water wisely, the following initiatives were identified.

Table 3-3: Objective 2: Enable the Richmond community to use water wisely

Initiative	Summary	Implementer	Cost*	Potential Funding Source
Install low-flow fixtures in City buildings	Install water-efficient fixtures in all City buildings	Public Works - Facilities Mgmt. Div.	$	General Fund or Short-term loan
Create a rebate program for water-efficient fixtures and appliances	Create a rebate program for residents to purchase water-efficient fixtures and appliances	Public Utilities	$	General Fund (Utility Payments)
Promote rainwater collection systems	Promote rainwater collection systems for use in homes and businesses	Public Utilities; Planning and Development Review; Redevelopment and Housing Authority	$	Alternative Water Supply Assistance Fund[i]

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

i This fund was established by Senate Bill 1416 in 2001 to be administered by the VA Dept of Housing and Community Development. There is limited information on the status of the fund at this time, but the DHCD could be consulted for additional information and resources in any efforts to promote rainwater collection systems.

	Broader Impacts Upon Implementation				Economic/Time Impacts for Implementer			
Initiative Benefits and Implementation	GHG reduction potential	Fuel/energy savings potential	Positive public health impacts	Potential for job creation	Cost to implement	Funding feasibility	Payback Period	Time to implement
Low-flow fixtures in City buildings	Somewhat	Somewhat	Less	Less	More	More	Short	Short
Rebate program for water-efficient fixtures and appliances	Somewhat	Somewhat	Less	Less	More	Somewhat	Long	Somewhat
Rainwater collection systems	Less	Less	Somewhat	Less	More	More	Long	Somewhat

Less Favorable · Somewhat Favorable · More Favorable · Short · Medium · Long

For more information, please refer to Appendix A: Initiative Evaluation Criteria

Install low-flow fixtures in all City buildings – The City should install water-efficient fixtures throughout existing City buildings to reduce water consumption, including low-flow faucet aerators and dual-flush toilets. The City will conserve water, thereby reducing energy and water use, and lead the community by example.

The cost premium is low for water efficient fixtures and the payback is short, typically less than two years. Water efficient fixtures also reduce energy consumption since energy is required in the pumping, distribution, and heating of water. Greenhouse gas emissions reductions could result from this reduction in energy use, though it will be difficult to directly quantify. The Facilities Management Division of the Public Works Department could implement this measure.

Create a rebate program for low-flow fixtures and water-efficient appliances – The City's Department of Public Utilities (DPU) already recognizes the benefits of using water wisely. As an EPA WaterSense partner, DPU has committed to water efficiency and conservation and providing resources to its customers to use water wisely and save money. The City should take an additional step and establish a rebate program through DPU for residents to purchase low-flow fixtures and water-efficient appliances that will reduce water consumption and save residents money over time. Typically a rebate is provided to the purchaser once they have provided proof of purchase and installation.

Water conservation programs such as a rebate program allow the water utility to continue to meet the water needs of the community while deferring costs associated with having to expand capacity, which would require significant capital expenditures. Therefore, the payback for such a program to the utility may be long-term, but would accelerate the payback to consumers who may not have otherwise purchased a water-saving fixture or appliance.

There are some overhead costs to implementing such a program. The Alliance for Water Efficiency estimates these to be anywhere from $25,000 to $100,000.[19] Investment must be made in a tracking system, administration, and marketing materials. The City may want to consider teaming up with local retailers to share resources for promoting the program.

Promote rainwater collection systems –The intent of this initiative is to encourage rainwater collection for use in homes and businesses to offset water consumption from Richmond's water supply, with the additional benefit of reducing stormwater runoff and overflows. These systems reduce the waste of potable water for non-potable needs by capturing rainwater and distributing it for those non-potable water uses such as toilet flushing, landscape irrigation, or car washing. Additionally rainwater harvesting systems are 95 percent efficient at collecting rooftop runoff.[20] This can be encouraged through rebate programs for rain barrels and perhaps other equipment that could be used in rainwater collection. The rebate programs would require similar setup and implementation as the rebate program described in the prior initiative.

Rainwater harvesting/reclamation systems provide numerous benefits to the City and the community. As population increases, so increases the demand on water supplies. Rainwater harvesting reduces the demand for taking surface and groundwater to meet those increasing demands. It also manages stormwater, thus reducing pollution. Given Richmond's average annual precipitation rates of 42-46 inches, rainwater harvesting systems could catch between 23,000 and 35,000 gallons annually per 1,000 square feet of roof in residential or commercial settings.[21] Design and installation of these systems can be a driver for job creation and economic development as design, installation, and materials production requires a wide network of professionals.

The City should initiate a program to educate community members and members of the building and retrofitting community about the opportunities inherent in water reclamation systems. This program could also address potential concerns about incorporating these systems into building design and retrofit projects. The Virginia Rainwater Harvesting Manual developed in 2007 by the Cabell Brand Center provides very detailed guidance and information on these systems specific to Virginia.

19 Alliance for Water Efficiency. Rebate and Voucher Program Introduction. Accessed October 2011. **http://www.allianceforwaterefficiency.org/rebate_voucher.aspx**

20 The Cabell Brand Center. (2007). Virginia Rainwater Harvesting Manual.

21 Ibid.

Objective 3: Improve the City's solid waste system

A healthy and sustainable urban environment also requires one that conserves its material resources. RVAgreen includes an objective to improve the City's solid waste system, which includes the often-taught basics of "reduce, reuse, and recycle." Reduction of materials reduces the amount of waste entering the waste stream, reduces lifecycle energy use from material production, limits raw material extraction, and decreases associated emissions from creation and transportation of materials to the city. For the materials that are consumed throughout the city, it is important to reuse and recycle the materials to the greatest extent possible to avoid the waste ending up in a landfill, where significant methane emissions are then released. Reusing and recycling materials can also provide revenue generation and economic development opportunities because some waste materials are of value to others and can be sold, generating revenue while reusing the material at the same time. Given the right infrastructure, waste can also be used as a fuel source for energy generation through municipal solid waste combustion, food waste-to-energy systems, methane recovery, or other similar technologies.

Where are we now?

The City of Richmond offers curbside recycling pickup for single family homes (and multi-family residences with fewer than four units). Central Virginia Waste Management Authority (CVWMA) also offers four recycling drop-off locations citywide for those without curbside pickup. While recycling rates have been increasing slightly from year to year, in its baseline year of 2008, the City collected only 6,903 tons of recycling. Compared with the 88,004 tons of waste collected in 2008, curbside recycling created a less than eight percent diversion rate. Richmond has 42.1 percent of its residents living in multi-unit structures. This population does not have curbside recycling and, therefore, recycling is not occurring at as high a rate as it could be. The City also does not provide recycling services to businesses, which must contract with private vendors if they choose to recycle at all.

According to Richmond's 2008 Greenhouse Gas Inventory, municipal solid waste that waste generated by residents within the city and picked up by the City's waste haulers was responsible for 12 percent of the City's 173,660 metric tons of CO_2e from government operations. While solid waste emissions were only 2 percent of the entire community's emissions, including all waste generated within the city, it still accounted for 47,773 metric tons of CO_2e. Overall however, the City has been making great strides with regards to solid waste management.

A key milestone in waste management was the implementation of single stream recycling in 2001, which makes recycling easier, thus increasing the recycling rate and reducing the vehicle fleet required for pickup. The Department of Public Works and CVWMA also developed an education and enrollment campaign to increase residential and business recycling throughout the city. A "Sustainability Scan on Residential Recycling" completed by students at VCU has identified a list of potential partners for expansion of recycling to multi-residential buildings.[22] These partners could be useful in the City's efforts to expand and increase recycling throughout the city. The City currently minimizes its own waste production by conserving paper and using post-consumer recycled paper in municipal offices. It also recycles within city facilities.

How will we reach our goal?

The following new initiatives were prioritized as the top ways to improve Richmond's solid waste system and increase recycling rates.

22 Evers, Jenna, and Houston, Alecia, "City of Richmond, VA Sustainability Scan: Residential Recycling," 2011.

Figure 3-2: Richmond Government Operations GHG Emissions by Sector

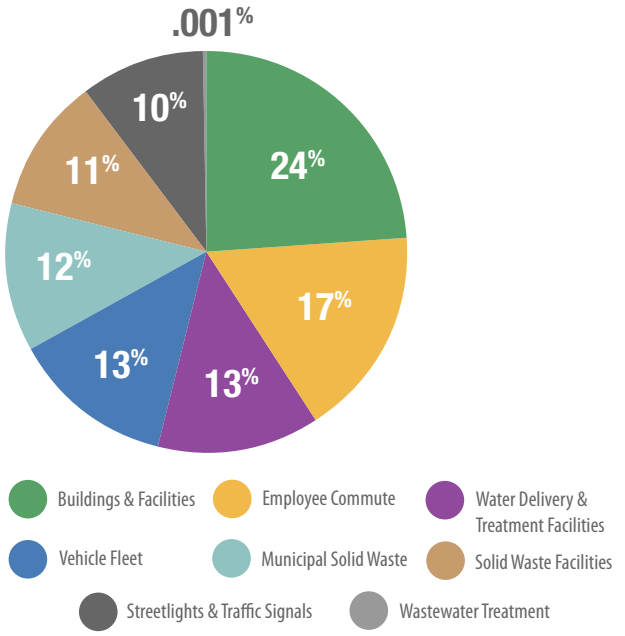


Figure 3-3: Richmond Community GHG Emissions by Sector

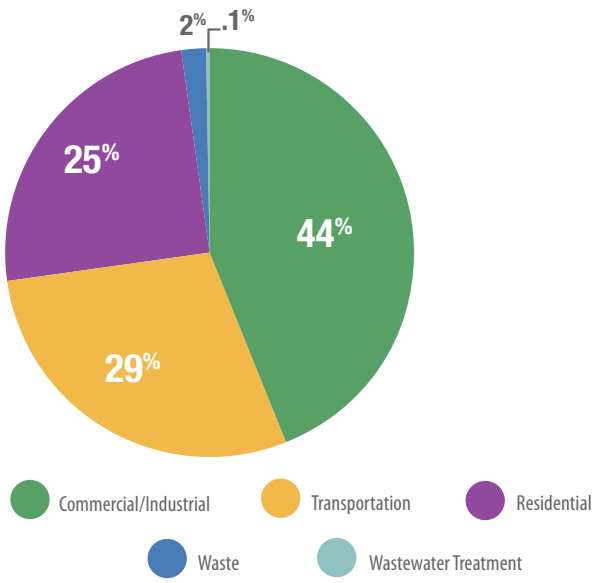


Table 3-4: Objective 3: Improve the City's Solid Waste System

Initiative	Summary	Implementer	Cost*	Potential Funding Source
Expand recycling service to commercial and multi-family sectors	Expand recycling service to commercial and multi-family buildings	Public Works; Budget and Strategic Planning; Procurement Services	$	Cost covered by collected fees
Adopt a material reduction procurement policy	Adopt a procurement policy that emphasizes materials reduction	Procurement Services; Institutions; State Agencies; Corporations	$	General Fund
Implement a Pay As You Throw program	Adopt a Pay As You Throw program to incentivize increased recycling	Public Works; Budget and Strategic Planning	$	This is essentially a financing mechanism in itself. The cost to implement will pay for itself in increased revenues.

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

	Broader Impacts Upon Implementation				Economic/Time Impacts for Implementer			
Initiative Benefits and Implementation	GHG reduction potential	Fuel/energy savings potential	Positive public health impacts	Potential for job creation	Cost to implement	Funding feasibility	Payback Period	Time to implement
Expand recycling service	■	■	■	■	■	■	●	●
Material reduction procurement policy	■	■	■	■	■	■	●	●
Pay As You Throw program	■	■	■	■	■	■	●	●

■ Less Favorable ■ Somewhat Favorable ■ More Favorable ● Short ● Medium ● Long

For more information, please refer to Appendix A: Initiative Evaluation Criteria

Expand recycling service to commercial and multi-family sectors – Through the RVAgreen development process, stakeholders indicated that the City should expand its recycling services to the commercial and multi-family sectors. Often these sectors do not recycle because they have to contract directly with a recycling company to provide pickup service. With 42 percent of Richmond's population living in multi-family housing and commercial waste contributing greatly to the overall waste production, getting these sectors to recycle is critical to improving the city's solid waste system.

The City of Philadelphia reported few upfront costs and anticipates a savings of $17 million per year from the expansion of their recycling services.

There will be costs to expand recycling pickup services to larger buildings. Large and multiple toters need to be provided, education and promotion of the services will need to happen, and the recycling vehicles will have to re-strategize their pickup routes and perhaps expand their pickup area. However, the fact that the City has already switched to single stream recycling will simplify some planning logistics. The Public Works Department will need to ensure that the current recycling center has the capacity to handle an increase in recyclables or, alternatively, seek an additional recycling facility to handle the additional volume. Public Works will also need to work with the Department of Public Utilities and the Budget and Strategic Planning office to establish appropriate fees and administration of fees to the commercial and multi-family sectors. Coordination with the Central Virginia Waste Management Authority (CVWMA) will also be required. If planned accordingly, the collection of fees can pay for the expansion of services. In fact, the City may save money through reduced costs for solid waste pickup and landfill tipping fees.

Adopt a City procurement policy that emphasizes material reduction – The City should lead by example and adopt an Environmentally Preferable Purchasing (EPP) Policy that emphasizes material reduction. This can include specifications for only high recycled-content paper, sustainably harvested wood products, products that come in less packaging, and reducing the amount of disposable kitchen/event products purchased. There should be an overall emphasis on reducing the amount of material purchased in the first place, then on purchasing goods that do not produce a lot of waste or require much in the way of raw material extraction to be produced. **Figure 3-4** shows a sustainable approach to materials and waste management, emphasizing reducing the purchase and use of goods first, then ensuring that goods are made of recycled materials, are reused if possible, and then finally recycled. This is an initiative that can and should be implemented throughout the community, not only by the City. Local higher education institutions and businesses should adopt EPP policies as well to reduce their individual footprint and to promote economic development and sustainable purchasing practices throughout the community.

While some environmentally preferable goods cost more than traditional ones, that cost premium has been decreasing in recent years due to higher demand and a more competitive supply market. Additionally, reducing the amount of goods purchased for ongoing activities– for example, eliminating the purchase of disposable products for kitchens and certain events—will reduce costs. Procurement Services will need to develop the policy. There are numerous examples of such policies since many municipalities have adopted them all over the country. Additional benefits to the community as a whole will be seen in the generation of more business for local suppliers of environmentally friendly products, promoting green economic development within the city.

Figure 3-4: Approach to Material Reduction and Waste Management

Implement a Pay As You Throw program – A Pay As You Throw (PAYT) program focuses on creating disincentives for trash while incentivizing recycling by charging a higher price for collection of trash than the collection of recycling. Typically, collection fees are based on weight or number of bins.

Currently the City charges a fee of $1.69/month for recycling and $17.50/month for solid waste collection[23]. This is charged through a fee added to the water utility bill. While the charge is already higher for trash than for recycling, the resident pays a standard fee regardless of their recycling behavior. The City could do what other communities have done, which is to charge residents for trash by the bag or by the bin and restrict the type of bag or bin that can be used. Some communities have done this by requiring a particular plastic bag be used for trash that must be purchased. In this way, residents are paying more for every additional bag of trash. The purchase of the bags creates a revenue stream by incorporating disposal fees and bag costs into the bag purchase price. It creates an incentive for residents to recycle more items or produce less waste to avoid the added cost of additional bag purchases.

This program should be implemented by the Department of Public Works. Initial costs to implement may include consulting or planning services to determine the feasibility and detailed structure of the program. The DPW could use the PAYT fees to fund waste collection services and eliminate or reduce fees for recycling services. Other communities have achieved substantial net savings from implementing this program while also significantly increasing recycling rates. A study done by Duke University and the EPA suggests that for each person participating in a PAYT program, emissions are reduced by 0.085 metric tons of CO_2e. If the entire population of Richmond participated in the PAYT program, that could result in a reduction of more than 17,000 metric tons of CO_2e – a 36 percent reduction in emissions from the community waste sector. These potential greenhouse gas reductions are additional support for implementing such a program.

Objective 4: Strive to continuously improve the quality of Richmond's indoor and outdoor air

A critical element of a healthy urban environment is to have clean air surrounding its inhabitants, both inside buildings and outdoors. Reducing ambient air pollution has obvious benefits, and healthy indoor air is equally important. The EPA estimates that the average American spends 90 percent of their time indoors and pollutants are often present in concentrations two to five times greater indoors than out.[24]

Where are we now?

According to a study by the Asthma and Allergy Foundation of America, Richmond is the country's Asthma Capital for both 2010 and 2011.[25] Additionally, the non-cancer respiratory risk for residents of Richmond, VA is

23 Office of the Mayor, City of Richmond; Richmond Biennial Fiscal Plan 2012-2013. Accessed October 2011. **http://www.richmondgov.com/Budget/documents/BiennialPlans/2012-2013_AdoptedBiennialFiscalPlan.pdf**

24 U.S. Environmental Protection Agency. Buildings and the Environment: A Statistical Summary. Accessed October 2011. **http://www.epa.gov/greenbuilding/pubs/gbstats.pdf**

25 Asthma and Allergy Foundation of America. Richmond Is Asthma Capital Again. Accessed August 2011. **http://www.asthmacapitals.com**

more than twice the risk of a Virginia Resident and almost 1.4 times the risk for the average United States citizen[26]. While the city's outdoor air quality meets standards established by the U.S. Environmental Protection Agency, these numbers are troubling and, given the amount of time the average person spends indoors, it is important to continuously improve the city's air quality for Richmond residents, especially those suffering from asthma and other respiratory illnesses. Improving air quality also reduces healthcare costs for citizens, employers, and City government.

26 U.S. Environmental Protection Agency, National - Scale Air Toxics Assessment. 2002 NATA US Cancer Risks Tract. Accessed October 2011. **http://www.epa.gov/ttn/atw/nata2002/tables.html#google**

How will we reach our goal?

To further the goal of continuous improvement of the quality of the community's indoor and outdoor air, the RVAgreen process has resulted in the following recommended initiatives.

Table 3-5: Objective 4: Strive to Continuously Improve the Quality of Richmond's Indoor and Outdoor Air

Initiative	Summary	Implementer	Cost*	Potential Funding Source
Adopt a green IAQ policy and/or O&M practices in City buildings	Adopt a green Indoor Air Quality policy and/or Operations & Maintenance standards for City buildings	Public Works; Procurement	$	General Fund
Develop a Traffic Management Plan to reduce congestion	Conduct a traffic management plan to identify strategies for reducing congestions	Public Works; Planning and Development Review	$	FHA Congestion Mitigation and Air Quality program; VA DOT Local Assistance Division
Participate in the Green and Healthy Homes Initiative	Participate in the Green and Healthy Homes Initiative to improve housing and promote sustainability	Health Department; Redevelopment and Housing Authority; community partners	$	General Fund

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

	Broader Impacts Upon Implementation				Economic/Time Impacts for Implementer			
Initiative Benefits and Implementation	GHG reduction potential	Fuel/energy savings potential	Positive public health impacts	Potential for job creation	Cost to implement	Funding feasibility	Payback Period	Time to implement
Green IAQ/O&M Policy	■	■	■	■	■	■	●	●
Traffic Management Plan to reduce congestion	■	■	■	■	■	■	●	●
Green and Healthy Homes Program	■	■	■	■	■	■	●	●

■ Less Favorable ■ Somewhat Favorable ■ More Favorable ● Short ● Medium ● Long

For more information, please refer to Appendix A: Initiative Evaluation Criteria

Adopt a green indoor air quality policy and/or operations and maintenance practice in City buildings – This policy or practice would include numerous standards that improve the indoor air quality of City buildings. It can include using certified green cleaning products, using low- or no-VOC products, formaldehyde-free products, proper maintenance of natural and mechanical ventilation systems, and other efforts that will improve the indoor environment for City employees and visitors.

Such a policy requires little, capital investment, and may save the City money. Savings will come from avoided repair costs due to preventive maintenance measures, reduced absenteeism and worker illness, and possibly energy costs through proper maintenance of ventilation systems. This initiative will require coordination with Procurement Services (for purchasing of green cleaning products, low-VOC paints and adhesives, etc), the Facilities Management Division of Public Works, Richmond Public Schools, and possibly the Richmond Health District.

Reduce street congestion through a traffic management plan – The City could develop a team and/or hire a consultant to oversee the evaluation of congested areas of the city and develop a plan for reducing congestion in those areas through proven design and best management practices for traffic management. It is important to note that this initiative should not duplicate the work being done through the Richmond Connects program nor any initiatives recommended in the Transportation chapter of this Plan. However, the City could pursue development of a study or plan that would address congestion issues and improve air quality.

The U.S. Department of Transportation's Federal Highway Administration administers a Congestion Mitigation and Air Quality (CMAQ) program, which allocates funding to support a variety of transportation-environment projects that can reduce congestion and improve air quality[27]. This could include the redesign of intersections, installation of roundabouts, traffic signal synchronization, signal upgrades, traffic signage evaluation and improvements, and other related projects. Funds are allocated to Virginia through the Commonwealth Transportation Board (CTB) and locally managed through RRPDC.

As a starting point, the City could have an assessment and or feasibility study done that could make recommendations for these types of improvements to be implemented as funding permits. A comprehensive study or plan could cost as much as $500,000 or more[28]. However, it may be possible

The Green and Healthy Homes Initiative ensures homes are safe, healthy, energy efficient, and sustainable. Richmond could become one of the first cities designated as a "Green and Healthy" city under the program.

The City has already adopted a policy requiring that new buildings be built to Leadership in Energy and Environmental Design (LEED) standards. The City could consider adopting a similar policy of using LEED for Existing Buildings standards for all of the existing municipal buildings. The LEED EB guidelines include measures for Indoor Air Quality, while other measures in Water, Energy, Site, and Materials Management could serve as helpful guidelines for the City to achieve several other objectives outlined in this plan.

27 U.S. Department of Transportation, Federal Highway Administration, "Congestion Mitigation and Air Quality Improvement (CMAQ) Program," **http://www.fhwa.dot.gov/environment/air_quality/cmaq**, accessed November 2011

28 Personal communication with David Beardsley, Director of Traffic Engineering, VHB, November 17, 2011.

for the City to break this down into studies or plans for specific improvement areas, such as a traffic light synchronization study. A study itself will not produce cost savings, GHG reductions, job creation or public health benefits. However, the implementation of recommended improvements could have extensive medium- to long-term benefits.

Participate in the Green and Healthy Homes Initiative – The Green and Healthy Homes Initiative is a public-private partnership focused on improving housing in economically challenged neighborhoods to ensure that homes are safe, healthy, energy efficient, and sustainable. A formal set of standards is under development to designate cities as "Green and Healthy" and Richmond could be recognized as a leader for being one of the first cities to participate.

