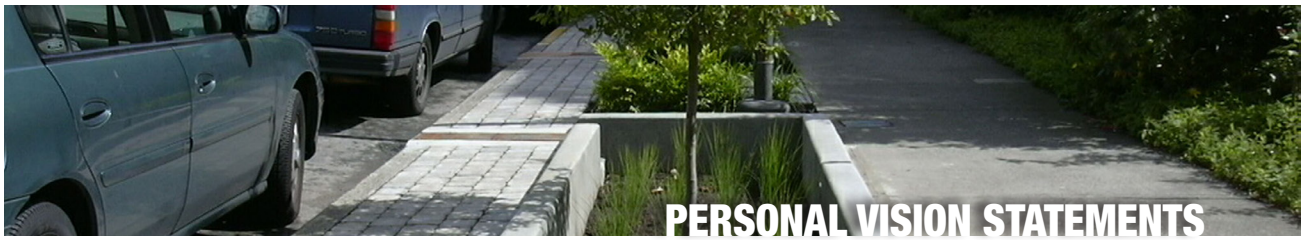
Chapter 6

Sustainability and Green Practices



"The city is a leader in sustainable development in the State of Alabama."

"Create a mindset around green innovation and conservation."

GOALS	POLICIES FOR DECISION MAKERS
City operations serve as a model of energy and resource efficiency.	• Continue organizational and operational improvements to maximize energy and resource efficiency and reduce waste.
	• Give preference to energy-efficient design, materials and equipment in public facilities and infrastructure.
	• Expand the use of renewable energy sources for city operations.
Reinvestment in existing communities conserves resources and sensitive environments.	• Support clean-up and adaptive reuse of brownfields.
	• Encourage the preservation and adaptive reuse of existing structures to reduce construction waste and conserve energy and materials.
	• Encourage urban farming and community gardens to reduce food deserts and food imbalance areas.
Private developments incorporate cost-effective sustainable planning and design features at citywide, neighborhood and site levels.	• Consider incentives for energy-efficient, “green” building.
	• Encourage development that protects the city’s water resources.
	• Encourage the use of natural drainage in stormwater management systems where feasible.
	• Encourage the use of conservation and low-impact development techniques
	• Support improvement of state water quality standards and encourage water efficiency standards and enforcement.
The city makes every effort to help meet air pollution standards.	• Consider incentives for the development of multimodal transportation systems that reduce vehicle emissions.
	• Encourage vehicle emission inspections to improve air quality, industrial opportunity, and community health.
	• Promote the recruitment of clean industry.
	• Consider incentives for private industries to further reduce emissions over time.
	• Encourage energy-efficient design, materials and equipment in existing and new private developments.
	• Support the improvement of state energy policy standards and programs.

findings

The City has recently initiated organizational programs to improve energy efficiency.

Green Building Focus and the Green Resource Center of Alabama are located in Birmingham.

The City maintains an active recycling program but recycling is not mandatory.

The Alabama Environmental Council and others offer recycling programs for materials not served by the city recycling program.

There are many LEED accredited engineering, construction and design professionals in the metro area.

A majority of Alabama's LEED certified buildings have been constructed in the Birmingham area.

The Health Action Partnership has been successful in integrating local initiatives to raise awareness and improving the built environment and promoting active transportation as a major element in improving public health.

challenges

The city recycling program is not available to multi-family and non-residential developments. Some businesses perform or contract out recycling.

The value and benefits of cost-effective green development need to be demonstrated more effectively.

Comprehensive improvements in cost-effective sustainability will require partnerships with neighboring municipalities and the private sector.

More awareness about the quality of life and economic development benefits of cost-effective sustainability is needed.

While the region is experiencing only moderate growth, its urbanized area and vehicle miles traveled (VMT) are increasing at a much faster rate.

State law must be changed to allow the re-use of greywater and advance water efficiency.

A. What the Community Said

During the Visioning Forum, participants identified Birmingham's top assets, several of which support the city's overall sustainability: access to health care; affordable housing and cost of living; higher education; and diversity. Table discussions revealed several overall priorities that would also further the city's sustainability goals: improving public education, better public transit, better pedestrian and bicycle facilities, mixed use development, neighborhood revitalization and mixed income housing, and improve air quality.

During the Communities of Interest workshop on Green Systems and Sustainability, attendees identified issues that brought them to the meeting and table discussions provided a set of priorities. Several of those dealt with sustainability topics.

Issues

- Air and water quality
- Interconnected green infrastructure network
- Sprawl
- Food deserts
- Support for sustainable development practices
- Recycling
- Community health and the built environment

Priorities

- Improve air and water quality
- Use development regulations to support sustainable development
- Increase access to fresh foods
- Protect biodiversity and wildlife habitat
- Promote and expand recycling
- Improve connectivity
- Increase public awareness on green systems and sustainability
- Promote alternative, clean energy sources and energy efficiency

B. What is Sustainability?

The most widely accepted definition of sustainability is "meeting today's needs without compromising the ability of future generations to meet their own needs." Another way to view sustainability is the balance point among economic, community and environmental systems and values. This is referred to as the "triple bottom line." In both viewpoints, sustainability revolves around how the use of a variety of resources affects our lives, our economy and our future.

Worldwide, cities and metropolitan areas play an important role in achieving greater sustainability and reducing pollution. While metropolitan areas cover only about 1% of the planet, they contribute almost 80% of air-polluting emissions. The sprawling, auto-dependent nature of exurban and suburban development around central cities is a major contributor to air-polluting emissions in cities. On the other hand, dense urban environments in core cities are much more resource-efficient and energy-efficient per capita than suburban and exurban areas.

Recently, the City of Birmingham launched an effort to promote more sustainable practices in its own operations and to encourage green building in the city. The City's Office of Economic Development has been tasked with developing programs to acknowledge and create incentives to encourage sustainable design in new private-sector development.

SUSTAINABILITY CHALLENGES

Birmingham is making progress in meeting the challenges of becoming a truly sustainable city—creating and maintaining the desired balance among community, economic and environmental systems and values. Birmingham's challenges can only be fully addressed through continuing and enhancing regional partnerships, with other local governments and with the business community.

Birmingham's sustainability challenges include:

- Air quality
- Soil contamination
- Water quality and efficiency
- Energy and resource use
- Community health

Air Quality

Improving and maintaining air quality has been a struggle for the city and the region. By fully and permanently addressing air quality conditions, Birmingham and the surrounding region can reduce health risks to children, seniors and asthma sufferers and simultaneously release the metro area from restrictions imposed due to Clean Air Act violations. However, Birmingham must balance the costs of improving air quality with potential reductions in health care expenditures.

Soil Contamination

The city contains areas where the land itself has become highly contaminated. Arsenic and BaP contamination are often associated with coal processing, a significant component of the region's historic steel-producing industry. The two contaminants are linked to skin and respiratory problems, cancer and other health problems. Lead contamination in soil is also a known problem related to the city's historic industries. Given the widespread development of industrial facilities throughout Jones Valley, it is likely that similar problems exist in other parts of the city beyond the boundaries of the plants.

Acting under the Superfund law in late 2011, the EPA designated resources to work with the City, the County Health Department, residents and area industries to further test and clean up sites in the Collegeville, North Birmingham, Fairmont and Harriman Park neighborhoods.

