

**INTERIM REPORT
to
Mayor Ron Littlefield**

CHATTANOOGA'S
**CLIMATE
ACTION PLAN**

**June 2008
Submitted by**



CHATTANOOGA GREEN COMMITTEE
www.chattanooga.gov/chattanoogagreen

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And the **Chattanooga Green Committee**

"More than two years ago, on behalf of Chattanooga, I signed the U.S. Conference of Mayors Climate Protection Agreement. I'm proud to say that Chattanooga was one of the early cities committed to the cause of reducing greenhouse gases – there are now more than 800 cities nationwide.

I have appointed the Chattanooga Green Committee to advise and assist us in moving Chattanooga further toward the long-sought goal of sustainability and they have worked diligently towards this goal. It is important that we, as a community, determine the path we take as we continue to address environmental issues in Chattanooga."



Mayor Ron Littlefield

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LETTER FROM THE CHAIR

TO: Mayor Ron Littlefield

During the fall of 2007 you appointed twelve members to serve as an advisory panel on environmental issues. The specific charge was to investigate and make recommendations regarding Chattanooga's participation in the U.S. Conference of Mayors Climate Protection Agreement. This twelve person panel is comprised of members representing a good cross section of Chattanooga's business, academic, political, and public sectors. In December we held our first organizational meeting and elected a chair. We also designated four task forces that are uniquely relevant to the Chattanooga cultural and natural landscapes: Energy Efficiency; Natural Resources; Healthy Communities; and Education and Policy.

The self-named **Chattanooga Green Committee** has taken its mission seriously and vigorously pursued all aspects of issues pertaining to sustainability. We have made field trips and brought in subject matter experts to educate us. We have held robust discussions with staff and colleagues. In April, we hosted a visioning session that engaged the community and resulted in over 1,000 suggestions. This visioning process was recognized by ICLEI and lauded as a model for the nation. We plan to continue with educational and informational outreaches on many levels.

We have now finished the task of integrating the comments and suggestions of citizens, subject matter experts, professional staff, and committee members into an Interim Report. This document contains our initial thoughts regarding objectives and potential actions for each of the four task forces. We do believe that this is a "snapshot" of our progress to date and is not meant to be an all-inclusive list of objectives and potential actions. In the final Climate Action Plan, which we shall submit at the end of 2008, we intend to include cost-benefit analyses, projected costs, carbon reduction projections using our software models, and progress indicators, all of which will provide you with comparative analysis for supporting the funding and implementation of various actions.

Is this an ambitious goal? Absolutely! But you have entrusted us with an incredibly important mission that will impact all of us in Chattanooga and around the globe. Therefore, we believe that the citizens of Chattanooga deserve nothing less than our best effort. We are honored to be a part of the committee and dedicate ourselves to excellence as we complete this task.

Gene Hyde, Chair
Chattanooga Green Committee

NOTE TO THE PUBLIC

As you read this Interim Report, keep in mind that it is just that - an INTERIM report. The work is far from complete. The **Chattanooga Green Committee** will submit a final **Climate Action Plan** to Mayor Littlefield in December 2008. This interim document indicates a general direction and is still open to further research and discussion.

The “objectives” and “potential actions” listed in this report are only recommendations at this time. Decisions regarding which recommendations to implement will be made by elected officials following completion of the **Climate Action Plan**. Words like “require” versus “promote” indicate the Committee’s overall sense of urgency or importance on a particular issue, but may change as further information is considered.

Comments on this report should be directed to www.chattanooga.gov/chattanoogagreen.

U.S. MAYORS CLIMATE PROTECTION AGREEMENT

“We are taking actions to reduce climate pollution in our communities, while at the same time improving quality of life and economic vitality for our residents and businesses. Our message – that we, as cities and as a nation, can and should cut our contributions to global warming pollution – is being heard around the country and the world.”

Seattle Mayor Greg Nickels, 2005

Scientific evidence and consensus continues to strengthen the idea that climate disruption is an urgent threat to the environmental and economic health of our communities. (*Scientific Assessment of the Effects of Global Change on the United States, May 2008.*) Many cities, in this country and abroad, already have strong local policies and programs in place to reduce human-caused greenhouse gases (GHGs), but more action is needed at the local, state, and federal levels to meet the challenge. On February 16, 2005, the Kyoto Protocol - the international legislation to address global climate change - entered into force for the 181 countries that have ratified it to date. The U.S. did not ratify the Kyoto Protocol.

On that day, Seattle Mayor Greg Nickels launched a parallel initiative - the U.S. Mayors Climate Protection Agreement - to advance the goals of the Kyoto Protocol through leadership and action at the LOCAL level by American cities. With 85% of the world's population living in cities and metro areas, cities are in a unique position to confront many sources of greenhouse gas emissions and create truly effective and lasting solutions.

To date, 850 Mayors from the 50 U.S. states, the District of Columbia and Puerto Rico have signed the U.S. Mayors Climate Protection Agreement, representing a total population of 79,989,435 U.S. citizens.



Under the Agreement, participating cities commit to take the following actions. Mayor Littlefield signed this Agreement on behalf of the City of Chattanooga.

- A. We urge the federal government and state governments to enact policies and programs **to meet or beat the target of reducing global warming pollution levels to 7 percent below 1990 levels by 2012**, including efforts to: reduce the United States' dependence on fossil fuels and accelerate the development of clean, economical energy resources and fuel-efficient technologies such as **conservation**, methane recovery for energy generation, waste to energy, wind and solar energy, fuel cells, efficient motor vehicles, and biofuels;
- B. We urge the U.S. Congress to pass bipartisan greenhouse gas reduction legislation that includes 1) **clear timetables** and **emissions limits** and 2) a flexible, **market-based** system of tradable allowances among emitting industries; and
- C. We will strive to meet or exceed Kyoto Protocol targets for reducing global warming pollution **by taking actions in our own operations and communities such as:**
 1. **Inventory** global warming emissions in city operations and in the community, set **reduction targets** and create an **action plan**;
 2. Adopt and enforce **land use policies** that reduce sprawl, preserve open space, and create compact, walkable urban communities;
 3. Promote **transportation options** such as bicycle trails, commute trip reduction programs, incentives for car pooling and public transit;
 4. Increase the use of clean, **alternative energy** by, for example, investing in "green tags," advocating for the development of renewable energy resources, recovering landfill methane for energy production, and supporting the use of waste to energy technology;

5. Make **energy efficiency** a priority through building code improvements, retrofitting city facilities with energy efficient lighting and urging employees to conserve energy and save money;
6. Purchase only **Energy Star** equipment and appliances for City use;
7. Practice and promote **sustainable building practices** using the U.S. Green Building Council's LEED program or a similar system;
8. Increase the average **fuel efficiency** of municipal fleet vehicles; reduce the number of vehicles; launch an employee education program including anti-idling messages; convert diesel vehicles to biodiesel;
9. Evaluate opportunities to increase pump efficiency in **water and wastewater** systems; recover wastewater treatment methane for energy production;
10. Increase **recycling** rates in City operations and in the community;
11. Maintain healthy **urban forests**; promote tree planting to increase shading and to absorb CO₂; and
12. Help **educate** the public, schools, other jurisdictions, professional associations, business and industry about reducing global warming pollution.

CHATTANOOGA GREEN COMMITTEE

In November 2007, Mayor Ron Littlefield appointed the following 12 people to serve on the **Chattanooga Green Committee** and charged them with advising him on steps the City government, local business and industry, and individual citizens can take to make Chattanooga a more green and sustainable community.

Gene Hyde - Chair

City of Chattanooga, Division of Urban Forestry

Jim Frierson - Vice Chair

Advanced Transportation Technology Institute

Heather Adcox

US Green Building Council
(Elemi Architects)

Jeannine Alday

Hamilton County Government

Bob Colby

Chattanooga-Hamilton County
Air Pollution Control Bureau

June Coppinger

Chattanooga Tree Commission
(Keller Williams Realty)

Teresa Groves

Chattanooga Home Builders Association

Anj McClain

Green/Spaces

Councilwoman Sally Robinson

Chattanooga City Council

Roger Tudor

Associated General Contractors of East Tennessee

John Tucker

University of Tennessee at Chattanooga
Department of Biological and Environmental Sciences

David Wade

Electric Power Board

STAFF - The Chattanooga-Hamilton County Regional Planning Agency and the City's Urban Forester provide staff assistance to this Committee. In addition, two UTC graduate students – Sarah Rankin and Brad McAllister - were hired and assigned to work with the Committee during 2008. The **Chattanooga Green** office is currently housed in the:

Planning & Design Studio
 Development Resource Center
 1250 Market Street, Suite 3010
 Chattanooga, TN 37402

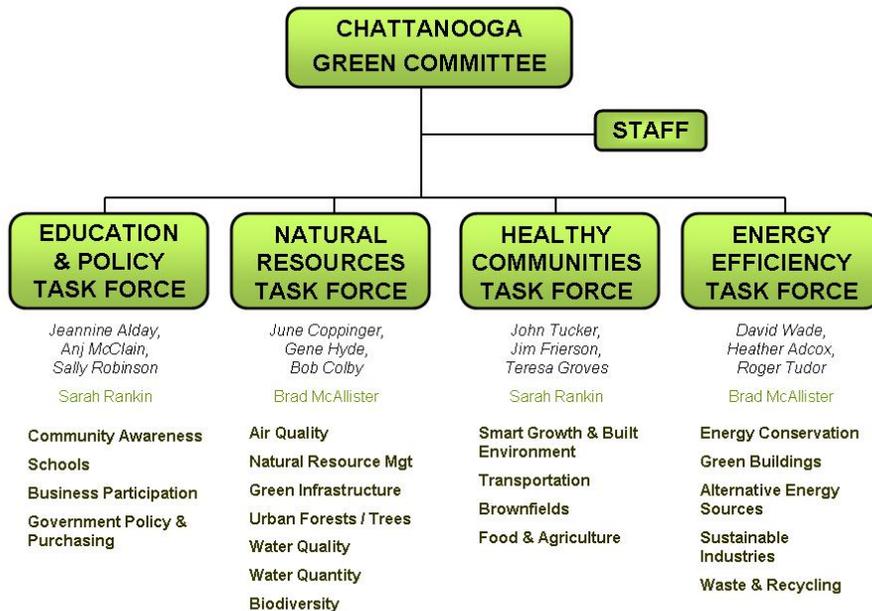
Inquiries and comments about this Interim Report and other **Chattanooga Green** activities can be directed to www.chattanooga.gov/chattanoogagreen.

TASK FORCES

To address the many facets of climate change, the **Chattanooga Green Committee** divided themselves into four Task Forces:

1. Natural Resources
2. Healthy Communities
3. Energy Efficiency
4. Education & Policy

Each Committee member serves on a Task Force and each Task Force is charged with researching and crafting recommendations on a number of more specific topics as shown in the organizational chart below.



SUBJECT MATTER EXPERTS

Realizing the need to gather reliable information about greenhouse gas emissions and potential solutions, the **Chattanooga Green Committee** has enlisted the help of several "Subject Matter Experts (SMEs)," as they have come to be called. These experts, most of whom are located in the Chattanooga area, have knowledge and experience in various "green" technologies, business and industry, academics, as well as existing government programs. As the Committee continues to refine their recommendations, they will no doubt call on many more Subject Matter Experts. In fact, new SMEs are added to the list every week. Both the Committee and the City staff continue to look for people who are knowledgeable in these fields and have experience with potential solutions.

While we like to be the first in new initiatives, we don't always have to reinvent the wheel. Cities across the U.S., and around the globe, are facing many of the same challenges. While each region has its own unique set of circumstances, we can certainly learn from each other and tailor ideas from other cities to meet our own needs.

VOLUNTEERS

Each Task Force is also considering ways to involve more citizens in this process. During the April 24 Public Input meeting, over 220 people volunteered to help with the **Chattanooga Green** initiative. In addition to providing feedback on this Interim Report, other ideas for volunteer activities that have surfaced so far include establishing a Speakers Bureau, training volunteers to conduct basic home energy audits, and volunteering at Chattanooga's first Alternative Fuel Vehicle (AFV) Odyssey in October. The list is potentially endless and the Committee is continuing to solicit ideas for more community involvement.

CHATTANOOGA'S CARBON FOOTPRINT

Carbon Footprint – the sum of all greenhouse gases produced through human activities, measured in units of carbon dioxide.

ICLEI – Local Governments for Sustainability

In 2006 the City of Chattanooga joined ICLEI (International Council on Local Environmental Initiatives) – now called “ICLEI - Local Governments for Sustainability.” ICLEI is a membership organization that provides tools and support to local governments striving to set and achieve their local climate protection and sustainability goals. Currently there are over 1000 local governments worldwide who are members, including 400 in the United States. ICLEI members include small rural towns, mid-sized cities and major metropolitan areas. Representation stretches from the Atlantic coast to the Pacific and includes 48 U.S. states. Tennessee members include Gatlinburg, Knoxville, Signal Mountain and Chattanooga.

To its members ICLEI supplies expertise, direct, on-call support, networking and innovative climate protection and sustainability tools. ICLEI is headquartered in Oakland, California and has five regional offices in Boston, Seattle, Denver, Houston, and Chicago. Later in 2008 a new regional office will open in Atlanta to help support the growing number of members in the Southeast.