Participation in the program is free and costs to implement should be low. The program will result in energy improvements and emissions reductions at the community level. Homes will be safer, healthier, and more affordable for residents, which is especially important to the low-income population of Richmond. The Richmond Redevelopment and Housing Authority should work with the Richmond Health District to create a strategy for participation in the program and to begin implementation of its requirements. This initiative is similar but separate from the Healthy Homes Initiative that is currently run through the Richmond Health District. The two programs are complementary and could be run together. It will be helpful for these entities to also work with other health and housing-related agencies in the broader Richmond community, including the Virginia Housing Coalition, Virginia Supportive Housing, the Better Housing Coalition, Home Builders Association of Virginia, Hands On Greater Richmond, and Habitat for Humanity Virginia.

Table 3-6: Recommended Indicators and Targets for Environment Focus Area

Objective	Suggested Indicators	Suggested Targets
Protect and enhance Richmond's water resources	# of DEQ "Do Not Eat" advisories	Zero advisories by 2025
	% impervious cover	Downward trend
	Volume of chemicals/hazard materials purchased by City	Downward trend
	Water infiltration rates	Upward trend
Enable the Richmond community to use water wisely	Water consumption - per capita citywide	Downward trend
	Water consumption - City government	Downward trend
	Gallons of water harvested	Upward trend
Improve the City's solid waste system	Recycling/Diversion Rate	Upward trend
	Tons landfilled	Downward trend
	Generation of waste *(per capita or by sector)*	Downward trend
	Recycled content of purchased goods	Upward trend in both the amount of recycled content in the goods and the number of goods purchased that are from recycled content
Strive to continuously improve the quality of Richmond's indoor and outdoor air	Air quality measurements *(those taken already for EPA standards compliance)*	100% compliance
	# of green homes built or % of housing built green	Upward trend
	Asthma Rates citywide	Downward trend

4. Open Space & Land Use

The way a city plans for new development, including the location and distribution of different land uses, buildings, housing, and open space resources, has a tremendous effect on the day to day quality of life of its residents. In addition, thoughtful planning for new development, housing, and parks and recreational resources can contribute significantly to the achievement of sustainability goals by reducing the overall energy use of residents, promoting a healthy lifestyle, and offering a greater choice of housing options. Richmond's vision for sustainability includes fostering the liveliness and energy of Richmond as an important urban center with all the park and open space amenities that connect the community and its residents to the natural world.

Goal

Develop a thriving cityscape that connects people to natural spaces

Objectives

1. Encourage 24/7 communities with more sustainable and affordable housing options throughout the city
2. Increase accessibility, quantity, and quality of public space
3. Increase Richmond's tree canopy
4. Protect historic building stock and promote the use of vacant and blighted property

Objective 1: Encourage 24/7 communities with more sustainable and affordable housing options throughout the city

Mixed-use living in the Shockoe Bottom district.

Through the Plan development process, a key identified objective is to encourage the development of lively and diverse neighborhoods that are active throughout the day and night, and include a mix of land uses. Some primary planning tools that the City has available to achieve this objective are local zoning, ordinances and codes. These tools can be developed or amended to promote the efficient use of land and mixed land uses and to create more affordable housing. These efforts will also help to promote economic development by increasing the city's vibrancy which will in turn attract new residents and businesses.

Where are we now?

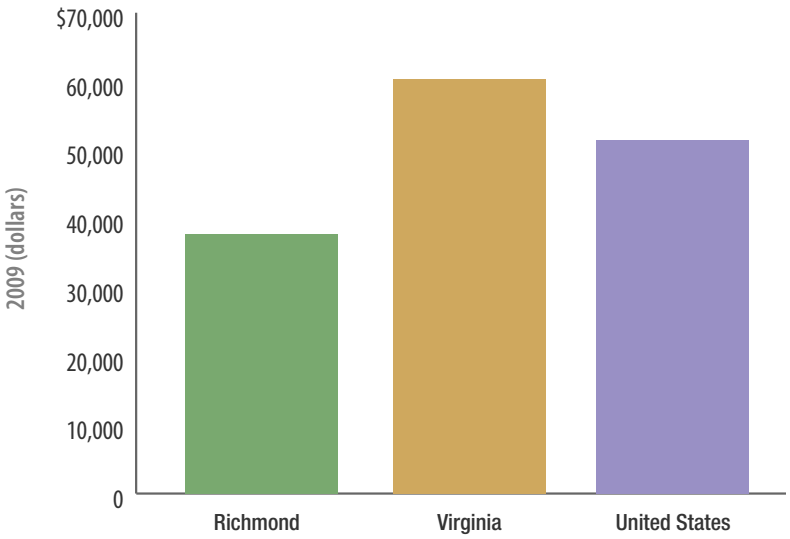
The City has begun to develop standards and policies that support 24/7 communities including the following:

- The City is currently working with the Center for Disease Control and the Congress for a New Urbanism to create pedestrian-oriented development standards. The City's zoning ordinance already contains several mixed-use districts.
- The City has made the development and support of "unique, healthy and inclusive communities and neighborhoods" a leading goal of its Biennial Fiscal Plan.
- The City of Richmond's Downtown Master Plan calls for the establishment of mixed-use neighborhoods in the downtown area to help revitalize areas and create more vibrancy.

Affordable housing is an important characteristic of a sustainable community. Affordable housing is generally defined as housing that requires a household to pay no more than 30 percent of its annual income on housing. Families who spend more than 30 percent of their income for housing are considered cost burdened and may have difficulty affording necessities such as food, clothing, transportation and medical care.[1] The median household income in Richmond is lower than the state and national averages at just under $40,000 (see **Figure 4-1**).

1 U.S. Department of Housing and Urban Development website, Affordable Housing, **http://www.hud.gov/offices/cpd/affordablehousing/. Accessed November 16, 2011.**

Figure 4-1: Median Household Income (Source: 2005-2009 American Community Survey)



Fortunately, Richmond has a number of organizations devoted to the provision and rehabilitation of high-quality affordable housing. The Richmond Redevelopment and Housing Authority (RRHA) is active and one of the largest housing authorities in the state. RRHA, a property management and real estate development company, provides affordable housing and leads community revitalization efforts throughout the city. RRHA, through its Property Management and Assisted Housing rental housing program, serves nearly 10,000 residents in approximately 4,100 public housing units and, through the federal government's housing choice voucher program , which provides housing assistance to nearly 3,000 families. The housing choice voucher program provides a housing subsidy to very low-income families, the elderly, and the disabled to afford decent, safe, and sanitary housing in the private market.

Through its real estate and community development initiatives, RRHA offers homeownership opportunities and leads neighborhood redevelopment and conservation programs throughout Richmond in partnership with the City. Another important organization that is a community leader in providing affordable housing is Richmond's Better Housing Coalition (BHC), a private, non-profit devoted to partnering with public agencies, businesses, and community-based organizations to provide affordable housing and revitalize neighborhoods. BHC manages a number of multifamily developments including 7 active senior communities for low- to moderate-income older adults.

How will we reach our goal?

The Plan development process identified the following recommendations to encourage 24/7 communities with more sustainable and affordable housing options throughout the city.

Table 4-1: Objective 1: Encourage 24/7 Communities with more Sustainable and Affordable Housing Options throughout the City

Initiative	Summary	Implementer	Cost*	Potential Funding Sources
Zoning changes to promote higher density and mixed use	Implement zoning changes that promote higher density and mixed-use	Planning and Development Review; City Council	$	General Fund
Adopt an energy efficient housing policy	Adopt a policy that new housing be built to green and/ or energy efficiency standards	Planning and Development Review; City Council	$	General Fund; developer pays to meet new standard
Establish an affordable housing requirement	Require a percentage of new housing developments to be affordable	Planning Department; City Council	$	General Fund; developer pays to meet new standard

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

	Broader Impacts Upon Implementation				Economic/Time Impacts for Implementer			
Initiative Benefits and Implementation	GHG reduction potential	Fuel/energy savings potential	Positive public health impacts	Potential for job creation	Cost to implement	Funding feasibility	Payback Period	Time to implement
Zoning for higher density and mixed use	More Favorable	More Favorable	Somewhat Favorable	Somewhat Favorable	More Favorable	More Favorable	Long	Medium
Energy efficient housing policy	Somewhat Favorable	Somewhat Favorable	Somewhat Favorable	Less Favorable	More Favorable	More Favorable	Long	Short
Affordable housing requirement	Less Favorable	Less Favorable	Less Favorable	Less Favorable	More Favorable	More Favorable	Long	Medium

Less Favorable · Somewhat Favorable · More Favorable · Short · Medium · Long

For more information, please refer to Appendix A: Initiative Evaluation Criteria

Zoning for higher density and mixed use – Adopting zoning changes that promote higher density and mixed uses can have multiple benefits for a community, including utilizing land more efficiently, reducing the number and length of vehicle trips, and improving public health by increasing opportunities to walk and bike. Additionally, areas that provide opportunities to live, work, and play are particularly attractive to a young, mobile workforce and to active retirees, both of which are key demographic targets to stimulate economic growth. Through changing land use patterns and reducing automobile trips, this initiative can significantly reduce greenhouse gas and criteria air pollutant emissions. Zoning revisions will likely be moderate in cost depending on whether an external consultant is required to draft the proposed zoning changes or if it can be completed in-house. These zoning changes can be done during typical or comprehensive planning processes, and grants may be available as well. In addition, denser, more walkable neighborhoods encourage residents to walk more resulting in health benefits, such as better cardiovascular health and decreased obesity.

Energy efficient housing – Adopting policies that encourage new housing be built to green or energy efficiency standards represents one of the most cost effective ways to begin reducing Richmond's overall energy use and associated greenhouse gas emissions. Municipalities in Virginia can use a number of green building incentives to help encourage construction of energy-efficient/green buildings. One option is to incorporate "incentive zoning" into the City's zoning ordinance, which would allow increased project density or streamlined permitting or other benefits and bonuses to a developer that provides certain green building features or amenities. For example, Arlington County Virginia provides density bonuses (increased project density) for office buildings meeting Leadership in Energy and Environmental Design (LEED) standards. Another incentive tool the City could consider is the assessment of eligible energy efficient/green buildings at a reduced rate for real estate tax purposes. As the City continues to take a leading role in energy efficient housing, it may want to work directly with the Commonwealth and the Virginia Municipal League to discuss opportunities to improve the current minimum requirements under the statewide building energy code.

Through the implementation of this initiative, the City may incur small costs to draft the changes in policies and to administer the program. There are public health benefits associated with green building construction since it provides more livable environments and often uses more eco-friendly materials. In addition, Richmond is likely to further its economic and workforce development goals by creating green building industry jobs, from engineering to planning, in the form of construction personnel, material suppliers, and building technicians.

Affordable housing – Affordable housing is essential to becoming a sustainable community. The City can utilize its zoning and regulatory authority to require a percentage of all new housing constructed be affordable.

In creating an affordable housing ordinance, the City can review other city ordinances to explore the many options in developing such a requirement. Depending on the City's review and evaluation of its own affordable housing resources and needs, it could develop an ordinance requiring that new residential developments have a certain percentage of housing for moderate, low, to very-low income households. An alternative to requiring a certain percentage of affordable housing through regulation is to provide incentives to encourage developers to choose to build affordable housing. This is often accomplished through creating density bonuses, streamlining the review process, or fee waivers.[2]

2 Municipal Research and Services Center of Washington. (Updated 12/2010). Affordable Housing Ordinances/Flexible Provisions. Accessed December 2011. **http://www.mrsc.org/subjects/housing/ords.aspx**

For site plan projects, Arlington County's Affordable Housing Ordinance requires a certain percentage of low to moderate income housing.

Source: http://www.arlingtonva.us/departments/CPHD/housing/development/CPHDHousingDevOrdinance.aspx#summ

Increasing the amount of affordable housing options will demonstrate the City's commitment to social equity, an important component of sustainability. Increasing the amount of affordable housing can also be a sound economic development strategy by ensuring that there is adequate workforce housing near job hubs. The presence of such housing may have a moderate effect on reducing GHGs by reducing the length and number of automobile trips for these workers who now may be located closer to jobs. This initiative is likely to be low-cost for the City as it can typically be done as part of a zoning revision.

Objective 2: Increase accessibility, quantity, and quality of public space

A city's public spaces include not only parks and other recreation areas, but public squares, plazas and streets. In addition to providing residents with recreational opportunities, parks can improve Richmond's natural environment by reducing stormwater runoff, improving air quality, and providing wildlife habitat. Parks can also be tourist attractions that can help bring revenue to nearby establishments. Residential properties in proximity to parks also tend to have higher property values.

Where are we now?

Richmond Green Infrastructure Assessment
Produced by the Green Infrastructure Center and E² Inc. for the City of Richmond, Virginia
December 2010

The City acquired its first municipal park, Monroe Park, in 1851 making it one of the oldest municipal park systems in the country. Since then, the City's park system has grown to include more than 160 parks, open spaces, sports complexes and playgrounds totaling almost 2,000 acres, which is about 9.3 acres for every 1,000 residents. These parks provide city residents numerous leisure and recreational opportunities. The Department of Parks, Recreation and Community Facilities has begun to develop master plans for each of its parks and facilities. The City partnered with the Green Infrastructure Center, the Richmond Regional Planning District Commission and E² Inc. to assess the green infrastructure in Richmond and produce a Green Infrastructure Assessment in 2010. This assessment identified parcels that could enhance existing open space holdings. Please refer to **Figure 4-2** below for more information.

The Richmond community recognizes the importance of the James River, which runs through the heart of the city, as an important asset of the community. Through the Richmond Riverfront Plan, currently in progress, the City is establishing the James River as a primary focus of the community. The Plan's goals are to promote a sustainable riverfront corridor, strengthen linkages between the river and adjacent neighborhoods, identify sites for strategic private redevelopment and public improvements, and evaluate the development of open spaces and public recreational opportunities along the riverfront. The City's Downtown Master plan also places a heavy focus on the river.

Figure 4-2: Conserved Land in Richmond

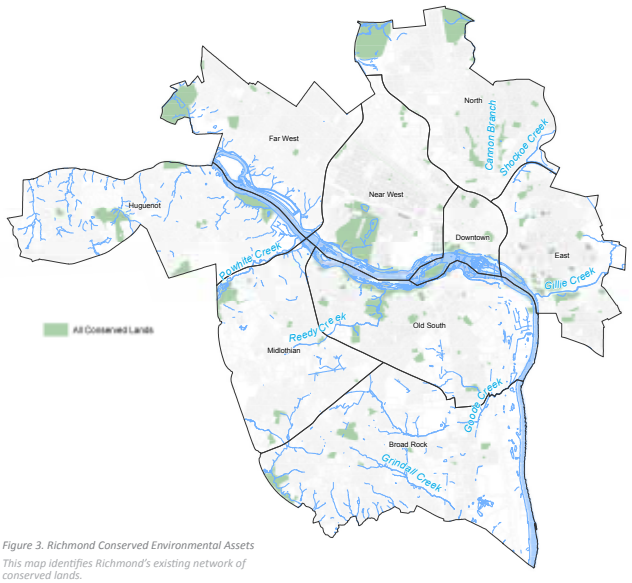


Figure 3. Richmond Conserved Environmental Assets
This map identifies Richmond's existing network of conserved lands.

Source: Green Infrastructure Assessment, 2010

Beyond these planning efforts, the City is working to acquire and expand the amount of conservation land in Richmond. Currently, there are a number of permanent conservation easements protecting sensitive ecological zones. The City is exploring the development of additional conservation easements to ensure that more parks and riverfront areas are permanently protected.

The City is currently engaged in the Recreation Trails and Greenways project that, when complete, will expand pedestrian and bicycle infrastructure throughout Richmond creating linkages between the downtown core, key neighborhoods and the city's wealth of open space and natural resources.

How will we reach our goal?

The following initiatives were identified by the planning process to increase the accessibility, quantity and quality of public space.

Table 4-2: Objective 2: Increase Accessibility, Quantity, and Quality of Public Space

Initiative	Summary	Implementer	Cost*	Potential Funding Sources
Riverfront Plan	Create a riverfront plan for open space and recreation	Planning and Development Review; Parks and Recreation; community partners	$	Already Funded
Improve accessibility of bike and pedestrian paths	Improve lighting, safety, and comfort of bike/ped pathways between public spaces	Planning and Development Review; Parks and Recreation; community partners	$$	VA Dept of Conservation and Recreation
Parks maintenance program	Invest in an expanded parks maintenance program	Parks and Recreation; community partners	$	VA Dept of Conservation and Recreation

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000

Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

	Broader Impacts Upon Implementation				Economic/Time Impacts for Implementer			
Initiative Benefits and Implementation	GHG reduction potential	Fuel/energy savings potential	Positive public health impacts	Potential for job creation	Cost to implement	Funding feasibility	Payback Period	Time to implement
Riverfront Plan	■	■	■	■	■	■	●	●
Bike and pedestrian path improvements	■	■	■	■	■	■	●	●
Parks maintenance program	■	■	■	■	■	■	●	●

■ Less Favorable ■ Somewhat Favorable ■ More Favorable ● Short ● Medium ● Long

For more information, please refer to Appendix A: Initiative Evaluation Criteria

Create a riverfront plan for open space and recreation – Richmond is in the process of developing the Richmond Riverfront Plan that will establish the river as the focus of the community, promote a sustainable riverfront corridor, strengthen linkages between the river and adjacent neighborhoods, identify sites for strategic private redevelopment and public improvements, and evaluate potential for quality open spaces and public recreational opportunities along the riverfront. The James River is currently an under-utilized open space and recreational asset and taking steps to improve public access and recreational opportunities will not only benefit Richmond residents but will also provide important economic development and business opportunities. Increased recreation and tourist activity along the waterfront will attract businesses, such as restaurants and shops, to serve a new base of customers.

Improve lighting, safety, and comfort of bike and pedestrian pathways between public spaces- Improving the bicyclist and pedestrian experience can help to encourage biking and walking for both recreation, fitness, and as a means of commuting. In addition, this initiative may result in significant public health benefits by encouraging an increase in bicycling and walking throughout the city. Park lighting improvements may include LED lighting upgrades which are brighter, more reliable and more energy efficient than existing lighting. Pathway upgrades may include repaving, widening, separation of bicycle track from pedestrian pathways or other improvements. Pathways that are unsafe or in poor condition deter people from utilizing them for recreational and commuting activities. Improving these conditions and ensuring user safety is essential to improving access to and utilization of public space, which is an important aspect in achieving Richmond's transportation and open space goals.

Invest in an expanded parks maintenance program – Enhancing ongoing parks maintenance will ensure more attractive parks and will encourage more people to take advantage of these Richmond assets. Experience in other communities has demonstrated that the environmental conditions of open space determine the extent to which and the manner in which open space is used. The City's Parks and Recreation Department as well as community groups and Richmond residents can take ownership of their parks to create safe, healthy, and attractive spaces. A parks maintenance program would include documented policies and schedules for landscaping, trash and debris removal, painting, pathway cleaning, and snow and ice removal. Ongoing preventative maintenance can also reduce the costs of massive capital improvements that can be costly and can occur as a result of deferred maintenance.

Objective 3: Increase Richmond's tree canopy

A healthy urban tree canopy is important for cities as it not only provides aesthetic beauty; it also provides a variety of environmental services that contribute to a healthy urban environment. The leaves and roots of trees help remove pollutants from the environment by taking in CO_2 and releasing oxygen and helping to filter other pollutants, including dust, ash, pollen and smoke. One acre of trees absorbs the same amount of CO_2 every year as driving a car 26,000 miles creates. Trees also reduce stormwater runoff and help prevent soil erosion, protecting nearby streams and rivers. By creating shade, trees also help to reduce the "heat island" effect, common in dense urban environments, where acres of concrete and asphalt surfaces absorb heat during the day and release it at night, at times significantly raising the air temperature.

Where are we now?

The City realizes how valuable its urban tree canopy is and has made protecting and enhancing it a high priority. The City's Public Works' Urban Forestry Division maintains all City-owned trees. The City completed a partial street and public tree inventory in 2009, and estimates there are 110,000 street and public trees of more than 80 species in Richmond.

The City Council has established an Urban Forestry Commission to improve the City's urban forestry resources through a combination of policies, development advice and fundraising efforts. The City is also exploring the development of both an urban tree management plan and downtown tree planting program. The City's Urban Forestry Division currently has a simple permit process to allow citizens to plant trees on public rights of way. The City administration has also committed to the annual planting and establishment of nearly 2,000 trees in an effort to replenish the urban forest.

The Urban Forestry Division is currently replacing trees at a higher rate than they are being removed, at a rate of 1.7 trees to 1. This rate could be increased with additional resources. Through the efforts of the Urban Forestry Division and Richmond's citizens, the urban forest is slowly being replenished with an emphasis on replacing trees in high visibility areas and in areas where stocking levels are lower.

Figure 4-3: Richmond's Current Tree Canopy

Urban Tree Canopy Analysis: Richmond, VA.
This analysis conducted by Virginia DOF illustrates the spatial distribution of various land cover classifications within the city. (Image: Virginia Department of Forestry)

Richmond residents are getting more involved in the protection and improvement of the tree canopy. Non-profit organizations, such as the all-volunteer Tree Stewards organization, hold tree planting events, which help increase awareness of tree and provide outreach to citizens. Tree Stewards also provide classes and information that teach the community how to properly care for trees and provide support to people and organizations interested in caring for public trees.

How will we reach our goal?

To effectively increase the tree canopy, the planning process has identified the following initiatives.

Table 4-3: Objective 3: Increase Richmond's Tree Canopy

Initiative	Summary	Implementer	Cost*	Potential Funding Sources
Adopt a tree replacement policy	Implement a one-to-one tree replacement policy	Public Works - Urban Forestry	$	General Fund, Contingency Fees
Encourage residents to plant trees in empty tree wells on public property	Encourage residents to utilize the existing policy that permits them to plant trees in empty tree wells on public property	Public Works -Urban Forestry; City Council; community partners	$	Private citizens
Create and disseminate a tree species list	Develop and disseminate a list of appropriate tree species for planting within the city	Public Works - Urban Forestry	$	General Fund

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

	Broader Impacts Upon Implementation				Economic/Time Impacts for Implementer			
Initiative Benefits and Implementation	GHG reduction potential	Fuel/energy savings potential	Positive public health impacts	Potential for job creation	Cost to implement	Funding feasibility	Payback Period	Time to implement
Tree replacement policy	■	■	■	■	■	■	●	●
Resident tree planting policy	■	■	■	■	■	■	●	●
Tree species list	■	■	■	■	■	■	●	●

■ Less Favorable ■ Somewhat Favorable ■ More Favorable ● Short ● Medium ● Long

For more information, please refer to Appendix A: Initiative Evaluation Criteria

Implement a one-to-one tree replacement policy – Under this initiative, the City could adopt a policy that requires that for every public street tree that is removed, another tree of similar caliper (or tree trunk diameter) is planted to replace it. This ensures that Richmond's tree canopy is not further reduced by piecemeal removal of trees or replacement of trees with smaller, less productive ones. Urban Forestry Division staff arborists generally prefer that the largest (at maturity) tree be planted that a site can support in order to maximize the benefits associated with increased canopy. The City could also require that every public tree removed is replaced with one from an appropriate species and site. Urban Forestry staff will continue to emphasize the concept of 'right tree, right place' and evaluate each planting site for its potential and select species accordingly. While a new tree replacement policy is important, this alone will not reduce GHG emissions as it primarily maintains existing tree canopy. As part of a larger tree planting program, expanding the urban tree canopy helps absorb GHG emissions and results in public health benefits by improving air quality.