Water Quality and Efficiency

Over time, industrial and other urban developments have diminished water quality in area streams and waterways. Various programs have been established to improve water quality and have been met with some success, though work continues to meet water quality standards.

While the region experienced significant droughts in 2000 and 2007 and water use restrictions were put in place temporarily, there have been few ongoing measures to encourage water conservation in the area. A study conducted for the Birmingham Water Works Board (BWWB) predicts that the number of residential customers in its entire service area will increase from 600,000 currently to 700,000 by 2025. The utility does not have the capacity today to meet that demand but has taken steps to increase water supply by tapping additional sources.

Efforts to increase water capacity, the high costs of which ultimately are borne by ratepayers, should be balanced with greater conservation and water efficiency efforts.

Energy and Resource Efficiency

Buildings consume 49% of all the energy produced in the United States, and by 2035, about 75% of all the buildings in the country will be new or renovated. This means that the next 25 years offer an opportunity to establish energy efficiency throughout the building sector. Efficient energy use allows city government, businesses, institutions and residents to reduce their utility bills.

Residential energy use is high compared to other states due to heating and air conditioning demand during the winter and summer respectively. This is an area in which cost-effective and energy-efficient building design would enable businesses and residents to lower energy consumption while also saving money.

Land consumption is an important measure of resource efficiency that directly affects energy use and environmental conditions. When land consumption increases at a rate faster than population growth, it often means increased commuting distances, energy use and vehicle emissions. Between 2000 and 2010 the Birmingham metro area saw an increase in population of 12.94% while the amount of land converted to "urbanized area" increased 35.14%. This reflects an ongoing trend of outward suburbanization. Between 1982 and 2001, the metro area population grew by only 24% but annual vehicle miles traveled nearly doubled in that same time frame. In effect, outward expansion of the metro area is increasing land and energy consumption and pollution at the expense of the City of Birmingham's existing neighborhoods, which are losing population.

Continued "greenfield" development at the far edges of the region will require new infrastructure and building materials, expansion of municipal and utility service areas and costs, and increasing transportation costs and pollution. Taking advantage of Birmingham's existing

THE "URBAN HEAT ISLAND" EFFECT

Urbanized areas typically experience warmer temperatures than surrounding rural areas, a phenomenon known as the "urban heat island" effect. A city's concentration of buildings, pavement, and other materials that retain and radiate heat increases temperatures. These elevated temperatures increase production of ozone, affect weather patterns, and can stress ecosystems in area streams. Increased temperatures also mean added energy use and cost in cooling buildings. Landscaping, trees and white-painted "cool roofs" can reduce these effects.

neighborhoods and the roads, water and sewer lines already in place provide opportunities for residential and business investment that will conserve resources and avoid added facilities and service costs ultimately borne by taxpayers. The Birmingham metro area's overall low density and outward sprawl contribute to the lack of an effective public transportation system. Reinvestment in declining neighborhoods will allow the city to establish more transit-supportive development patterns, including mixed uses and higher residential and employment densities in strategic locations. And, an effective transit system can attract riders, who would otherwise commute by car and contribute to air quality problems.

Brownfield redevelopment is also an important component of resource efficiency that aids neighborhood reinvestment. Brownfields are sites formerly used for industry or other activities that are now believed to be contaminated by toxic materials. Their redevelopment requires assessment and clean-up, depending on the proposed use. There is no database that identifies all brownfields in the City of Birmingham. These large sites, often in central and highly accessible locations, provide the opportunity to completely re-envision areas of the city and build new employment centers and mixed-use communities that also support regional transit while remediating earlier pollution.

Recycling of paper, plastic, glass, computer equipment and other household and office goods diverts these materials from the solid waste stream and puts them back into use. The city currently operates a strong curbside recycling program for single-family households. But the strength of the voluntary program in diverting waste from landfills may have plateaued. To increase these reductions, a recycling incentive program may be used. Programs such as the Alabama Environmental Council's (AEC) downtown recycling facility provides options for business and multifamily recyclers to drop-off recycling. The AEC center also accepts glass and other materials the city program currently does not.

COMMUNITY HEALTH

Community health is affected not only by the quality of the air we breathe and the water we drink, but also by conditions in the built environment that influence physical activity and the availability of healthy food choices. According to a 2007 report from *Forbes* magazine, Birmingham was ranked as the second-most obese metropolitan area in the United States. Likewise, Alabama is ranked the second most obese state in the nation, according to a 2011 report by the Robert Wood Johnson Foundation and the Trust for America's Health. Increased obesity has become a national health concern due to obesity-related chronic illnesses, including Type 2 diabetes, cancer and heart disease.

Jefferson County's Health Action Partnership has focused on obesity, in addition to smoking, as a preventable health condition that can be mitigated in part through public policies that affect the design of the built environment. Through a Communities Putting Prevention to Work (CPPW) grant from the Centers for Disease Control, Health Action Partnership members have developed a number of initiatives to combat obesity and its associated health problems in Jefferson County.

Sedentary Environments

One way that cities have begun to address obesity trends is to establish new policies and regulations and enhance the built environment to facilitate physical activity, particularly walking and bicycling. For over fifty years, low-density sprawl has been the dominant pattern of growth in most American cities. This pattern of development has led to reliance on the automobile for virtually all daily trips, even in the city. In many city neighborhoods, homes are far from schools, parks, places of work, and shopping areas. The streets that connect these everyday destinations, more and more, lack adequate sidewalks, if any, to accommodate those who do choose to walk. Many destinations

are designed for access solely by car, making them uncomfortable, if not unsafe, environments for pedestrians.

Land use policies that suppress density, minimum parking requirements and suburban street standards have contributed to a decline in the city's originally interconnected, walkable environments. While most Birmingham neighborhoods reflect traditional urban forms, city development regulations can make it difficult to reinvest in those neighborhoods in accordance with their original urban patterns to reinforce walkability.

In 2011, the Birmingham metro area ranked as the 16th-most dangerous in the nation for pedestrians and in 2010, one of the three worst cities in the country for bicycling. To overcome these problems in Birmingham's built environment, which ultimately affects the health of residents, the Freshwater Land Trust (FWLT), Conservation Alabama, the AARP and other Health Action Partnership members have pursued efforts to encourage more active lifestyles. FWLT prepared the Red Rock Ridge and Valley Trail System plan to create bike and pedestrian facilities along on- and off-road corridors to better interconnect neighborhoods and community destinations. Conservation Alabama has lobbied state and local governments to pass Complete Streets policies to assure bicycle and pedestrian facilities are considered in street construction projects. The Birmingham Planning Commission adopted a Complete Streets policy in 2011, which is advisory to the City and the regional transportation planning organization.

In addition to weaknesses in city infrastructure for walking and bicycling, crime, property neglect and loss of population add to the conditions that discourage residents from leading more active lifestyles.

