

How we construct, preserve, renovate, adapt and use buildings has an enormous impact on our economy, our health, and the environment. The good news is that buildings offer many opportunities to meet our sustainability goals and create greener, healthier, more vibrant social, economic and environmental benefits for the citizens of Charleston.

Charleston is uniquely positioned to be, not only a local leader, but a national and international leader in sustainable building preservation, design, construction and operation. With more than 3000 existing historic structures in the City, historic buildings are a significant contributor to the City's cultural legacy and charm and celebrated throughout the nation and the world. Many of the construction practices used in the past to construct our historic buildings applied principles such as appropriate orientation on the property, the use of local and durable building materials, providing natural ventilation and achieving good day lighting to improve the health and comfort of the building's owners and users. These principles inherent in many of our historic structures, along with improved energy efficiency, are now considered sustainable or "green". Therefore it is fitting that Charleston take a leadership

role in developing the best practices that will integrate the best of historic preservation standards with the best of modern sustainable standards and practices to continue the legacy begun by our founders more than three hundred years ago.

Energy efficiency and sustainability in buildings are largely an untapped resource that can help solve many of the issues we face today with job creation, health care and environmental stewardship. In the US an achievable 23% reduction in energy consumption between now and 2020 could save the American public \$1.2 trillion.¹

In Charleston, buildings and related energy use account for 58% of our energy consumption and the resultant greenhouse gas emissions. Nationally, buildings account for:

- 72% of the electricity used;
- 39% of the energy used;
- 40% of the raw materials used;
- 14% of the potable water used; and
- 30% of the (total solid) waste output.²

As these figures show, choices made during a building's design, construction and operation can have a profound impact. These choices include, for example, the energy efficiency of the building, the environmental impact of the

BETTER BUILDINGS

ACTIONS

1. Require new City-owned buildings and renovations to non-historic existing City-owned buildings to be sustainable.
2. Require modifications to historic City-owned buildings to follow current best practices with regard to integrating historic preservation with modern sustainable practices.
3. Encourage private sector to adopt voluntary sustainable building practices.
4. Encourage disclosure of utility data and building performance.
5. Develop a weatherization program.
6. Help increase financing options.
7. Focus on public outreach.

BENEFITS

-  Reduce energy costs
-  Create jobs
-  Improve public health
-  Protect clean air
-  Protect clean water
-  Conserve natural resources
-  Enhance quality of life
-  Slow climate change
-  Protect cultural identity
-  Raise awareness

In the previous chapter, energy usage within buildings was discussed, and in this chapter, the production, transmission, and conservation of energy are examined.

The burning of fossil fuels generates much of the energy that powers our daily activities. Charleston's reliance on fossil fuels raises three questions concerning the sustainability of our community and the possibility of reducing our dependence upon these sources:

- How can we reduce our dependence on costly fossil fuels that generate global warming greenhouse gases?
- How can we protect public health and ensure clean air and water while providing needed energy?
- How can we promote the creation of a local "clean energy" economy, which would reduce the flow of energy dollars out of our community and nation?

Charleston citizens can draw on the successes of other communities that have wrestled with these questions and have established practical solutions.

The Current System

Currently, South Carolina depends heavily on fossil fuels for its energy needs, consuming 61% of its electricity from coal-fired power plants.¹ Charleston, in particular, receives at least 66% of its power from this source.²

When coal is used to generate electricity it releases more heat-trapping carbon dioxide than other fossil fuels. Along with carbon dioxide, coal releases oxides of sulfur that produce acid precipitation and trace metals like mercury. As a consequence, coal burning reduces the region's air quality, contaminates waterways, and compromises public health (Visit <http://www.scdhec.gov/environment/water/fish/docs/map.pdf> to view map of SC's contaminated waterways) .

Coal is often seen as an inexpensive generator of electricity, but hidden costs associated with the human health problem and environmental pollution can be costly to a community- three times greater, in fact, than the cost of energy production.³

Win-Win Choices

This plan recommends that Charleston place a high priority on energy efficiency and renewable energy, which would decrease greenhouse gases, reduce toxic

CLEANER ENERGY

ACTIONS

1. Establish an "Efficiency-First" principle.
2. Use energy efficiently.
3. Generate and support renewable energy.
4. Transmit and deliver electricity efficiently.
5. Encourage the public to participate.