Develop and disseminate a list of appropriate tree species for planting within the city – While increasing the tree canopy is important, care needs to be taken in selecting appropriate tree species based on individual site conditions and available resources as well as Richmond's particular climate and geology. While the Urban Forestry Division has an approved tree species list, it is reviewed internally and not yet available to the general public. City arborists are currently available to help guide citizens with species selection and espouse the concept of 'right tree, right place'. Native trees, which may be preferable due to being adapted to regional climate and the provision of improved habitat for local fauna, may not serve as the most robust and reliable species for planting in a harsh urban environment. Often, non-native trees survive better in an urban setting that differs significantly from native forests. Under this initiative, the City's Forestry Division would refine and distribute the current list of appropriate tree species for planting to residents, developers, and City staff. This would be a low-cost, easy to implement initiative since the existing species list could be refined and easily posted online. While this initiative will not in itself result in significant GHG emissions and energy use reduction, the presence of a large and healthy tree canopy does absorb greenhouse gases improving air quality and resulting in public health benefits.

The City of Philadelphia has a highly successful tree planting program which targets tree planting in neighborhoods where the tree canopy is sparse. New York City began the 1 million trees initiative with the goal of planting one million trees and is currently over half-way toward achieving this goal.

Encourage residents to plant trees in empty tree wells on public property – As noted earlier, current Urban Forestry Division Policy allows for and encourages citizens to participate in tree planting by allowing the planting of trees on the public right of way with a permit. These permits are used to help control species selection and prevent the improper placement of trees (e.g. - large stature trees under power lines). The City encourages residents to plant trees in public tree wells with its Adopt A Tree program that subsidizes the cost of the trees. The greatest potential to increase the tree canopy in Richmond is to encourage citizens to both plant new as well as preserve existing trees growing on private and public property. Areas with a low-canopy and/or low tree-to-person ratio should be among the first priorities for new plantings.

Under Richmond Grows Gardens, organized by the City's Green Richmond Initiative, the City offers under-utilized city property to eligible organizations via an online application process for use as community gardens.

Objective 4: Protect historic building stock and promote the use of vacant and blighted property

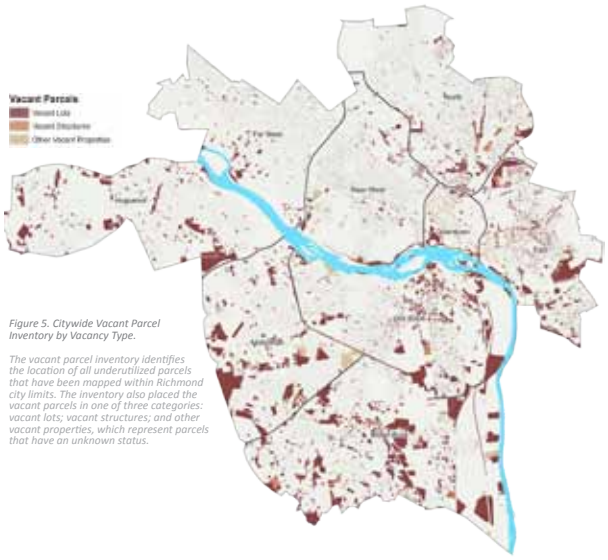
Richmond is known for its historic buildings which range from Georgian to Federal, Greek Revival, Queen Anne, Art Deco and Modernist. The maintenance and preservation of historic buildings are important as they contribute to the city's character and serve as a daily reminder of the city's past. While the protection of historic buildings is important, the Great Recession has left many cities, including Richmond, coping with growing numbers of vacant and blighted properties. Vacant properties challenge communities by weakening surrounding property values and creating special maintenance and safety concerns. Making efficient use of existing resources by reusing vacant property and redeveloping brownfields helps to improve environmental quality, neighborhood property values, and public health and safety.

Where are we now?

Richmond has a healthy historic preservation movement; several organizations are working in the city to protect historic buildings and districts. Currently, more than 175 historic buildings, sites and districts in Richmond are listed on the national and/or state historic registries. The Department of Planning and Development Review also has 15 City Old and Historic Districts that protect approximately 3,300 properties.

As of January 2011, the City of Richmond's Vacant Building Registry indicated that more than 2 per of the city's buildings had been continuously vacant for at least one year. These properties decrease the value of surrounding properties and can cause liability or safety concerns for the city. Vacant buildings encourage vandalism and can be subject to fire and other safety hazards. Contaminated sites are often left vacant, causing environmental hazards and complicating the process of returning land to productive use. The U.S. Conference of Mayors estimated that in 2008, Richmond had more than 110 brownfields affecting about 160 acres of the city. According to the EPA, brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.[3]

Figure 4-4: Vacant Parcels



Source: Green Infrastructure Center and E2 Inc. (2010). Richmond Green Infrastructure Assessment Report.

3 U.S. Environmental Protection Agency. Brownfields and Land Revitalization. Accessed January 2012. **http://www.epa.gov/brownfields/index.html**

Recently, the City has made strides in the redevelopment of brownfields by successfully working with the EPA to redevelop an old armory.

Collaboration between the City, Whitehall-Robins Healthcare, and a Brownfields Pilot project funded by a $2,000 grant from EPA led to the cleanup and expansion of Whitehall Robin's facility on a contaminated former armory site. The highlights of the project include:

- Establishing 100,000 square feet of new laboratory and office space
- Creating 250 temporary jobs for site cleanup, construction and redevelopment
- Increasing tax revenue by approximately $100,000 per year

There are a number of programs and policies in place to help address the problems associated with vacant and blighted property in the city. The City has found great success working with non-profit organizations to improve vacant land and abandoned buildings.

Richmond also has used federal funds provided through the Community Development Block Grant and HOME program to improve and preserve existing housing stock, to help create new housing and to increase homeownership opportunities. Richmond's award-winning Neighborhoods in Bloom (NiB) program, helps Richmond to revitalize and maintain Richmond's historic neighborhoods through rehabilitation and new housing construction. In 2011, the NiB program is focused on the Bellemeade, Blackwell, Carver-Newtowne West, Church Hill Central, Highland Park Southern Tip, Southern Barton Heights and Swansboro neighborhoods.[4]

Other organizations, such as Tricycle Gardens, use vacant lands to create community gardens and offer educational programs. The City also has a Spot Blight Abatement Program, which targets dilapidated property to accommodate and encourage rehabilitation instead of demolition. Active Code Enforcement and Richmond's Vacant Property Registry are also primary tools to address the vacant property issue in the city. Richmond's Vacant Property Registry includes an online registry of parcels that have been vacant for over a year and registered with the Commissioner of Buildings.

How will we reach our goal?

To further the goal to protect historic buildings and promote use of vacant and blighted property, the planning process identified the following initiatives.

4 City of Richmond. Consolidated Action Plan Draft. FY 2011-12. Accessed January 17, 2011. **http://www.richmondgov.com/EconomicCommunityDevelopment/documents/2011-2012ConsolidatedAnnualActionPlan.pdf**

Table 4-4: Objective 4: Protect Historic Building Stock and Promote the Use of Vacant and Blighted Property

Initiative	Summary	Implementer	Cost*	Funding Sources
Adopt transfer of ownership legislation for vacant property	Adopt legislation that allows transfer of ownership of abandoned/vacant property	Planning and Development Review; City Council; Law Dept	$	General Fund
Brownfield Redevelopment	Redevelop brownfield sites	Planning Department; Economic and Community Development; community partners	$$$	U.S. EPA's Municipal Brownfield Redevelopment program; private developers
Adopt policy to promote redevelopment of vacant property for urban agriculture	Adopt policy/zoning that promotes use of vacant properties for community gardens and urban agriculture	Planning and Development Review; City Council	$	General Fund

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

Initiative Benefits and Implementation	Broader Impacts Upon Implementation				Economic/Time Impacts for Implementer			
	GHG reduction potential	Fuel/energy savings potential	Positive public health impacts	Potential for job creation	Cost to implement	Funding feasibility	Payback Period	Time to implement
Transfer of ownership for vacant property	■	■	■	■	■	■	●	●
Brownfield Redevelopment	■	■	■	■	■	■	●	●
Policy to redevelop vacant land for urban agriculture	■	■	■	■	■	■	●	●

■ Less Favorable ■ Somewhat Favorable ■ More Favorable ● Short ● Medium ● Long

For more information, please refer to Appendix A: Initiative Evaluation Criteria

Adopt legislation that allows transfer of ownership of abandoned/vacant property – In this initiative, the City would adopt legislation that allowed transfer of the abandoned/vacant property to the City following certain legal procedures and based on a certain time period since abandonment. The City could also develop a land bank to facilitate this process which can increase City revenues. "Land banks act as a legal and financial mechanism to transform vacant, abandoned and tax-foreclosed property back to productive use…"[5] Richmond's current vacant building registry can be used as a basis for beginning a land banking program. Although the GHG emission reduction and fuel savings for this initiative would be minor, it is a relative low-cost and effective way of facilitating the redevelopment of abandoned and vacant property within the city. The taxes on possible new construction on vacant lots could refund any City expenditures on the property. The redevelopment of these properties would have a positive impact on the public health of nearby residents by removing previously mentioned potential hazards. In addition, this measure would advance economic and workforce development goals by improving property values, enhancing neighborhood revitalization, and increasing revenues to the City.

Redevelop brownfield sites – In this initiative, the City could facilitate brownfield redevelopment by creating an inventory of brownfields in the city and establishing goals, priorities and procedures for their remediation and reuse. The City can also explore how best to promote brownfield planning and redevelopment, and increase resources dedicated to brownfield planning, testing and cleanups. Brownfield redevelopment can further the Richmond's economic development goals by turning underutilized properties into vibrant, functional ones. This could result in increased local tax revenues, transformation of declining neighborhoods, and job creation. Brownfield redevelopment in the city core also has the potential to reduce transportation related greenhouse gas emissions by approximately 20 to 40 percent in comparison to sprawling development patterns. While the costs of a redevelopment program may be high, funding may be available through state and federal sources, such as EPA's Municipal Brownfield Redevelopment grant, through the use of bonds, general tax revenue and private funds.

Adopt policy/zoning that promotes use of vacant properties for community gardens and urban agriculture – Through this initiative, existing community garden initiatives could expand and more opportunities for urban agriculture could be provided through possible revisions to Richmond's zoning code. The cost of adopting zoning amendments would be relatively low but would reap public health benefits by increasing residents' access to fresh produce.

5 de Witt, Jessica. Land Banks, Revitalizing Blighted Communities with Land Banks. Accessed December 2011. **http://www.umich.edu/~econdev/landbank**

Table 4-5: Recommended Indicators and Targets for Open Space Focus Area

Objective	Suggested Indicators	Suggested Targets
Encourage 24/7 communities with more sustainable and affordable housing options throughout the city	Percent of residential, mixed-use projects as a percentage of total new development	Upward trend
	Distribution of low income housing by neighborhood	Trending towards equalizing
	Percent of new and substantially-rehabilitated housing that complies with the City's new Green Building Ordinance as a percentage of the total new and rehabilitated housing	Upward trend
Increase accessibility, quantity, and quality of public space	Number of miles of improved bike and pedestrian paths and trails	Upward trend
	Number of acres of public open space by type (including public gathering places, gardens, and other public lands utilized as open space)	Upward trend
	Acres of park per city resident	Upward trend
	Percent of households and population within ¼ and ½ mile of a park by neighborhood	Upward trend
Increase Richmond's tree canopy	Number of street and public trees	Upward trend
	Number of trees planted from City tree species list	Upward trend
	Percent of tree canopy coverage	Upward trend
Protect historic building stock and promote the use of vacant and blighted property	Acres of brownfields that have been redeveloped for other uses	Upward trend
	Percent of vacant building as a percent of total buildings	Downward trend
	Number of community gardens	Upward trend

5. Transportation

While transportation is the movement of people and goods, sustainable transportation encourages individuals to reasonably choose between walking, biking, transit, and highly efficient automobiles for their daily transportation needs. A truly multi-modal and sustainable transportation environment results in people making trips that are often more convenient, healthier, and more cost-effective, with fewer GHG emissions.

Goal

Transform Richmond into a multi-modal city

Objectives

1. Reduce citywide Vehicle-Miles-Traveled (VMT) per capita
2. Manage parking supply to encourage alternate modes of transportation
3. Make Richmond a bike and pedestrian friendly city

Objective 1: Reduce citywide Vehicle-Miles-Traveled (VMT) per capita

GRTC is one of the primary public transit modes in the city.

Although transportation is a vital part of the economy and is essential for everyday activities, it is also a significant source of greenhouse gas (GHG) emissions. In fact, GHG emissions that result from transportation account for almost 30 percent of the total GHGs within the city (see **Figure 5-1**). Reducing the vehicle-miles-traveled (VMT) in the city will be an important component of reducing air pollution and GHG emissions . One of the primary ways that the community can reduce VMT is to use alternative modes of transportation instead of single occupancy vehicles for daily commuting and travel.

Where are we now?

In 2011, the City initiated the Richmond Strategic Multimodal Transportation Plan, the Richmond Connects Study, which is a year-long planning study that will update, revise, and reinvent the transportation plan for Richmond. This transportation chapter of this plan is designed as a complement to Richmond Connects.

In 2009, over 4.9 million vehicle miles were traveled in the city.[1] Three-quarters of Richmond area residents have a commute time between 0 and 29 minutes. A majority of residents commute to work by driving alone although Richmond has a slightly greater percentage of people commute to work by carpools, transit, biking, or walking compared to national and state averages. Currently, public transit has a nearly 20 minute disadvantage over driving; however, biking and walking have the lowest average commute times of all transportation modes. The following figures and tables further illustrate these comparisons.

1 Michael Baker Jr, Inc. , Richmond Connects. Draft 2011. Accessed January 2012. **http://www.richmondgov.com/EconomicCommunityDevelopment/documents/StateofTransportationReportPart2Roadways.pdf**

Figure 5-1: Richmond Community GHG Emissions by Sector (2008)

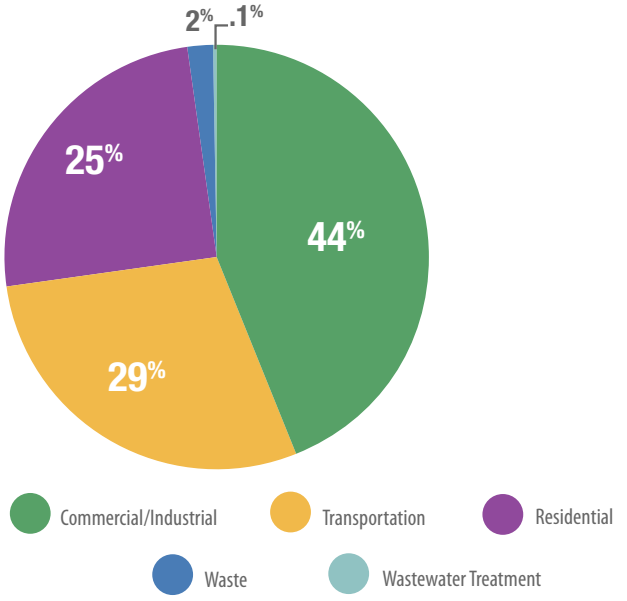


Figure 5-2: Average Commute Time in Richmond

Source: American Community Survey 2005-2009, 5 year estimates

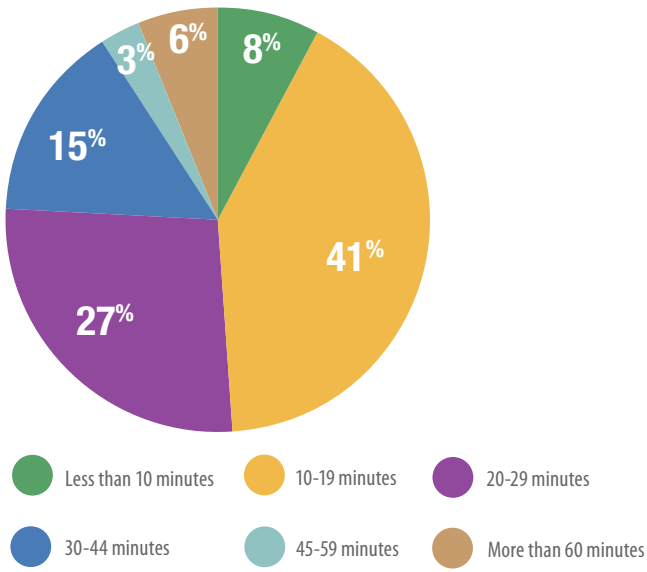


Figure 5-3: Commuting to Work

Source: 2005-2009 American Community Survey

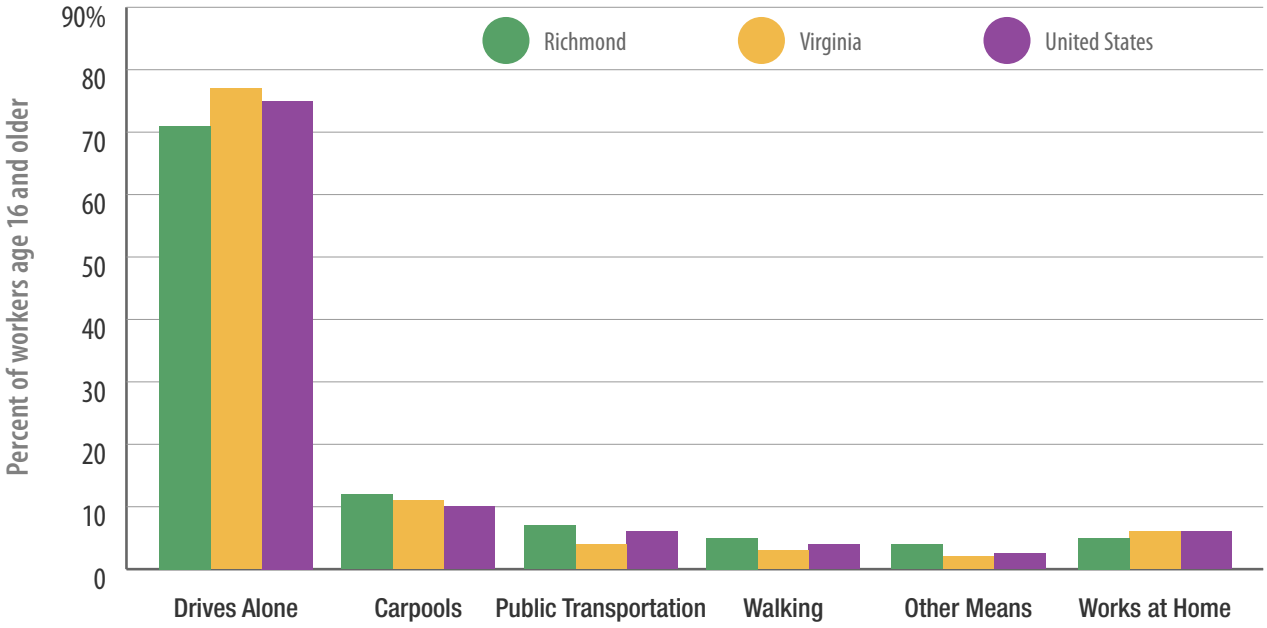


Table 5-1: Mean Travel Time to Work by Means of Transportation: Richmond

(2006-2008 ACS 2 year estimate, compiled for Census Transportation Planning Product Program: ctpp.transportation.org)

Means of transportation	Time (Minutes)
Total	**20.9**
Car, truck or van (drove alone)	19.5
Car, truck or van (2 person carpool)	20
Car, truck or van (3+ person carpool)	28.5
Bus or trolley bus	38.2
Bicycle	17.9
Walk	9.5
Taxicab, motorcycle or other method	20.7

A Transportation Research Board study found that areas with population densities above 10,000 persons per square mile are amenable to higher transit use, such as public transit, biking, and walking. The Richmond Connects Study has identified several Richmond neighborhoods that have sufficient density (at least 10,000 persons per square mile) to support transit: Monroe Ward, the Fan, areas around Virginia Commonwealth University (VCU), and some of the Richmond Redevelopment and Housing Authority (RRHA) communities.[2] National research has shown 4,000 persons per square mile is the minimum density needed to see an increase in transit mode share. Areas of Richmond with population densities between 4,000 and 10,000 persons per square mile include large areas of the city's North Side, West End and older portions of the South Side and East End.

The density of employment opportunities per acre also plays a role in transportation mode share as the percentage of people taking transit or walking for their commute rises above 20 jobs per acre. The Richmond Connects Study identifies Downtown Richmond as a major employment center, which has densities that can support a greater number of transportation options.

Public transportation systems directly benefit individuals, businesses, and governments by improving mobility and economic opportunities, while reducing road congestion, greenhouse gas emissions, and travel times within the region. GRTC Transit System (GRTC) is the primary

2 According to a national study by the Transportation Research Board (TRB) report, a density of 10,000 persons per square mile significantly shifts the transportation modal mix from single-occupancy vehicles to other modes such as transit, biking, and walking. Transportation Research Board. (2006). Commuting In America III NCHRP Report 550/TCRP Report 110. Accessed November 2011. **http://www.trb.org/Main/Blurbs/156993.aspx.**

Did you know?

RideFinders' supports 118 vanpools servicing the Greater Richmond area in locations such as Chester, Chesterfield, Colonial Heights and Midlothian. Ridefinders also serve long-distance commuters to Washington D.C. and Blackstone and from Hampton, Williamsburg, Fredericksburg, and Charlottesville.

public transportation provider for the Richmond region, providing transit service to the City of Richmond, Henrico County, and parts of Chesterfield County. GRTC operates a hub-and-spoke system with routes converging in the area of Downtown Richmond. The Richmond Connects Study identified the highest levels of transit service along Broad Street corridor and some Northside routes. The Southside areas of the city have the lowest levels of transit service. As of 2012, GRTC operates 27 local bus routes and 12 express routes using 161 buses and cutaway vans.