ICLEI has developed a 5-milestone process that serves as a roadmap for cities developing their climate protection and sustainability programs. The 5 milestones are:

- Milestone 1: Conduct a Greenhouse Gas Emissions Analysis**
- Milestone 2: Establish a Reduction Target**
- Milestone 3: Develop a Climate Action Plan**
- Milestone 4: Implement the Climate Action Plan**
- Milestone 5: Monitor Progress and Report Results**

Chattanooga has completed Milestone 1 and the **Chattanooga Green Committee** is currently working on Milestones 2 and 3. For Milestone 2, communities may adopt the Climate Protection Agreement goal of reducing greenhouse gas emissions 7% below 1990 levels by 2012 or they may set their own target.

Developing a **Climate Action Plan** (Milestone 3) requires the adoption of a viable set of steps for achieving a municipality's greenhouse gas reduction targets. It serves as a roadmap of policies and actions that can be implemented and monitored. This Interim Report serves as a first draft of Chattanooga's **Climate Action Plan**.

Among ICLEI's most valuable resources is the Clean Air and Climate Protection software (CACP). This city-wide carbon auditing software is the accepted protocol for cities

inventorying and reporting their carbon footprint. In 2007, Chattanooga completed an analysis for 1990 and 2006, and projected 2012 emissions. Further calculations projected 2020 and 2050 emissions.

While the CACP software is the widely accepted method of carbon emissions inventory and reporting in the United States, the software results are not pinpoint accurate. Carbon tracking and monitoring is new to science and just burgeoning in the urban environment. Because some of the data is not available for every year, certain assumptions must be made. It is important to note that the outputs of the CACP software are relative estimates of Chattanooga's carbon footprint. These numbers should be used to project future carbon emissions, estimate the potential benefits of specific actions and policies and monitor progress over time. The CACP data can be used as a relative measure that compares Chattanooga's carbon footprint to national and regional averages, however, the data should not be used to directly compare the overall sustainability of multiple cities.

Carbon Sequestration – the storage of atmospheric carbon by trees, plants, and other materials; one of the most promising ways of reducing the buildup of greenhouse gases in the atmosphere.

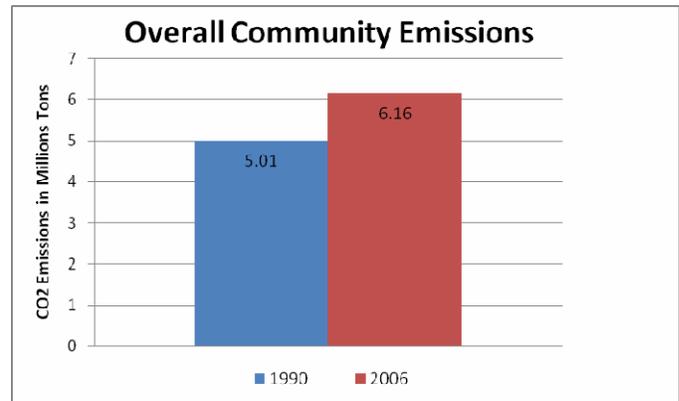
ICLEI is updating the current version of the CACP software and plans to release a web based version later in 2008. Improvements, such as the ability to credit the carbon sequestration abilities of the urban forest, will be included in the upcoming version of the program. These updates will allow for a more accurate analysis of Chattanooga's carbon footprint.

The majority of carbon emissions within the Chattanooga City limits can be attributed to electricity use and transportation.

The CACP software allows us to measure carbon emissions at two levels: 1) city-wide and 2) within the operations of City government. According to the analysis, the majority of carbon emissions within Chattanooga's city limits can be attributed to electricity use and transportation. Energy supplied by natural gas also plays a major part in Chattanooga's footprint. Other factors include landfill waste decomposition and specific industrial processes that directly release GHGs into the atmosphere.

COMMUNITY Greenhouse Gas Emissions

Greenhouse gas emissions are reported as Carbon Dioxide equivalents (CO₂eq); this includes CO₂ as well as 5 other GHGs: Methane, Nitrous oxide, Perfluorocarbons, Hydrofluorocarbons and Sulphur hexafluoride. In 1990, city-wide, or COMMUNITY greenhouse gas emissions totaled 5,009,579 tons and rose to 6,162,281 tons in 2006. This represents a 23% increase over the 16 year period. **To achieve a 7% reduction below 1990 levels, we would therefore need to lower our greenhouse gas emissions 30% below where we are today (23% + 7% = 30%).**

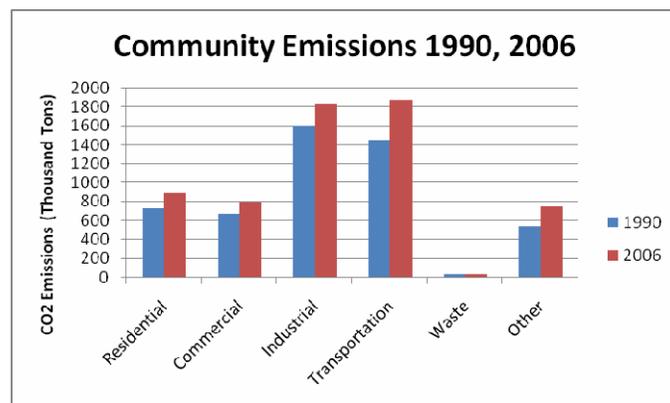


The transportation sector showed the greatest increase in CO₂eq emissions during that time. In 1990 the sector emitted 1,455,124 tons of CO₂eq; in 2006 it increased to 1,878,579 tons representing a 29% growth in CO₂eq emissions.

Over this same period, emissions from the residential sector grew 21.35%, commercial grew 18.08% and industrial grew 15.31%. Combined, the growth in these three sectors represents 520,689 tons of CO₂. Electricity use is responsible for the majority of the increase in these three sectors.

Emissions from waste grew 14.84%, however this represents only 3,582 tons of CO₂.

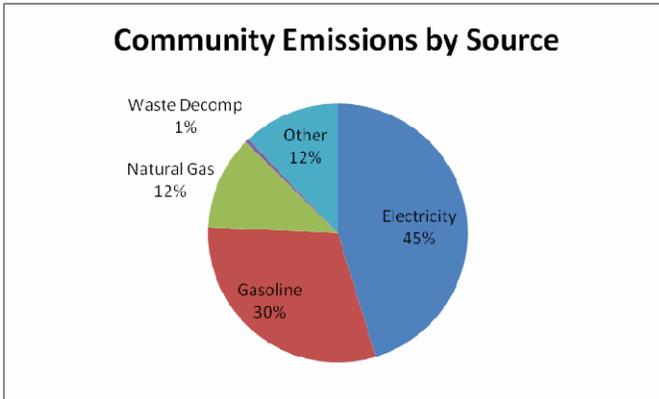
CO₂ emissions in the “Other” category increased 38.04%. This category accounts for other sources of atmospheric GHGs including specific industrial processes that emit directly and landfill methane flares. The “Other” category also includes credits for the carbon sequestration capabilities of the urban forest.



A major factor in the growth of greenhouse gas emissions in Chattanooga is overall population growth. From 1990 to 2006 the City of Chattanooga experienced welcomed population and economic growth, increasing the number of residential electric power customers from 125,719 to 141,836. While overall emissions increased, the average

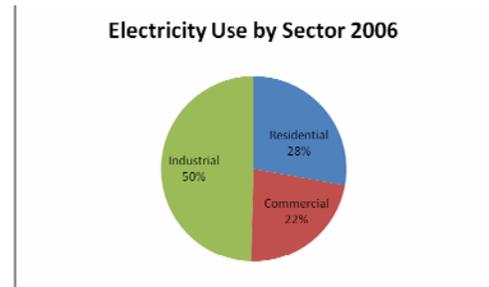
monthly use of each customer remained relatively constant, around 1300 Kilowatt hours (KWH).

COMMUNITY EMISSIONS BY SOURCE



Within the city limits, electricity use accounts for the highest amount of greenhouse gas emissions at 2,789,432 tons (45% of total emissions). The majority of this electricity is used to power buildings and the processes that go on within buildings. Some electrical energy also powers streetlights (see City Government Emissions).

Fifty percent of Chattanooga's electricity use is within the industrial sector, 28% in residential and 22% in commercial.

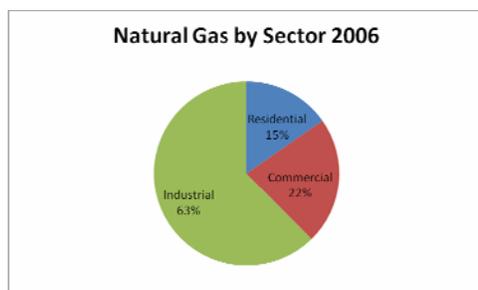


Since 1980, the number of miles Americans drive has grown three times faster than the U.S. population, and almost twice as fast as vehicle registrations.

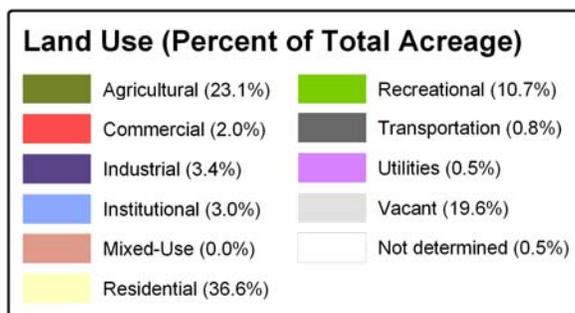
- Federal Highway Administration, *Highway Statistics 2005*.

By source, gasoline accounts for 30% of Chattanooga's greenhouse gas emissions. This was calculated using Vehicle Miles Traveled (VMT) and does not take into account gasoline used to power lawn equipment, construction equipment, boats and other recreational equipment. Also, the calculation does not take into account that some vehicles may be powered by diesel, biodiesel or another alternative fuel. Further research is necessary to determine the fuel-use attributes of the vehicles that use Chattanooga's roadways. **Vehicle Miles Traveled (VMT) - the number of miles that vehicles are driven.**

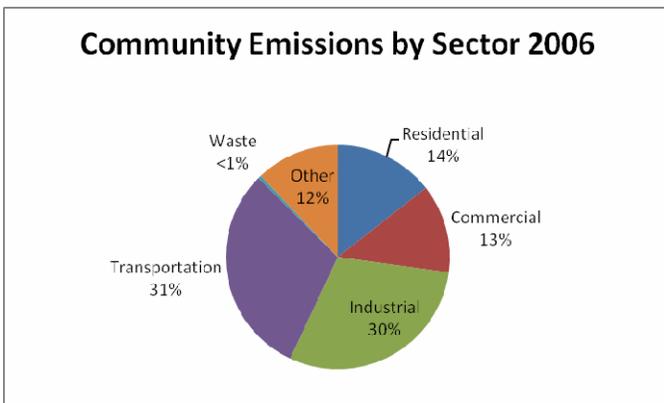
Natural gas accounts for 12% of Chattanooga’s total greenhouse gas emissions. Slightly under two-thirds of these emissions are generated by industry and slightly over one-third come from combined residential and commercial uses.



To better understand these figures, below is a listing of land use percentages for the county – Source **2030 Comprehensive Plan**, Hamilton County, RPA, 2005.



COMMUNITY EMISSIONS BY SECTOR



In 2006, the transportation sector was responsible for 31% of greenhouse emissions in Chattanooga. This assumes an average miles per gallon for all vehicles calculated by ICLEI. When the fleet structure is not known, ICLEI recommends using this assumption.

In greenhouse gas emissions, the industrial sector follows a close second

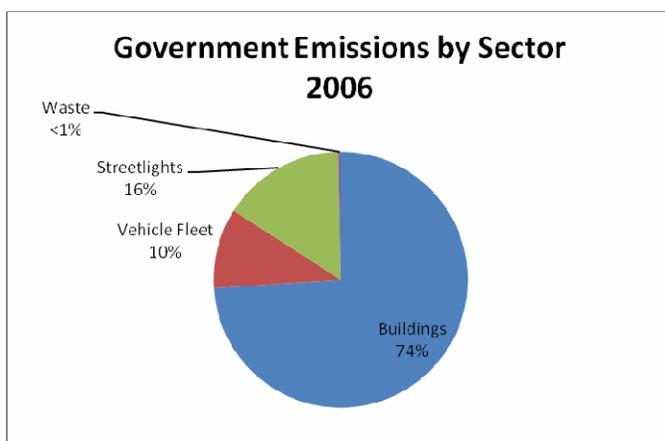
to the transportation sector. High electricity and gas use account for the emissions from the industrial sector.

The residential and commercial sectors combine to account for 27% of greenhouse gas emissions. The majority of this can be traced to electricity use; however some can be attributed to natural gas use.

Decomposition of landfill waste adds only half a percentage to the total greenhouse gas emissions. These emissions are from the release of CO₂ and methane when landfill materials breakdown through natural processes. For purposes of this analysis, estimations of waste share were made. Waste share is the relative percentage of materials disposed of at landfills. Elements that make up Chattanooga's community waste share are paper products (30%), food waste (10%), plant debris (8%), wood/textiles (10%) and miscellaneous other waste (42%).

The "Other" category accounts for sources of atmospheric carbon that cannot be attributed to the other specified sectors, such as landfill methane flares and specific industrial processes that emit directly. The "Other" category also includes credits for the carbon sequestration capabilities of the urban forest.