Fighting childhood obesity and encouraging regular exercise, the Walking School Bus program began in 2011 with support from Health Action Partnership members. Only a few city schools participate in the program. *Photo by Chrisopher Jones.*

While many of Birmingham's older neighborhoods were designed to be walkable, like the one above, over time the city has become more difficult to get around on foot. *(Photo KPS Group)*

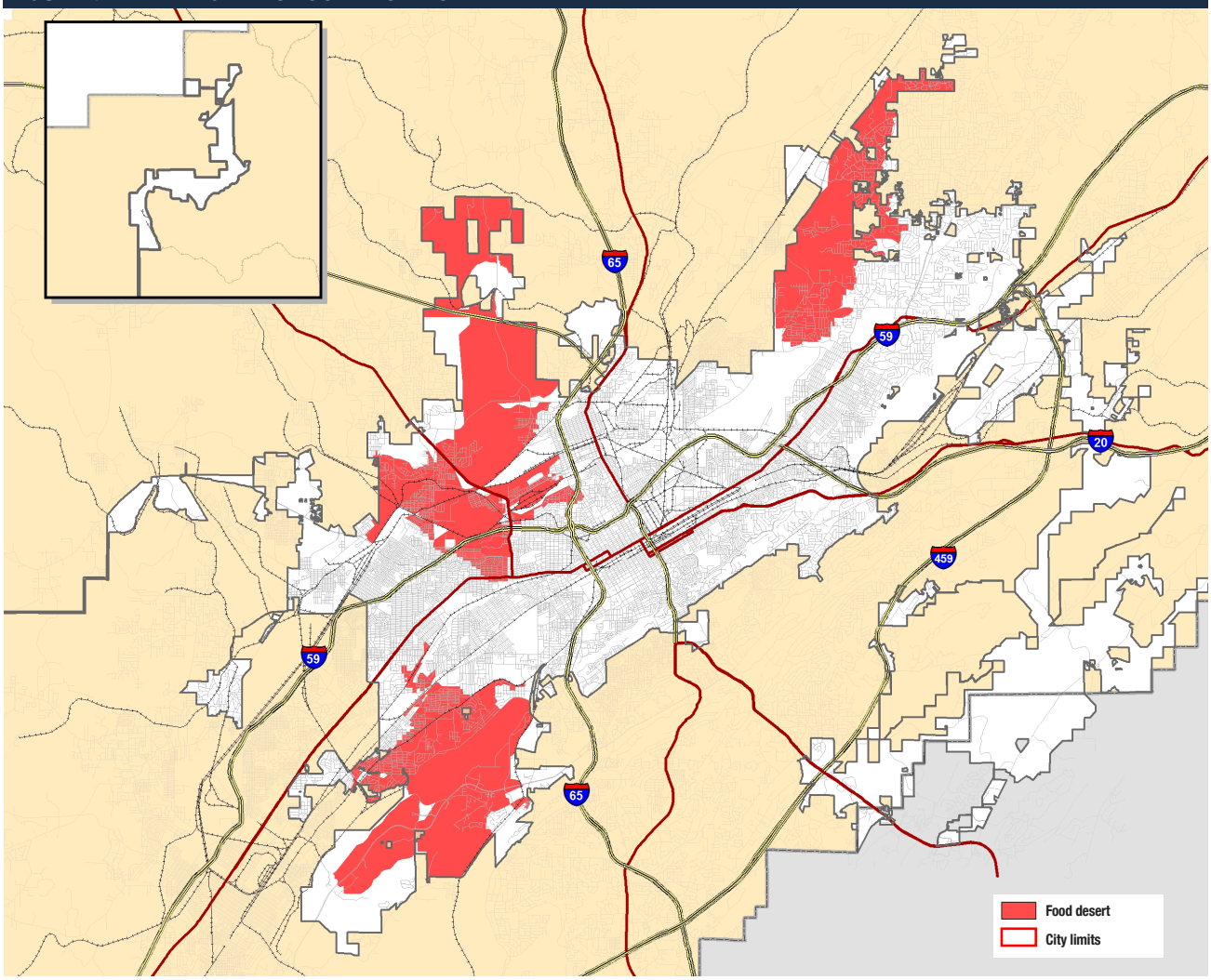
Food Security

While Birmingham is gaining a reputation for its cuisine, "food imbalance" exists, particularly in economically and socially-distressed neighborhoods. More than 88,000 residents live in areas of the city with limited access to fresh produce and other healthy foods normally offered by mainstream grocers or in areas where establishments offering fringe, or unhealthy, food are much more accessible than mainstream grocers. In essence, one quarter of the city's population lives in areas where it is much easier to purchase candy, fried food and soda than it is to buy fruits and vegetables. Figure 6.1 reveals the areas of the city where the lack of fresh food access is most significant—commonly called "food deserts."

A Main Street Birmingham study indicated that food imbalance in Birmingham appears to decrease life expectancy and increase the percentage of deaths related to diabetes and cancer. According to the study, "living in areas of Birmingham with Food Desert conditions correlates with more premature death…and...we should be especially concerned about the prevalence of cancer."

Other studies have also shown that proximity to fast food offerings is a major factor in unhealthy diets even when full service supermarkets are relatively close. The Main Street Birmingham Study indicated that areas of food imbalance occur throughout the city but with the most impact in west Birmingham and in northeast Birmingham.

FIGURE 6.1: BIRMINGHAM'S FOOD DESERTS



Considering its size and population, Birmingham has relatively few mainstream grocers or other vendors offering fruits, vegetables and other nutritious foods. Instead the city is blanketed with convenience stores, mini marts, dollar stores and fast food restaurants that sell ready-made, pre-packaged foods that are high in salt, fat and sugar. This is due largely in part to the criteria that many mainstream grocers, particularly franchises, use to select sites—population density and income levels. Fringe food businesses are more willing to locate in neighborhoods that have demand but less buying power. (See Chapter 7, pp. 7.15–7.17, for more information on the distribution and the economics of grocery stores.)

BENEFITS OF SUSTAINABILITY

Becoming more sustainable as a community offers a variety of benefits to the local economy, to the natural environment and to residents.

Economic Benefits

- Long-term savings through more cost-effective, efficient use of energy and resources
- Removal of economic development restrictions due to non-attainment status of federal air quality standards
- Green jobs at a variety of skill levels
- A higher quality of life attractive to both employers and employees
- Enhanced city image

Environmental Benefits

- Reduced air pollution, improved air quality
- Reduced flooding, improved water quality
- Urban heat island reduction
- Wildlife habitat protection and restoration

Community Benefits

- Improved mobility
- Access to nature and green space
- Reinvestment in existing communities
- Decreased transportation costs
- Improved community health

LOCAL INITIATIVES AND ORGANIZATIONS

Local organizations and efforts are working toward a more sustainable Birmingham, with most directing their efforts at specific sustainability challenges but with an increasing amount of collaboration.

Bike to Work Day in Downtown Birmingham is an annual event promoted by the Regional Planning Commission of Greater Birmingham, a Health Action Partnership member *(Photo by Michelle Williams, Birmingham News)*

Alabama Power

Birmingham's electric utility promotes use of Energy Star products and a variety of other energy-efficient products and services. Alabama Power also created a bike-share program for its employees for health and recreational benefits, to decrease traffic and air pollution and to emphasize the company's support for downtown activity and pedestrian and bicycle access.

Health Action Partnership (HAP)

A coalition of more than 60 government and nonprofit agencies, private foundations and business leaders, HAP focuses on improving community health in Jefferson County. Members include the Jefferson County Health Department, United Way of Central Alabama, UAB School of Public Health, Community Foundation of Greater Birmingham and many others. Several HAP members have pursued sustainability initiatives related to community health through a grant from the Centers for Disease Control, including the Freshwater Land Trust's countywide trail plan and Main Street Birmingham's food desert study.