GRTC has also been active in helping to reduce traffic congestion, VMT and improve air quality within the city and the greater Richmond area through a number of its programs including the GRTC Ridefinders. GRTC Ridefinders is an extensive transportation demand management (TDM) program which promotes carpooling, vanpooling, park and ride usage, telework consultations, commuter guides, and many other services. RideFinders also offers the Emergency Ride Home (ERH) program in the event of an emergency or unexpected change in work schedule.

GRTC is also planning a number of improvements as part of its Comprehensive Operations Analysis (COA) completed in 2008 including modifications to the route structure to increase route efficiency and service to new neighborhoods while also eliminating redundant service. The COA also recommends the construction of a downtown bus transfer center, along with neighborhood bus transfer centers to encourage the convergence of bus routes to facilitate bus transfers at key points.

In addition, GRTC has been studying the opportunity for bus rapid transit (BRT) on Broad Street. The defining elements of a BRT system includes exclusive bus lanes, specially designed stations with fare collection machines, specially designed high capacity vehicles, high frequency with express routings, automatic traffic signal control, and next bus arrival information at stations. The BRT system would improve transit operations along Broad Street and provide faster public transportation service along the Broad Street corridor.

Through its Rideshare program, the City offers transit passes to municipal employees. This program is managed by the Department of Public Works (DPW), and encourages municipal employees to use GRTC and reduce individual car use. Approximately 19 percent of municipal employees participate. Recognizing that 17 percent of municipal GHG emissions are from employee commutes, the City is also in the process of implementing a telecommute and alternative work schedule initiative with the goal that 20 percent of eligible employees will participate in either telework or alternative work schedules.

Richmond's Downtown Master Plan process includes an assessment of Richmond's one-way street system. The Master Plan includes recommendations to convert certain one way streets in the Downtown area into two way streets. While one-way streets can move traffic quickly and efficiently, they can also limit access and visibility to land uses within those blocks having a negative effect on businesses in those areas. One-way streets are also confusing to visitors and tourists and can discourage bicycle use. The Richmond Connects Study process will include further evaluation of the pros and cons of converting specific one-way streets to two-way streets.

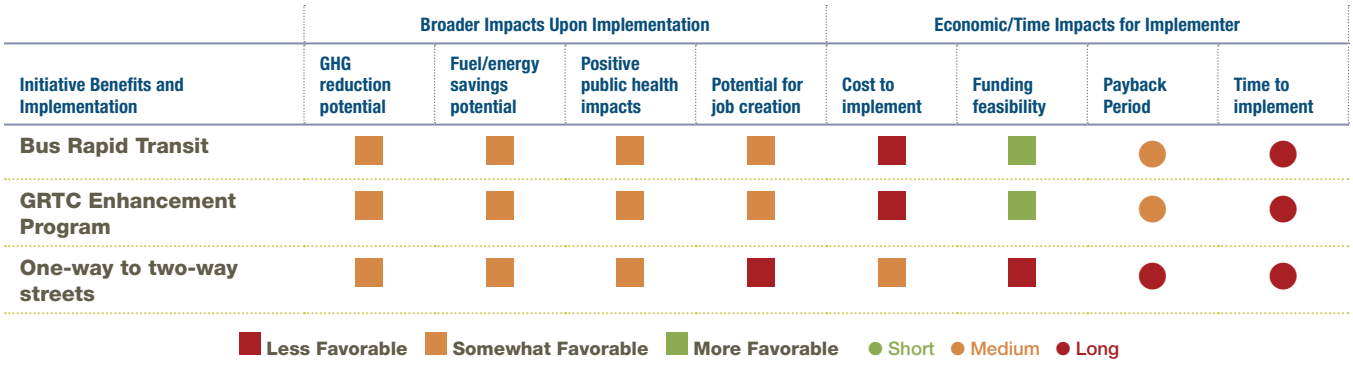
How will we reach our goal?

The Sustainability Plan process has identified the following priority initiatives to reduce VMT in the city.

Table 5-2: Objective 1: Reduce Citywide Vehicle-Miles-Traveled (VMT) Per Capita

Initiative	Summary	Implementer	Cost*	Potential Funding Sources
Support Bus Rapid Transit (BRT)	Continue to identify opportunities to support Bus Rapid Transit in the city	GRTC; Planning and Development Review; VDOT; Public Works	$$$	Federal Transit Administration – New Starts, Small Starts Programs and Urbanized Area Formula Funding, GRTC, VDOT, City General Fund, Broad Street Community Development Authority
GRTC Enhancement Program	Invest in and support a GRTC Enhancement Program	GRTC and MPO; Planning and Development Review; Public Works; VDOT; Federal Transit Administration	$$$	Federal Transit Administration - Urbanized Area Formula Program, GRTC, VDOT, City General Fund, Broad Street Community Development Authority
Convert one-way streets to two-way streets	Convert existing one way streets to two way streets to reduce congestion and improve traffic flow	Planning and Development Review; Public Works; City Council	$$	VDOT, City General Fund, Broad Street Community Development Authority

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.



For more information, please refer to Appendix A: Initiative Evaluation Criteria

Continue to identify opportunities to support Bus Rapid Transit in the city – Many cities provide a BRT dedicated lane on the roadways in order to increase the bus' ability to move quickly through downtown traffic. BRT system performance is assessed according to five key attributes – travel time, reliability, identity and image, safety and security, and capacity. Each of the BRT system elements has different effects on system performance.

Enhanced BRT systems have the potential to reduce traffic congestion, offer a competitive alternative to autos, and can help to spur economic development by inducing private development and improving land values along BRT routes.

As stated earlier, GRTC is investigating the feasibility of BRT on Broad Street, which presents a unique urban planning opportunity, to coordinate transportation investments with new Transit-Oriented Development (TOD) and to capture the maximum value from a BRT investment.

Under this initiative, GRTC, the City Planning Department and Public Works Departments would closely coordinate the implementation of BRT infrastructure. A BRT system would help to reduce greenhouse gas emissions by helping to promote transit use over the use of single occupancy vehicles. In addition, while the cost of planning and constructing BRT infrastructure would be high, funding

BRT and Economic Development

Cleveland's Health Line BRT has generated $4.3 billion in completed or planned development along Euclid Ave, including by 2025, 7.9 million square feet of commercial development, 5400+ new or renovated housing units, $62.1 million in annual local taxes, $1.98 million in tax revenue for the transit authority, and 13,000 new jobs in the area. Similar BRT stories can be found in Ottawa, Pittsburgh, Denver, and Los Angeles. A preliminary study by the National BRT Institute finds that every 100 feet closer to a BRT station may increase the value of single family home by $1,600.

Sources: Economic Development and BRT Presentation by Cliffe Henke, Parsons Brinckerhoff at Public Transit Discover Conference: October 2010. BRT and Economic Development Presentation by Sam Zimmerman on Alameda-Contra Costa Transit Authority website.

may be available from state and federal grants. The largest federal funding source for major new "fixed guideway" transit projects are the Federal Transit Administration's (FTA) New Starts and Small Starts programs, which GRTC and the City should pursue. The FTA has a number of other programs such as the Urbanized Area Formula Funding program, which makes federal resources available to urbanized areas for transit capital and transportation related planning.

Invest in and support a GRTC Enhancement Program – The GRTC Enhancement Program would involve various upgrades and improvements to the GRTC system, including expanding the range of service territory and the hours of operation, investing in alternative fuel buses, identifying efficiencies in route patterns, enhancement of the overall signage, cleanliness and amenities, and creation of new revenue opportunities. GRTC has identified some of these areas as priorities in its 2010 annual report. The key components to successful and popular transit systems include an environment (including stations, stops, services, routes, employees and rolling sock) that is perceived as safe, comfortable, reliable, fast, simple, efficient, attractive, and user-friendly. The GRTC Enhancement Program moves the GRTC forward in achieving those ideals.

The GRTC Enhancement Program is a continuing GRTC project, some elements of which can be funded through a combination of federal grants from the FTA such as the Urbanized Area Formula Program, and state agencies such as the VDOT. Coordination between GRTC and the City's Planning and Public Works Departments will be key to the program's success. Certain complementary improvements such as streetscape beautification, pedestrian signage, and lighting could be financially supplemented by a matching program from the City, business improvement districts such as the Broad Street Community Development Authority, or other sponsors.

Convert one way streets to two way streets – Under this initiative, the City would continue to evaluate the conversion of one way streets to two way streets. As stated earlier, the City's Downtown Master Plan identifies a few one-way streets in Downtown for conversion and the current Richmond Connects transportation study is further evaluating these options. The conversion of key transportation corridors to two-way streets could help to enhance pedestrian access and increase the visibility of downtown businesses. While the conversion of one way streets to two way street would have a moderate effect on greenhouse gas emissions and energy/fuel use and public health benefits, this initiative will help to enhance the pedestrian experience overall and further the city's economic development goals by increasing access to Downtown businesses.

Objective 2:
Manage parking supply to encourage alternate modes of transportation

While it is important to have adequate parking within a city, the presence of too many surface parking lots can be a deterrent to pedestrian access and can encourage use of single occupancy vehicles for transportation over high occupancy vehicles, transit, and other modes of transportation. From an economic perspective, parking is an expensive form of land development that does not derive the full value from the land, especially when it is the exclusive use of the property, deterring economic development.

Where are we now?

The City of Richmond, through paved surface parking and downtown parking decks, can accommodate more than 340,000 passenger vehicles, which is more than 1.5 spots per Richmond resident. The Richmond Connects study analyzed the number of parking spaces in conjunction with employment density - parking spaces per employee in downtown. Jobs are used instead of population because commute to work is generally the number one driver of transportation decisions, and residential parking cannot be accurately counted. The Study found that there are portions of the Downtown that have fewer than one parking space per employee and other areas that have over five parking spaces per employee. This parking imbalance leads to the perception that there is not enough parking to meet the demand within certain areas of Richmond.

Cities throughout the country have realized success through investment in BRT infrastructure including Boston, Cleveland, Pittsburgh, Denver, and Los Angeles.

Table 5-3: Publicly Accessible Parking Inventory - Downtown Only

Parking Type	Number of Spaces
Surface	4,977
Deck	16,152
Garage	457
Structured (Deck + Garage)	16,609
Total Public Parking	21,586

Source: Data compiled from GRTC Ridefinders Downtown Commuter Guide. Accessed August 2011. http://www.ridefinders.com/FrontEnd/HTML/WSI/images/rate%20card.pdf

The 2009 Downtown Area Parking Study addressed both on and off-street parking capacity in Downtown, and provided a clear framework for a parking transformation that would optimize use of the existing parking capacity. The Study concludes that while there is currently adequate parking supply to meet existing parking demand, the on-street parking is often near or over capacity while off-street parking is often well under capacity. The Study also concluded that streets with a high demand for on-street parking did not have metered parking or that the metered parking was underpriced during peak times compared to cities of similar size. In addition to on-street parking constraints Downtown, many neighborhoods, especially those around VCU's Monroe Park Campus, also have high demand for on-street parking.

GRTC's Ride Finders has a downtown area public parking space inventory and map available on their website which includes parking costs, number of spaces, and type. Tools like this give people information that enables them to better utilize existing parking capacity. The GRTC also currently provides several convenient and free park and ride parking lots that run along express service routes to the downtown Business District.

How will we reach our goal?

In order to more effectively manage parking to encourage alternate modes of transportation, the planning process resulted in the following recommended initiatives.

Table 5-4: Objective 2: Manage Parking Supply to Encourage Alternate Modes of Transportation

Initiative	Summary	Implementer	Cost*	Potential Funding Sources
Require bicycle and ride-share preferred parking	Require new and encourage existing parking lots and facilities to provide bicycle parking and ride-share (including private companies like ZipCar/alt fuel/hybrid preferred parking	City Pedestrian, Bicycle and Trails Coordinator; Planning and Development Review; businesses; Commercial and Residential Property Owners; City Council	$	City General Fund, Developers, Local Businesses and Non-profits
Replace parking minimums with maximums	Replace parking minimums in city code with parking maximums	Planning and Development Review; City Council	$	City General Fund
Visible Park and Ride Lots	Establish visible park and ride lots for commuters	GRTC; Public Works	$$	GRTC

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000

Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

	Broader Impacts Upon Implementation				Economic/Time Impacts for Implementer			
Initiative Benefits and Implementation	GHG reduction potential	Fuel/energy savings potential	Positive public health impacts	Potential for job creation	Cost to implement	Funding feasibility	Payback Period	Time to implement
Bicycle and ride-share facilities	■	■	■	■	■	■	●	●
Replace parking minimums with maximums	■	■	■	■	■	■	●	●
Visible Park and Ride Lots	■	■	■	■	■	■	●	●

■ Less Favorable ■ Somewhat Favorable ■ More Favorable ● Short ● Medium ● Long

For more information, please refer to Appendix A: Initiative Evaluation Criteria

Bikes along the VCU campus corridor.

Require new and encourage existing parking lots and facilities to provide bicycle parking and ride-share – Under this initiative, the City would require the creation of dedicated spots within a parking facility for bicycle , carpool, or alternative fuel vehicle parking. These spots should be located near the exit or elevator to provide an incentive. The City could revise its zoning code to require that new buildings with car parking provide bicycle parking capacity and carpool capacity equal to a certain percentage (5 percent for example) of the car parking capacity provided. In addition, the zoning code could be revised for new residences and office buildings to set aside space for long-term and short term bicycle parking. The City could also work with GRTC to develop bicycle parking near key transit hubs to facilitate biking to transit.

This initiative is expected to have some benefits for greenhouse gas emissions and fuel use reduction as the provision of bicycle and ride-share facilities could help to increase bicycling/carpooling over the use of single occupancy vehicles. The cost for the City to implement such a measure is expected to be minimal as the developer or building owner would pay for the cost for bicycle/ride-share infrastructure.

Replace parking minimums in city code with parking maximums – Minimum parking regulations specify a minimum number of parking spaces per square foot of retail space, living unit, or employment, often well beyond what is necessary on an average day, and often irrespective of the amount of parking that may be available already on adjacent land. Minimum parking requirements cause greater development costs and can create economic obstacles to density that would support public transit and reduced energy use, and causing a tremendous amount of land and floor area to be used for cars instead of people. Surface parking also contributes to greater stormwater loads (and non-point source pollution) as well as to the heat island effect.[3] The cost of providing minimum parking is bundled into the cost of housing, goods and services. Unbundling parking reduces these costs, saving developers money and possibly spurring additional economic and workforce development.

Under this initiative, the City would revise its zoning code to eliminate minimum parking requirements and include maximum parking limits for new developments. Depending on the proposed land use, a particular ratio of parking spaces would be allowed as the maximum. For example, an office building may require a maximum of 0.7 spaces per 1,000 square feet of gross leasable floor area in a central business district. Several U.S. cities vary maximum parking requirement ratios across different neighborhoods based on characteristics of different districts or land uses, and the distance of a proposed land use from transit. The City could review the limits other municipalities have instituted as well as the parking generation manual of the Institute of Transportation Engineers. Maximum parking may also be accompanied by transferrable parking entitlements that can be transferred or sold to another development if unused. The City could revise its zoning code to allow for shared parking arrangements between adjacent property owners such as allowing developers to contract with adjacent parking providers for their parking spaces. Some cities have also put a cap on the total number of spaces in certain districts such as in a central business district.

Establish visible park and ride lots for commuters – Park and ride lots are parking facilities at transit stations, bus stops, and highway onramps, particularly at the urban fringe, to facilitate transit and rideshare use. Parking in a park and ride lot is generally free or significantly less expensive than parking in urban centers. The GRTC maintains the park and ride lots for express routes to Downtown. Under this initiative the number of park and ride lots could be expanded and the visibility for these park and ride lots would be increased, which would encourage greater use of park and ride lots. The greenhouse gas

3 See the Environment section for further details on stormwater as it relates to impermeable surface and non-point source pollution.

reduction and fuel savings under this initiative would be moderate as more drivers use transit reducing the length of vehicle trips, fuel consumption, and associated greenhouse gas emissions. The City could work with GRTC to investigate further opportunities for park and ride lots. The City could also pursue leasing lots from private entities as a means to minimize costs and capitalize on existing land use. This initiative may also require cooperation with other localities where the park and ride lots should be placed. Ideally, the lots should also be connected to the bicycle and pedestrian pathways as well as main roadway corridors to encourage biking and walking to transit.

Objective 3: Make Richmond a bike and pedestrian friendly city

Making Richmond a bike and pedestrian friendly city will need to involve multiple partners including the Bicycle, Pedestrian and Trails Planning Commission, GRTC, and various City departments. Having a bike and pedestrian friendly city encourages people to replace car trips, particularly short ones, with trips that do not generate significant GHG emissions Short vehicle trips which are especially common in urban areas generate more emissions since the vehicle operates less efficiently and idles excessively which increase fuel use and emissions. On average 40 percent of vehicle trips are less than two miles. This distance is easily biked. In urban traffic, bike trips can often be as fast as, or faster than driving when parking is factored into the time of the trip. A bike and pedestrian friendly city also improves safety for bicyclists and pedestrians, and provides a more healthful environment for residents by encouraging biking and walking as viable forms of exercise.

Where are we now?

Table 5-5: City Roadway, Bicycle, and Pedestrian Infrastructure

Type	Number (miles)
Roadways (centerline)	851.78
Lane Miles of Roadway	1,909.7
City owned roadways	824
Marked Bike lanes (centerline)	1.1
Sidewalk (5-foot width)	760

Source: Richmond Connects Draft State of Transportation Report, June 27, 2011.

Most of the roadways in Richmond are owned and maintained by the City, and 72 percent of the City-owned roadways are classified as local roadways, and nine percent are classified as collectors. Collector roadways are used by traffic to connect to main arterial roads from local roads. Local and collector roadway types present good opportunities for bicycle and pedestrian infrastructure.[4]

While the City has designated many roadways as shared roadways; most do not have marked bike lanes, shared lane markings, or bike route signs. In November 2011, the City began installing the first of approximately 80 lane miles (40 centerline miles) of bike sharrows that will be placed along specific corridors in the city, which will be completed in the spring of 2012. Sharrows are shared lane markings that improve bicycling conditions on roads where designated bike lanes are either infeasible or inappropriate due to traffic or roadway conditions. The City has plans for 20 lane miles of additional sharrows per year for the next five years for a total of 180 lane miles of shared lane marking bike routes within five years.

Currently, there are about 490 outstanding citizen requests for sidewalk repair or maintenance through the Sidewalk Improvements Program, at an approximate cost of $15 million. At the current rate of funding, it would take 20 years to finish the current backlog. There are an additional 164 citizen requests, totaling approximately $12 million, for new sidewalk. The Commonwealth of Virginia has discontinued state funding for new sidewalks.[5]

Table 5-6: Bicycle and Pedestrian Accidents

Source: Mayor's Pedestrian, Bicycling and Trails Planning Commission Report, November 2010

	2000 – 2003	2004 - 2010
Cyclists Hit by Vehicles	~214	196
Pedestrians Hit by Vehicles	~457	518

4 Richmond Connects Study – Draft State of Transportation Report. Accessed November 2011. **http://www.richmondgov.com/EconomicCommunityDevelopment/TransportationPlanning.aspx**

5 Ibid.

The City and its partners have made progress on meeting the goal of making Richmond a more bike and pedestrian friendly city. Mayor Jones established the Bicycle, Pedestrian and Trails Planning Commission to advise the City on ways to incorporate bicycling and walking as viable methods of transportation in Richmond. The Commission issued a report and recommendations in November 2010. Bicycle and pedestrian crash data presented in this report can be used as a resource in evaluating where bike and pedestrian improvement investment is needed most, and may act as a reasonable baseline measure for bike and pedestrian infrastructure success, once implemented.

In addition to the work by the Bicycle, Pedestrian and Trails Planning Commission, the City is in the process of planning and developing its two remaining sections of the Virginia Capital Trail, a 55 mile bicycle and pedestrian trail connecting Richmond to Williamsburg. The City will be placing bike racks of uniform design throughout the community to increase visibility of bike parking and to encourage bicycling for transportation.

Nearly 90 American universities offer campus bike programs, according to the Association for the Advancement of Sustainability in Higher Education. The University of Richmond has a number of programs to support bike use on campus, including a limited-service bike shop, a bike share program, a bike rental service, and a bike recycling program that refurbishes abandoned bikes and sells them at a deep discount to students. VCU has also been active in promoting biking and hosts an annual event, the Great Bike Round Up, for bike riders. During this all day event, the VCU Police help register students' bikes and mechanics from local bike shops give free bike tune-ups and answer questions. VCU has also been increasing the number of bike racks on both of its two campuses. The GRTC also supports bike riding and has placed bicycle racks on all GRTC buses.

How will we reach our goal?

In order to further the goal of making Richmond a more bike and pedestrian city, the following initiatives have been recommended.

Table 5-7: Objective 3: Make Richmond a Bike and Pedestrian Friendly City

Initiative	Summary	Implementer	Cost*	Potential Funding Sources
Adopt a Complete Streets policy	Adopt a formal complete streets policy	City PBT Coordinator; Planning and Development Review; Public Works; City Council	$	City General Fund
Assess Bike/Ped infrastructure	Conduct an assessment of the city's bike and pedestrian infrastructure	City PBT Coordinator; Planning and Development Review; community partners	$	GRTC, City General Fund, VDOT
Bike Share program	Implement a bike share program in the city	City PBT Coordinator; Planning and Development Review; Public Works; community partners	$$	City General Fund, University of Richmond, Virginia Commonwealth University

* Overall Cost: $ - < $100,000, $$ - $100,000 to $500,000, $$$ - > $500,000
Please note all cost estimates are based on averages from best practices around the country and will vary based on level of implementation.

	Broader Impacts Upon Implementation				Economic/Time Impacts for Implementer			
Initiative Benefits and Implementation	GHG reduction potential	Fuel/energy savings potential	Positive public health impacts	Potential for job creation	Cost to implement	Funding feasibility	Payback Period	Time to implement
Complete Streets policy	■	■	■	■	■	■	●	●
Bike/Ped infrastructure assessment	■	■	■	■	■	■	●	●
Bike Share program	■	■	■	■	■	■	●	●

■ Less Favorable ■ Somewhat Favorable ■ More Favorable ● Short ● Medium ● Long

For more information, please refer to Appendix A: Initiative Evaluation Criteria

Adopt a formal complete streets policy –The principles of Complete Streets were developed to provide a balanced transportation system for all modes of travel. Streets should be safe, comfortable, and convenient for anyone travelling by foot, bicycle, transit, or automobile for all ages and abilities. Complete Streets offer a full range of travel choices and connect to a network that is accessible to all people, including children, seniors and people with disabilities. Taking a "Complete Streets" approach to public policy and planning for a community improves the quality of life for those living and working in the city. The City has taken steps toward adopting a complete streets policy with the acceptance and adoption of the Mayor's Pedestrian, Bicycle and Trails Planning Commission Report by the Richmond City Council in February 2011, which recommended the City move forward with implementation of "complete streets". In addition to adopting a complete streets policy, the City should create an implementation plan for this policy. The City could complete a design manual for complete streets as has been done for other cities across the U.S.