CITY GOVERNMENT Greenhouse Gas Emissions



ICLEI's CACP software also calculates CITY GOVERNMENT data as a subset of the community data. Not surprisingly, energy use in city buildings accounts for nearly three-quarters of the city government's carbon footprint. The majority of this can be attributed to inefficient energy use within city buildings.

Energy used to power streetlights accounts for 16% of the total

government emissions. Streetlight power use is included in the electricity source emissions. (see Government Emissions by Source graph).

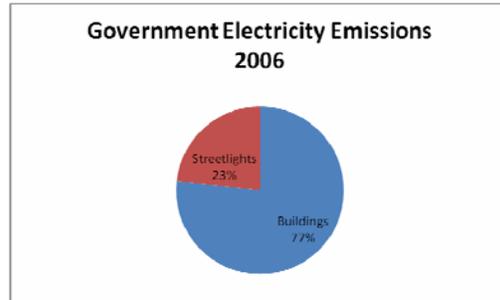
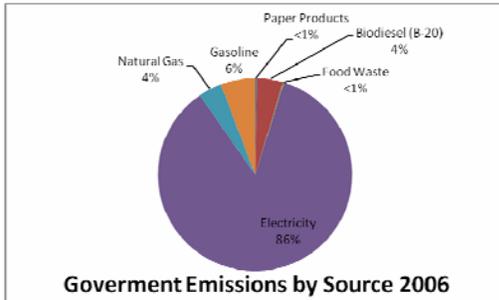
The city's vehicle fleet accounts for 10% of city government's carbon footprint.

GOVERNMENT EMISSIONS BY SOURCE

By source, a stunning 86% of City government greenhouse gas emissions comes from electricity use. This represents nearly 88,000 tons of CO₂.

Vehicular gasoline use accounts for 6% of total government emissions, representing 5,900 tons. Natural gas and biodiesel each account for 4% of the government’s carbon footprint. Food waste and paper-product decomposition contributes less than 1%.

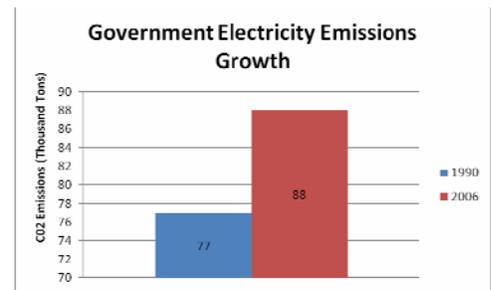
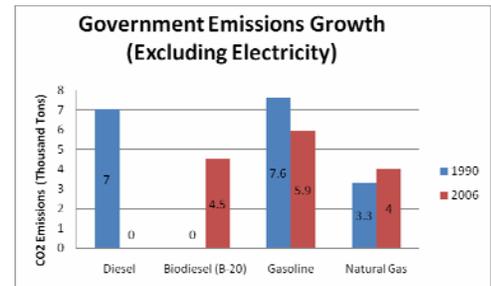
Of the total government emissions from electricity use, 77% is the result of building operations. The remaining 23% is from city operated streetlights.



GOVERNMENT EMISSIONS GROWTH

Overall greenhouse gas emissions from government operations grew from 94,800 tons in 1990 to 102,691 tons in 2006 (an 8.32% increase).

Electricity use by City government operations grew by 11,062 tons or 14.41%. Emissions from the use of natural gas in City government operations also increased from 1990- 2006. Natural gas increased 748 tons (22.98%). On the other hand **City government gasoline emissions decreased by 1,697 tons (a reduction of 22.32%)**. Several factors may have led to this decrease. Most notably is a decrease of 1,613,057 Vehicles Miles Traveled (VMT) from 1990 to 2006. The decrease in emissions also resulted from the purchase of hybrid for the city fleet. Since the city now uses a 20% biodiesel fuel in all diesel burning vehicles, traditional diesel was not entered into the program for 2006.



COMMUNITY FORECASTING & SETTING CARBON REDUCTION TARGETS

ICLEI’s CACP software allows users to project future greenhouse gas emissions based on expected growth within the city. The CACP software assumes 1% annual growth within all sectors and transportation. It is possible to modify the assumed 1% growth value; however this has not been done for the Chattanooga analysis.

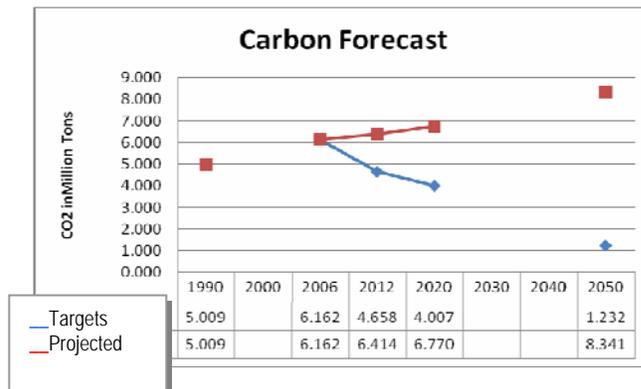
Different organizations, countries, and cities have established various benchmarks to suit their own political realities. Three of the most widely accepted benchmark years are as follows:

- 1) The Mayors Climate Protection Agreement sets a goal of a **7% reduction** in greenhouse gas emissions **from 1990 levels by 2012**. This agreement was signed by Mayor Ron Littlefield in 2006.
- 2) The EU Council has established a goal of **20% reduction** in greenhouse gas emissions **from 1990 levels by 2020**. This benchmark has been adopted by many municipalities in the United States who fear that meeting the MCPA goal by 2012 will be too difficult.
- 3) In a report released in 2007, the multi-governmental, International Panel on Climate Change (IPCC) warned that greenhouse gas emissions must be reduced by **80% from current levels by 2050**. According to the report, this global goal must be met to mitigate the worst effects of global climate change. Many municipalities and federal governments have adopted this reduction level as a long term goal.

Greenhouse gas emission forecasts were calculated for Chattanooga for these same three benchmark years: 2012, 2020 and 2050.

The CACP software calculated that Chattanooga’s carbon footprint will steadily grow based on current practices. Using the assumed rate described above, it is anticipated that Chattanooga will emit 6.414 million tons of CO_{2eq} in 2012, 6.770 million tons in 2020, and 8.341 million tons in 2050. This is in stark contrast to the reduction targets that have been adopted for the three target years.

As mentioned above, more information concerning the anticipated growth of the City of Chattanooga should be collected.



Reduction from Forecast

	B.A.U. (MTPA)	Target (MTPA)	Reduction to Reach Target (MTPA)	% Reduction from B.A.U
2012	6.414	4.658	1.756	27%
2020	6.770	4.007	2.763	41%
2050	8.341	1.232	7.109	85%

Note: MTPA = Million Tons per Annum

NEXT STEPS WITH ICLEI AND FUTURE TOOLS

Milestone 2 of ICLEI's 5 Milestone process is to establish a reduction target. While ICLEI does not require that one of the targets in the above section be used, many cities have adopted one or more of the described targets.

Realizing that there are limitations in the current version of the CACP software, ICLEI is currently in the process of releasing two more software options to complement the greenhouse gas auditing program. As an ICLEI member, Chattanooga will be able to take advantage of these new software tools.

Climate and Air Pollution Planning Assistant (CAPPA) - Currently in EPA review stages, ICLEI's forthcoming CAPPA software will assist local governments in developing a comprehensive Climate Action Plan (Milestone 3). The program will be both a best practices guide and a strategy development tool. Users will be able to supply inputs such as energy usage, budget specifics, anticipated growth, and reduction goal data. The program will generate recommended actions items and create a proposed plan. Included with each action item will be specifics on carbon and other greenhouse gas reduction abilities, initial costs, possible financial gain, payback period, ramp-up time, employee time commitment, and other factors important in making informed decisions. Users will be able to prioritize action items based on the needs of their specific community. The program will facilitate immediate feedback from ICLEI's climate experts through a web-based interface.

Project 2 Degrees - Project 2 Degrees will be the second generation of the current CACP software. Scheduled for release in the fourth quarter of 2008, this program will build on CACP's initial success through the use of more accurate assumption factors, updated fuel and electricity costs, user-friendly web-based interface, and automatic data-entry accuracy checker. The program will also track progress over time and generate more complete reports. Credits for the carbon sequestration capabilities of the urban forest and methane capture at landfills will also be generated. Microsoft is spearheading the development of the program which will be released to all members of the ICLEI network.

Star Community - In conjunction with the U.S. Green Building Council (USGBC), and with support from the EPA, ICLEI is developing a sustainable community designation rating. Similar to the Leadership in Energy and Environmental Design (LEED) system developed by USGBC, which rates individual buildings, the Star Community rating will give recognition to communities who meet specified criteria. ICLEI has asked Chattanooga to participate in the development of this rating.

OTHER STUDIES

Other national studies have attempted to chart the carbon footprint of the urban environment. In May 2008, the Brookings Institute released a study that calculated the carbon footprint of the 100 most populated metropolitan areas in the United States. The end results were reported as the calculated per capita carbon footprint of each city based

on highway transportation miles and residential energy use. Future Brookings reports will include commerce, manufacturing, air travel and waste.

The Brookings report ranked the 100 metropolitan statistical areas (MSA) by carbon footprint size. According to the study, the Chattanooga MSA had the 13th largest carbon footprint. Other metropolitan areas of note in Tennessee include Nashville (6th largest footprint), Knoxville (10th largest footprint) and Memphis (24th largest footprint).

The Brookings study reported that from 2000-2005 the Chattanooga MSA per capita carbon footprint increased 47.78%. **The transportation portion increased 127.2% and the residential energy portion decreased 2.7%.** Overall, the average Chattanooga resident emitted 3.110 tons of CO_{2eq} per year. The difference between the numbers reported by Brookings and the CACP software reflects differences in data collection methods and the sectors included.

Summary of Differences between ICLEI CACP Analysis and Brookings Institute Study

	ICLEI CACP	BROOKINGS
Reported Results	Overall City Footprint	Per Capita Footprint
Reporting Area	Chattanooga City Limits	Chattanooga MSA
Conducting Agency	City of Chattanooga	Brookings Institute
Sectors Included	Total vehicle miles traveled, Residential electricity, Commercial electricity, Industrial electricity, Residential gas, Commercial gas, Industrial gas, Landfill decomposition, Specific industrial processes	Highway miles, Residential electricity
City Government Footprint Included	Yes	No
Comparative City Rankings	No	Yes
Estimates Future Emissions	Yes	No
Per Capita Footprint	No	Yes
Associated Years	1990, 2006, 2012,2020,2050 (forecasted)	2000, 2005
Gases Included	CO ₂ , CH ₄ , N ₂ O, PFCs, HFCs, SF ₆	CO ₂

ONGOING ACCOMPLISHMENTS

Chattanooga is not starting from scratch. A number of initiatives are already underway in this community that will help reduce our carbon footprint. The following list highlights some of them. While some may seem to be small steps, every bit helps. Cumulatively, these initiatives add up to a much larger whole and have the potential to permanently change the way we do business in Chattanooga.

Clean Air - Chattanooga has a history of being proactive to meet federal health-based air quality standards. A vehicle emission testing program, instituted to reduce pollutants going into the air, has resulted in reduced greenhouse gas emissions due to fuel-savings. A seasonal burning ban which prohibits burning between May 1 and October 1 has reduced greenhouse gas emissions through alternative methods of disposal for yard waste and debris. Reduced heavy-duty diesel truck speeds on limited access highways throughout Hamilton County has resulted in less fuel being burned and, thus, lowered greenhouse gas emissions.

Electric Shuttle - Since 1992, Chattanooga has employed battery-powered electric buses on its free downtown shuttle route, serving a million riders annually and operating on seven-minute intervals. With no diesel engine and zero tailpipe emissions, electric buses are by far the least carbon-consumptive mode of transportation available.

City Fleet - The City government has already taken some steps to reduce its greenhouse gas emissions including the purchase of 12 hybrid vehicles and over 300 flex-fuel vehicles. In addition, diesel burning vehicles in the city fleet now use a 20% biodiesel fuel.

Hamilton County School Buses - Hamilton County government has retrofitted 105 school buses with diesel oxidation catalysts.

UTC Environmental Fee - UTC students adopted a \$10 Green Fee as part of their college fees and tuition. The purpose of the Green Initiative is to help UTC save energy and become more environmentally conscious through initiatives such as recycling bins, occupancy sensors to turn off lights when classrooms are not in use, and the hiring of a Recycling Coordinator.

Green Roof in Renaissance Park - This 5,000 square foot, open-air pavilion was constructed to be environmentally unique and serves as the gateway to Renaissance Park. In addition to its green roof, the pavilion features energy efficient fluorescent lights that use 50-80% less energy than incandescent lights and waterless no-flush urinals in the restrooms. A "green roof" is a roof that is partially or completely covered with vegetation and soil, planted over a waterproofing membrane. Benefits include stormwater management, reduced energy costs, and reduction of the urban heat island effect common in most cities. Green roofs also extend roof life and provide effective sound insulation. A handicap accessible demonstration featuring the plants used on the green roof is provided on site where everyone can see the materials used. A collaborative effort between the

Tennessee Department of Environment and Conservation, Chattanooga Parks and Recreation and the Tennessee Department of Agriculture, the pavilion serves as gathering place to educate visitors about Renaissance Park and Chattanooga's sustainability initiatives.