Green Resource Center of Alabama (GRCA)

GRCA is a nonprofit advocacy and informational hub for sustainability and "green" thinking. The Resource Center is intended to connect businesses, local governments and individuals to resources and information on sustainable living and development practices.

Jones Valley Teaching Farms in Downtown Birmingham *(Photo by Magic City Post)*

Green Building Focus

Birmingham-based Green Building Focus promotes green design and building through conferences held across the globe. Several of the conferences have been held in Birmingham, promoting green building to the region and promoting the region to green builders and manufacturers.

Jones Valley Teaching Farms (JVTF)

JVTF is a nonprofit urban farm located in Downtown Birmingham. The operation, which began in 2002, has implemented three programs in support of its overall mission to support urban agriculture and access to fresh, locally grown produce to the metro area. JVTF operates a working and teaching farm, on- and off-site educational programs, and an initiative promoting nutrition in public schools.

UAB Sustainable Smart Cities Research Center

UAB's Sustainable Smart Cities Research Center was recently established through a partnership between the UAB Schools of Business, Engineering and Medicine and the Minority Health and Health Disparities Research Center. Following a symposium hosted by UAB, representatives of the participating schools announced formation of the research center, which will conduct academic research as well as join with community volunteers through several sustainability-themed working groups.

In addition, many other organizations directly or indirectly promote sustainability in Birmingham:

- Alabama Chapter of the American Society of Landscape Architects
- Clean Fuels Coalition
- Keep Birmingham Beautiful Commission
- REV Birmingham
- Birmingham Chapter of the American Institute of Architects
- Birmingham-Jefferson Food Policy Council
- Birmingham Chapter of the US Green Building Council of Alabama
- Regional Planning Commission of Greater Birmingham
- Urban Ministry
- My Green Birmingham

C. Recommendations

goal 1

City operations serve as a model of energy and resource efficiency.

POLICIES

- Continue organizational and operational improvements to maximize energy and resource efficiency and reduce waste.
- Give preference to energy efficient design, materials and equipment in public facilities and infrastructure.
- Expand the use of renewable energy sources for city operations.

STRATEGIES

The City has already taken initial steps to become "greener" and more sustainable. Over several years, the City has begun using cleaner, alternative fuels for city vehicles, including school buses. The City of Birmingham was awarded an Energy Efficiency and Conservation Block Grant for $2.5 million to install geothermal heat pumps in several recreation centers to increase their energy efficiency. In 2010, REV Birmingham prepared the report *Cost-Effectiveness of Greening Birmingham: A Report on Sustainability.* That report included recommendations for the city government as well as the private sector to develop a more sustainable community. The city is now working to implement some of these recommendations including assessing energy use in existing facilities and creating incentives for green development by the private sector. Following the April 2011 tornados, the city opted to recycle tornado debris and materials from demolished buildings rather than send the materials to area landfills.

The City should continue and expand upon these efforts by committing to cost-effective policies and initiating processes that will improve City operations and serve as a model to other local governments, businesses and residents alike. As one of the largest employers in the metro area,

the City's organizational improvements will have broad, positive impacts.

A. Develop a citywide sustainability program for all operations and facilities.

This effort would ultimately reflect better use of tax dollars in the way that the City conducts day-to-day operations while also serving as an example to other institutions, businesses and residents in adopting more sustainable practices in their own endeavors.

ACTIONS

1. Prepare a Sustainability Plan.

To maximize energy efficiency, waste reduction and resource conservation, and long-term fiscal health, the City should prepare and implement a Sustainability Plan framed by overall policies for more sustainable city operations and implemented through specific goals, actions and benchmarks. Preparation of the plan would involve collaboration among City departments to identify ways in which day-to-day operations, facilities and equipment can be improved to save money and energy and reduce waste while maintaining and potentially improving operational efficiency and the effectiveness in the services the City provides to the community.

Benchmarks are essential to ensuring the effectiveness of the policies, providing accountability and giving clear targets for measuring progress. Diligently tracking progress will allow the City to determine whether particular aspects of the program are both meeting desired goals and are cost effective. This also will help identify where elements of the plan need to be adjusted to improve long term success.

In preparing this plan, the City should take advantage of professional, institutional and nonprofit resources in the area. A Sustainability Committee or similar advisory body should be created that includes city officials and staff, business leaders, utilities representatives, residents, and the UAB Smart Sustainable Cities Research Center. In addition, Birmingham has a large number of public and private sector resources to draw from to assist in this: Leadership in Energy and Environmental Design (LEED) accredited engineers, designers and planners; and groups such as the Green Resource Center, the Southern Environmental Center, at Birmingham Southern College, and the Alabama Environmental Council.

The plan should begin with an inventory of emissions from city operations and the community, set reduction targets and identify internal and external policies and actions to achieve targets. Policy recommendations should address operations and procedures that contribute to energy use and pollution as well as facility and equipment purchases. External policies would address ways the city impacts the actions of others, from land use policies and transportation to recycling and promotion of sustainable building practices. Organizations like UAB's Sustainable Smart Cities Research Center can be tapped to help the city analyze existing conditions, perform research and establish quantifiable goals for the plan.

2. Update departmental policies and procedures.

To assure implementation, plan recommendations should be incorporated into written policies and procedures for each department. Involvement of staff in updating departmental policies and procedures will help employees understand the value of improved practices while also soliciting the input of those who will ultimately be responsible for carrying out normal tasks under new policies. Training programs may also be helpful in instituting new procedures.

Potential improvements to departmental practices include integrated pest management; use of native, drought-tolerant landscaping and rain harvesting for irrigation in public open spaces; and integration of money-saving low-impact development/green infrastructure design techniques for stormwater management.

3. Incorporate green design in City facilities.

By incorporating green design methods in the construction of new city facilities, such as those promoted by the US Green Building Council's LEED rating system, the city can reduce emissions from city buildings and reap the benefits of energy and water efficiency. The LEED rating system promotes a variety of sustainable design methods focused on site selection,

energy and water efficiency, pollution reduction, use of recycled and renewable building materials, and indoor air quality. When the LEED certification system began, added upfront costs for green design presented an obstacle to widespread adoption. As more and more industries have become involved in green building, however, those costs have fallen and can be greatly outweighed by the long-term savings in operational costs.

The City need not officially certify new or renovated facilities through LEED or a similar system but can strive to integrate these design and facilities operations practices into city building, site design and building management.

Green design can be incorporated into building grounds, parking lots and city parks and create savings on maintenance and reduce water usage for irrigation in a cost-effective manner. Recycled and recyclable materials can also be used in city facilities to increase cost-effective resource efficiency and reduce waste. Renovation of city facilities should include measures to enhance indoor air quality such as by reducing the use of building materials, finishes, and cleaning products that release volatile organic compounds (VOCs).

4. Evaluate lifecycle costs in development of new city facilities and for purchase of equipment.

Proposals for new City facilities should take into account two primary costs—the initial costs of design and construction and the long-term expenses associated with operating and maintaining a facility over many years—its lifecycle costs. To assure cost-effectiveness in capital project decisions, lifecycle costs must be reasonably quantified and considered along with initial costs to fully comprehend the total cost of each capital project. This is an economic hallmark of the green building movement, which promotes cost-effective energy and resource efficiency in the design, construction and operation of buildings.