Assess bike and pedestrian infrastructure – While the Richmond Connects study and the Mayor's Pedestrian, Bicycle and Trails Planning Commission have made significant progress in assessing Richmond's bike and pedestrian infrastructure, the City can deepen its baseline assessment. This can be accomplished by mapping all active bike and pedestrian pathways in Richmond, creating a comprehensive evaluation process to ensure that pathways and bike and pedestrian infrastructure are prioritized for improvements, and ensuring that new pathways are designed with complete streets principles in mind. The Green Infrastructure Assessment completed in December 2010 by the Green Infrastructure Center, E2 Inc., Richmond Regional Planning District Commission, and the City of Richmond provides recommendations both at the city-wide level and by neighborhood level through concept plans to improve pedestrian access and provide complete streets within Richmond.

While the focus of the Green Infrastructure Assessment is geared toward providing access to open space and preservation of significant ecological resources, it also provides the community with an assessment tool and a plan to use as a basis for planning for new and existing bicycle and pedestrian facilities.

Bike Share Programs in these cities have exceeded expectations for subscriptions and use filling latent demand for urban biking as a form of basic transportation:

- Chattanooga (300 bikes)
- Boston (610 bikes)
- Minneapolis (700 bikes)
- Ottawa (100 bikes)
- Washington DC/Arlington, VA (1,100)
- New York City (10,000)

Implement a bike share program in the city – Bike share programs are growing in popularity in Tier One cities across the country for recreational, tourist, and commuter uses. In fact bike share programs are becoming a very popular method of providing transit service for that first or last mile of a passenger's trip as well as routine trips throughout the day for errands, commuting to and from work, etc. Public transit serves fixed routes with stops in central locations in a city. Often a final destination is within a mile of a bus stop, and a person's decision to take transit may be influenced by the availability of a bike share program on that last mile, effectively extending the reach of transit systems.[6] In a typical bike share system, bikes are made available throughout the city on solar-powered bike racks to anyone who is a member of the bike share or has a credit card and wants to use a bike. Pre-fabricated bike racks can be purchased and can be easily moved around a city. Bike share bicycles can be returned at any bike share rack around the city, sometimes at no charge for the first 30 minutes.

It is very important to implement a bike share system in a bicycle friendly atmosphere in order for the system to be successful, and for users to be safe. Typically, cities implement a series of major bicycle infrastructure improvements, then add a bike share system to amplify the

6 Szczepanski, Carolyn. (2011, October 18). The Last Mile: How Bike-Ped Improvements Can Connect People to Transit. DC.Streets.Blog.Org. Accessed November 2011. **http://dc.streetsblog.org/2011/10/18/the-last-mile-how-bike-ped-improvements-can-connect-people-to-transit/**; and Institute for Local Government. (2011, January). In Focus: The Last Mile and Transit Ridership. Accessed November 2011. **http://www.ca-ilg.org/node/3216**

push for more bicycle infrastructure investments. A comprehensive bicycle system with appropriate infrastructure helps to add more users as the population becomes more confident in the safety and efficiency of bicycles as a form of transportation. The City could work with community partners to pursue a bike share program that is city-wide or focused on specific areas.

The local universities in Richmond, VCU and the University of Richmond, could institute bike share programs on their respective campuses. St. Xavier University in Chicago operates a sophisticated bike share system through the use of student bike ID cards. Students are issued bike ID cards upon registration and can "check out" bikes with these cards for short periods of time (the first 15 minutes are free). The local universities can review the bike share policies and programs of other universities to develop one that suits their needs.

Table 5-8: Recommended Indicators and Targets for Transportation Focus Area

Objective	Suggested Indicators	Suggested Targets
Reduce citywide Vehicle-Miles-Traveled (VMT) per capita	Modal split – number of trips by type citywide	Upward trend of sustainable transportation options including transit, pedestrian, bike, and carpool.
	Number of one-way streets in Downtown	Downward trend
	Number of cars per household citywide	Downward trend
	Mean travel time of commute time to work by sustainable transportation options such as transit, walking, and biking	Downward trend
Manage parking supply to encourage alternate modes of transportation	Ratio of parking per job by neighborhood.	Greater balance of parking per job for city neighborhoods
	Number of bicycle/ride share facilities provided at car parking facilities	Upward trend
	Number of new, improved, or expanded GRTC system routes	Upward trend
Make Richmond a bike and pedestrian friendly city	Number of city streets evaluated that meet the Complete Streets criteria.	Upward trend
	Number of bicycle and pedestrian collisions involving motor vehicles	Downward trend
	Total miles of bicycle lanes and paths	Upward trend

6. Education and Outreach

RVAgreen: A Roadmap for Sustainability is designed to be a community wide plan. While the City spearheaded the effort to develop RVAgreen, the entire community was afforded the opportunity to contribute to its development and the community will also play a role in its implementation. To ensure that the entire Richmond community is aware of RVAgreen and the opportunity to be part of its implementation, an education and outreach strategy is essential. The City of Richmond can support community wide education and outreach on RVAgreen and its goals through a three step strategy:

1. Leverage engagement from sustainability planning process
2. Design and implement an ongoing awareness program
3. Partner with the Community

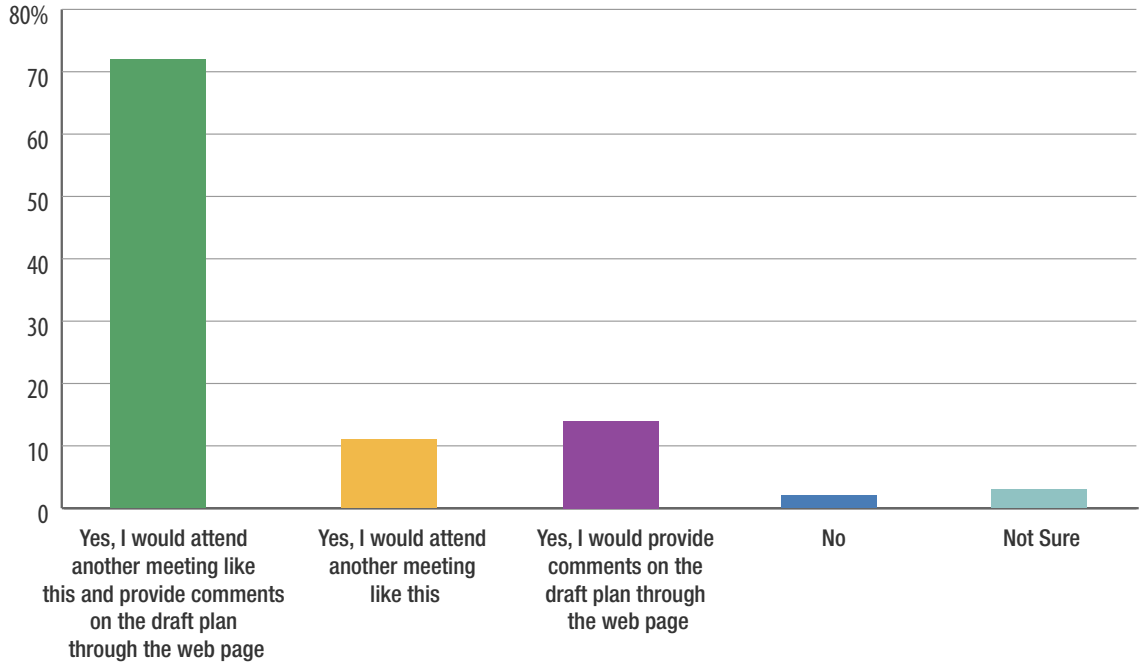
Leverage engagement from sustainability planning process

The RVAgreen development process consisted of broad community engagement, including the creation of a Sustainability Advisory Committee and a Stakeholder Group, the hosting of a community workshop attended by nearly 300 people and, two meetings with the City's Executive Team. Additionally, community members were invited to engage in the process through an online survey and attendance at MPACT and City Council District meetings. To support the ongoing engagement of the community on the implementation of RVAgreen, the City of Richmond can leverage the already engaged group of stakeholders.

The Sustainability Advisory Committee (SAC) consists of 40 representatives from City staff, state agencies, business, non-profits, and institutions. The Stakeholder Group represents 75 separate organizations that work in Richmond. The Executive Team is another 40 people that are intimately familiar with Richmond, and finally the nearly 200 community workshop attendees indicated, through real time polling, an overwhelming interest to stay involved in this process (see **Figure** below). All of these groups of Richmonders were invited to attend another community meeting where this plan was unveiled. This was an additional opportunity to further engage them in the implementation of the Plan. The vast majority of the community workshop participants indicate a desire to continue to be engaged in the sustainability planning process. The City can leverage this interest and focus it on the implementation work.

Question #5 of the Post Workshop Keypad Polling

Would you be willing to engage further in the development of the City's Sustainability Plan?



Design and implement an ongoing awareness program

The City has already developed a logo and icons for RVAgreen: A Roadmap for Sustainability. These can be the foundation of an ongoing awareness program. The logo should be incorporated throughout all of the City's existing sustainability materials- both online and in hard copy. Working with partners, like those identified above, to provide links to the Plan and to identify RVAgreen projects, will ensure that the RVAgreen message is spread widely. The City can also work with partners to promote events that support the goals of RVAgreen.

Polling at the community workshop indicated that City communication and Family/Friends were the primary sources of communication on the workshop. The City can utilize these existing channels again to engage people in the implementation of the sustainability plan. The City has several existing listservs, blogs, newsletters, and other contact lists that can be utilized to spread the word about opportunities to drive implementation of the sustainability plan.

An effective awareness program will include the following:

- A realistic goal
- Consistent message with logo
- Communication strategy detailing how get message out to the public (website, blogs, events, editorials, articles, meetings, etc.)
- Ongoing events utilizing message and logo
- Annual reporting of progress

Community Workshop Polling Question #6

How did you hear about the Community Workshop?

	Number	Percent
City website	9	6.43
City communication	36	25.71
TV news	0	0
Radio	3	2.14
Newspaper	11	7.86
Neighborhood blog	7	5
Civic or neighborhood association	8	5.71
Flyer	6	4.29
Family, friend or co-worker	36	25.71
Other	24	17.14
Totals	140	100

Partner with the Community

The City has already laid the groundwork for Building a Better Richmond through the creation of the City's Sustainability Office, the implementation of energy conservation measures throughout government operations, the installation of the first green roof, and applying green building design standards to new municipal buildings. By continuing to move forward on its commitments to sustainability, the City of Richmond will demonstrate that this is a priority and that these types of actions can be feasibly implemented. But the City cannot implement RVAgreen alone. A strong education and outreach effort to work with key community partners is vital to the success of RVAgreen. It is a community based plan and it will take the community working together with the City to meet the goals and objectives identified in RVAgreen.

APPENDIX A:

Initiative Evaluation Criteria

The tables throughout each chapter of RVAgreen provide details on the potential benefits and impacts of each initiative based on a set of evaluation criteria. Specific implementation considerations were also evaluated. The following table outlines those criteria which fall into one of two groups, "Broader Impacts Upon Implementation" and "Economic/Time Impacts for the Implementer." As visible in this table, scores could be "most favorable," "somewhat favorable," or "not very favorable." This evaluation was conducted prior to the prioritization of initiatives that eventually led to the final selection of the initiatives described in this plan. Further details on the evaluation and prioritization process can be found in **Appendix B**.

TABLE A-1: RVAGREEN INITIATIVES EVALUATION SCORING

		Score 1 - Most Favorable	Score 2 - Somewhat Favorable	Score 3 - Not very Favorable
Broader Impacts Upon Implementation	**GHG Emissions Reduction Potential**	Emissions reductions are likely or certain to occur.	Some emissions reductions are possible.	Emissions reductions are likely to be indirect, minimal/ non-existent, or non-quantifiable.
	Energy Use/Fuel Savings Potential	Energy reduction is likely or certain to occur.	Some energy reduction is possible.	Energy use reductions are likely to be indirect, minimal/non-existent, or non-quantifiable.
	Public Health Impacts (based on improvements in air quality, water quality, comfort and wellness)	Many health benefits in multiple sectors such as air, water, wellness, etc.	Some health benefits in one or two sectors such as air, water, wellness, etc.	No health impacts or impacts are indirect.
	Potential for Job Creation	Job creation likely.	Job creation possible.	Job creation unlikely.
Economic/Time Impacts for Implementer	**Cost (for the implementer)**	Cost likely to be $0 - $100,000.	Cost likely to be between $100,001 and $500,000.	Cost could be greater than $500,000.
	Funding Feasibility	Known funding sources available, or specific municipal budget line item exists, to cover a significant portion (or completely fund) the initiatives. Or the cost is minimal enough that funding feasibility is high.	Some existing outside funding sources may be available to cover a reasonable portion of the costs or may be funded through General Fund.	Small or no portion of costs likely to be covered through existing, available funding sources.
	Payback Period (for the implementer)	Short payback (0 - 5 years).	Medium payback period (5-10 years).	Long payback period (> 10 years) or NO payback or the payback is to a party other than the implementer.
	Time to Implement	Can be implemented in the short term (0 - 2 years).	Can be implemented within 2-5 years.	Long-term strategy; more than 5 years to implement.

APPENDIX B:

Sustainability Planning Process

Development of RVAgreen, Richmond's sustainability plan, involved multiple phases of research, assessment, stakeholder engagement, prioritization, and synthesis of information. The goal was to develop the content for this plan through a transparent and collaborative effort with representatives of the City, relevant stakeholders, experts, and the community as a whole. It was essential to determine past and current sustainability efforts, identify key issues for the community, and develop goals and objectives moving forward.

Stakeholders

The City selected three groups of individuals to assist with the development of goals, objectives, and initiatives of the Plan. The City selected a Sustainability Advisory Committee (SAC) for their individual expertise in various areas of sustainability and for their knowledge of Richmond. Members represented City and state agencies, business, non-profits, and select institutions. A total of 40 representatives were invited to participate in the process. Meetings in March, May, June, and September 2011 convened 20, 20, 21, and 26 SAC members, respectively, and the groups were engaged intermittently through email and phone communication.

The City selected a Stakeholder Group to represent a variety of organizations throughout Richmond, all of which have a stake in shaping the city's future and its efforts to achieve social, economic, and environmental sustainability. A total of 75 organizations were invited to participate. There were 27 individuals in attendance at a June 2011 meeting and 15 participants at a meeting held in September 2011, representing a total of 34 different agencies and organizations.

The Executive Team, composed of the City of Richmond's Department heads, also participated in the process. These individuals were brought into the planning process to ensure that objectives and initiatives aligned with efforts already underway and to speak to consistency with department objectives and efforts. They were also invaluable in the prioritization of initiatives and in gaining insight regarding the feasibility of implementation. There were 38 department representatives invited. Approximately 30 attended a meeting convened in August and 21 were in attendance at a meeting held in September.

Defining the Framework

The consultant team worked with the City's Office of Sustainability to develop an overall framework for the Plan. It was determined that the Plan would be divided into five focus areas, each with an established goal, objectives, initiatives, and indicators.

Economic Development

Energy

Environment

Open Space & Land Use

Transportation

The five focus areas were identified based on existing priorities for the City and local government best practices from around the country. The focus areas provided a way to organize the planning process, group ideas, and structure the final plan. The following are the definitions used by the City, consultant team, and stakeholders in the process of developing the components of this plan.

- **Goal:** An observable and measurable end result having one or more objectives to be achieved within a fixed timeframe.
- **Objective:** A specific, measurable target that initiatives are intended to attain.
- **Initiative:** The specific action that has been identified to achieve the objective.
- **Indicator:** A metric by which progress towards a specific objective and goal is tracked over time.

Baseline Assessment

The consultant team began the plan development process with a "baseline assessment," which was an effort to capture an overall profile of Richmond. This included research to determine demographic characteristics, including population, income, occupational breakdowns, and other similar statistics. The consultant team also investigated and analyzed the energy profile, health statistics, air and water quality measurements, transportation data, housing statistics, waste disposal and recycling rates, tree canopy, open space and land use information, energy performance and greenhouse gas emissions.

Sources of this data included federal agencies like the Census, Department of Energy, Environmental Protection Agency, state agencies, such as the Virginia Department of Environmental Quality and Virginia Department of Transportation, as well as regional planning agencies, local government agencies, and others.

The initial assessment was supplemented throughout the planning process with additional research as needed for supporting the intent of particular goals and objectives. The baseline assessment data was then synthesized for each focus area and is presented in the *"Where are we now"* section and throughout each chapter of RVAgreen.

Best Practices Research

The consultant team conducted a thorough investigation of sustainability "best practices" of local governments throughout the country, especially cities with similar characteristics and population as Richmond. This research was divided among team members by focus area. The team then reviewed approximately 25 sustainability and climate action plans from other communities to identify useful details on strategies used to achieve their sustainability goals, such as cost to implement, timeframes for implementation, benefits achieved, and indicators used to measure progress. The results of these best practices were entered into a database and used as examples for the process of identifying goals, objectives, and initiatives for the Plan.

Current Initiatives

Similar to the baseline assessment, the current initiatives were used to determine where Richmond currently stands in its efforts toward becoming a sustainable Tier One city. The current initiatives are those actions or programs already underway in Richmond. The City provided the consultant team with a detailed list of initiatives, which were organized by those that were "completed," "in progress," or "upcoming." The consultant team, once again, synthesized this information into the focus areas of the Plan, with the understanding that some initiatives may overlap with multiple focus areas.

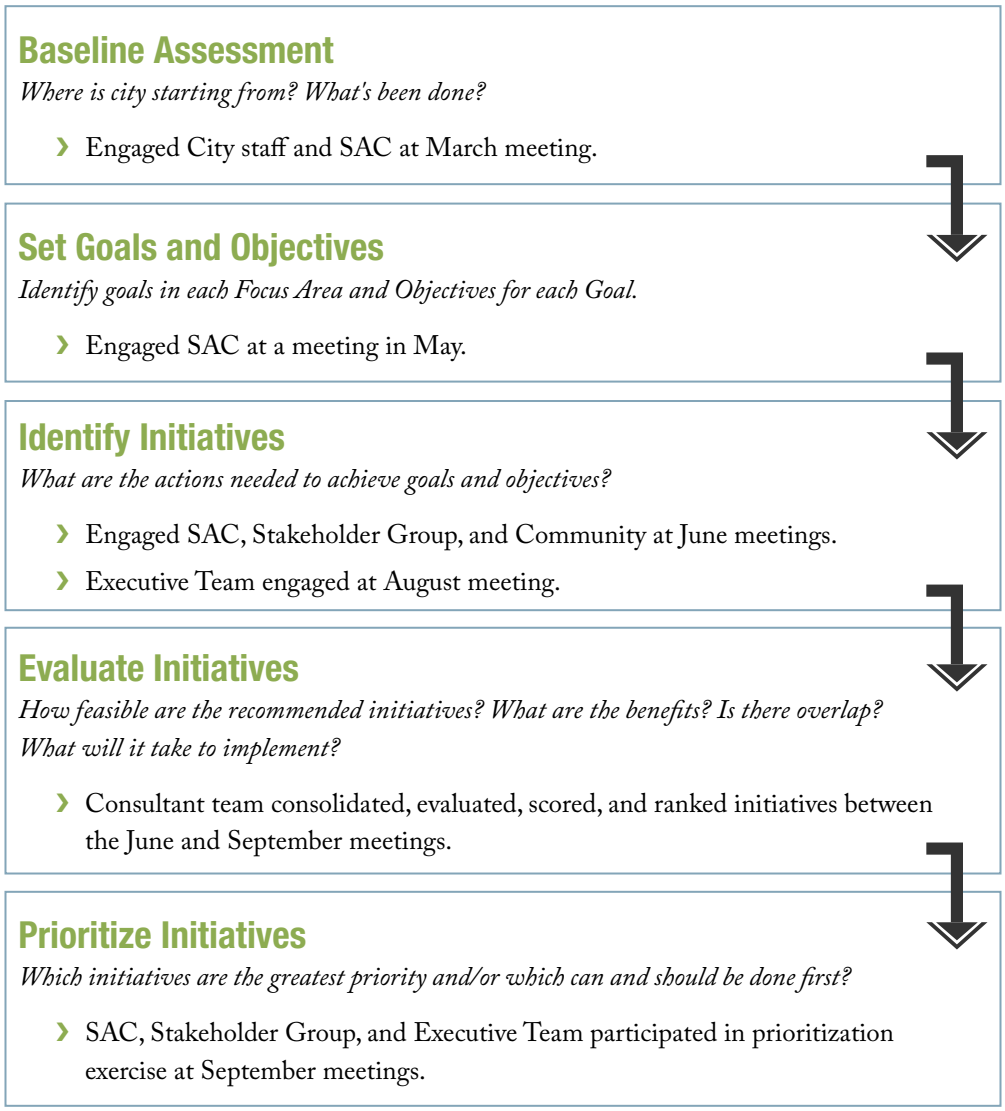
These initiatives were reviewed by City staff, the Sustainability Advisory Committee, and the Stakeholder Group to confirm the accuracy of the information and to identify any significant missing initiatives. Opportunities were also provided during the June 2011 Community Workshop for participants to provide additional initiatives currently moving forward in Richmond. See **Appendix D** for a final list of the city's Current Initiatives identified through this process.

Identifying Goals, Objectives, and Initiatives

The Sustainability Advisory Committee (SAC) convened four times throughout the planning process. During the first meeting, the SAC learned about the overall process for developing RVAgreen. An overview of the process is depicted in **Figure B-1.** At the second SAC gathering in May 2011, participants were divided into five focus groups representing the focus areas of the Plan – Economic Development, Energy, Environment, Open Space & Land Use, and Transportation - and held small group discussions to provide details on current initiatives. Participants were provided summary data from the Baseline Assessment and examples of goals and objectives from other cities' sustainability plans. Through a facilitated discussion, each focus group discussed current issues, realistic goals, and specific objectives for the focus area. Notes were compiled from all focus groups in order to shape the proposed list of goals and objectives for Richmond's Sustainability Plan.

These goals and objectives were brought to another set of meetings held in June 2011. On June 8th, the SAC was convened again to identify initiatives to achieve the selected goals and objectives. On June 9th, two meetings, the Stakeholder Group and a Community Workshop, were held to engage the community more broadly in the identification of initiatives. These meetings also provided an opportunity to review the proposed goals and objectives and provide any feedback on their intent and/or wording. At both meetings participants were polled using the Turning Point® keypad polling system to gauge interest in and knowledge of particular sustainability issues and priorities. The questions and results of all keypad polling can be found in **Appendix D.** Notes were compiled from all of these meetings to develop a list of potential initiatives to be included in the Plan.