Living Wall - The City is using Filtrex "socks" to control erosion and renew vegetation on the steep slope at the foot of the Walnut Street Bridge. Mesh tubes are filled with organic compost consisting of yard waste diverted from the City's landfill, and are then staked to the ground. Because growing vegetation sequesters carbon, this erosion control method also reduces our carbon footprint. Furthermore, diverting the yard waste from the landfill acts to reduce the amount of methane emissions, a potent greenhouse gas.

15% Tree Canopy Required in Downtown Zoning - In urban areas with an abundance of paved surfaces, the heat island effect typically raises temperatures 8-10 degrees higher than surrounding areas. Trees are an outstanding remedy that improve air quality and supply shade, which in turn lowers temperatures, and reduces air-conditioning related energy use. Studies by American Forest and other conservation organizations indicate a minimum of 15% tree canopy cover is required in urban areas to provide this benefit. Currently, downtown Chattanooga only has an 8% canopy cover. Zoning regulations for the downtown now require one tree for every 5 parking spaces in new parking lots, which equates to a 15% canopy cover.

"Take Root" - Take Root is a program to further increase the tree canopy in the downtown area by planting 1,500 trees through local donations. Current research by Chattanooga's Division of Urban Forestry reveals that 1,500 trees will reduce carbon dioxide emissions by approximately 141,000 pounds in ten years and by 250,000 pounds in twenty years.

Anti-idling Policy for City Vehicles - In May 2008, City officials asked employees driving City vehicles (with some exceptions in the Fire and Police Departments) to cut back on fuel usage by turning off vehicles if they idle more than 30 seconds. Turning off and restarting a vehicle uses about the same amount of gas as idling for 10 seconds (www.dailyfueleconomytip.com). The City will also review requests for new vehicle purchases by comparing expected gas mileage of the old and new vehicle being requested. By policy, City vehicles are replaced every five years, which has proven to save gasoline since new cars are more efficient. New hybrids will be available in August 2008, and three have been ordered for City parking enforcement employees. Hamilton County Emergency Medical Services is also trying to cut fuel usage for non-critical situations. Employees are asked to leave their station only once for a meal in a 24-hour period, possibly pick up food while returning from a call, and training and supplies are being delivered to the station instead of having employees travel to them. (Chattanooga Times Free Press, Jacqueline Koch, June 23, 2008).

Methane Collection at the Landfills - Methane is collected and used to generate 2 megawatts of electricity at the Summit Landfill.

Traffic Signals Converted from Incandescent Bulbs to LED - After installation, the electricity bills dropped from \$12,000 per month to approximately \$5,000 per month.

Jefferson Heights - Jefferson Heights is an in-town neighborhood with restaurants, shops and one of the city's newest elementary schools nearby. More than 20 eco-friendly, EarthCraft certified houses (with more planned) makes it one of the greenest communities in the city with prices ranging from \$130,000-\$200,000. Jefferson Heights is also included in the national LEED-ND (Neighborhood Development) pilot program aimed at expanding the rating system for individual buildings to entire neighborhoods.

Green Buildings - Two North Shore and the River Street Architecture office on Cherry Street are Chattanooga's first projects to register for LEED certification. In addition, the new Blue Cross Blue Shield campus is striving for LEED certification. These buildings incorporate sustainable practices and materials such as natural daylighting, water conservation, paint with no volatile organic compounds (VOCs), formaldehyde-free adhesives, drought resistant landscaping, recycling of construction materials and even the reuse of construction materials from nearby sites. For the Two North Shore project, the estimated additional cost for these "green" initiatives was only 2% and was absorbed within the project.

Green/Spaces - Green/Spaces is a two-part initiative: 1) incentive funding for 20 commercial development projects to be built and certified green in 3 years and, 2) a resource center showcasing the best eco-friendly building materials and methods. The new Green/Spaces resource center will be located on Main Street and their website is www.greenspaceschattanooga.com.

Green Power Switch - Green Power is an environmentally friendly electric power option from EPB and TVA supporting the use of renewable energy resources like wind, solar power and methane gas (resources that create less waste and less pollution, and are located in the Tennessee Valley). Residential customers may purchase Green Power at a rate of just \$4 per 150 kilowatt-hour block. Each block amounts to approximately 12% of the typical household's energy usage. The generated Green Power is then added to TVA's total power mix, which is shared by customers in the Tennessee Valley. Adding \$8 (2 150 kilowatt-hour blocks) to a monthly residential or business bill provides the same environmental benefit as recycling 240 pounds of aluminum, recycling 880 pounds of newspaper or planting an acre of trees. For as little as about 5% of its monthly electric power bill, a business can support the use of renewable energy resources. Contact EPB at 423-648-1372. Source: www.epb.net

ATTI - Hydrogen Fuel Cells Research - In June, 2006, TVA gave its 52 acre electric vehicle test track to the University of Tennessee at Chattanooga (UTC) and the Advanced Transportation Technology Institute (ATTI), a nonprofit organization that advances clean transportation technology. At UTC, engineers, professors and students research and develop alternative-fuel vehicles including electric, hybrid and clean fuel vehicles like

those powered by the hydrogen fuel cell. Hydrogen is the simplest and most abundant element in the universe. As fossil fuel pollutes the air and costs rise (along with dependency on foreign oil), a fuel-cell project and the newly acquired test track will assist in the quest for alternative energy strategies and have a positive impact on these issues. All levels of government collaborated with the UT SimCenter at Chattanooga to bring Ion America of Silicon Valley's fuel cell to the UTC campus for testing. Solid-oxide fuel-cells will be able to make electricity to heat and cool homes without transmission lines, and operate automobiles. A limited-liability company (EVamerica) has been created to design, develop, manufacture and assemble medium to heavy-duty electric, hybrid-electric and fuel-cell vehicles and has a strong working relationship with ATTI. Source: <http://pr.utk.edu> and www.nrel.gov/hydrogen.

Electric Power Board Building - The EPB's new headquarters was built on a Brownfield site. All windows open to create air flow and allow for more natural light, and carpets and wallpaper are made of recycled materials. There are three air compressors per floor for more efficient heating and cooling and fans are in place to evacuate smoke in case of fire in the large atrium. A recycling program for paper, plastic and aluminum is in place.

Moccasin Bend Wastewater Treatment Plant - The Moccasin Bend Wastewater Treatment plant is by far the city's largest recycling operation, measured in tonnage. In 2007, it diverted 93,205 wet tons of processed biosolids to land application on 5,612 acres of productive farms in Tennessee and Alabama. This established recycling program saves local landfill space worth an estimated \$2.84 million annually (over one year of capacity). The use of this safe high-nitrogen biosolid material replaces synthetic fertilizer, which is typically produced using natural gas as a primary energy source. At the current rate of application, the Moccasin Bend program avoids the production of 59,642,000 cu. ft of natural gas, thereby making a significant reduction in CO2 emissions into the atmosphere. (That carbon quantity will be calculated in our final report).

PUBLIC INPUT

Chattanooga is known across the U.S. for its public visioning processes, which began with “Vision 2000” in 1984. Since then, we have repeatedly proven that when a community comes together to solve problems, bold results can be expected. Drawing on our previous successes, a public visioning process was held on April 24, 2008, to coincide with the week of Earth Day. The event, “Chattanooga Green,” drew approximately 500 people.



Exhibitors showcasing “green” products and programs participated. They included the Air Pollution Control Bureau, AquaShield, Inc., Advanced Transportation Technology Institute, Outdoor Chattanooga, CARTA, Crabtree Farms, Earthscapes, EPB, Green/Spaces, the US Green Building Council, the Chattanooga Nature Center, Normal Park School, Orange Grove, Recycle Right, Take Root, the Trust for Public Land, Master Gardeners and a community group promoting a petition for curbside recycling.

Attendees were entertained by the Battle Academy Elementary School choir, led by Elizabeth Brackin, singing *My Planet, Your Planet*.

The event welcomed Kim Lundgren, the U.S. Services Director for ICLEI USA. It was important for the **Chattanooga Green Committee** to share this process with ICLEI so that they will have a better understanding and respect, for what Chattanooga is striving to accomplish.

All attendees were presented with the facts of the US Mayors Climate Protection Agreement, and then asked to boldly answer the question: “What specific steps should we take to make Chattanooga a more green community?” Each table of 6 - 10 participants



shared ideas on ways to accomplish the “greening” of Chattanooga, and then voted for their group’s top three ideas.

The most prevalent topics revolved around the issues of recycling & waste, transportation and education, both community-wide and school-based. Other popular topics included green buildings and greener building codes, government policies, including green purchasing

programs, energy conservation and food and agriculture. The complete list of topics and the most popular suggestions can be found in the Appendix or at www.chattanooga.gov/chattanoogagreen.

SURVEY

A voluntary paper survey was distributed to the attendees at the **Chattanooga Green** visioning meeting, resulting in 299 responses. Of the 52% who considered themselves well informed on climate change and other environmental issues, 68% of them had not yet completed an audit of their personal carbon footprint.

Although 98% of the respondents agreed that a good public transportation system is an essential element of an environmentally progressive city, only 5% said they use public transit to get to work or school; 82% of the respondents commute 7 or more miles one-way. Although the circumstances that influence this choice cannot be determined from this survey, it is apparent from those surveyed that 72% would support a tax in order to get improved transit to more areas and on a more frequent schedule.

In the building sector, respondents felt strongly that they would seek out an energy efficient house when buying a new home (94%), and 93% further felt that a home energy rating system (similar to miles per gallon for automobiles) would be beneficial in better understanding the energy efficiency of individual houses.

When organizing the **Chattanooga Green** visioning event, it was anticipated that the turnout would reflect those in the community that are the 'choir,' so to speak, for the sustainable-community movement. It is surprising to note that of the 299 survey respondents, only 29% regularly participated in recycling at home and only 27% had replaced incandescent bulbs with compact fluorescent bulbs.

The complete survey results can be found in the Appendix or at www.Chattanooga.gov/ChattanoogaGreen.

**GOAL : Reduce global warming pollution levels to 7 percent below
1990 levels by 2012.**

- U.S. Conference of Mayors, Climate Protection Agreement

CHATTANOOGA'S CLIMATE ACTION PLAN

Recommendations

OBJECTIVES AND POTENTIAL ACTIONS

While the U.S. Mayors Climate Protection Agreement lays out this overarching goal and a number of related challenges designed to accomplish that goal, each city must develop its own carbon reduction targets, a timetable for achieving those targets, and a plan for how to get there.



Based on 1) the public input, 2) the carbon footprint data gathered by staff using the CACP software, and 3) research and conversations by the **Chattanooga Green Committee**, the four Task Forces recommend the following general OBJECTIVES and more specific POTENTIAL ACTIONS. As mentioned before, much work remains to be done. This is just a beginning.

Costs, indicators and responsibilities are not contained in this initial set of OBJECTIVES and POTENTIAL ACTIONS. This Interim Report is meant to indicate a general direction, prompt feedback from elected officials and the community as a whole, and point to where more research and consideration is needed.

The ACTIONS recommended may potentially be carried out in multiple ways by local government, private businesses, or individual citizens. Each one of us can help by instituting basic conservation measures in our everyday lives, but the community as a whole will need to take deliberate, proactive steps to meet our goals and reduce our collective carbon footprint.

CRITICAL ISSUES

Chattanooga has a well-deserved reputation for taking innovative steps to become a sustainable city. However, there are a number of currently incomplete environmental projects that serve to diminish the credibility of this reputation. The **Chattanooga Green Committee** believes completion of these projects would greatly improve the likelihood of successful acceptance and implementation of the initiatives recommended in this report.

The Chattanooga Green Committee has therefore identified some issues that are believed to warrant immediate action, possibly even prior to the completion of the final Climate Action Plan in December.

OBJECTIVE: Establish a permanent City commitment to sustainability and energy conservation.

Potential Action: Hire a Sustainability Coordinator to coordinate education efforts and the implementation of accepted recommendations. Locate the Sustainability office in the Development Resource Center, or other public venue, for visibility and exposure.

Potential Action: Designate the **Chattanooga Green Committee** as a permanent board to oversee the activities of the Sustainability Coordinator.

OBJECTIVE: Honestly address Chattanooga's incomplete environmental projects, identified as "Critical Issues" by the Green Committee.

Potential Action: Address unresolved issues such as:

- The stormwater detention pond at the Development Resource Center
- Safe compact fluorescent lightbulb disposal
- The community's request for stepped-up curbside recycling
- The non-functioning water tower at Market and 17th Streets

Rationale:

If unaddressed and left in their current state, any of these projects can call into question the City's commitment and sincerity regarding implementation of the new initiatives proposed in this interim report.

OBJECTIVE: Retain and expand the downtown electric shuttle service.

OBJECTIVE: Support CARTA's funding requirements for operations through diverse funding from public and private sources.

Rationale:

The **Chattanooga Green Committee** received a loud and clear message from the public visioning session. This was a popular topic with ample illustrations for what the

community is already proud of, and also allows for expansion when it makes sense. The most viable areas for expansion include more of the North Shore, areas of the South Side, and a connecting service between UTC and the MLK corridor.