CHATTANOOGA WOOS ENVIRONMENTALLY-FRIENDLY AUTOMAKER

In 1969 Chattanooga was considered to have the worst air quality of any city in the nation—an issue well understood in Birmingham. After taking strong steps to address the issue, by 1989 Hamilton County was declared "in attainment." This great achievement led Chattanooga to take on broader environmental goals. In 2009, the City adopted a plan that focused on achieving greater sustainability through energy efficiency, healthy communities, natural resources, and education and policy. The city formed a 14-member "green committee" that included city, county, and utilities officials, business community representatives, and a variety of subject matter experts. The committee held a series of community meetings to identify potential strategies and priorities. The committee focused on four areas: energy efficiency, healthy communities, natural resources, and education and policy.

The plan included recommendations and specific actions on alternative energy and green building; smart growth, food, agriculture and transportation; air and water quality, green infrastructure and urban forestry; and community awareness, education and participation. Since adoption of the plan, the city has expanded recycling, established funding for a downtown electric shuttle used by locals and tourists alike, improved the city vehicle fleet and vehicle-use policies, planted 1,500 trees downtown, established a bikeshare program, provided $2 million in incentives for green developments, and created a methane energy-production facility at its landfill.

*The community's progressive commitments to the environment and quality of life were positive considerations in Volkswagen Group of America's decision to build an automotive production facility in Chattanooga. That decision represented a $1 billion dollar investment by Volkswagen and the creation of 2,000 jobs. Once open, the plant will generate an estimated $12 billion in new income and $1.4 billion in total new tax revenue. In addition to new on-site jobs, Volkswagen forecasts that the facility will also create 9,500 supplier-related jobs in the region.**

Environmentally responsible manufacturing and sustainable mobility are core values of the automaker. The company, in partnership with the State of Tennessee and local organizations, donated two trees for planting in the community for every tree that was removed to develop the auto plant. The facility is located on 1,350 acres in Enterprise South Industrial Park, a former brownfield site. The plant was recognized in 2011 as the first auto plant to receive LEED Platinum certification, the highest level of certification offered by the US Green Building Council.

* *Volkswagen Group of America, **http://www.volkswagengroupamerica.com/chattanooga/index.html***

Lifecycle costs should also be considered in the purchase of city equipment, from vehicles to copying machines.

5. Continue cost-effective conversion of the vehicle fleet to reduce costs and emissions.

In 2007 the City began converting its fleet to the use of alternative fuels to curb vehicle emissions. This process not only mitigates impacts the city fleet has on air quality, but it also offers savings opportunities. As new alternative fuel technologies emerge and more and better hybrid vehicles are manufactured, the City will have additional options to save taxpayer dollars in fueling its fleet.

Several municipalities have begun using biodiesel fuels made from recycled vegetable oil. In Alabama, Daphne, Gadsden, Hoover and Montgomery are producing fleet fuels from recycled residential and commercial cooking oils. Cooking-oil recycling programs not only reduce dependence on petroleum-based fuel—with its associated costs and pollution—but they also reduce demand on landfills and wastewater treatment systems.

In 2011, Birmingham became the first city in the state to run school buses on compressed natural gas, a cheaper and cleaner alternative to diesel fuel. *(Photo by Marie Leech, Birmingham News)*

B. Increase recycling.

By improving and increasing recycling services, not only will more waste be diverted from landfills, but the cost of recycling per ton can be reduced below that of conventional refuse collection.

1. Expand city recycling program to more users where feasible.

Adjusting the current city recycling program to extend pick-up services to multifamily developments has the potential to divert large quantities of materials from the solid waste stream. A number of cities have extended these services to multifamily housing. A study performed by the US Conference of Mayors and ECODATA, Inc., found that of 40 communities sampled, the amount of materials recycled by multifamily households compared to single-family households was comparable, at 14.6:16.0. Given the large number of multifamily households in Birmingham, extending recycling services to multifamily households can divert significant amounts of solid waste from landfills.

Best practices among successful multifamily recycling programs include using large, portable containers or carts, set-outs of at least three containers to allow for sorting, and furnishing one set of containers per 15-19 units. Several high-performing municipal recycling programs use private firms to collect recyclables. Some communities have converted to single-stream recycling in which materials to be recycled are sorted at recovery facilities rather than residents. Single-stream recycling makes the recycling process easier for residents, and the single-compartment trucks they use are cheaper and more flexible for fleets.

The City can also encourage more recycling for businesses and institutions. Some cities offer curbside pick-up, sometimes for a fee, while others offer convenient drop-off locations in business areas. These can also be used in combination. Some businesses already pay private firms to haul their recyclables.

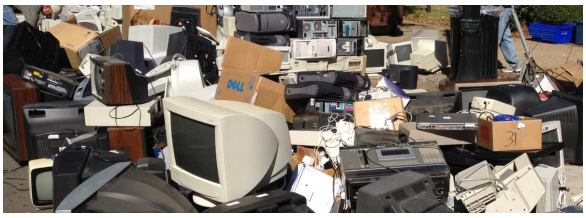
To initiate a non-residential recycling program, downtown Birmingham and the city's commercial-revitalization districts could act as initial test areas. The concentration of businesses in these areas may allow for more efficient drop-off and/or pickup services. These areas also may have merchants groups through which recycling services can be organized and promoted with the businesses in those districts.

2. Promote participation in recycling.

A critical element in increasing the cost-effectiveness of recycling is to increase participation and the amount of materials recycled. To increase recycling and ultimately reduce solid waste going to landfills and conserve resources, participation must be boosted.

Detailed record keeping can help focus promotions. By knowing how many and where containers are distributed and the quantity of materials being recycled from households (including distinguishing between single-family and multifamily households), the city recycling program will be better able to target promotions while also measuring the effectiveness of the program.

The City can work with area recycling centers and organizations to assure that there are convenient options for area businesses, institutions and residents to recycle the widest possible variety of household and office materials. Recycling promotions, such as the City's E-cycle Day for electronic waste, should continue and expand to increase awareness of the methods and benefits of solid waste reduction, recycling and reuse.



E-cycling in Birmingham *(Photo by D'arcy Norman, Magic City Post)*

goal 2

Reinvestment in existing communities conserves resources.

POLICIES

- Support clean-up and adaptive reuse of brownfields.
- Encourage the preservation and adaptive reuse of existing structures to reduce construction waste and conserve energy and materials.
- Encourage urban farming and community gardens to reduce food deserts and food imbalance areas.

STRATEGIES

A. Attract private investment to existing communities.

See Chapter 4 (p. 4.22) and the strategies in Chapters 7 (pp. 7.8–7.32) and 8 (pp. 8.9–8.20).

B. Identify and participate in priority brownfield projects.

Reclamation of vacant and underutilized brownfield sites for new economic uses will help to restore community and environmental conditions while also contributing to the city's economy. Many of these sites depress the value of adjacent properties, some of which are located in what would otherwise be highly valuable real estate. Several brownfield sites are in highly visible locations with convenient access to area interstates.

Brownfields can also be sites for clean, renewable energy creation. The US Department of Energy created a national initiative in 1999 to redevelop brownfields as Brightfields[CM], facilities that generate solar energy. Photovoltaic and similar solar technologies require little maintenance and can be installed quickly without penetrating or disturbing contaminated ground. Upon installation, these solar arrays generate power immediately without environmental impacts. Because of the ease of transportation and

installation, brightfields can serve as interim uses until a brownfield is redeveloped.