FIGURE B-1: SUSTAINABILITY PLANNING PROCESS



Public Outreach and Community Engagement

In addition to the SAC and stakeholder meetings, the broader Richmond community was afforded several avenues to engage in the RVAgreen planning process. A community workshop was held on June 9, 2011. This event attracted approximately 178 people from the Richmond community. At the community workshop, participants were welcomed by Mayor Dwight C. Jones and then provided an overview of the sustainability planning process and the progress to date. The participants then responded to a series of keypad polling questions, which were aimed at understanding the audience and identifying their priorities and interests as it relates to sustainability in Richmond. This included gauging their acceptance of specific potential initiatives. Finally, the participants engaged in small group discussions about the five focus areas.

The questions included:

1. What is your biggest concern about Richmond's economic state?
2. What are the most effective ways to inform you of how to reduce energy consumption in your home?
3. What is your biggest concern about the state of Richmond's natural environment?
4. What would increase your desire to spend time in Richmond's public spaces (walking or engaged in other recreational activities)?
5. What factors/incentives would most increase your willingness to take public transportation?

To promote the community workshop, a significant outreach effort was undertaken that included in-person, written, and electronic communication to the public. The outreach effort included:

- Flyers developed in both English and Spanish were posted throughout the city, including the library and the Housing Authority;
- The workshop date and details were added to at least five online and print community calendars;
- City staff and consultants promoted the event in person at City Council District Meetings, churches, and other key group meetings;
- Several local blogs posted the event;
- An editorial ran on the RVA News Network;
- Posting the event on several local listservs were as well as Facebook and the City's website;
- VCU students were directly engaged to promote and assist with the community workshop;
- Members of the Sustainability Advisory Committee spread the word;
- The 4th Annual Civic Association Community Workshop (50 attendees) was attended on July 9 to further engage the community in RVAgreen.

In addition to the community workshop and these other in-person meetings, the public was provided an opportunity to offer comments and feedback through a specific RVAgreen email address and an online survey. To attempt to engage those members of the community that could not make the workshop, the City staff and consultant team attended a few other meetings. Three Mayor's Participation Action and Communication Team (MPACT) meetings were attended on the following dates:

- Precinct 1- July 13, 2011 # of Attendees = 20 # of Comment Cards Completed = 11
- Precinct 4- July 21, 2011 # of Attendees = 12; # of Comment Cards Completed = 7
- Precinct 2- August 1, 2011 # of Attendees = 20; # of Comment Cards Completed = 0

Finally, all meeting materials, including presentations, were posted on the City's website.

Evaluation and Synthesis of Proposed Initiatives

The meetings of the SAC, Stakeholder Group and community workshop resulted in a combined list of over 600 initiatives that were suggested by participants. The consultant team first consolidated this list so that unique initiatives were only listed once for all focus areas. Because many initiatives were mentioned multiple times at more than one meeting, those initiatives that were mentioned at multiple meetings were prioritized. Through this synthesis and prioritization the list of initiatives was pared down to approximately 200. An additional review by the consultant team was then done to further pare down the list by combining and rephrasing initiatives that were very similar in their intent, details, and would have similar costs, benefits, and implementation plans. The City also did a preliminary review of consolidated initiatives to highlight those that should proceed to the evaluation stage. This brought the list down to a more manageable 114 total initiatives that would then be more comprehensively evaluated.

The consultant team developed a streamlined process and scoring system for the evaluation of the initiatives. **Table B-1** shows the criteria and scoring method employed in the evaluation process. The initiatives described within this sustainability plan can each be categorized as one of the following:

- **Policy:** This would include any initiative that calls for the adoption of a policy, regulation, or zoning change. Adoption of a policy itself does not directly result in environmental, social, or economic benefits. It is the implementation and enforcement of such a policy that will have an impact. However, to avoid confusion in the nuances of adoption versus implementation of a policy, such initiatives were evaluated based on their intent. So, for example, if the intent of a policy is to improve energy efficiency through procurement of more efficient equipment, it was assumed in evaluation of this initiative that such equipment would indeed be purchased. However, it is important to note that with regard to "cost to implement," "funding feasibility," and "payback," these criteria were consistently – and in all categories—evaluated with respect to the process of adopting the policy. For this reason, policies typically receive favorable scores with regard to the financial feasibility since adoption of a policy requires relatively little financial investment. It is important to note that these criteria – those which could be classified as "economic impacts for the implementer"—are always evaluated with respect to the implementer. This is significant because there may be instances where a benefit or payback could be to a party other than the implementer of the initiative.
- **Program:** This type of initiative includes any type of program creation, including a training, resource, educational or outreach program. Similarly to a policy initiative, these were evaluated for their environmental and socio-economic benefits based on the intent of the program, not on creation of the program itself. However, since the initiative is really the act of creating the program, the funding feasibility criteria were evaluated based on the process of creating the program.
- **Study/Assessment:** A study or assessment, such as a feasibility study, is important to moving any sustainability plan forward. However, it is important to remember that studies and assessments create no direct benefits. It is not possible to evaluate such an initiative for environmental or socio-economic benefits on intent in this case because it

is impossible to predict the results of the study and what recommendations/actions may or may not come out of the study. Therefore, the lowest score was given for the "broader impacts" criteria for these initiatives, and the financial criteria were evaluated for having the study conducted.

› **Direct Action/Implementation:** This is the most straightforward type of initiative as all criteria can be evaluated based on the implementation and results of a direct action.

TABLE B-1: RVAGREEN INITIATIVES EVALUATION SCORING

		Score 1 - Most Favorable	Score 2 - Somewhat Favorable	Score 3 - Not very Favorable
Broader Impacts Upon Implementation	**GHG Emissions Reduction Potential**	Emissions reductions are likely or certain to occur.	Some emissions reductions are possible.	Emissions reductions are likely to be indirect, minimal/ non-existent, or non-quantifiable.
	Energy Use/Fuel Savings Potential	Energy reduction is likely or certain to occur.	Some energy reduction is possible.	Energy use reductions are likely to be indirect, minimal/non-existent, or non-quantifiable.
	Public Health Impacts (based on improvements in air quality, water quality, comfort and wellness)	Many health benefits in multiple sectors such as air, water, wellness, etc.	Some health benefits in one or two sectors such as air, water, wellness, etc.	No health impacts or impacts are indirect.
	Potential for Job Creation	Job creation likely.	Job creation possible.	Job creation unlikely.
Economic/Time Impacts for Implementer	**Cost (for the implementer)**	Cost likely to be $0 - $100,000.	Cost likely to be between $100,001 and $500,000.	Cost could be greater than $500,000.
	Funding Feasibility	Known funding sources available, or specific municipal budget line item exists, to cover a significant portion (or completely fund) the initiatives. Or the cost is minimal enough that funding feasibility is high.	Some existing outside funding sources may be available to cover a reasonable portion of the costs or may be funded through General Fund.	Small or no portion of costs likely to be covered through existing, available funding sources.
	Payback Period (for the implementer)	Short payback (0 - 5 years).	Medium payback period (5-10 years).	Long payback period (> 10 years) or NO payback or the payback is to a party other than the implementer.
	Time to Implement	Can be implemented in the short term (0 - 2 years).	Can be implemented within 2-5 years.	Long-term strategy; more than 5 years to implement.

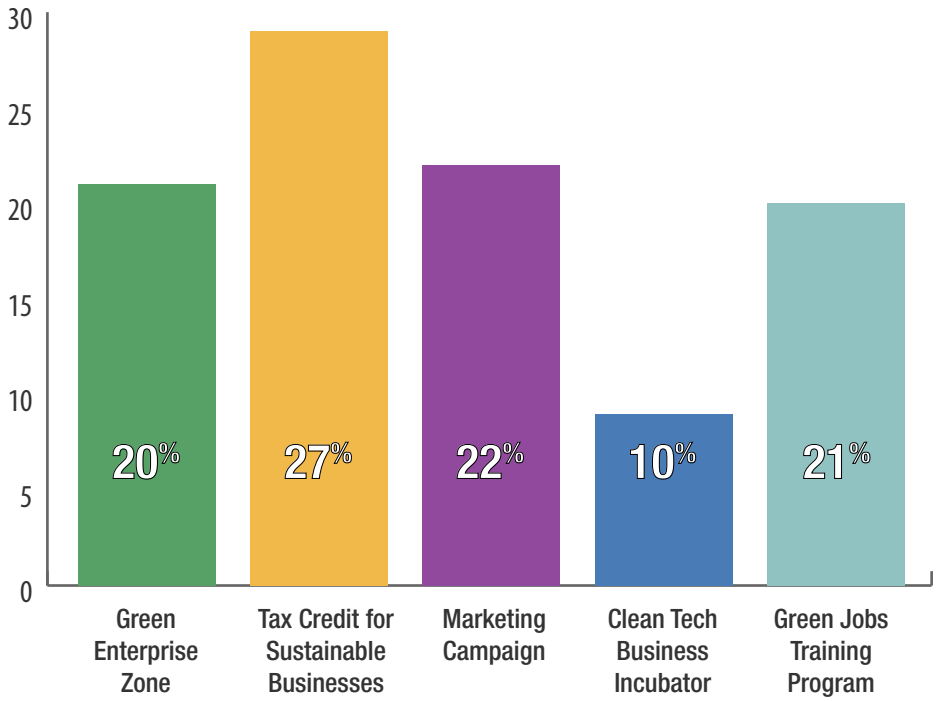
Based on scores received, initiatives were ranked within each focus area, but not across focus areas. It is important to note that when initiatives received the same score, an initiative was ranked higher based on a ranking established by the City. The criteria used for evaluation

were based on the City's priorities as well as ensuring that the goals of the Energy Efficiency and Conservation Block Grant (EECBG) were being addressed. The consultant team evaluated initiatives using their expertise in each focus area as well as through review of case studies and best practices of other communities that had implemented similar initiatives.

Prioritization of Initiatives

In September 2011, the City and the consultant team convened the Sustainability Advisory Committee, Stakeholder Group, and the Executive Team in three separate meetings with the purpose of reviewing and prioritizing the 114 evaluated initiatives. The scoring and preliminary ranking of these initiatives, along with descriptions and annotations about the scoring were all provided to the meeting participants in advance of the meeting. During the meeting, participants received a review of all finalized goals and objectives and had access to hard copies of the initiative details and preliminary ranking. During the meeting, the consultant team ran a keypad polling process during which participants were able to rank their top three initiatives (in order)[1] under each objective. An example of the polling and results can be seen below for the "Create more green jobs" objective.

FIGURE B-2: OBJECTIVE: CREATE MORE GREEN JOBS



1 The Turning Point® keypad polling system is able to register each keypad's responses in order (accepting the first choice as the top choice) and uses a scoring system to determine which initiatives received the highest vote overall. For example, a participant's top choice would receive 3 points in the system, while its second choice would receive only 2, and the 3rd choice only 1.

The results of keypad polling for the prioritization exercise and for all three meetings can be found in **Appendix C.** The results among all three groups were remarkably consistent. However, there were a few objectives where the top three initiatives differed among the groups. Given the internal expertise of the Executive Team members and their understanding of the City's budget and operational realities, the final ranking results for these few objectives were weighted such that the Executive Team results were given twice as much weight as the other two stakeholder groups' results. The weighted average ranking for each initiative was used to identify the top three initiatives for each objective. Mayor Dwight C. Jones and the City's Chief Administrative Officer approved all prioritized initiatives in November 2011.

The City held a final community workshop in February 2012 to share the goals, objectives, and initiatives of the Plan with the public and to discuss how the community could play a role in the implementation of each initiative. Approximately 75 participants attended the meeting and indicated the role they would be willing to play in driving implementation of each initiative.

Overall, the City of Richmond undertook a fairly extensive public process to develop the RVAgreen Sustainability Plan. Several opportunities have been offered, including online and in-person meetings, to allow the community to provide input into the process and in particular the identification and prioritization of initiatives. In total, more than 400 people had the opportunity to provide direct feedback and to participate in the identification, prioritization, and implementation prioritization of initiatives. Given that there was an overwhelming consistency in the results of the prioritization exercise among the Sustainability Advisory Committee, the Stakeholder Group, and the Executive Team, and that a large number of citizens came out to the two workshops, the City can feel confident that there is broad support for the initiatives identified for the Plan.

APPENDIX C:

Keypad Polling Results

Keypad polling was used in a number of meetings to help quickly determine opinions of the engaged groups. The first round of keypad polling was used to gauge overall thoughts on the general sustainability of Richmond, areas of strength and weakness, and general thoughts on willingness to support specific potential initiatives. This first round also obtained basic demographic information of those being polled. The Stakeholder Group and the Community were polled in June 2011. The second round of polling was held in September 2011 with the Sustainability Advisory Committee, the Stakeholder Group, and the City's Executive Team. This round of polling was specific to prioritizing the initiatives that were identified through the June meetings. The results of all polling efforts are provided here.

SESSION NAME: **Stakeholders Meeting**

June 9, 2011

1	**On a scale of 1 to 5, how would you describe your level of knowledge of sustainability issues?**	
	1...Beginner	0%
	2	4%
	3	32%
	4	40%
	5...Expert	24%
2	**What do you think is the biggest challenge facing Richmond and its residents and businesses today?**	
	Poverty	42%
	Unemployment	21%
	Quality of educational resources	17%
	Water quality	8%
	Access to public transit	8%
	Energy costs	4%
	Air quality	0%
3	**What are the greatest inequities in Richmond?**	
	Distribution of wealth	40%
	Education	24%
	Housing	16%
	Transportation	12%
	Jobs	4%
	Access to services	4%
4	**Where is equity most balance in Richmond?**	
	Access to services	67%
	Transportation	13%
	Housing	8%
	Education	8%
	Jobs	4%
	Distribution of wealth	0%
5	**In your opinion, what is the most important characteristic of a "Sustainable Richmond"?**	
	Thriving economy	36%
	Multi-modal transportation options	36%
	A clean environment	12%
	A stable energy system	12%
	Plentiful and accessible public open space	4%

SESSION NAME: **Stakeholders Meeting**

June 9, 2011

6	**Do you think that the city should allocate resources to help all of Richmond become more sustainable?**	
	Yes, as much as possible	75%
	Yes, but with minimal financial investment	25%
	No, I do not think the city should allocate any resources to sustainability	0%
7	**Are you willing to make changes in your personal life to be more sustainable?**	
	Yes, and I am ready to do more or get started	88%
	I already have made some changes and am not willing/able to do more	12%
	No, I will not make any changes	0%
8	**What is your biggest concern about the state of Richmond's natural environment?**	
	Recycling/solid waste stream	43%
	James River water quality	30%
	Public open green space	17%
	Air quality	9%
	Tree canopy	0%
9	**What is the best aspect of Richmond's natural environment?**	
	Public open green space	46%
	Tree canopy	21%
	James River water quality	17%
	Air quality	17%
	Recycling/solid waste stream	0%
10	**What is your biggest concern about Richmond's current economic state?**	
	Jobs that match the skills of the unemployed	42%
	Level of investment in redevelopment	38%
	Overall availability of jobs	17%
	Affordable housing options	4%
11	**What is the most promising aspect of Richmond's current economic state?**	
	Affordable housing options	33%
	Level of investment in redevelopment	29%
	Overall availability of jobs	25%
	Jobs that match the skills of the unemployed	13%

SESSION NAME: **Community Workshop**

June 9, 2011

1	**What is your favorite sports team? (multiple choice)**	
	VCU Rams	51%
	Richmond Flying Squirrels	25%
	Richmond Kickers	16%
	U of R Spiders	8%
2	**In what Council District do you live? (multiple choice)**	
	I don't live in the city	24%
	Central (5th)	18%
	West End (1st District)	16%
	Northside (3rd)	13%
	North Central (2nd)	12%
	Southside (8th)	7%
	East End (7th)	5%
	Southwest (4th)	4%
	South Central (9th)	1%
	Gateway (6th)	0%
3	**How long have you lived in Richmond? (multiple choice)**	
	Less than two years	8%
	Two to five years	14%
	Five to ten years	14%
	Ten to twenty years	11%
	More than twenty years	38%
	I don't live here and never have	8%
	I don't live here but I used to	7%
4	**How old are you? (multiple choice)**	
	Under 18	1%
	18-29	17%
	30-39	17%
	40-49	17%
	50-59	26%
	60-69	14%
	70 and over	6%
5	**What is the highest level of education you have completed? (multiple choice)**	
	8th grade or less	1%
	High School	8%
	Technical Training School	1%
	Associates Degree	3%
	Bachelors Degree	43%
	Masters Degree or higher	44%

SESSION NAME: **Community Workshop**

June 9, 2011

6 How did you hear about the Community Workshop? (multiple choice)

City communication	26%
Family, friend or co-worker	26%
Other	17%
Newspaper	8%
City website	6%
Civic or neighborhood association	6%
Neighborhood blog	5%
Flyer	4%
Radio	2%
TV news	0%

7 What is your primary reason for joining the workshop today? (multiple choice)

Interested to understand what the city is doing	84%
Want to learn how to be more sustainable in my own life	7%
Curious to see who would be here	4%
Free food	3%
Accompanying a friend	2%
Had nothing else to do today	0%

8 How would you describe your level of knowledge on issues impacting sustainability? (multiple choice)

Expert	55%
I understand the concept, though have not applied it	27%
Beginner	13%
No knowledge	4%

9 What do you think is the biggest challenge facing Richmond and its residents and businesses today? (multiple choice)

Poverty	29%
Quality of educational resources	24%
Unemployment	18%
Access to public transit	17%
Energy costs	7%
Water quality	4%
Air quality	2%

10 Where are the greatest inequities in Richmond? (multiple choice)

Distribution of wealth	36%
Education	31%
Transportation	11%
Access to services	8%
Housing	8%
Jobs	6%

SESSION NAME: **Community Workshop**

June 9, 2011

11	**Which is most fairly provided in Richmond? (multiple choice)**	
	Access to services	50%
	Transportation	16%
	Education	10%
	Housing	10%
	Jobs	10%
	Distribution of wealth	4%
12	**In your opinion, what is the most important characteristic of a "Sustainable Richmond"? (multiple choice)**	
	Thriving economy	31%
	Multi-modal transportation options	20%
	A clean environment	20%
	A stable energy system	20%
	Plentiful and accessible public open space	9%
13	**Do you think that the city should allocate resources to help all of Richmond become more sustainable? (multiple choice)**	
	Yes, as much as possible	75%
	Yes, but with minimal financial investment	19%
	No, I do not think the city should allocate any resources to sustainability	6%
14	**Are you willing to make changes in your personal life to be more sustainable? (multiple choice)**	
	Yes, and I am ready to do more or get started	86%
	I already have made some changes and am not willing/able to do more	8%
	No, I will not make any changes	6%
15	**Currently Richmond residents pay a fee for both trash and recycling pick up. On a scale of 1-5, how supportive would you be of a Pay – As-You-Throw system where there is unlimited free recycling, food, and yard waste pick-up and a fee for each bag or barrel of trash? (multiple choice)**	
	1...Not supportive	12%
	2	4%
	3	10%
	4	18%
	5...Very supportive	56%
16	**Would you replace faucets or showerheads at home with water conserving fixtures? (multiple choice)**	
	Yes	61%
	Only when mine stop working	25%
	Only if I got a rebate	7%
	No	8%

SESSION NAME: **Community Workshop**

June 9, 2011

17	**How often do you spend time in one of Richmond's parks? (multiple choice)**	
	More than once a week	41%
	Every 1-2 weeks	18%
	Once a month	17%
	Less than once a month	24%
18	**Would you live in a neighborhood with offices and shops within walking distance? (multiple choice)**	
	Yes, definitely	40%
	Yes, as long as I could still have my own house	12%
	Maybe	2%
	No	4%
	I already do	42%
19	**Which do you think would be the most effective way to encourage a green job economy in Richmond? (multiple choice)**	
	Work with existing businesses to become more sustainable	53%
	Market Richmond to attract new, sustainable businesses	27%
	Train the existing workforce on new industries	13%
	Adding curriculum at vocational and community schools	8%
20	**If a vacant parcel in your neighborhood were to be redeveloped as a community garden providing local produce, would you: (multiple choice)**	
	Support the initiative as a buyer of produce grown at the garden	44%
	Both grow and buy produce	44%
	Actively participate as a grower	9%
	Be opposed to a community garden	4%
21	**If your employer offered an incentive program to take public transit would you do it? (multiple choice)**	
	Yes	58%
	No	15%
	Maybe	28%
22	**Which factor would most increase your willingness to ride a bike in the city of Richmond (to work, to school, for errands, for pleasure)? (multiple choice)**	
	Bike lanes	75%
	Places to shower and change at near work	12%
	Bike sharing programs	9%
	Expanded bike transport on buses	4%

The following questions were asked of the Community Workshop participants at the end of the workshop to gauge any changes of opinion or understanding from the beginning of the workshop.