This is a clear example of leadership dating back to 1992. Chattanooga was ahead of the curve then, and it is important for us to stay ahead of the curve now. The technology itself is completely mature, but the envelope needs to be pushed of *where* we provide service.

Electricity displaces the burning of diesel fuel, resulting in greenhouse gas reduction and air quality benefits.

OBJECTIVE: Expand the use of alternative modes of transportation.

Potential Action: Make a multiyear commitment to match the private foundation support of the Bicycle Coordinator position in the Outdoor Chattanooga office with City funds.

Rationale:

It is already an established success story with benefits to visitors and residents alike.

It is a tangible example of a mode of alternative transportation with significant health benefits.

The public expressed its support of alternative transportation in the public visioning sessions.

This position will take advantage of the existing and planned bicycle routes and infrastructure, which are part of the existing Bicycle Master Plan.

“When we try to pick out anything by itself, we find it hitched to
everything else in the universe.”

John Muir

NATURAL RESOURCES TASK FORCE

AIR QUALITY

Chattanooga has a long history of dealing with air quality issues due to the unique topography of the area as well as being an industrial and transportation hub. Named by the U.S. Department of Health, Education, and Welfare to be the most polluted metropolitan area in the country from 1961 to 1965, Chattanooga embarked upon a journey to improve air quality – a journey that continues as federal air quality standards are tightened on a regular basis. Chattanooga succeeded in meeting total suspended particle standards in the mid 1980's. It became one of the first areas in the eastern United States to achieve the 1-hour ozone standard and be designated as “in attainment” in December 1989. Faced



more recently with the prospect of being designated “non-attainment” for the first 8-hour ozone standard adopted by U.S. EPA, Chattanooga opted to enter into a voluntary Early Action Compact with EPA to achieve the standard quicker than it would have under the prescribed federal timeline. This compact allowed Chattanooga to continue pursuing economic development opportunities and achieving cleaner air sooner for its citizens.

Over the last decade, many programs such as vehicle emissions testing, gasoline vapor recovery from service stations, a seasonal open burning ban, and lowering truck speed limits have been implemented to improve air quality. The local Air Pollution Control Bureau monitors pollutants and allergens and works with local industries to ensure compliance with regulatory requirements. We have reached attainment under current EPA requirements for the 8-hour ozone standard adopted in 1997. However, EPA adopted a tighter 75 parts per billion standard which we do not meet currently. Any local or regional reductions in greenhouse gas emissions will help in meeting these more restrictive ozone standards since fuel combustion is the largest contributor to both ozone and fine particle formation. Activities affecting air quality come from sources that are both local and from the greater region (coal fired power plants). Local contributions include vehicle emissions (both on-road and off-road), construction and excavating equipment, and energy inefficiency in buildings. Additionally, the heat gain problems presented by our region's topography and its inversion aspects, along with an over

abundance of impervious and paved surfaces, all contribute to the air quality challenges faced by our community.

Chattanooga is NOT in attainment for PM2.5 under the [EPA's annual](#) standard. We ARE in attainment for PM2.5 under the [State's daily](#) standard. We hope by the end of 2008, to have EPA reclassify us as being in attainment for PM2.5. Chattanooga IS in attainment for ozone.

- Bob Colby, Air Pollution Control Bureau

OBJECTIVE: Reduce vehicle miles traveled in order to reduce pollutants being emitted into the atmosphere.

Potential Action: Actively promote the use of alternative forms of transportation, public transportation, car and van pooling, flexible work scheduling by employers where possible, alternative fuels, and alternative-fueled vehicles.

OBJECTIVE: In the short term, achieve and stay in attainment with EPA PM2.5 and Ozone standards; in the long term, strive to exceed those standards.

Potential Action: Address transportation and other primary contributors to overall air quality in the community.

Potential Action: Investigate a lawn mower exchange program to incentivize property owners to replace gasoline mowers with cleaner alternative mowers (electric or battery powered).

Potential Action: Continue to use industrial best management practices to reduce impacts and study new potential solutions.

Potential Action: Incorporate HOV lanes in future highway expansions.

BIODIVERSITY

The City includes a diverse community of biological resources that are often overlooked within the urban environment. Chattanooga is blessed with the Tennessee River, numerous creeks and streams, as well as a setting of mountains and ridges. The natural resources that originate with this area are rich in a biodiversity of species, flora and fauna. These special areas provide habitat for wildlife, such as the birds and insects that are crucial to many agricultural and landscape processes. Protection measures for native



ecosystems should strive to balance the built environment with nature. We should put forth solutions that make wiser use of water, soil and vegetation. Promoting Chattanooga as a tourism destination for outdoor activities is only possible if we protect these diverse biological resources.

OBJECTIVE: As development occurs, protect wildlife and native plants.

Potential Action: Fund an urban ecosystems analysis partnering with TVA, UTC, and the Chattanooga Area Landscape Professionals (CALP) extension office.

Potential Action: Include biodiversity assets in the existing pre-construction review of development plans.

Potential Action: Amend the Landscape Ordinance to promote the use of native plant species for landscaping.

Potential Action: Encourage local nurseries to stock and promote native species.

Potential Action: Develop incentives that encourage the use of bioretention and erosion control systems, preferably containing native species, instead of conventional solutions.

GREEN INFRASTRUCTURE

A critical element related to healthy living and a clean environment lies in the Green Infrastructure of the community. A good foundation for Green Infrastructure has been put in place by area land trusts and City programs that have built parks, conserved land and provided recreation over the last few decades. Our community has taken pride in large scale parks such as Coolidge Park and Greenway Farm. In order to utilize and integrate these spaces within the sustainability goals of the community, we must study access, connections, and corridors. Ideally, as we develop and build our community, we can connect to a network of green infrastructure that provides not only green cooling effects and carbon sequestration, but also provides corridors for wildlife movement and promotes walking or biking. A fractured system of isolated spaces does not serve wildlife, plants or human occupants efficiently. Green areas provide relief from the “unhealthy hazards” of city dwelling; parks enhance our lives, forested areas help to cool the city and our natural habitat provides opportunities for recreation.



OBJECTIVE: Expand the green network of open space, critical natural areas, parks, greenways and wildlife corridors throughout the City.

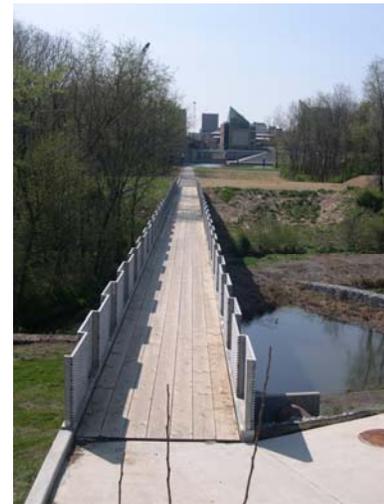
Potential Action: Develop a comprehensive *Greenprint Plan*, based on models from other successful programs, that identifies existing open space and opportunities for future acquisition and conservation of new lands.

Potential Action: Provide green infrastructure (parks, trailheads or other) within walking distance of homes and businesses.

Potential Action: Establish dedicated public funding to match efforts of private land trusts for the conservation, purchase, and maintenance of critical areas identified in the *Greenprint Plan*.

NATURAL RESOURCES MANAGEMENT

The natural resources of the Chattanooga area are precious and should be protected, conserved and used wisely. A sustainable community action plan that encourages smart growth and development, and includes funding resources, policies and staffing to implement programs, is needed as part of systems approach. Two landmark attributes of the Chattanooga area are our ridges and riparian areas. Programs should address stormwater, tree cover, hillsides and sensitive areas. These programs serve to offer protection and limited use for natural resource areas as a long term mission and are crucial to maintaining a healthy environment. We must promote the unique assets of our community as with regards to the natural setting.



OBJECTIVE: Maintain our ridges and hillsides as forested areas with limited development.

Potential Action: Analyze regulations addressing clear-cutting and erosion control for these areas to determine their effectiveness.

OBJECTIVE: Preserve the 100-year floodzone and riparian zones in their natural state to minimize flood damage and to provide critical habitat and natural buffers for filtering water pollutants. *(The Green Committee wants to get more input from TDEC and the City's Stormwater Management staff regarding this set of recommendations.)*



Potential Action: Adopt regulations to guide development in these areas.

Potential Action: Adopt an ordinance establishing a stream bank protection program (including natural buffers).

Potential Action: Establish Low Impact Development (LID) as the Best Management Practice to reduce runoff volume and flow velocity for stream channel and floodplain protection.

Potential Action: Require LID for all City-governed projects.

Potential Action: Require more stringent sedimentation control during construction activities near highly impaired streams.

URBAN FORESTRY

Tree plantings have a significant impact on reducing GHGs and cleaning our air. Increasing the tree canopy and forested areas of the community is an achievable goal. Many practices have been put into place including a working Tree Commission, a City urban forestry program and a well landscaped public realm. However, we have room to grow and should continue the greening of our community by utilizing both the private and public sectors in programs such as “Take Root” and urban forestry awards that acknowledge participation. Tree cover on hillsides, slopes and ridges, as well as rights of way, undeveloped property, planted riparian areas and natural buffers of vegetation add to the overall “greenprint” of our community. These green spaces cool the city and clean the air. Foliage and root systems provide beneficial filtration that protects water quality. Additional benefits are provided as the desirability and attractiveness of the community are enhanced as trees are planted.



OBJECTIVE: Strive to obtain the following tree canopy cover in Chattanooga, recommended by *American Forests* as a minimum for community health:

- 15 % in the Downtown
- 25% in urban residential areas
- 50% in suburban residential areas
- 40% overall

Potential Action: Expand the Take Root Initiative to new areas of the community to increase tree canopy.

Potential Action: Analyze the Landscape Ordinance to increase the number of trees in new developments, renovations and parking lots. (Incentives and number of trees to be determined.)

Potential Action: Amend the landscape ordinance to create incentives to retain existing trees rather than removing trees and replanting in new developments.

Potential Action: Re-establish a stock nursery program for urban forestry and development initiatives.

According to a STRATUM Analysis conducted in 2007, Chattanooga's street tree population removes 20,000 tons of CO₂ from the atmosphere per year.

WATER QUALITY

Human activities can result in diminished water quality. Rooftops, paved streets and parking lots lessen the natural ability of the land to absorb stormwater. Secondly, these built surfaces add pollution to waterways from oil and contaminant runoff during storm events. Improper construction activities can increase the amount of sediment in our rivers and streams. We need to pay more attention to the natural systems that cleanse and replenish this critical resource.

Reuse of stormwater for the purposes of irrigation and cleansing, as well as the recapture and reuse of rainwater, plainly make sense.

Disturbance of the floodplains and riparian areas can shift waters to cause flooding or unnatural erosion.

Many of the area's streams and creeks have been listed as impaired (TDEC's 303(d) list) and they are highly sensitive to any further misuse and pollution. Indicators that our watersheds need increased

protection are the warnings that area waters not come into contact with our skin, consumption of fish should be limited, and diminished recreational opportunities due to unhealthy or unsavory conditions. The City has made progress in identifying Best Management Practices that encourage better technologies for handling water quality concerns during development. We must make improvements to our water quality; the issue has surfaced repeatedly as a top priority.



OBJECTIVE: Improve the water quality of area rivers, lakes and streams.

Potential Action: Develop retrofitting plans to incorporate stormwater controls and Best Management Practices (BMPs) in places where insufficient or no stormwater controls exist, especially on new and existing City sites.

Potential Action: Continue the Sanitary Lateral Assistance Program (SLAP) to identify and eliminate sanitary waste discharges into the stormwater system.

Potential Action: Incentivize the use of pervious pavement in parking lots and appropriate driving areas.

Potential Action: Continue the Water Quality Education program and enhance the outreach program as it relates to the emerging water quality and green infrastructure issues.

Potential Action: Support development and adoption of the City of Chattanooga Watershed Plan.

Potential Action: Require natural buffers of sufficient width along streams to filter runoff.

Potential Action: Limit development in the 100-year floodzone.

WATER QUANTITY

A comprehensive approach must be considered with regard to the overall state of water in our region. Although Chattanooga is situated along the Tennessee River and we currently find adequate aquifers and recharge areas in place, our community must not have a false sense of abundance.

While presently living in relative luxury as concerns water use, we could easily find ourselves in a period of crisis if there are drastic weather changes or usage should shift. Unlike other southern cities that may find themselves “putting out fires” as they face water shortages and drought conditions, with planning and careful strategies, our community can get ahead of the curve before crisis arises. Adequate and well managed water quantity is essential to continued economic growth and our goal of a truly sustainable community. A detailed strategy is needed to guide future water use and as a response to out-of-state requests for transfers.



OBJECTIVE: Protect surface and ground water as a precious resource both for human consumption and private industry.

Potential Action: Adopt a long-term conservation plan and strategy to protect our water resources. Determine capacity and develop a plan that assures an adequate quantity of

water to meet future needs. Adopt new measures to maintain stream base flows and reduce flooding potentials.

Potential Action: Adopt measures to limit development in groundwater recharge areas.

Potential Action: Modify the building code to allow the use of graywater in toilets and landscape irrigation.

Potential Action: Adopt an education program to promote water conservation and efficiency in homes and businesses.

“ Deal with transportation and land use
or you may as well stop now.”