C. Encourage adaptive reuse of existing buildings where appropriate.

When cost-effective and feasible, the reuse of existing buildings—as opposed to redevelopment—not only helps preserve Birmingham's historic character, but it also reduces construction waste going to landfills and reduces the energy and resources necessary to provide and transport new building materials. Building reuse, particularly in the case of historic buildings, is more labor-intensive than new construction, but less intensive in terms of materials costs. In that sense, it can be much more beneficial to the local economy, providing more construction jobs and depending less on construction materials manufactured and purchased from other locales. Adaptive reuse of buildings is recycling on the large scale.

Most historic buildings were built to last, particularly compared to many modern buildings that are financed, designed and constructed for a much shorter shelf life. Adaptive reuse will not be feasible in every situation but many older buildings, particularly commercial ones, were designed with simple, flexible floor plans making them easy to adapt to new uses.

Existing federal income tax credits provide financial incentives for the adaptive reuse of historic buildings. The State of Alabama allows a 50% property tax reduction for historically contributing, income-producing properties in designated historic districts. In 2013 a bill, approved by the State Legislature, provides state income tax credits on top of federal incentives for historic preservation projects.

1. Require cost comparison for redevelopment projects involving City financial support.

When City financial assistance is requested for private for-profit or nonprofit investment in existing neighborhood or business areas—particularly projects involving existing buildings—a comparison of the costs associated with adaptive reuse—compared to that of demolition and new construction—should be required.

BRIGHTFIELDS—EXELON CITY SOLAR, CHICAGO

In July 2010, Exelon, the nation's largest power company and owner of a gas power plant in Alabama, completed work on the City Solar power plant, the largest urban solar power plant in the United States. The 41-acre tract sits on a brownfield on Chicago's South Side that had been vacant for over 30 years. Exelon removed toxic chemicals and other pollutants from the site prior to construction. The 10-megawatt solar-energy generation station produces 14,000 megawatt-hours per year, providing enough electricity to power approximately 1,500 homes. The $60 million project created 200 jobs during construction and sourced much of its labor and building materials from South Side companies. The plant provides permanent jobs in operations, maintenance and security. Exelon City Solar also expands the local tax base: Exelon is leasing the long-vacant brownfield property from the City of Chicago, generating revenues from rent and real estate taxes. The electricity generated by the brightfield required a new electrical substation, the first modern infrastructure built in the neighborhood in decades. City Solar also features sustainable landscaping and an up-to-date security system. Exelon received a federal loan guarantee for more than two-thirds of the project's $60 million budget.

SunPower has announced its intention to work with the City of Chicago to choose five other sites within the city for the installation of 2-kilowatt solar-generation systems. More information: ***http://www.exeloncorp.com/assets/energy/powerplants/docs/pdf_ExelonCitySolarFact.pdf***

2. Compare costs of reuse versus new construction for capital projects.

The cost comparison requirements described in Action 1 should be extended to city capital projects. Conservation and reuse of existing buildings should be adaptively reused unless structural, programmatic or other concerns prove reuse to be infeasible.

Adaptive reuse of historic buildings like Elyton School above preserves community character, reduces waste and recycles buildings. *(Photo by Jeremy Erdreich, Bhamarchitect's Blog.)*

3. Facilitate the development of a Preservation Guild.

Preservation guilds are groups of designers, builders and craftspeople with recognized proficiency in the renovation of historic buildings. Given the historic building stock throughout the city in commercial areas and neighborhoods, the benefits of an organized pool of resources such as this would be profound.

Members of this preservation guild could be tapped to compare preservation costs versus new construction (as described in Actions 1 and 2 above), to carry out preservation projects, and to provide ongoing guidance to city staff and officials regarding historic preservation. Benefits to members of the guild would include: marketing and networking, training, and collaboration.

D. Encourage urban farming and community gardens to reduce food deserts.

Community gardens and urban agricultural initiatives like Jones Valley Teaching Farm represent one strategy to address food desert and food imbalance issues in Birmingham's existing neighborhoods.

1. Continue support for community garden programs.

There are currently over a dozen community gardens in Birmingham operated and supported by a combination of neighborhood groups and nonprofit organizations, such as Urban Ministry's WE (West End) Community Gardens initiative. These efforts can increase residents' access to fresh produce while also serving as community-building projects. Community gardens can also be used as part of a larger strategy to occupy vacant lands with new uses in declining neighborhoods. The city can continue support for these initiatives by connecting interested parties to technical assistance, government and private funding sources, and helping community groups find and assemble appropriate properties to create new gardens.

2. Encourage urban agriculture.

Larger in scale than community gardens and focused more specifically on food production, urban farming is a growing trend throughout American cities. In Birmingham, Jones Valley Teaching Farm maintains the only urban agricultural operation in Birmingham. Expansion of JVTF and/or development of new urban farms will help provide access to fresh, nutritious foods in Birmingham's food deserts and food imbalance areas.

A variety of sites throughout the city can be converted to productive urban farms given the availability of vacant land, including former residential properties acquired through past flood buyout efforts. The City's assistance with land assembly could be instrumental to creating adequately sized sites. Urban farming can also occur on brownfields provided the sites are remediated or planting areas are raised or otherwise separated from contaminated soils.

To make the development of urban farms more practicable, the zoning ordinance should be amended to include specific allowances and standards for urban farming in some residential zoning districts. Residential zoning districts currently allow "truck gardening," which limits operations to the growing of produce and excludes some activities often associated with urban farming today, such as on-site sales and educational programs.

Urban agriculture could become the focus of disinvested areas of the city such as Ensley. A combination of indoor and outdoor urban farming, on the model of innovative enterprises like The Plant in Chicago and Growing Power in Milwaukee can be the foundation of a new economic sector for Birmingham. (See Chapter 8, pp. 87–8.8.)

INNOVATIONS IN URBAN AGRICULTURE

Hydroponic plant beds in The Plant. *(Photo by Julie Beck)*

Indoor Farms

A possible reuse of brownfields that would benefit urban agriculture and access to healthy foods in Birmingham is vertical or building-based agriculture. While some see the future of urban agriculture as skylines filled with vegetative towers, some innovators are utilizing former industrial buildings and warehouses to grow food in the urban environment.

Chicago's The Plant is a former meat-packing plant now used for hydroponic food production (kale, chard, lettuce and arugula) and also houses the New Chicago Beer Company, and a bakery. In addition to its ambition as an innovative, sustainable food production facility, The Plant also is intended to be a net-zero-energy and net-zero-waste building.

Will Allen leads a training workshop at Growing Power's Milwaukee facility. *(Photo by Growing Power.)*

"Genius" Urban Farmer Advises Cities Around the US

Led by Will Allen, winner of a MacArthur "genius" award, Growing Power, Inc., uses demonstration projects, outreach, and technical assistance to promote sustainable urban food systems and train urban youth in many areas of food production from farming to cooking. A national nonprofit and land trust, Growing Power operates urban farms in Milwaukee and Chicago. Allen worked with the New Orleans Food and Farm Network in 2008, and in 2011 Growing Power received a $1 million grant from the Wal-Mart Foundation to fund its work with 20 urban food-production organizations in 15 US cities.

goal 3

Private developments incorporate cost-effective sustainable planning and design features at the regional, citywide, neighborhood and site levels.