1	**Do you think that the City should allocate resources to help all of Richmond become more sustainable?**	
	Yes, as much as possible	80%
	Yes, but with minimal financial investment	18%
	No, I do not think the City should allocate any resources to sustainability	2%
2	**What do you think is the biggest challenge facing Richmond and its residents and businesses today?**	
	Quality of educational resources	33%
	Poverty	30%
	Access to public transit	14%
	Unemployment	13%
	Water quality	5%
	Energy costs	4%
	Air quality	1%
3	**What portion of the workshop today was most valuable?**	
	Small Group Discussion	84%
	Keypad polling	9%
	Did not find the workshop to be valuable	5%
	Welcome by Mayor	2%
	Video	0%
	Presentations	0%
4	**I am leaving this workshop with a better understanding of ways to become more sustainable.**	
	Somewhat Agree	49%
	Strongly Agree	23%
	Somewhat Disagree	17%
	Disagree	11%
5	**Would you be willing to engage further in the development of the City's Sustainability Plan?**	
	Yes, I would attend another meeting like this and provide comments on the draft plan through the webpage	73%
	Yes, I would provide comments on the draft plan through the webpage	13%
	Yes, I would attend another meeting like this	11%
	Not sure	2%
	No	1%

SESSION NAME: **Sustainability Advisory Committee**

September 22, 2011

1 Objective: Increase the use of alternative energy sources (priority ranking)

Promote electric vehicles	25%
Lower permit fees – Alt. energy	22%
Low interest loans – renewables	22%
Food waste-to-energy	11%
Study solar, wind, cogen, geothermal	10%
Green power purchasing	5%
Heat recovery at treatment plants	4%
Renewable Energy Certificates	0%

2 Objective: Lower building energy consumption citywide (priority ranking)

Tax breaks for energy efficiency	21%
Residential weatherization	20%
Green roofs/white roofs	16%
Assist businesses in efficiency	14%
Free or reduced-price energy audits	7%
Energy efficiency education programs	6%
Connect with utility incentive programs	6%
Smart meters	5%
Energy requirements in code	5%
Create a website or info center	0%

3 Objective: Reduce energy use in City Government operations (priority ranking)

Performance contracts	24%
Policy for Ops & Maintenance	20%
Green fleets	17%
Energy efficiency procurement	13%
Energy Management System	12%
Maximize efficient use of space	12%
Green Team in City departments	2%

4 Objective: Protect and enhance Richmond's water resources (priority ranking)

Stormwater BMPs	26%
Clean vehicle maintenance	19%
Reduce impermeable surface	15%
Label all drains to the river	13%
Organic pesticide and fertilizer	13%
Regional task force	9%
Boating pollution reduction	4%

SESSION NAME: **Sustainability Advisory Committee**

September 22, 2011

5	**Objective: Enable the Richmond community to use water wisely (priority ranking)**	
	Low-flow fixtures in all city buildings	23%
	Native or drought resistant plantings	21%
	Restructure water rates	16%
	Rebate for water efficiency	15%
	Promote rainwater collection systems	13%
	Policy on sprinkler use	10%
6	**Objective: Improve the city's solid waste stream (priority ranking)**	
	Expand recycling service	29%
	Procurement policy-material reduction	23%
	Ban the use of bottled water	19%
	Pay-As-You-Throw	17%
	Ban or charge for plastic bags	13%
7	**Objective: Strive to continuously improve the quality of Richmond's indoor and outdoor air (priority ranking)**	
	Green Indoor Air Quality policy	30%
	Traffic management plan	23%
	Green and Healthy Homes	20%
	Citywide anti-idling policy	19%
	Radon remediation program	8%
8	**Objective: Create opportunities for Richmond businesses to enhance their overall sustainability (priority ranking)**	
	One-stop resource center	31%
	Green business recognition	28%
	Educate landlords – Green leases	25%
	Sustainable tourism program	16%
9	**Objective: Create more green jobs (priority ranking)**	
	Tax Credit for sustainable businesses	27%
	Marketing campaign	22%
	Green jobs training program	21%
	Green Enterprise Zone	20%
	Clean tech business incubator	10%
10	**Objective: Make local, healthy, and sustainable food accessible and affordable (priority ranking)**	
	Urban agriculture on public lands	21%
	Eliminate food deserts	21%
	Vacant lots – urban agriculture	19%
	Farmers markets	15%
	Locally grown food at grocery stores	14%
	Education campaign – local food	10%

SESSION NAME: **Sustainability Advisory Committee**

September 22, 2011

11	**Objective: Improve the state of good repair and efficiency of city infrastructure (priority ranking)**	
	Life Cycle Cost analysis	24%
	Restore trolley system	23%
	Regional partnerships	22%
	Prioritize updating of the water main	19%
	Beautification program	13%
12	**Objective: Encourage 24/7 communities with more sustainable and affordable housing options throughout the city (priority ranking)**	
	Density bonuses	28%
	Require building to green standards	23%
	Zoning changes	23%
	Require % of affordable housing	17%
	Green leases	10%
13	**Objective: Increase accessibility, quantity, and quality of public space (priority ranking)**	
	Parks maintenance program	25%
	Riverfront plan for open space	22%
	Improve bike/ped pathways	22%
	Pocket parks	18%
	Free Wi-Fi in public spaces	7%
	Invest in conservation easements	5%
	Develop a park stewardship program	2%
14	**Objective: Increase Richmond's tree canopy (priority ranking)**	
	Plant trees in empty tree wells	29%
	One-to-one tree replacement	25%
	List of appropriate tree species	25%
	Comprehensive tree canopy study	21%
15	**Objective: Protect historic building stock and promote the reuse of vacant and blighted property (priority ranking)**	
	Redevelop Brownfield sites	22%
	Transfer of ownership	19%
	Reduce fees for adaptive reuse	16%
	Urban agriculture	14%
	Absentee owners fee	10%
	Strict codes for property maintenance	9%
	Historic building demolition permits	8%
	Historic district status review	4%

SESSION NAME: **Sustainability Advisory Committee**

September 22, 2011

16	**Objective: Reduce citywide vehicle-miles-travelled (priority ranking)**	
	Bus Rapid Transit (BRT)	31%
	One way streets to two way	28%
	GRTC enhancement program	26%
	Transp. Mgmt. Association	10%
	Conduct transit survey	6%
17	**Objective: Manage parking supply to encourage alternate modes of transportation (priority ranking)**	
	Bike parking, ride share, alt. fuel parking	23%
	Parking minimums for maximums	20%
	Eliminate surface parking from key areas	15%
	Install dynamic parking guidance systems	11%
	Park & Ride lots	9%
	Inventory of on and off street parking	9%
	Parking permit fees for 2nd/3rd vehicle	6%
	Vehicle excise tax to fund improvements	6%
18	**Objective: Make Richmond a bike and pedestrian friendly city (priority ranking)**	
	Safe Routes to School	21%
	Assess bike and ped infrastructure	19%
	Formal Complete Streets policy	17%
	Workplace incentives	13%
	Bike share program	9%
	Traffic calming	7%
	Bike/ped media/marketing	6%
	Key destinations for bike riders	4%
	Summer Streets or Weekend Streets	3%

SESSION NAME: **Stakeholders Meeting**

September 22, 2011

1	**Objective: Increase the use of alternative energy sources (priority ranking)**	
	Low Interest Loans – Renewables	21%
	Promote electric vehicles	20%
	Study solar, wind, cogen, geothermal	17%
	Lower Permit Fees – Alt. energy	16%
	Green power purchasing	9%
	Heat recovery at treatment plants	7%
	Renewable Energy Certificates	5%
	Food waste-to-energy	4%
2	**Objective: Lower building energy consumption citywide (priority ranking)**	
	Assist businesses in efficiency	20%
	Tax breaks for energy efficiency	19%
	Smart meters	14%
	Residential weatherization	12%
	Free or reduced-price energy audits	10%
	Energy requirements in code	7%
	Green roofs/white roofs	7%
	Connect with utility incentive programs	5%
	Energy efficiency education programs	5%
	Create a website or info center	0%
3	**Objective: Reduce energy use in City Government operations (priority ranking)**	
	Performance contracts	21%
	Energy efficiency procurement	19%
	Policy for Ops & Maintenance	19%
	Green fleets	15%
	Energy Management System	15%
	Maximize efficient use of space	9%
	Green Team in City departments	3%
4	**Objective: Protect and enhance Richmond's water resources (priority ranking)**	
	Stormwater BMPs	26%
	Reduce impermeable surface	21%
	Organic pesticide and fertilizer	19%
	Regional task force	15%
	Clean vehicle maintenance	9%
	Label all drains to the river	7%
	Boating pollution reduction	2%

SESSION NAME: **Stakeholders Meeting**

September 22, 2011

5	**Objective: Enable the Richmond community to use water wisely (priority ranking)**	
	Rebate for water efficiency	24%
	Promote rainwater collection systems	20%
	Restructure water rates	20%
	Low-flow fixtures in all city buildings	17%
	Native or drought resistant plantings	13%
	Policy on sprinkler use	5%
6	**Objective: Improve the city's solid waste stream (priority ranking)**	
	Expand recycling service	29%
	Pay-As-You-Throw	22%
	Ban or charge for plastic bags	20%
	Ban the use of bottled water	14%
	Procurement policy-material reduction	14%
7	**Objective: Strive to continuously improve the quality of Richmond's indoor and outdoor air (priority ranking)**	
	Green and Healthy Homes	28%
	Green Indoor Air Quality policy	24%
	Traffic management plan	20%
	Citywide anti-idling policy	16%
	Radon remediation program	12%
8	**Objective: Create opportunities for Richmond businesses to enhance their overall sustainability (priority ranking)**	
	Green business recognition	31%
	One-stop resource center	30%
	Educate landlords – Green leases	25%
	Sustainable Tourism Program	13%
9	**Objective: Create more green jobs (priority ranking)**	
	Tax Credit for sustainable businesses	29%
	Green Enterprise Zone	21%
	Green jobs training program	19%
	Marketing campaign	17%
	Clean tech business incubator	14%
10	**Objective: Make local, healthy, and sustainable food accessible and affordable (priority ranking)**	
	Vacant lots – urban agriculture	26%
	Farmers markets	20%
	Locally grown food at grocery stores	19%
	Eliminate food deserts	16%
	Urban agriculture on public lands	13%
	Education campaign – local food	7%

SESSION NAME: **Stakeholders Meeting**

September 22, 2011

11	**Objective: Improve the state of good repair and efficiency of city infrastructure (priority ranking)**	
	Restore trolley system	28%
	Regional partnerships	22%
	Life Cycle Cost Analysis	20%
	Prioritize updating of the water main	17%
	Beautification program	14%
12	**Objective: Encourage 24/7 communities with more sustainable and affordable housing options throughout the city (priority ranking)**	
	Zoning changes	29%
	Require building to green standards	26%
	Density bonuses	18%
	Require % of affordable housing	16%
	Green leases	12%
13	**Objective: Increase accessibility, quantity, and quality of public space (priority ranking)**	
	Riverfront plan for open space	23%
	Improve bike/ped pathways	19%
	Parks maintenance program	17%
	Pocket Parks	15%
	Develop a park stewardship program	13%
	Free Wi-Fi in public spaces	9%
	Invest in conservation easements	4%
14	**Objective: Increase Richmond's tree canopy (priority ranking)**	
	One-to-one tree replacement	32%
	Plant trees in empty tree wells	26%
	List of appropriate tree species	25%
	Comprehensive tree canopy study	18%
15	**Objective: Protect historic building stock and promote the reuse of vacant and blighted property (priority ranking)**	
	Urban agriculture	22%
	Redevelop Brownfield sites	22%
	Transfer of ownership	17%
	Reduce fees for adaptive reuse	14%
	Absentee owners fee	12%
	Historic district status review	10%
	Strict codes for property maintenance	2%
	Historic building demolition permits	0%

SESSION NAME: **Stakeholders Meeting**

September 22, 2011

16 Objective: Reduce citywide vehicle-miles-traveled (priority ranking)

GRTC enhancement program	33%
Bus Rapid Transit (BRT)	26%
Transp. Mgmt. Association	20%
One way streets to two way	13%
Conduct transit survey	8%

17 Objective: Manage parking supply to encourage alternate modes of transportation (priority ranking)

Bike parking, ride share, alt. fuel parking	31%
Parking minimums for maximums	25%
Park & Ride lots	14%
Eliminate surface parking from key areas	13%
Install dynamic parking guidance systems	7%
Parking permit fees for 2nd/3rd vehicle	5%
Vehicle excise tax to fund improvements	3%
Inventory of on and off street parking	3%

18 Objective: Make Richmond a bike and pedestrian friendly city (priority ranking)

Bike share program	18%
Formal complete streets policy	17%
Workplace Incentives	17%
Assess bike and ped infrastructure	16%
Traffic calming	11%
Safe Routes to School	9%
Summer Streets or Weekend Streets	7%
Bike/ped media/marketing	4%
Key destinations for bike riders	2%

SESSION NAME: **Executive Team**

September 23, 2011

1 Objective: Increase the use of alternative energy sources (priority ranking)

Lower permit fees – Alt. energy	23%
Low interest loans – Renewables	23%
Promote electric vehicles	16%
Food waste-to-energy	10%
Heat recovery at treatment plants	8%
Green power purchasing	8%
Study solar, wind, cogen, geothermal	6%
Renewable Energy Certificates	4%

2 Objective: Lower building energy consumption citywide (priority ranking)

Tax breaks for energy efficiency	19%
Residential weatherization	18%
Assist businesses in efficiency	11%
Green roofs/white roofs	10%
Smart meters	10%
Energy requirements in code	8%
Energy efficiency education programs	8%
Connect with utility incentive programs	6%
Free or reduced-price energy audits	6%
Create a website or info center	4%

3 Objective: Reduce energy use in City Government operations (priority ranking)

Green fleets	25%
Maximize efficient use of space	19%
Energy efficiency procurement	18%
Policy for Ops & Maintenance	13%
Performance contracts	11%
Energy Management System	9%
Green Team in City departments	6%

4 Objective: Protect and enhance Richmond's water resources (priority ranking)

Organic pesticide and fertilizer	22%
Stormwater BMPs	19%
Clean vehicle maintenance	16%
Reduce impermeable surface	15%
Label all drains to the river	14%
Regional task force	14%
Boating pollution reduction	0%

SESSION NAME: **Executive Team**

September 23, 2011

5	**Objective: Enable the Richmond community to use water wisely (priority ranking)**	
	Rebate for water efficiency	24%
	Low-flow fixtures in all city buildings	23%
	Promote rainwater collection systems	20%
	Native or drought resistant plantings	16%
	Restructure water rates	15%
	Policy on sprinkler use	2%
6	**Objective: Improve the city's solid waste stream (priority ranking)**	
	Expand recycling service	36%
	Procurement policy-material reduction	25%
	Ban or charge for plastic bags	17%
	Pay-As-You-Throw	16%
	Ban the use of bottled water	5%
7	**Objective: Strive to continuously improve the quality of Richmond's indoor and outdoor air (priority ranking)**	
	Traffic management plan	33%
	Green Indoor Air Quality policy	26%
	Green and Healthy Homes	23%
	Citywide anti-idling policy	13%
	Radon remediation program	5%
8	**Objective: Create opportunities for Richmond businesses to enhance their overall sustainability (priority ranking)**	
	Green business recognition	35%
	One-stop resource center	32%
	Sustainable tourism program	19%
	Educate landlords – Green leases	14%
9	**Objective: Create more green jobs (priority ranking)**	
	Green jobs training program	29%
	Green Enterprise Zone	23%
	Tax credit for sustainable businesses	23%
	Marketing campaign	16%
	Clean tech business incubator	10%
10	**Objective: Make local, healthy, and sustainable food accessible and affordable (priority ranking)**	
	Farmers markets	25%
	Locally grown food at grocery stores	19%
	Eliminate food deserts	19%
	Vacant lots – urban agriculture	14%
	Education campaign – local food	14%
	Urban agriculture on public lands	11%

SESSION NAME: **Executive Team**

September 23, 2011

11	**Objective: Improve the state of good repair and efficiency of city infrastructure (priority ranking)**	
	Beautification program	28%
	Life Cycle Cost analysis	19%
	Restore trolley system	19%
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	Transfer of ownership	16%
	Reduce fees for adaptive reuse	16%
	Urban agriculture	15%
	Redevelop Brownfield sites	12%
	Strict codes for property maintenance	10%
	Historic building demolition permits	8%
	Historic district status review	5%

SESSION NAME: **Executive Team**

September 23, 2011

16 Objective: Reduce citywide vehicle-miles-traveled (priority ranking)

Bus Rapid Transit (BRT)	26%
One way streets to two way	26%
GRTC enhancement program	20%
Conduct transit survey	15%
Transp. Mgmt. Association	12%

17 Objective: Manage parking supply to encourage alternate modes of transportation (priority ranking)

Bike parking, ride share, alt. fuel parking	28%
Park & Ride lots	19%
Parking minimums for maximums	16%
Inventory of on and off street parking	11%
Vehicle excise tax to fund improvements	9%
Eliminate surface parking from key areas	9%
Parking permit fees for 2nd/3rd vehicle	5%
Install dynamic parking guidance systems	5%

18 Objective: Make Richmond a bike and pedestrian friendly city (priority ranking)

Bike share program	18%
Formal complete streets policy	15%
Bike/ped media/marketing	15%
Workplace incentives	14%
Traffic calming	12%
Assess bike and ped infrastructure	11%
Safe Routes to School	8%
Summer Streets or Weekend Streets	6%
Key destinations for bike riders	2%

APPENDIX D:

Current Achievements

An important component of the planning process was to determine where Richmond currently stands with regard to sustainability. Specifically, the process engaged all stakeholder groups to identify what initiatives have already been implemented within City government and throughout the community. The City provided the consultant team with a detailed list of initiatives, which were organized by those that were “completed,” “in progress,” or “upcoming.” This was used as the foundation of this Appendix.

Focus Area Initiative	Initiative	Summary	Status

Economic Development

	Comprehensive Economic Development Strategy	The City of Richmond has developed a Comprehensive Economic Development Strategy that analyzes the City's current socio-economic trends and provides short and long term actions and strategies for improving the City's economic conditions and ensuring that Richmond can continue to grow its local economy.	Complete
	Shop RVA	An association of local business owners is working to expand Richmond's Shop Local culture.	In Progress
	Mayor's Youth Academy	The Mayor's Youth Academy brings representatives from government, the non-profit, faith-based and private sectors to provide job training for youth, develop youth employability skills, expose youth to educational and vocational opportunities, provide professional mentors and encourage continued school enrollment.	In Progress
	Industry Analysis	The Greater Richmond Partnership, Inc. is developing a target industry analysis for Richmond.	In Progress
	CEOs for Cities	Richmond's business community has shown its dedication to ensuring that Richmond becomes a next-generation City through its involvement with CEOs for Cities, a non-profit organization that allows business leaders to improve their cities.	In Progress
	Mobile Workforce Development	Several Richmond Departments and Offices are working together to develop a Mobile Workforce Development Program.	In Progress
	Corporate Sustainability	Richmond companies are increasingly incorporating sustainability goals and principles into their everyday activities.	In Progress
	Innsbrook Community	The Innsbrook Development incorporates a variety of housing types and businesses with community amenities, including open and recreational spaces, community facilities and transportation options to cultivate a 24/7 Live Work Play environment. The Innsbrook Next planning and development initiative will seek to improve these connections and provide residents, employees and visitors with a true village experience.	In Progress
	Hybrid and Electric Vehicle Maintenance Education	J. Sargeant Reynolds Community College has received grant funding to develop and offer a certificate program focused on alternative fuel vehicle maintenance.	In Progress
	LEED Training Program	To encourage LEED-certified development in the City, this program uses Energy Efficiency and Conservation Block Grant (EECBG) funds to train plan reviewers, inspectors, facility staff and other City employees about sustainable building principles. In addition to training these professionals to administer the City's LEED and green building program, the training program will provide educational materials on green building to the public.	In Progress
	Food Policy Task Force	The City created a Food Policy Task Force, a broad-based group of professionals and community members, to further its urban agriculture efforts. Among other initiatives, it will conduct a food assessment of the community.	In Progress

Focus Area Initiative	Initiative	Summary	Status
	Virginia Green	Virginia Green is a statewide program working to reduce the environmental impact of Virginia's tourism industry. It is a partnership between the DEQ, the Virginia Tourism Corporation and the Virginia Hospitality and Tourism Association. Virginia Green works with both members of the tourism industry and tourists to encourage the companies and visitors to make environmentally-friendly choices. Many Richmond businesses participate in this program.	In Progress
	Community Gardens	The City created Richmond Grows Gardens, its Community Garden Program, to enable the public to use vacant city-owned parcels for the development of community gardens throughout the City of Richmond. Community gardens are also an economic driver. Blighted property can be turned into urban gardens to provide a local source of healthy food for a community.	In Progress
	School and Children's Gardens	A number of City public schools have gardens including Linwood Holton Elementary School which also has a Farm to School program, Mary Scott Elementary School, Southampton Elementary School, and G.H. Reid Elementary School. The 17th Street Farmer's Market sponsors the Little Sprouts Garden which works with volunteers and children from several Richmond Redevelopment Housing Authority communities to educate the children about local food and work ethics.	In Progress
	Farmers Markets	Richmond currently has active farmers markets including the 17th Street Farmers Market and the South of the James Market. Farmers markets enable citizens to purchase fresh, local, healthy food and assist local farmers.	In Progress
	Incentive Programs	The City of Richmond offers a series of financial tools and incentives for businesses relocating and expanding within the City. CARE is designed to revitalize and return economic viability to mature neighborhood districts. The City's Enterprise Zone Program offers financial incentives to qualified commercial and industrial users in specific Enterprise Zone areas of the City. The City offers partial exemption from real estate taxes for qualifying rehabilitated and replaced structures. The Contractor Assistance Loan Program provides capital t contractors that are located within the City of Richmond that lack access to traditional financing.	In Progress
	Revolving Loan Fund	The City established a loan fund of $2 million which is available to stimulate the revitalization of Richmond's neighborhoods and promote permanent job creation for low and moderate income residents by helping to bridge the credit gap for independent real estate developers and smaller employers. Affordable live-work spaces and a new restaurant in the Broad Street corridor and Arts District are among the first projects that received gap funding from the loan fund.	In Progress
	COOP for Community	A COOP for Community Center has been proposed to provide businesses and citizens with a one-stop-shop that will assist them with developing COOP work with the Departments of Finance and Economic Development.	Upcoming
	Green Jobs	The City's Office of Minority Business Development has been researching green job opportunities.	Upcoming

Focus Area Initiative	Initiative	Summary	Status
Energy			
	Renewable Energy Generation	Virginia Commonwealth University has installed a number of renewable energy sources on campus, including solar panels, a supplemental biomass gasification unit, and several solar thermal domestic hot water heaters.	Complete
	USGBC Membership	In January 2009, the City of Richmond joined the US Green Building Council.	Complete
	LEED Resolution	City Administration is following a Resolution, adopted in January 2009, to apply LEED standards to eligible new and existing City facilities. A new municipal facilities greater than 10,000 sq. ft. must be built to at least a LEED Silver standard.	Complete
	Building Upgrades	The City of Richmond, Virginia Commonwealth University and University of Richmond have conducted a number of renovations at municipal, recreation, and campus facilities to improve energy efficiency and promote energy and resource conservation. These renovations include: new energy efficient roof systems, the installation of motion sensors, upgrades to the ventilation systems, lighting upgrades, waterless urinals and dual flush toilets.	Complete
	DPU Conservation Program	The Conservation Program was designed to reduce existing customers' energy costs, make businesses more competitive, and reduce Richmond's carbon footprint. Using Energy Efficiency Conservation Block Grant (EECBG) funds, it offered two types of financial rebates to all existing DPU customers: Incentive Rebates for Energy Audits to help pay for energy audits and Incentive Rebates for Retrofit Equipment to help replace inefficient heating equipment.	Complete
	LEED Buildings	Virginia Commonwealth University, University of Richmond and John Tyler Community College have built or renovated several buildings to LEED standards. John Tyler Community College was the first in the Virginia community college system to build a LEED Certified building and VCU was the first in the state to build a LEED Platinum building.	Complete
	Energy Management Plan	The City developed an Energy Management Plan with annual energy and fuel reduction goals as part of Mayor Jones' Green Government Order.	Complete
	Team RVAgreen Government	The City formed Team RVAgreen Government, a volunteer team of City employees created to implement the provisions of Mayor Jones' Green Government Order and to build awareness, educate and empower employees to own sustainability and make a difference in their work place.	Complete
	CNG Stations	The City of Richmond Department of Public Utilities worked with local businesses to install a CNG fueling station in the City.	Complete
	Weatherization Kit Giveaway	The Department of Public Utilities coordinates a yearly event and distributes weatherization kits to senior customers.	In Progress
	Greening the Richmond Public School	Ten of Richmond's public schools have ESCO contracts that have resulted in 36% energy savings. RPS hopes to expand the ESCO project to additional schools. Additionally, the City is building four new LEED Silver schools.	In Progress
	Energy Management	Several Richmond Businesses are working with Tridium (a Honeywell Business) to manage and monitor energy consumption in their buildings.	In Progress