BENEFITS

-  Reduce energy costs
-  Create jobs
-  Improve public health
-  Protect clean air
-  Protect clean water
-  Conserve natural resources
-  Enhance quality of life
-  Slow climate change
-  Raise awareness

Community design has a powerful impact on clean air, clean water, and the rural areas and natural habitats areas that surround the city. More spread-out communities require more driving, which means more smog. And when communities expand outward they displace rural and natural areas. Community design also determines how much pollution is washed off of paved surfaces into surrounding water ways during rainstorms.¹

Automobile use is a direct result of how our communities are designed: how neighborhoods are laid out, and how they relate to one another. Community design can allow residents to use their cars sparingly, allowing them to choose walking, biking, and public transit more often. Community design can also promote more appropriate stormwater management practices.

Roughly 40% of Charleston’s greenhouse gas emissions are related to transportation. To reduce these emissions and to protect the environment and

human health in other ways, it is necessary to reduce the use of automobiles over the next few decades. Fortunately, this is not as daunting a task as it may seem. Ingenious solutions are close at hand, right here in our own city.

Like all healthy cities, Charleston continues to grow and evolve. If the decision is made to grow responsibly - and to use the city’s uniquely intact historic neighborhoods as a guide - we can dramatically reduce our dependence on the automobile for future generations. There will also be a special bonus for our children and grandchildren: Charleston will be cleaner, greener, healthier, safer, and generally more livable for our children and grandchildren.

Better Choices

Charleston is a national leader in not only the preservation of our historic structures, but in the preservation of our historic neighborhoods and communities. On the peninsula everything is close together. Homes casually mix with businesses, and residents enjoy the option of walking, biking, or hopping on a bus. Also, the public open spaces are some of the most beautiful in the world -

SUSTAINABLE COMMUNITIES

ACTIONS

1. Plan future growth to reduce vehicle emissions.
2. Decide first where growth should occur, then plan transportation accordingly.
3. Encourage sustainable site design.
4. Create a sea level rise adaptation plan.
5. Raise public awareness.

BENEFITS

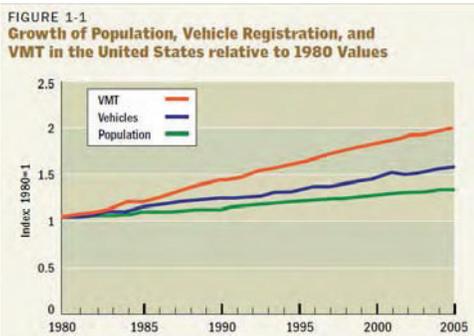
-  Reduce energy costs
-  Create jobs
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-  Protect clean air
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-  Conserve natural resources
-  Enhance quality of life
-  Slow climate change
-  Protect cultural identity
-  Raise awareness

The previous chapter mentioned that 40% of Charleston’s greenhouse gas emissions are transportation related. This chapter continues the discussion about how to minimize transportation-related emissions.

It seems that an obvious way to reduce these emissions would be to improve vehicle and fuel technologies. But it turns out that, by itself, this cannot succeed. Even though vehicle and fuel technologies are advancing quickly, the total number of miles traveled in vehicles is expected to rise.¹

As the graph shows, between 1980 and 2005, the number of miles Americans drove grew three times faster than the population. This trend is expected to continue into the near future. Between 2005 and 2030 the number of miles driven is expected to grow 48% -- more than twice the population growth of 23%.²

In the Charleston region, the rate of population growth and increase in Vehicle Miles Traveled (VMT) is expected to align more closely than this



Source: Federal Highway Administration. "Vehicle Registrations, Fuel Consumption, & Vehicle Miles of Travel as Indices," *Highway Statistics 2005*.

national trend. According to the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) Long Range Transportation Plan (2003), the region’s population is expected to grow by 34.6% from 2003 to 2030, with VMT growing approximately 39% in that same time period.

According to the Urban Land Institute, “the United States cannot achieve...large reductions in transportation related emissions without sharply reducing the growth in the number of miles driven.”³ This conclusion is echoed by many groups, including the American Association of State Highway and Transportation Officials (AASHTO), which is now urging that the national growth rate of vehicle miles traveled be cut in half.⁴

Reducing Vehicle Miles Traveled

So why is Vehicle Miles Traveled soaring in the US? Because most newer communities, including Charleston’s suburbs, separate workplaces and schools from residential areas and make residents dependent on automobiles for basic needs.