POLICIES

- Consider incentives for energy-efficient, "green" building.
- Encourge development that protects the city's water resources.
- Encourage the use of natural drainage in stormwater management systems where feasible.
- Encourage the use of conservation and low-impact development techniques.
- Support improvement of state water-quality standards and encourage water-efficiency standards and enforcement.

STRATEGIES

A. Incentivize green building and neighborhood design.

The City is currently developing a program to honor and provide incentives for green building efforts within the community. Ultimately this program could include both financial and regulatory incentives to increase green building practices.

1. Audit and amend development regulations.

The first step in encouraging the private sector to incorporate cost-effective sustainable development and green design practices in new investment is to thoroughly assess current regulations and modify those that prevent or make sustainable design practices impractical. The zoning ordinance, subdivision regulations, engineering standards and design review guidelines should be revised to consider incentives for the use of cost-effective green design practices.

Incorporation of conservation subdivisions as well as other changes in the subdivision regulations and zoning ordinance would better support green infrastructure or low-impact development techniques, including modifying road pavement width requirements, allowing greater use of roadside swales, and lowering and otherwise modifying parking requirements to avoid excessive impervious surfaces in new development and redevelopment.

More compact, mixed use development is an important aspect of city sustainability and a fundamental characteristic of a walkable, bike- and transit- supportive environment. Zoning regulations directly control density and the mixture of uses permitted throughout the city's zoning districts. Density limitations should be adjusted to better support transit use and traveling within the city's neighborhoods and business areas on foot and by bicycle. In urban areas, front yard setbacks should be transformed to "build-to lines" to assure pedestrian-oriented development patterns and prevent parking lots between sidewalks and buildings.

These changes should be directed toward business districts and the residential areas that surround them, particularly areas along major corridors served by transit. This can be done through an overlay system similar to the Highland Park Form-Based Overlay,

CHARLOTTE'S SMART ENERGY NOW PROGRAM

*Charlotte, North Carolina's Smart Energy Now program intends to decrease energy use in Uptown Charlotte by 20% in five years. The program, introduced in 2010, includes real-time monitoring of energy consumption in 70 downtown buildings. Building managers will use the collected data to improve building performance. The program is a joint effort of Charlotte Center City Partners, Duke Energy, Cisco and Verizon and is part of the city's Envision Charlotte sustainability program. More information: Smart Energy Now, **http://www.duke-energy.comSmartEnergyNow/**.*

however, that approach does not affect the uses allowed in the underlying zoning districts. The preferred approach would be to prepare and adopt form-based regulations that are designed to be applied in multiple, strategic locations. As part of the development of area-specific plans, such as for the Strategic Opportunity Areas identified in this plan, regulating plans may be prepared that interconnect the land use, transportation and urban design goals for the Opportunity Areas with the form-based regulations necessary to achieve them through private investment.

Parking regulations within the zoning ordinance also have an impact on walkability and transit use. In transit catchment areas, minimum parking requirements should evolve to maximum parking thresholds and other regulatory changes that allow shared and remote parking.

2. Provide incentives for green design.

Green building which is cost-effective is not only good for the environment, it can be economically beneficial to building owners. For example, incentives for cost-effective green building in commercial real estate can increase a property owner's cash flow and raise property values. Green design may reduce building-based air pollutants, increasing energy efficiency, which further reduces air pollution by lowering demand for energy production that uses fossil fuels.

To actively pursue green design in Birmingham, the City can offer a combination of financial and regulatory incentives. Financial incentives may come in the form of sales tax rebates, loan guarantees or other forms of financial support. Cities such as Chattanooga have provided streamlined permitting processes for green development projects. Another way Birmingham has traditionally encouraged desired development and redevelopment projects is committing to infrastructure improvements, such as streetscape projects, in targeted areas.

Non-financial inducements for green design could include density or height incentives for specific green building elements, particularly in commercial, multi-family and mixed-use districts, where increased density is needed to better support transit. Green and sustainable development techniques that might be considered for incentives include LEED certification, green roofs, and facilities for alternative transportation such as secure bike parking and showers.

Ruffner Mountain's Treetop Visitors Center earned a LEED Gold designation in 2011. The center's green design features include stormwater recycling, a green roof, energy efficient lighting and control systems, and use of recycled and locally-produced building materials. *(Photo: KPS Group, Inc.)*

A report by the National Association of Industrial and Office Properties (NAIOP) offers useful information on the relative value of various incentive strategies for green design. The report includes surveys of designers, builders and government agencies to better understand what types of municipal programs are most likely to trigger increases in green building by the private sector. The top three incentives, besides monetary awards, included priority permit processing; marketing, publicity and awards; and density bonuses. Others included reductions in development fees; tax rebates and loan funds or assistance.

3. Adopt a cost-effective green-compatible building code.

At a minimum, any standards in the city's currently adopted building code (the 2009 International Building Code) that prohibit or deter green design and construction practices should be modified to enable, if not encourage, their use. The City is reviewing the International Green Construction Code, prepared by the International Code Council with support of American Institute of Architects (AIA), American Society for Testing and Materials (ASTM) International, the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), the USGBC

COOL ROOFS

Roof design offers an opportunity to improve energy efficiency in buildings. Because sunlight hits roofs throughout the day, they either allow or decrease heat transfer into a building's interior. Under full sun, the surface of a black roof can be as much as 50° F hotter than the air around it. Cool roofs have high solar reflectance—they reflect the sun's rays—and high thermal emittance—they radiate the heat not reflected. Cool roofs can be especially beneficial during Birmingham's hot summer months, reducing energy use and saving money spent on cooling.*

*As part of PlaNYC, New York City created NYC°CoolRoofs, a program that helps building owners reduce energy costs and reduces city temperatures by applying a special white coating to roofs. The coating has both high solar reflectivity and high infrared emissivity. The program is supported by corporate sponsors, including power utility ConEdison, community and nonprofit groups, vendors and other government organizations. Since the program's inception, 2.6 million square feet of roofs in New York City have received a CoolRoof coating.***

Cool roofs can be created on pitched and flat roofs and do not have to be white. EnergyStar-approved cool metal roofing comes in dark colors, though they are not as reflective as lighter colors. At peak temperatures, a white roof measures 20°F cooler than a roof with aluminum coating and 30°F cooler than a dark roof.

Green roofs are a unique branch of cool roofs that do more than reduce building temperatures and the urban heat island effect: they can also capture stormwater. Green roofs are roof systems that include vegetation, a growing medium and a waterproofing membrane to prevent absorbed water from entering the building structure. Like rain gardens and bioswales, green roofs are a low-impact development technique for stormwater management. Green roofs have been used in Birmingham at Ruffner Mountain Nature Center, the Social Security Administration Building, the new Children's Hospital and UAB's Hulsey Center, among others.

* Wikipedia, "Cool Roof," ***http://en.wikipedia.org/wiki/Cool_roof***.

** NYC°CoolRoofs, ***http://www.nyc.gov/html/coolroofs/html/home/home.shtml***.

and the Illuminating Engineering Society (IES). This model code can be used as a guide in amending current building codes or adopted as an overlay code.

As a start, cost-effective green building code standards could be made mandatory for municipal projects. This can serve as a testing period, allowing local designers, builders and inspectors to become familiar with the new standards and develop local best practices to meet them. The green building incentive program being prepared by the City can use elements of the green building code as metrics for offering incentives, either as a substitute for or in combination with LEED certification.