Focus Area Initiative	Initiative	Summary	Status
	Historic Tax Credits	As an incentive to private developers and property owners, the Historic Tax Credit has encouraged private owners to utilize green building techniques in their buildings.	In Progress
	Richmond Region Energy Alliance (RREA)	The RREA is a non-profit working to bring energy efficiency retrofits to scale in the Richmond region by creating a one-stop shop resource for homeowners.	In Progress
	Technology Upgrades	Virginia Commonwealth University has been working with Hastech to complete technological upgrades that will save energy and reduce the university's utility costs.	In Progress
	Computer Updates and Recycling	The City is in the process of organizing a major upgrade to municipal computers. This project includes implementing virtual desktops on City computers, installing iPower and VMware software and continuing the municipal computer recycling program.	In Progress
	LED Traffic Lights, Solar Streetlights and Solar Signage	The City is in the process of converting traffic signals and pedestrian signal heads to LED lights. As of December 1, 2011, over 290 out of 469 signalized intersections have been converted. The Department of Public Utilities has a solar street light pilot in the Randolph West Subdivision neighborhood. The City is exploring the possibility of using solar powered panels to light signs on municipal buildings.	In Progress
	Lights Out and Computers Off	Municipal employees are encouraged to turn the lights off in their offices whenever they leave the room and are encouraged to power their computers down at night and on weekends.	In Progress
	Energy Accounting System	The City used Energy Efficiency and Conservation Block Grant (EECBG) funds to purchase Energy CAP-an energy accounting system to help it track utility and energy information and identify energy and cost savings opportunities.	In Progress
	Methane Capture at Wastewater Treatment Plant	The City is exploring the possibility of using a gas digester at the wastewater treatment plant to capture methane and reduce emissions.	Upcoming
	Renewable Energy at Capped Landfills	The City is exploring the possibility of using capped landfills for solar energy generation.	Upcoming
	Building Renovations and Retrofits	The City of Richmond is planning energy efficient upgrades at many municipal facilities. These upgrades include: lighting upgrades and building envelope improvements.	Upcoming
	Server and Data Center Upgrades	The City is exploring remote hosting of its mainframe and a Storage Area Network to reduce energy use.	Upcoming
	Telecommute Support	The City will enhance its bandwidth, which will enable more employees to connect to municipal applications remotely.	Upcoming

Focus Area Initiative	Initiative	Summary	Status

Environment

	Green Roofs	In 2010, the Department of Public Utilities installed the first green roof on a City facility at one of its wastewater treatment facilities. It will install a second green roof in 2011.	Complete
	Green Cleaning	Virginia Commonwealth University worked with Sustainable Design Consulting to develop a green cleaning policy which has been implemented in all buildings on the Monroe Park Campus and MCV Campus as well as at the VCU Rice Center.	Complete
	Virginia Environmental Excellence Program	The Virginia Environmental Excellence Program allows facilities to be recognized for their environmental accomplishments. This partnership works to improve environmental performance and stewardship.	Complete
	Record Management & Maintenance System	The DPW created a records management system that controls the creation, maintenance, use and disposition of records and transactions in digital form. It reduces paper, employee travel time and other resources.	Complete
	Recycling and Composting	Both Virginia Commonwealth University and University of Richmond have extensive recycling and composting programs on campus.	Complete
	Stormwater Utility	The City of Richmond is one of the few localities in Virginia to create a dedicated stormwater utility. The Stormwater Utility offers both a commercial and residential credit program to encourage property owners to use Best Management Practices (BMPs).	Complete
	Water Supply Plan and Rate Structure Changes	The Department of Public Utilities incorporated the EPA's WaterSense sustainable infrastructure concepts into the 2008 water supply plan and instituted a Cost of Service Rate Structure in 2007/2008 to promote water conservation.	Complete
	Water Reclamation	Some fire stations use captured rainwater to wash fire trucks.	Complete
	Richmond Tree Stewards	The Tree Stewards is a non-profit that offers an 'adopt-a-tree' program where residents can purchase trees for planting. It also offers advice and guidance on tree planting and maintenance.	In Progress
	Leaf Collection and Mulching	The City of Richmond collects leaves each Fall and uses them to make mulch. The mulch is available to residents free of charge and is being used in the Youth Garden.	In Progress
	Healthy Homes	Richmond City Health Department's Healthy Homes Initiative, a program of the Center for Disease Control, is a comprehensive, coordinated approach to preventing disease and injury that result from deficiencies in the home environment. The focus of the initiative is to identify health, safety, and quality-of-life issues in people's homes, and to coordinate a response from various community resources to eliminate or mitigate these problems. Addressing the health hazards in these homes presents a significant opportunity to improve public health. The RCHD Healthy Homes Initiative is working with a variety of City agencies and community-based organizations and is now available as a referral service for education and home assessments.	In Progress
	Sustainable Design Institute	Virginia Commonwealth University has a Sustainable Design Institute and is working to map green assets throughout Richmond.	In Progress
	Virginia Naturally Program	Virginia Naturally is an environmental education program that holds public events and works with the Richmond Public Schools.	In Progress

Focus Area Initiative	Initiative	Summary	Status
	Give Aways	The Department of Public Utilities gives away low flow shower heads and toilet devices.	In Progress
	Citywide Recycling	The Department of Public Works and CVWMA developed an education and enrollment campaign to increase residential and business recycling throughout Richmond.	In Progress
	Water Management Plans	The City is in the process of developing a Watershed Master Plan, Combined Sewer Overflow Plan, and Environmental Plan to reduce stormwater runoff and protect the water table and riverfronts.	In Progress
	Restoration and Bay Nutrient Project	The City is working to keep sediment out of its creeks, rivers and the bay and to reduce nitrogen and phosphorous effluents in the Chesapeake Bay.	In Progress
	Wastewater Management	The City has a long term plan to prevent untreated sewage from discharging into the James River during large rain storms.	In Progress
	Water Conservation Awareness and Upgrades	The City, Virginia Commonwealth University and University of Richmond are committed to educating community members about water and resource conservation. Each have also taken steps to use low-flow and water conservation devices in new construction and renovations.	In Progress
	In-vessel Anaerobic Digester	Virginia Commonwealth University is planning to install an in-vessel anaerobic digester, which will divert one ton of daily organic waste from the landfill. The in-vessel anaerobic digester will: reduce the landfill material the university creates, reducing methane emissions as well as reduce the cost of waste disposal. The byproduct created by the digester will be used as compost and soil nutrients for landscaping on campus.	In Progress
	Storm Water Management Plan	Virginia Commonwealth University is working on a number of stormwater management techniques to reduce runoff.	In Progress
	Green Events Team	The City formed a Green Events Team to work with special event promoters to encourage event organizers, sponsors, and attendees to be as “green” as possible, reducing solid waste and the overall environmental impact of events.	In Progress
	Green Purchasing	University of Richmond has a goal of using the Cradle to Cradle concept of purchasing products that are sustainable produced and can be easily recycled, reused or re-purposed.	In Progress
	Paper Conservation	The City is conserving paper, ink and other supplies by reducing the number of printers it operates, putting reports and other documentation online, setting printer defaults to double-sided and authenticating printing jobs. The City also uses post-consumer recycled paper.	In Progress
	Green Purchasing	The City is developing a Sustainable and Green Purchasing Policy as part of Mayor Jones’ Green Government Order.	In Progress
	Recycling	The City is implementing mixed paper and co-mingled recycling in municipal facilities, including City Hall, Main St. Station, Marshall Plaza, and the police headquarters.	In Progress
	Green Streets	The Virginia Department of General Services is implementing a Green the Capitol Initiative which is greening Capitol Square through the installation of rain gardens, porous pavers, and green streets.	In Progress
	Green Lunch Program for City Employees	The Green Lunch is a quarterly event for City employees where expert speakers share their views on sustainability topics.	In Progress

Focus Area Initiative	Initiative	Summary	Status
	Sign Replacement	The Department of Parks, Recreation and Community Facilities is planning to replace all wooden signage throughout its system of facilities with 40% recycled content plastic signs.	In Progress
	Rubber Sidewalks	The Department of Public Works has a pilot program to study the effectiveness of rubber sidewalks.	In Progress
	Green Alleys	The City is installing two demonstration green alleys as the start of a new initiative using Low Impact Development (LID) technologies. These alleys utilize permeable pavement and underground infiltration/underdrain systems.	In Progress
	Green Cleaning	The City is exploring green cleaning supplies and green cleaning companies.	Upcoming
	Regional BMPs	The City is interested in creating City credits for through a stormwater utility program to sell to developers.	Upcoming
	Rain Gardens	The City of Richmond is working with the Richmond Public Schools and other organizations to develop rain gardens in locations throughout the City.	Upcoming

Focus Area Initiative	Initiative	Summary	Status

Open Space & Land Use

	Green Infrastructure Assessment	The Green Infrastructure Assessment provides a potential citywide green infrastructure network and strategies that can be applied at the neighborhood scale to improve habitat, recreational access, and water quality.	Complete
	Downtown Master Plan	The City has developed a Downtown Master plan that focuses on improving the downtown and ensuring sustainable development in the neighborhood. This plan includes recommendations for streetscapes, street and private trees; a form based zoning ordinance; mass transit and converting some streets from one way to two ways. The Plan also places a heavy focus on the river as a public asset.	Complete
	Outdoor Classroom	Linwood Elementary School worked with the student body to design and build an outdoor classroom.	Complete
	Teaching Gardens	Richmond Audubon Society has worked with Swansboro and Southampton Elementary Schools to develop teaching gardens.	Complete
	Community and Children's Gardens	Richmond Grows Gardens, a citywide Community Garden Program, permits organizations to use vacant and underutilized City property for community gardens. Several locations in the City offer community garden opportunities where residents can lease plots of land to have their own, personal gardens. In addition to the community gardens, Richmond has a Children's Garden where children living in several of the Richmond Redevelopment Housing Authority communities work with volunteers to learn about gardening and local food production. The University of Richmond has a community garden on campus where faculty, staff and their family can work with students to grow their own fruit and vegetables.	In Progress
	Green Themed Discussions	The Urban Land Institute has sponsored a number of community conversations about adaptive reuse, high density development, transit oriented development and many other sustainable land use techniques. Additionally, the Urban Land Institute offers technical assistance programs for people interested in green development.	In Progress
	Low Impact Development	The City of Richmond has several Low Impact Development (LID) projects in progress.	In Progress
	Pedestrian-Oriented Development Standards	The Center for Disease Control has partnered with the Congress for a New Urbanism to create pedestrian-oriented development standards.	In Progress
	Blighted and Vacant Property Redevelopment	There are several programs in place to help deal with blighted and vacant property within the City. These include the Neighborhoods in Bloom Program, a Vacant Property Registry, Active Code Enforcement, a Spot Blight Abatement Program and the Tricycle Gardens Program. Additionally, the Department of Public Works is in the process of refortifying enforcement agendas to provide education and address blight and right-of-way ordinances throughout the City.	In Progress

Focus Area Initiative	Initiative	Summary	Status
	Parks, Recreation and Community Facilities Master Planning	The Department of Parks, Recreation and Community Facilities is in the process of completing master plans for each of its parks and properties. The 2010 Green Infrastructure Assessment was part of the Department's ongoing planning efforts. The Green Infrastructure Assessment used several factors to identify parcels that could provide strategic benefit to the City's existing stock of recreational and open spaces. The Green Infrastructure Assessment has also contributed to the Recreation Trails and Greenways project currently underway.	In Progress
	Blighted Property Redevelopment	The Neighborhoods In Bloom program works with non-profit groups to buy, rehabilitate, and sell vacant houses for homeownership. City staff also manage the Neighborhood Stabilization Program to buy foreclosed properties to be restored for affordable housing.	In Progress
	Conservation Easements	Richmond already has a number of permanent conservation easements for sensitive ecological zones and public parkland, but the development of additional easements at several parks and along rivers is being explored.	In Progress
	Urban Forestry Commission	The City Council established the Urban Forestry Commission to help improve the City's urban forestry resources through policies, development advice and fundraising.	In Progress
	Richmond Riverfront Plan	The City of Richmond will establish the James River as a focus of the community, promote a sustainable riverfront corridor, strengthen linkages between the river and adjacent neighborhoods, identify sites for strategic private redevelopment and public improvements, and evaluate potential for quality open spaces and public recreational opportunities along the riverfront.	In Progress
	Urban Tree Canopy	The City of Richmond is exploring a tree-planting program to improve the downtown tree canopy.	Upcoming
	Urban Tree Policy	The City of Richmond is exploring the development of an urban tree management plan which would include processes for determining which species of tree to plant and how to best manage the tree canopy.	Upcoming

Transportation

Focus Area Initiative	Initiative	Summary	Status
	Big Belly Solar Compactors	The City of Richmond has installed 44 Big Belly Solar Trash Compactors and Recycling Units in various locations around the City. The recycling units compact trash and recycling using renewable energy and reduce the number of truck pickups required, thus reducing trash vehicle travel and associated fuel use.	Complete
	Zipcar	Both Virginia Commonwealth University and University of Richmond have partnered with Zipcar to have vehicles available on campus. University of Richmond's two cars are hybrid vehicles.	Complete
	Zimride	Both the Virginia Commonwealth University and University of Richmond have joined the Zimride system which allows community members to find and share rides.	Complete
	GRTC's Ridefinders	Ridefinders connects GRTC customers with other people who live and work in the same areas so that they can share rides.	Complete
	Green Bike Programs	University of Richmond has a number of programs to support bike use on campus. These programs include having a limited-service bike shop on campus, a bike share program, a bike rental service and a bike recycling program that refurbishes abandoned bikes and sells them at a deep discount to students.	Complete
	Mayor's Bicycle, Pedestrian and Trails Planning Commission	Mayor Jones created the Bicycle, Pedestrian and Trail Planning Commission to research and recommend ways that my administration can support bicycles and walking in order to reduce vehicles on the road, enhance economic development and improve the health of our residents.	Complete
	City Fleet Maintenance	The City of Richmond has changed several of the fleet maintenance policies, including switching to synthetic oil and switching the type of brake pad used in fleet vehicles.	Complete
	DPW Waste Haulers	The Department of Public Works has replaced its fleet of diesel powered collection vehicles with new CNG trucks. This reduced the size of the fleet from 37 trucks to 25, saved fuel, reduced greenhouse gas emissions and reduced operating costs.	Complete
	To the Bottom and Back	Operates buses on continuous loops throughout Richmond's major arteries Thursday - Saturday from 6pm - 3am, filling a void that existing public transit creates.	Complete
	Anti-idling policy	The City has implemented an anti-idling policy for City fleet vehicles and equipment.	Complete
	Capital Trail	The City is in the process of planning and developing its two remaining sections of the Virginia Capital Trail, a 55 mile bicycle and pedestrian trail connecting the City of Richmond to Williamsburg.	In Progress
	Bike Sharrows	The City is installing 40 miles of sharrows – shared lane pavement markings – to be completed in 2012.	In Progress
	Employee Benefits	Commonwealth of Virginia employees receive benefits for utilizing particular transportation demand management strategies.	In Progress
	Virginia Capital Trail	The Virginia Capital Trail is a 55 mile bicycle and pedestrian trail that will connect Richmond to Williamsburg and will be complete in 2014. The Riverfront phase of the trail was completed in 2009.	In Progress
	Standardized Bike Racks	The City of Richmond is installing bike racks with a uniform design in various locations around the City.	In Progress

Focus Area Initiative	Initiative	Summary	Status
	High Speed Rail Commission	Private companies are implementing transportation demand management strategies in Richmond.	In Progress
	Bike and Scooter Parking	Virginia Commonwealth University has been increasing the number of bike racks on both of their campuses and has installed racks designed specifically for scooters and mopeds.	In Progress
	Carpooling and Public Transit Incentives	Both Virginia Commonwealth University and University of Richmond encourage carpooling and have been working to increase public transit use on their campuses. Additionally, several area schools offer shuttles and/or escort services to students and other community members.	In Progress
	Electric Vehicle Study	The Commonwealth of Virginia has just begun a study on Electric Vehicles in the state.	In Progress
	GRTC Passes	Through its Rideshare program, the City offers transit passes to municipal employees.	In Progress
	Shared Municipal Vehicles	Several City departments pair staff members up to share a single municipal vehicle.	In Progress
	Telecommute and Alternative Work Schedule Initiative	The City is working to broadly implement a telecommute and alternative work schedule initiative with the goal that 20% of eligible employees will participate in either telework or alternative work schedules.	In Progress
	Alternative Fuel Vehicles	The City of Richmond has an Electric Vehicle Pilot Project planned and it also plans to research alternative fuel vehicles to determine the best approach for incorporating hybrid and/or alternative fuel vehicles into the municipal fleet.	In Progress
	Right Size City Fleet	The City of Richmond plans to study its fleet usage to determine the best distribution of City vehicles among the municipal departments and offices.	Upcoming
	GRTC CNG Buses	The GRTC is considering converting its bus fleet to CNG buses.	Upcoming

APPENDIX E:

Suggested Sustainability Indicators

Focus Area	Objective	Suggested Indicators	Suggested Targets
Economic Development			
	Create opportunities for Richmond businesses to enhance their overall sustainability	Number of businesses participating in Green Business Program	10 businesses to join during inaugural year
		Electricity and Natural gas consumption from the commercial and industrial sector	Downward trend
		Waste tonnage from the commercial and industrial sector	Downward trend
		Participation rates in utility energy efficiency programs	Upward trend
		Transit ridership	Upward trend
		Number of attendees at a green lease educational session	10% of the commercial building owners/property managers in the City
	Create more green jobs	Unemployment rate	Downward trend
		Number of new “green” businesses locating to Richmond	Upward trend
		Number of participants at green job training programs	Upward trend
		Interest expressed by developers and businesses in the existing Local Technology Zone or a Green Business District	Upward trend
	Make local, healthy, and sustainable food accessible and affordable	Number of food deserts	0 within Richmond by 2015
		Number of farmers’ markets in the City	Upward trend
		Number of new, local farmers engaged in the network	Upward trend
		Number of vacant lands converted to community gardens	Upward trend
	Improve the state of good repair and efficiency of City infrastructure	Number of capital improvement projects utilizing a life cycle cost analysis	100% by 2013
		Number of calls to City regarding litter	Downward trend
		BRT ridership numbers	Upward trend

Focus Area	Objective	Suggested Indicators	Suggested Targets
Energy			
	Reduce energy consumption in City government operations	MMBTU (Million British Thermal Units) consumed	1% annual energy use reduction
		# of alternative fuel vehicles in City fleet	Upward Trend
		# of City-owned LEED or Energy Star buildings	Upward Trend
		Fuel Savings from 25 CNG garbage trucks	1% vehicle fuel use reduction
	Lower building energy consumption citywide	MMBTU consumed by sector - commercial, residential, industrial	30% reduction by 2025
		# of Homes Weatherized	Upward Trend
		# of Businesses implementing energy improvements	Upward Trend
	Increase the use of alternative energy sources	Number of Electric Vehicle Charging Stations	Upward Trend
		MWH Capacity of Renewable Installations	Upward Trend
		Electric vehicle or CNG ownership	Upward Trend

Focus Area	Objective	Suggested Indicators	Suggested Targets
Environment			
	Protect and enhance Richmond's water resources	# of DEQ "Do Not Eat" advisories	Zero advisories by 2025
		% impervious cover	Downward trend
		Volume of chemicals/hazard materials purchased by City	Downward trend
		Water infiltration rates	Upward trend
	Enable the Richmond community to use water wisely	Water consumption - per capita citywide	Downward trend
		Water consumption - City government	Downward trend
		Gallons of water harvested	Upward trend
	Improve the City's solid waste system	Recycling/Diversion Rate	Upward trend
		Tons landfilled	Downward trend
		Generation of waste *(per capita or by sector)*	Downward trend
		Recycled content of purchased goods	Upward trend in both the amount of recycled content in the goods and the number of goods purchased that are from recycled content
	Strive to continuously improve the quality of Richmond's indoor and outdoor air	Air quality measurements *(those taken already for EPA standards compliance)*	100% compliance
		# of green homes built or % of housing built green	Upward trend
		Asthma Rates citywide	Downward trend

Focus Area	Objective	Suggested Indicators	Suggested Targets
Open Space & Land Use			
	Encourage 24/7 communities with more sustainable and affordable housing options throughout the City	Percent of residential, mixed-use projects as a percentage of total new development	Upward trend
		Distribution of low income housing by neighborhood	Trending towards equalizing
		Percent of new and substantially-rehabilitated housing that complies with the City's new Green Building Ordinance as a percentage of the total new and rehabilitated housing	Upward trend
	Increase accessibility, quantity, and quality of public space	Number of miles of improved bike and pedestrian paths and trails	Upward trend
		Number of acres of public open space by type (including public gathering places, gardens, and other public lands utilized as open space)	Upward trend
		Acres of park per City resident	Upward trend
		Percent of households and population within ¼ and ½ mile of a park by neighborhood	Upward trend
	Increase Richmond's tree canopy	Number of street and public trees	Upward trend
		Number of trees planted from City tree species list	Upward trend
		Percent of tree canopy coverage	Upward trend
	Protect historic building stock and promote the use of vacant and blighted property	Acres of brownfields that have been redeveloped for other uses	Upward trend
		Percent of vacant building as a percent of total buildings	Downward trend
		Number of community gardens	Upward trend

Focus Area	Objective	Suggested Indicators	Suggested Targets
Transportation			
	Reduce citywide Vehicle-Miles-Traveled (VMT) per capita	Modal split – number of trips by type citywide	Upward trend of sustainable transportation options including transit, pedestrian, bike, and carpool.
		Number of one-way streets in Downtown	Downward trend
		Number of cars per household citywide	Downward trend
		Mean travel time of commute time to work by sustainable transportation options such as transit, walking, and biking	Downward trend
	Manage parking supply to encourage alternate modes of transportation	Ratio of parking per job by neighborhood.	Greater balance of parking per job for City neighborhoods
		Number of bicycle/ride share facilities provided at car parking facilities	Upward trend
		Number of new, improved, or expanded GRTC system routes	Upward trend
	Make Richmond a bike and pedestrian friendly city	Number of city streets evaluated that meet the Complete Streets criteria.	Upward trend
		Number of bicycle and pedestrian collisions involving motor vehicles	Downward trend
		Total miles of bicycle lanes and paths	Upward trend

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