- Post Carbon Cities: Planning for Energy and Climate Uncertainty

HEALTHY COMMUNITIES TASK FORCE

SMART GROWTH / BUILT ENVIRONMENT

The average American is responsible for annual emissions of 24.5 metric tons of CO₂. Residents of New York City, however, are responsible for only 7.1 metric tons of CO₂ per year, less than one-third the national average. New York City is more energy efficient for two key reasons: a more efficient transportation system and more efficient (higher density) buildings.

Local governments are well-positioned to address climate change because they have influence over three key areas:

- -Building, construction and energy efficiency
- -Local land use and transportation patterns
- -Local economic activity

Vehicle Miles Traveled (VMT) - the number of miles that residential vehicles are driven.

Some of the biggest impacts on Vehicle Miles Traveled (VMT) can be achieved through changes to local land development policies. The key to making substantial greenhouse gas reductions and building healthy communities is to get all policies and practices, funding and spending, rules and regulations, and incentives pointing in the same direction, toward smart growth and away from sprawl.



Since 1980, the number of miles Americans drive has grown three
times faster than the U.S. population,
and almost twice as fast as vehicle registrations.

- Federal Highway Administration, Highway Statistics 2005.

From a climate perspective, the best development is highly accessible to existing urban centers, served by transit, and is dense, diverse, and well-designed. On the other hand, low-density, sprawling development keeps communities dependent on cars and undermines public expenditures on transit, pedestrian, and bicycle facilities.

OBJECTIVE: Reduce sprawl by increasing infill in already developed communities and where infrastructure is well established.

Potential Action: Consider updating the zoning and subdivision regulations and building codes to encourage projects that incorporate smart growth features such as mixed use, higher combined average densities, close proximity to retail, a balance of jobs and

housing, close proximity to transit services and schools, high intersection density, and the provision of green space, sidewalks, bicycle lanes and bicycle parking.

Potential Action: Educate the general public and political leaders about the benefits of infill development and higher housing densities.

Potential Action: Incentivize development projects that exceed compliance or achieve smart growth objectives mentioned above through incentives such as density bonuses, fee waivers, or streamlined permitting.

Potential Action: Promote workforce housing near jobs, such as allowing accessory apartments on single-family lots and density bonuses in return for affordable units.

Potential Action: Encourage developers of large projects to hold public meetings to engage citizens in the planning and design process early on.

Potential Action: Produce a handbook that illustrates housing typologies and commercial designs that are generally acceptable for infill development.

TRANSPORTATION

The Healthy Communities Task Force feels it is imperative to connect the realm of transportation to the household decision-making process, enabling citizens to make their transportation decisions based on their personal needs and the implications related to climate change. Rising gas prices are already causing individuals and businesses to look for transportation alternatives, but we need to facilitate those changes through City policies and programs.

To reach our climate protection goals, progress will be required in three areas of transportation: vehicle efficiency, fuel type, and vehicle miles traveled (VMT). Numerous studies show that the third element – VMT – may be the most important. Cities are in a unique position to have an impact on VMT through land use changes and prioritization of transportation funding through the Transportation Planning Organization (TPO).

OBJECTIVE: Decrease overall community Vehicle Miles Traveled (VMT).

Potential Action: Develop a communication network to coordinate carpooling, ridesharing and transit use.



Potential Action: Encourage employment solutions to cut down on VMT (4 day work weeks, telecommuting, other).

Potential Action: Develop a public relations and marketing campaign to teach gasoline savings.

OBJECTIVE: Support CARTA’s funding requirements for operations through diverse funding from public and private sources.

Potential Action: Prioritize transit lines to provide frequent, convenient scheduled transit service to areas that have the density to support it (12 units per acre or more) and to major destinations.

Potential Action: Incentivize private businesses to create employee programs and vouchers for the use of public transit, carpooling, and other alternatives to the private automobile.

OBJECTIVE: Promote and develop alternative transportation modes and infrastructure.

Potential Action: Expand the use of Intelligent Transportation Systems (ITS) for CARTA and other alternative transportation service providers.

Potential Action: Incentivize sidewalks and greenways as a condition of new developments.



Potential Action: Adopt pedestrian-friendly site and building design standards, including standards for setbacks, curb-cuts and parking, for commercial and institutional uses.

Potential Action: Incorporate recommendations from the adopted Bicycle Master Plan in all new street construction projects.

Potential Action: Complete the Greenway Plan and expand the number of greenway connections.

OBJECTIVE: Increase the use of biofuels among public and private fleets, recognizing that in the case of biofuel competition for food sources and natural forest cover, significant dislocations in supply, price and beneficial carbon sequestration and environmental benefits can occur.

OBJECTIVE: Encourage CARTA and the City of Chattanooga to use natural gas, electric-drive, hybrids, alternative fuel vehicles, and plug-in hybrids.

Potential Action: Urge the Electric Power Board (EPB), as the distributor of electricity, and TVA as the generator, to establish a marketing presence for the use of electricity as a transportation "fuel" that can supplement gasoline and diesel in both government fleets and private vehicles.

FOOD AND AGRICULTURE

It is recognized that through the diversification of food sources, benefits will be reaped in the spheres of producer/consumer economy, community, nutritional-health and the environment. It has been scientifically accepted that by *localizing* the food economy each average household could achieve around a 4-5% reduction of GHGs traditionally attributed to the transport of food (Weber and Matthews, 2008). This Task Force can foresee



that allowing communities access to the use of unused land through urban gardening initiatives provides both recreation and employment for both local growers and merchants, and also accommodates both urban wildlife and sanctuary opportunities. This can be effectively done in a way that permits for flexible use of the land in future land-use decisions.

OBJECTIVE: Increase public awareness of local and organic food sources.

Potential Action: Create a "local and organic foods" layer on the City GIS map. This is being developed by the Green Committee Staff.

OBJECTIVE: Strengthen local community growers and providers, including farmers markets, as an economic sector.

Potential Action: Establish a local Food Council that coordinates public outreach, determines best management practices for community farms, and identifies ideal opportunities for growers, purchasers and suppliers.

OBJECTIVE: Increase community farms, recognizing that an acreage per capita metric needs to be established, and accommodate low intensity farming in the city and surrounding residential areas.

Potential Action: Amend zoning and land use regulations if necessary to accommodate low intensity farming in the city and surrounding residential areas.

Potential Action: Locate and allocate available water resources for community gardening.

Potential Action: Designate areas and land for community gardening initiatives.

BROWNFIELDS

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. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land and both improves and protects the environment. - U.S. EPA, 2008

OBJECTIVE: Continue to encourage the reuse of previously developed land and buildings through concepts of Brownfield development.



Potential Action: Continue to apply for State and Federal funding to reuse Brownfields.

Potential Action: Reuse Brownfields for community gardens or nature parks, when it is safe to do so.

Potential Action: Review existing Brownfield data for sites with community garden or nature park potential.

Energy is the albatross of U.S. national security . . . There is not a full appreciation of our economic vulnerability.

- Sen. Richard G. Lugar (R-IN), March 2006

ENERGY EFFICIENCY TASK FORCE

ENERGY CONSERVATION

Electricity and natural gas use comprise 57% of Chattanooga's greenhouse gas emissions. There is no greater opportunity to reduce the City's use of energy, and thus its carbon footprint, than through energy conservation measures. Energy conservation initiatives represent a unique opportunity because these programs can be implemented with little or no changes in current structure. They are often less costly than other initiatives and materials necessary to carry out energy conservation measures are widely available. Conserving energy not only reduces greenhouse gas emissions but also represents an opportunity for significant financial gain. This has never been more apparent than in today's volatile energy market. With proper planning and foresight, minor changes in everyday activities can lower the city's carbon footprint AND lessen the strain on budgets that are becoming more restricted. Financial gains from energy savings can be used to fund other, more expensive, initiatives recommended in this document. When combined with these other measures, the cost effectiveness and carbon savings are compounded.



There is wide scale support for energy conservation within the community. Educated by higher home and business energy costs, citizens have become aware of the many environmental impacts related to energy use. Energy conservation was a reoccurring theme at the **Chattanooga Green** visioning event and related initiatives would likely be well supported within the community. It has been common practice for cities in the early stages of implementing a climate action plan to start with energy conservation measures.

OBJECTIVE: Reduce energy use by X% per capita, engaging water, gas, and electric utilities.

Potential Action: Create an incentive program to make existing buildings more energy efficient and less consumptive, beginning with energy audits.

Potential Action: Create a program to provide free or reduced-cost home energy efficiency upgrades for eligible families.

Potential Action: Document the City and County savings related to implementation of energy efficiency measures and explore using the savings to fund other Chattanooga Green initiatives.

OBJECTIVE: Increase public awareness about easy solutions to improve home energy efficiency.

RECYCLING & WASTE

Landfills generate substantial amounts of methane, a potent greenhouse gas. Landfills have been an issue of concern for several years regarding sustainable and feasible solutions to address the large amounts of waste they contain and the land they occupy. Reducing the waste being sent to area landfills will have a marked impact on the sustainability story of Chattanooga. Many other American cities have successfully reduced their landfill waste by diversifying and increasing their recyclable waste streams.



OBJECTIVE: Reduce the amount of waste going to landfills by X% per capita and improve recycling participation.

Potential Action: Create a program to incentivize residential and business recycling.

Potential Action: Support and promote local closed-loop recycling facilities and participants.

Potential Action: Establish recycling programs in all government buildings.

Potential Action: Create recycling drop-off centers at all grocery stores and other neighborhood sites.

Potential Action: Require recycling at major community events and government functions.

Potential Action: Eliminate free plastic bag distribution in stores.

Potential Action: Study the feasibility of charging for garbage pick-up by weight.

Potential Action: Consider the City purchase of a construction waste grinder that could be leased to private contractors.



Potential Action: Allocate funding for receptacles and pick-up service.

Potential Action: Hold a recycle competition, offering the winning organization exposure and formal recognition.

OBJECTIVE: Make recycling more economically feasible for the City.

Potential Action: Compare the costs and benefits of all alternatives including continued (or increased) curbside recycling, neighborhood drop-off centers, and private incentive programs for collection and processing.

Potential Action: Educate the community about the relative costs and benefits.

Potential Action: Explore the potential of carbon credit trading for the City.

SUSTAINABLE INDUSTRIES

Chattanooga has a proud and distinguished history as a community that embraces industry and supports industrial growth. The belief that profitable industries and environmentally benign practices are mutually exclusive is no longer valid in today's emerging economy. To be truly sustainable, an industry must balance the interests of the economy, the environment and the community. Government and industry must explore initiatives to support growth in ways that will conserve tomorrow's resources while building business. The **Chattanooga Green Committee** supports the following objectives and potential actions that will promote the ongoing development and recruitment of sustainable industries. Business and industry-wide education and outreach are central to the future of the city and the environment.



OBJECTIVE: Promote business sustainability through ongoing development and recruitment.

Potential Action: Create positive recognition for industries that achieve or surpass environmental standards.

Potential Action: Create incentives for existing Chattanooga industries to adopt sustainable practices.

Potential Action: Establish a clearinghouse utilizing existing organizations to provide information about economically successful and sustainable industry initiatives and accomplishments widely available to the media and community leaders.

Potential Action: Create a speakers forum about sustainable industries.

Potential Action: Encourage sustainable industrial operations to locate in the urban area and reuse Brownfield sites.

GREEN BUILDINGS

Many people spend the majority of their days indoors, seemingly disconnected from nature. Buildings account for a third of society's energy use, a third of our greenhouse gas emissions, and also use a vast amount of our precious resources. Green building practices have the ability to significantly reduce these numbers. In addition to being energy efficient, green buildings have many environmental, social and economic benefits. They are durable and, through the use of natural lighting and low volatile organic compound (VOC)-emitting elements, are healthier places to work and visit. Because green building standards require that materials be sourced regionally, they help to boost the local economy. Coupled with onsite energy generation, they can help support the energy needs of a rapidly growing city.



Thanks to many architects, builders and other advocates, green buildings have been at the forefront of the sustainability movement. Comprehensive rating systems and certifications, such as LEED, have set a baseline for the creation of green buildings. While



much of the focus has been on new construction, it is important to remember the large number of existing buildings that will need to be retrofitted with energy efficient measures. Popular opinion indicates that today's green buildings will be tomorrow's standards.

Like our neighbors in Atlanta, Chattanooga has begun to take the lead in sustainable building practices.

Privately funded Green/Spaces has set an unprecedented goal of 20 LEED certified building in the downtown area over the next three years. The organization is well on its way to accomplishing this goal and, through education, creating an atmosphere for future green growth. The **Chattanooga Green Committee** recommends that the City lead this transformation by implementing the following objectives and potential actions.

OBJECTIVE: Make sustainable building practices mainstream and increase the number of green buildings in Chattanooga.

Potential Action: Loosen restrictions on older buildings to allow for adaptive reuse.

Potential Action: Promote and enforce the existing energy code standards.

Potential Action: Sponsor training workshops for City code officials on the latest green building practices.

Potential Action: Offer incentives, such as streamlined permitting or LEED administration for green development, to facilitate the development approval process.



Potential Action: Continue financial incentives to property owners through programs such as Green/Spaces.

Potential Action: Evaluate existing building codes and consider updating the necessary sections to accommodate green buildings.

Potential Action: Adopt a green home rating system.

Potential Action: Develop a green building rating system similar to LEED, but specific to Chattanooga, that goes above and beyond standard design and construction.