4. Launch a white roofs program.

Birmingham's summers are very hot, and a simple program based on New York City's to paint roofs white can help property owners cut the cost of air conditioning. A "Birmingham Cool Roofs" project could be created as a partnership of the city, the business community and nonprofit organizations. The program could also be part of a youth jobs program to begin training teenagers and young adults for green jobs.

2.6 million square feet of roofs in New York City have received a "Cool Roof" coating. *(Photo by Tara McIsaac, Epoch Times.)*

B. Promote water conservation.

Water conservation at the municipal level reduces energy use and costs to transport drinking water. This includes avoiding or lessening capital projects necessary to expand municipal water capacity. Tapping new water sources far from the city require the construction of new dams, treatment facilities, long underground supply lines and other infrastructure. Greater water usage also requires more water treatment, which can increase energy use. Wise use (and reuse) of water helps reduce monthly bills for utility customers and helps avoid added costs of system expansion that are inevitably borne by ratepayers. While most city water systems have plans to address the occasional drought, more and more cities are taking on water conservation planning with more long-term goals.

Water conservation includes a variety of approaches, including: water efficient fixtures, drought tolerant landscaping, collection and reuse of rainwater, and recycling of greywater. Education and promotional programs are also important components of water conservation efforts.

1. *Advocate for state laws and local standards allow appropriate uses of greywater.*

Greywater is wastewater generated from laundry, dishwashing and bathing that can be reused mostly for irrigation of farms, gardens, lawns, parks and sports fields. Some jurisdictions in the United States also allow water from showers and bathtubs to be reused for flushing toilets. This is permitted under the International Plumbing Code but not the Uniform Plumbing Code. Recycling of greywater is currently prohibited under Alabama State Law. This is an area in which the City and area legislators can help to improve state law affecting water conservation while providing residents and businesses ways to save on monthly utility bills. In a 2012 report, the Alabama Water Agencies Working Group recommended development of regulations to allow water reuse and public education on water conservation among twelve issue areas and policy options.

The state currently has no statewide water conservation plan though one is expected to be produced by the Permanent Joint Legislative Committee on Water Policy and Management. Birmingham's support of this effort will ultimately prove beneficial in the city's efforts to conserve its own water supply.

2. *Support programs in partnership with the Birmingham Water Works Board to increase water efficiency.*

The City should partner with the BWWB in developing water conservation education programs that go beyond the promotional campaigns that usually occur in response to drought conditions.

Another way for the City and BWWB to increase water conservation, while also supporting reinvestment in existing communities, is repairing or replacing older water lines. Similarly, homeowners and owners of non-residential buildings should be encouraged to evaluate their water usage and determine if there are leaks in pipes within buildings or own private properties or minor repairs that can reduce water waste and water bills.

3. *Encourage water efficiency as a part of programs to promote green building design.*

LEED and other sustainable building design programs recognize water efficiency as a key element in green building. Improvements to local regulations by adding incentives, and other cost-effective green building

This rain garden at the Birmingham Botanical Gardens reflects one method to increase water conservation—by collecting or diverting rainwater to irrigate landscape areas. Cisterns and rain barrels can be used to collect rainwater for use on lawns, rain gardens and other landscape areas.

The Birmingham Water Works Board repaired leaks for over 200 customers during its Fix a Leak Week program. *(Photo: Linda Stelter, Birmingham News.)*

promotion efforts referred to in Goal 3 of this chapter (pp. 6.18–6.19) should include water efficiency alongside energy efficiency, site selection and other elements of sustainable design.

goal 4

The city makes every effort to reduce air pollution.

POLICIES

- Consider incentives for the development of multimodal transportation systems that reduce vehicle emissions.
- Encourage vehicle emission inspections to improve air quality, industrial opportunity, and community health.
- Promote the recruitment of clean industry.
- Consider incentives for private industries to further reduce emissions over time.
- Encourage energy-efficient design, materials and equipment in existing and new private developments.
- Support the improvement of state energy policy standards and programs.

STRATEGIES

A. Develop and implement a Sustainability Plan for city operations.

This strategy is described under Goal 1 of this chapter (pp. 6.10–6.16). In addition to air quality initiatives that may be included, the plan can include specific cost-effective strategies to reduce emissions.

ACTIONS

1. ***Establish measurable goals to decrease emissions from City operations.***
   To measure progress, assure cost effectiveness and be able to adjust efforts, a city Sustainability Plan should include an estimate of air-polluting emissions from city operation, the cost to reduce those emissions, and the potential cost saving resulting from Sustainability Plan Implementation. From this a reasonable cost-effective reduction target can be set and strategies enacted to meet the goal within the time frame of the plan.

2. ***Reduce transportation-related emissions.***
   This includes investing regularly in the development and maintenance of bicycle and pedestrian facilities, supporting transit, use of cleaner-burning fuels and metro-wide vehicle emissions testing.

3. ***Reduce emissions from buildings and energy use.***
   Building materials and equipment and energy consumption related to buildings are often overlooked factors in outdoor air quality. Promotion of green building design, including green rehabilitation and weatherization of existing buildings, will help to reduce air pollution caused by buildings directly and indirectly.

   Use of renewable energies to reduce statewide dependence on fossil fuel-based energy production also helps to reduce air pollution. There are a variety of renewable energy technologies available today and advances in technologies are making the harnessing of alternative energy sources more economical.

Geothermal energy is a promising renewable source because it relies on heat energy from within the earth, which varies little from place to place, in contrast to solar and wind power limitations. A growing renewable source in Alabama is biomass, which involves the burning of specific crops and wood that grow and store energy. Hydroelectric, solar and wind power are also renewable sources.

Unfortunately, there are few incentives available in the state to drive development of renewable energy sources in Alabama.

4. Support state and federal weatherization programs.

The Alabama Department of Economic and Community Affairs (ADECA) administers the Alabama Weatherization Assistance Program to help low income families afford a variety of energy efficiency improvements to their homes that reduce utility bills but also help reduce energy consumption that contributes to air pollution. The City should continue promotion of these programs through the Community Development Department and provide information, for example through the My Green Birmingham website regarding weatherization and the financial benefits of residential energy efficiency. These promotional efforts should also include information on federal renewable energy incentives.

5. Promote use of renewable energies.

The City should invest in different strategies to increase awareness, development and use of renewable energies. As the City continues its efforts to be a model for the region, to invest in alternative fuels for its fleet, and to improve energy efficiency in City facilities, harnessing solar, geothermal or other renewable power sources to reduce the City's own non-renewable energy consumption will be instrumental in raising visibility and underscoring the viability of renewable energy use.

A parallel approach is to work with area partners such as the UAB Sustainable Smart Cities Center, area legislators, the Birmingham Business Alliance and other stakeholders to develop and recommend a combination of state and private incentive programs to advance renewable energy production in the region.

D. Getting Started

ACTIONS	RESPONSIBLE PARTY
Form a Sustainability Committee or similar advisory group comprising City staff and officials, utilities representatives, university and business representatives, and subject matter experts.	City Departments; Mayor; City Council
Advance financial and regulatory incentives to encourage "green" development.	PEP; Planning Commission; City Council; Economic Development Office
Amend development regulations to accommodate urban farming, support transit and walkability, and encourage cost-effective green infrastructure and low-impact development techniques.	PEP; Planning Commission; City Council
Form a Birmingham Cool Roofs committee to develop a Cool Roofs program.	Mayor's Office; PEP; nonprofits