One way to reduce VMT is to rethink community design so that it is easier and safer to bike, walk, or use public transit. Borrowing principles from older areas like the Charleston peninsula, the nation’s new, sustainable communities site homes closer to schools and workplaces, leaving green space to be enjoyed by the whole

IMPROVED TRANSPORTATION

ACTIONS

1. Reduce dependence on single-occupancy vehicles.
2. Increase convenient, reliable public transportation.
3. Expand bicycle and pedestrian options.
4. Increase fuel efficiency and use of biofuels.
5. Improve air quality.

BENEFITS

-  Protect clean air
-  Improve public health
-  Reduce traffic congestion
-  Reduce traffic noise
-  Enhance quality of life
-  Slow Climate Change
-  Raise Awareness

This plan was developed during a time of great opportunity for the City to directly influence positive changes to waste management. During 2008 and 2009, issues coalesced to motivate and influence the waste management practices of the City, its citizens, and its businesses.

Beginning July 2008, the Bees Ferry Landfill no longer accepted construction and demolition waste from private haulers. In 2009, Charleston County Council committed to end its waste incineration program by January 2010. Also in 2009, Charleston County set a goal of a 40% recycling rate¹ -- four times the current rate. The County has also created a "Green Ribbon Committee" to evaluate existing waste management practices and gather public input.

Working in the context of these changes, the City of Charleston can capitalize on new opportunities to support progress on the County level and further the goals of climate protection and sustainability.

Where We Begin

Currently, Charleston participates in the County's successful but limited recycling and waste reduction program. For years, the County has been

burning 70% of its garbage in the incinerator, and putting 20% in the Bees Ferry Landfill.² Therefore, only 10% of waste is diverted from the incinerator and the landfill through recycling or composting.

As Charleston seeks to increase this "diversion rate," other cities and states can provide inspiring models. Six major cities nationwide, including Los Angeles, have diversion rates of 60% or better.³ California diverts 58% of its waste, and Maryland diverts nearly 50%.⁴ Major corporations are leaders in diversion as well. Safeway stores divert 85% of their waste, and Hewlett-Packard diverts more than 90%.⁵

The following recommendations roughly follow the EPA's solid waste hierarchy of reduce, reuse, recycle, and provide specific suggestions about how to proceed, focusing on the City and its potential to influence County decisions:

Zero Waste

The City should pass a resolution to have Zero Waste as its goal. Much as an employer sets "zero accidents" as a workplace goal, the resolution would frame the issue so that garbage is no longer accepted as inevitable.

In 2008, Zero Waste topped Newsweek's list of "10 Fixes for the Planet."⁶ Atlanta recently

ZERO WASTE

ACTIONS

1. Commit to a goal of Zero Waste.
2. Expand recycling and composting.
3. Explore energy recovery technologies.
4. Educate the public.

BENEFITS

-  Reduce energy costs
-  Conserve natural resources
-  Protect clean air
-  Protect clean water
-  Improve public health
-  Create jobs
-  Enhance quality of life
-  Slow climate change
-  Raise awareness

The Education Subcommittee supports the recommendations developed by the subcommittees of the Green Committee, as well as the best practices associated with these recommendations. This subcommittee also develops public outreach and educational efforts that go beyond the issues covered by the subcommittees, but serve the greater purpose of the Green Committee.

In the future, our efforts will become more varied as we develop programs to reach out to inform the public, Charleston businesses, and City employees about the recommendations.

From training volunteers to collect recyclables at City events in support of the Zero Waste Subcommittee; to creating resource guides on the web to help residents interested in weatherization per Building and Energy subcommittee goals; to advocating for more sustainable practices in City offices and schools, the Education Subcommittee helps the Sustainability Director and Charleston residents implement the programs that will move this plan's recommendations into everyday practice.

Since early 2009, some forty subcommittee members have

met monthly and worked more frequently in committee to develop educational programs to facilitate the big picture outlined within these pages. Unlike the other subcommittees, we are not asking the City to adopt additional recommendations. We exist to support the recommendations of other subcommittees with action and advice.

Some subcommittees will use the Education Subcommittee as a research and resource base, and some will rely on our combined skills to address larger marketing and outreach goals to “message” our community’s directional shifts. Community outreach and education efforts will focus on introducing new opportunities and technologies, as well as age-old, simple behaviors and practices that impact environmental preservation and energy conservation, and support healthier, more sustainable lifestyles. Our campaigns and actions are based on what will be most helpful to the City in becoming a leader in sustainable operations.



Green Committee in action

GREEN EDUCATION

ACTIONS

1. Provide volunteer training and support
2. Research and resource development
3. Develop curriculum and outreach

BENEFITS

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