OBJECTIVE: Lead by example by making a City commitment to upgrade and build LEED certified buildings.

Potential Action: Perform energy audits on all existing City buildings.

Potential Action: Prioritize energy efficiency/green building upgrades for City buildings. (Possible candidates include: Development Resource Center, Tivoli Theater, Memorial Auditorium, South Chattanooga Recreation Center)

ALTERNATIVE ENERGY SOURCES

Traditional fuel sources (fossil fuels) are known to have many associated negative environmental impacts. Recently, they have also become more expensive, and fears that supply may be waning have increased. Because traditional American cities rely on these types of fuel sources, they are particularly vulnerable to supply disruption and high prices. A city that explores a diverse portfolio of alternative energy solutions prepares itself for the unpredictable future. Because energy use comprises a large portion of the city's carbon footprint, exploring alternative sources not only prepares the city for the unthinkable, but also helps mitigate the unthinkable from happening.



Renewable energy also presents a unique opportunity for partnerships with local and regional leaders to help bring about needed change. Conservation measures are only the beginning. The City can take advantage of existing regional programs. These range from co-generation partnerships to federal funding sources. The **Chattanooga Green Committee** recommends identifying areas where renewable energy generation can be implemented and reaching out to other organizations and the public to create valuable energy generation partnerships.

OBJECTIVE: Create a resilient and prepared city by using locally generated renewable energy.



Potential Action: Identify City buildings that can be retrofitted with photovoltaic (PV) solar panels.

Potential Action: Identify and secure federal and state grant money that will help offset the cost of the installation of diverse alternative energy sources for government buildings, to serve as secure and safe havens for residents in the event of a disaster that impairs the current electric grid.

OBJECTIVE: Increase the City government's use of renewable energy sources by X% (to be determined).

Potential Action: Purchase green power for City government operations.

Potential Action: Become a TVA Green Power partner by generating energy that can be bought back by TVA.

OBJECTIVE: Encourage individuals to produce their own clean energy sources.

Potential Action: Create financial incentives for the purchase of solar panels.

“Education is the most powerful weapon which
you can use to change the world.”

Nelson Mandela

EDUCATION & POLICY TASK FORCE

GENERAL COMMUNITY AWARENESS

Community awareness and education is an important facet to becoming a more sustainable community. The overwhelming, and often confusing information found in national media sources makes decisions hard on our residents, who often WANT to know how to become 'greener' or don't yet understand the urgency to do so.

OBJECTIVE: Utilize and expand existing community awareness programs.



Potential Action: Identify the recommended actions that will have the largest impact on reducing our carbon footprint and develop a city-wide campaign for those initiatives.

OBJECTIVE: Develop a marketing plan and an information clearinghouse within the community that serves as a resources center for green program information.

Potential Action: Identify diverse partners within neighborhood associations.

Potential Action: Create a sustainability office and develop displays in publicly accessible buildings (like the new Outdoor Chattanooga building in Coolidge Park).



OBJECTIVE: Educate the community and decision-makers regarding the economic benefits of the Chattanooga Green program.

Potential Action: Document and quantify actual and projected cost savings of major Green Committee recommendations.

Potential Action: Create a document, website or handbook to consolidate and offer advice to residents and individuals on green practices for the home and workplace.

SCHOOLS

The realm of primary and secondary education is vital to the sustainable transformation of the community. Becoming a sustainable region requires the broad dynamic integration of the younger generations in a meaningful way so that the efforts of **Chattanooga Green** are ensured in the future public domain. The younger generations will inherit the community left to them. Providing them with the knowledge and tools for sustainable practices, a healthy future of the region is achievable.

OBJECTIVE: Develop an extensive environmental curriculum and for use in schools, churches, businesses, organizations, and public outlets.

Potential Action: Work with “Environmental Education in Tennessee” to create a **Chattanooga Green** School Program.

Potential Action: Work with Calvin Donaldson Elementary School to create a primary school curriculum that can be incorporated into other elementary schools.

Potential Action: Create a physical and tactile demonstration experience for elementary and middle-school-aged children at a central, and preferably, free-access location.

Potential Action: Identify local High Schools to cooperate in the creation of environmental education programs for the secondary schools.

Potential Action: Work with local post-secondary institutions to create a curriculum in sustainable living, as well as adult education, with partnerships for demonstration projects, podcasts, etc.

Potential Action: Develop a measurement tool for recording success of expanded environmental education curriculum in public schools.



BUSINESS PARTICIPATION

In an ideally-balanced community, economic fortitude and environmental stewardship coexist in a symbiotic relationship. It is imperative to further support business participation in mutually beneficial manner. The belief that profitable industries and environmentally benign practices are mutually exclusive is no longer valid in today's

emerging economy. To be truly sustainable, an industry must balance the interests of the economy, the environment and the community. Government and businesses must explore initiatives and cooperative efforts to support growth in ways that will conserve tomorrow's resources while building business.

OBJECTIVE: Increase business participation in initiatives to reduce greenhouse gas emissions.

Potential Action: Institute a program (similar to "Cool Biz") to promote energy efficiency in the workplace, such as allowing "business casual" dress codes to reduce energy consumption from air conditioning.

Potential Action: Create a handbook that outlines "green" goals for businesses.

Potential Action: Expand an awards and recognition program for businesses.

Potential Action: Support the development of a Green Toolkit for small business owners.

GOVERNMENT POLICY

Transforming into a sustainable, booming city that embraces healthy, prosperous living, will require effective communication between citizens and their lawmakers. As the city continues this process, it is important to get an accurate gauge of public opinion about the greenhouse gas reducing measures and other sustainable practices presented.

It is well-understood by the members of the **Chattanooga Green Committee** that many of the objectives and potential actions listed in this Interim Report and the final **Climate Action Plan** will require a thoughtful analysis of the policies needed to accommodate such progressive changes. It is recognized by this Committee that its primary contribution will be through stakeholder, subject matter experts, and volunteer coordination towards the efforts of successful implementation.

Many of the actions recommended throughout this Interim Report can be considered "government policy" issues but are not repeated in this specific section. The following Objectives may be applied to all the topics presented in this report.

OBJECTIVE: Set the standard and provide leadership in sustainability initiatives.

Potential Action: Build all City facilities to green standards, such as LEED.

OBJECTIVE: Support the creation of continuing education and credits for city professionals to learn about sustainable practices.

OBJECTIVE: Reach out to state and regional areas to network for combined brainstorming and problem solving.

PLACEHOLDER: Once the other Task Forces have completed and signed off on their recommendations, any government policy items will be included in this section.

GOVERNMENT PURCHASING

Procurement of consumer goods and supplies for government use is symbolically and politically important. Government itself is a major purchaser and consumer, and thus has the potential to influence the local market in a significantly 'greener' way. City employees and the public are the beneficiaries of the environmental benefits of a green purchasing program.



OBJECTIVE: Adopt a City of Chattanooga green purchasing program.

Potential Action: Create a pilot green purchasing program with a to-be-determined City department and site.

Potential Action: Coordinate with the City's Purchasing Director.

WORK REMAINING

The **Chattanooga Green Committee** recognizes that this report just begins to scratch the surface and much remains to be done. Several topics need more research before final recommendations can be made. They have only begun to explore some topics such as the industrial and commercial side of recycling. Other issues, such as Smart Growth, are so comprehensive and complex that they will need further consideration. The task forces will be calling on more SMEs and studying successes in other cities.

- More research is needed in several areas.
- More SMEs need to be identified and consulted.
- The costs of proposed actions need to be calculated.
- The potential reductions in our carbon footprint need to be determined for each recommended action.
- Specific indicators need to be established to measure our progress over time.
- Implementation options need to be described and pros and cons of each option identified.
- **Recommendations need to be prioritized based on costs, benefits, and community acceptance.**
- Responsibilities need to be assigned for carrying out each recommendation.
- The potential of carbon credit trading for the City needs to be explored.

COMMUNITY INVOLVEMENT

The Committee will begin to involve more citizens in the discussion. Many people have expressed an interest in becoming more involved in this Green initiative and several ways are being considered.

- Each Task Force will be inviting others to join them as they refine goals and recommendations.
- A Speakers Bureau may be formed to help educate the community about sustainability and climate protection.
- Volunteers may be trained to perform basic home energy audits.
- Volunteers will be asked to provide feedback on this Interim Report.

IMPLEMENTATION

With limited budgets, elected officials and the private sector will certainly need to weigh the costs and benefits of each recommendation before establishing priorities and taking action. Wherever possible, the Committee will estimate both monetary costs and savings and project the amount of carbon reductions that can be expected from each recommended action. Governmental departments, private organizations and businesses that are best suited to carry out each action will also be identified. Potential funding sources for various recommendations will also be included.

The draft Implementation Matrix found in the appendix will be completed to provide a quick reference that summarizes these components.

MEASURING PROGRESS OVER TIME

As a signatory of the U.S. Conference of Mayors Climate Protection Agreement, Chattanooga has committed to adopting a Climate Action Plan. However, adopting that Plan is only the third step in ICLEI's 5 Milestone process. The Plan then needs to be implemented and progress needs to be measured over time.

A set of sustainability indicators will be established to measure progress in reducing our carbon footprint. The ICLEI software and other studies will be helpful in determining which actions are achieving the desired outcome and which actions need to be revised.

APPENDIX

Public Visioning Results - Top 3 Ideas from Each Table

(The complete list of results from the Public Visioning Meeting can be downloaded from www.chattanooga.gov/chattanoogagreen.)

Survey Results

Draft Implementation Matrix

Upcoming Events

July 14 - 20 Society of Conservation Biologists Annual International Conference

October 3 Alternative Fuel Vehicles Odyssey

TOP 3 IDEAS FROM EACH TABLE

RANKING	IDEAS
RECYCLING & WASTE	
1	Door to door recycle program that actually works
1	Charge for the amount (per pound) of garbage used. "Pay as you throw." Penalty for those who use more
1	Bring back curbside recycling
1	Fully supported City recycling program. Education and leadership by the City are key.
1	Curbside recycling citywide; public common area recycling hubs.
1	More recycling center - in every community (apartments, office parks, schools)
	Recycle: 1) Drop off locations at grocery stores for convenience, 2) Pay to throw away. Weight, whatever - trash, 3) Sign-up and pay for Recycle Service, 4) More regular curbside pick-up, 5) Business' recycle - specifically downtown restaurants (bottles, cans)
1	Recycling trucks come every week like garbage trucks
1	Recycle stations at grocery stores (access 24/7) instead of where located now
1	Would like weekly recycling back.
1	Would like a bin system for recycling collection.
1	Reinstate weekly recycling.
1	Curbside recycle - make it more frequent and figure out an easier calendar to follow
1	Get rid of phone books (use internet), plastic bottles, etc. and statewide Bottle Bill (Eco Legislation)
1	Mandatory separation of recyclables; weekly pickup
1	Mandatory recycling - if you receive City garbage services - you must recycle
1	Recycle - re-use fiberfill; fabrics; dog toys; try to use everything
2	Mandatory curbside recycling.
2	"Pay as you throw" garbage policies -- require monthly/annual payment for different volumes of trash per household/business to incent recycling
2	Mining landfills.
2	Mandatory recycling, including mining landfills
2	Make recycling easier.
2	City buildings and businesses should recycle.
2	Reinstate weekly curbside recycling
2	Recycle plastic 1 - 7 levels
2	Weekly curbside recycling
2	Make recycling more convenient. Put drop-off centers at grocery stores, other central spots in neighborhoods.
3	Public hospitals set up recycle stations next to trash cans throughout public areas, then cooperate with public schools to pick up and sell cans and other materials to assist with funding.
3	Make recycling more robust: (1) in public buildings and parks; (2) hazardous waste recycling to include CFL's; (3) pickup reinvigorated; (4) tax trash and make recycling free.
3	Provide recycling bins and pick up weekly.
3	Free and timely recycling. Pick up on a weekly basis and provide bins.
3	Weekly curbside pickup
3	Separate food waste for composting, restaurants and schools
3	Recycling program on a weekly basis (profitable recycling program).
5	Institute local bottle bill.

TOP 3 IDEAS FROM EACH TABLE

RANKING	IDEAS
TRANSPORTATION	
1	Privately-funded alternative transportation pilot projects (e.g. work with US Express on alternative fuels - testing)
1	More sidewalks -- not just for walking but also for easier/safer access to mass transportation.
1	Improve transportation infrastructure; provide more public transportation options; and improve the ability to commute via bicycle (bike paths).
1	Public transportation with partnering cities
1	Promote and develop alternative transportation resources (bike paths, sidewalks, greenways).
1	Light rail system for commuters
1	20-year moratorium on all road expansion.
1	Improve public transportation: (1) look (aesthetic appeal); (2) access (especially mountains).
1	Eliminate road widening efforts.
1	Safe way for bikers/walkers to get from Southside to Northside - get across the city
1	Car free zone in part of downtown - permanent market / pedestrian plaza
1	Increase the number of greenways to connect all neighborhoods in the city.
2	More pedestrian friendly sidewalks
2	Rail System! Chattanooga is known for its trains - we already have the infrastructure - let's use it! Electric train / rail system creates jobs, etc.
2	Improve bus transportation in all neighborhoods - more routes, more frequency, more access
2	Increase sidewalks throughout the city
2	Better use of public transportation. Have parking lots where people can park and ride. Have "bus lanes."
2	Increase access to public transportation -- provide more routes, larger coverage area, more sheltered stops park and ride, variety of bus sizes to fit need (small, medium and large).
2	Promote better bicycling routes: safety issue and to make cycling more appealing
2	Double public transportation in the next 10 years.
2	Mass transit express system for communities like Soddy Daisy and Cleveland.
2	Incorporate light rail transit into and out of city.
2	Sidewalks and bikelanes in every neighborhood especially to connect to arteries. All arteries should have <u>broad</u> sidewalks to encourage pedestrians and bicycles.
3	Improve alternate travel; more facilities; dedicated bike lanes, more bike racks
3	Open the Riverwalk 24 hours
3	Incentivize public transit
3	Publicly fund a bicycle coordinator: Publicly fund a bicycle Plan
3	Support mag lev train
3	Connect all residential areas to food, stores, daily needs, by sidewalks and bike paths plus improve commercial districts in urban areas for food and service, walk to, revitalize
3	Better funding so CARTA can better serve.
3	Expand Electric Shuttle.
3	More access to public transportation in and out of the city for commuters from Cleveland, Soddy, Dayton, etc.
4	Support public transportation -- financially -- for existing public transport systems -- corporate sponsorships of public transit.

TOP 3 IDEAS FROM EACH TABLE

RANKING	IDEAS
EDUCATION (GENERAL & IN SCHOOLS)	
1	More local advertising on TV and radio to promote mass transit, green living, and overall environmental education, outreach, and incentives
1	Better market and advertising for public about recycling in Chattanooga
1	Education of green tips: newspaper, radio, TV, media outlets
1	Education for cyclist and motorist through a billboard signage campaign
1	Educate us! Young people in elementary, middle and high school. It's <u>our</u> future.
1	Establish curriculum in the schools so children can learn about the environment and how to protect it.
1	Elementary to college education of recycling and green life style, nutrition, healthy/wellness, active lifestyle
2	Public service announcements can be used as free advertising to educate the public on steps they can take (change lightbulbs . . .)
2	Develop "immediate result options" (i.e., no travel day, mass transit days, changing out lightbulbs, waterless/low flow urinals/showers).
2	Ongoing education for the general public with media partners
2	Public education - little things make a big difference; stay in shower less; light bulb change; raise awareness
2	See people who talk about the environment (like the Green Committee) pick up trash, clean up the city. (Those who are knowledgeable should visibly demonstrate what needs to be done; set an example.)
2	Educate the kids - through schools and partners like the Tennessee Aquarium to be good environmental stewards and influence their parents.
2	More environmental education in high school, middle school, and elementary school; specifically Calvin Donaldson Elementary as an environmental science magnet school, as a way to empower the community
2	Schools should focus on teaching younger kids (beginning in kindergarten) about the environment, as part of the curriculum, along with math and language; include a class on gardening.
2	Eco fundraisers for schools (no more magazines and contests) Have eco contests for students! (Get ideas)
3	Have speakers bureau speak to clubs, groups, churches, etc.
3	Public displays (signage) of City's environmental values - encourage resident and tourist participation
3	Increase environmental education throughout school system, public parks.
3	Develop alternative energy and "green jobs" programs at high school and college level.
3	Every school should have a garden, use as corrective behavior and also yearly/biyearly to the dump to see waste
GREEN BUILDINGS (BUILDING CODES)	
1	Change building to make it green; create our own.
1	Require all new industrial development to use green construction practices and be sustainable.
1	Tax incentives for "green" building for builders and individuals.
2	Provide tax incentives for LEED certified projects.
2	Develop alternative building codes to rehab older buildings more feasible; stagger schedule for meeting building code; keeping older buildings in long run is good preservation; energy and recycling (Knoxville example; New jersey section for adaptive reuse, flexible building code)
2	Requiring LEED certification for everything that is built (or comparable certification).
2	"Green" building codes.
2	Promote more "green roof" in commercial establishments
3	Green roof program
3	Tax incentives for alternative energy (solar and wind) for new buildings and retrofits.
3	Change Building Codes / train officials; Update codes to be specific to making Chattanooga Green. Plumbing, building, etc. (i.e. to allow rainwater to be used to flush toilets); Train and educate our codes officials!
3	Develop a variety of incentives for green building.
3	Recycle construction waste.
3	All buildings have solar panels.
3	Promote use of Siberian Larch wood products.

TOP 3 IDEAS FROM EACH TABLE

RANKING	IDEAS
GOVERNMENT POLICY (& PURCHASING)	
1	City of Chattanooga should take a leadership role and budget resources for Green initiatives
1	City should use "green" cleaning supplies by putting their "money where mouth is", lead by example
2	Make Chattanooga a zero waste city (homes and outdoor events - including Riverbend)
	Create a Sustainability Office/City Department to oversee: (1) green building codes; (2) development of public transport; (3) support of local food shed by city and county organizations; (4) conservation and natural resources; (5) publicizing/education.
2	Require government offices to use environmentally friendly products i.e. bamboo, cleaning, paper
2	Income tax / property tax breaks for greening of personal homes
2	Waive parking fees for hybrid / alternative fuel vehicles
2	City to lobby state for a tax-free day for energy efficient product purchases -- in conjunction with Earth Day.
3	Utilize more hybrid utility trucks.
3	Change building codes to require energy efficiency in all new infill construction. The City and County should lead the way.
3	All public buildings shall be green (City policy)
3	Establish MUCH higher goals for CO2 reduction and ANY environmental goal! 7% below is not sufficient; make it 50% or HIGHER
3	Look for government buildings to create green roofs
3	State and County need to FUND outdoor and environmental education.
3	Look at best practices in other cities -- see what is working and can be replicated here.
ENERGY CONSERVATION	
1	Institute local energy codes and ENFORCE THEM!
2	Use solar hot water collectors and photo voltaic panels on all Chattanooga city owned roof tops, as practical.
2	Institute a smart meter policy for electricity use.
2	Provide incentives to reduce energy use in both new construction and existing buildings
2	Light bulb exchange program
2	Tax credits for commercial energy efficiency upgrades.
3	Institute a "Cool Biz" policy (82 degrees in all buildings in the summer - with reasonable dress codes)
	(1) Convert gas residential lamp posts to solar; (2) replace mercury vapor/sodium with LED; (3) Require green roofs on all commercial buildings; (4) Establish a marquee project that becomes the "signature" of the Chattanooga Green Movement.
3	Provide city/state tax rebates/programs for homeowners using solar or other energy efficiencies.
FOOD & AGRICULTURE	
1	Encourage local / organic food sources that are affordable. Local Farmers Markets, small/community gardens.
2	Community farms - allocate City land to shared garden space
2	More urban food production, gardening program, composting, etc. (vacant lots)
3	Promote local farms
3	Stronger system of local food production
3	Local farmers market = daily market for commercial and public use and local neighborhood public gardens.
4	Urban/community gardens.
ALTERNATIVE FUELS	
1	CARTA buses can use leftover grease from restaurants for fuel.
2	Make CARTA 100% alternative / green fuels.
2	Provide subsidies for alternative energy and/or tax incentives (businesses and individuals).
2	Use throw away items and recycle into renewable energy (i.e. cooking oil, bottles)
2	Convert buses to B20 diesel.
2	Provide parking spaces where electric cars can plug in (green powered)

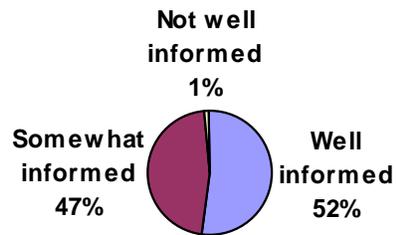
TOP 3 IDEAS FROM EACH TABLE

RANKING	IDEAS
SMART GROWTH / BUILT ENVIRONMENT (ZONING)	
1	Cajole and restrict development to achieve significantly higher green space/bio-mass to concrete/asphalt ratio
1	Change building and zoning codes to allow for uses in close proximity to each other; Physical design has to be appropriate; walkable; sustainable neighborhoods; private partnerships
1	Smartgrowth approach to local zoning.
1	Give developers incentives in zoning - reduce carbon footprint and they can build higher or denser - or brownfields
2	Institute urban growth boundary.
3	Work with city ordinances to promote green development
BUSINESS PARTICIPATION	
1	Make Chattanooga a green jobs training leader in the Southeast.
1	Put together a fun business challenge i.e. business have carbon footprint challenge: bike, turn off lights, what you can do at home at work - Green Business Award
1	Prohibit plastic shopping bags.
2	Recycling for restaurants/bars -- specifically glass -- also paper for businesses and cleaning for businesses and city facilities.
3	Attract more alternative green businesses (e.g. and Amory Lovins type car)
NATURAL RESOURCE MANAGEMENT	
1	Adopt "steep slope" ordinance that will maintain the trees on slopes. *For single-family residences. Also include "view shed" and "stormwater run-off"
3	More restriction on building on slopes
3	Pass laws to stop building and development in floodplains and riparian zones
3	Adopt policy to discourage development of steep slopes and floodplains to discourage cutting trees on slopes in floodplains and or developing properties.
OPEN SPACE	
1	The city should acquire Stringer's Ridge and then turn it into a park.
1	Implement the Greenbelt Master Plan that has already been developed.
2	Lower or no property taxed for land acquisition only -- preserve, not develop; create more open spaces, instead of chicken houses.
3	Utilize power line easements for greenways ("Power Walk")
WATER CONSERVATION & QUALITY	
1	Educate to conserve water with gardening; landscaping (xeriscape); use native plants and drought tolerant
1	Individuals should harvest rainwater, etc.
1	Copy Seattle stormwater runoff concept (permeable pavement, treat at source)
2	Require xeriscaping on all new building projects and encourage it for landscape renovation projects.
URBAN FOREST & TREES	
2	When designing buildings use existing trees -- (no clear cutting) -- no slash and burn -- don't cut down wind breaks. Be aware of the environment -- as little destruction as possible.
3	Require a minimum standard of old/mature trees to remain on properties being newly developed.
3	Offer incentives to owners of big box stores to give up parking areas for trees
AIR QUALITY	
1	Utilize "Ethos" to reduce emissions (by 30%), increase mileage and lower maintenance for Chattanooga vehicles.
2	Use of engine brakes on commercial trucks in city. Bar Jake brakes.
BIODIVERSITY	
2	Consider impact on wildlife from windmills, especially bats
BROWNFIELDS	
3	Clean up foundry sites at Mocassin Bend, US Ppe/Wheland Foundry. It is the front door to our city.
GREEN INFRASTRUCTURE	
1	No more stormwater management ponds.

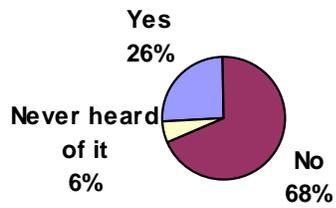
Chattanooga Green

Visioning Process Survey Results

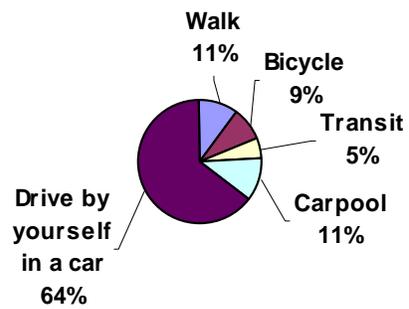
Q1: How informed do you consider yourself to be on climate change and other environmental issues?



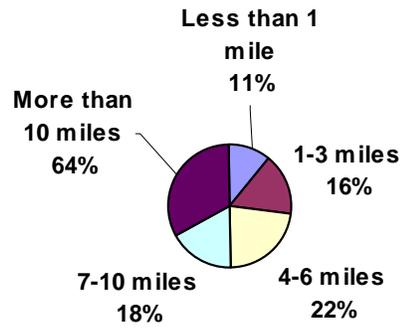
Q2: Have you completed an audit of your personal carbon footprint?



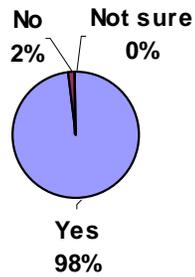
Q3: How do you get to work or school?



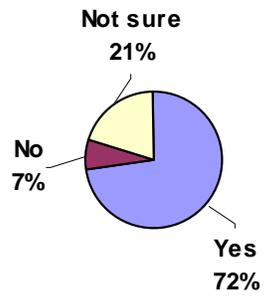
Q4: How far is your daily commute (one way) to work or school?



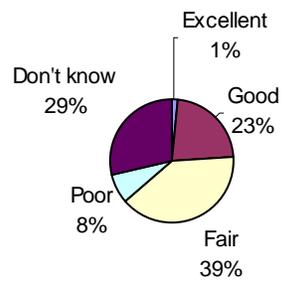
Q5: Do you believe a good public transportation system is an essential element of an environmentally progressive city?



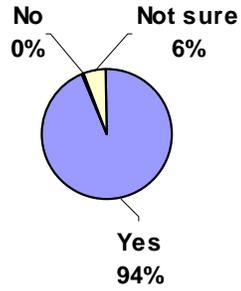
Q6: CARTA provides a lower level of transit service than most cities our size. Would you support a tax in order to get improved transit (more areas served and better frequency)?



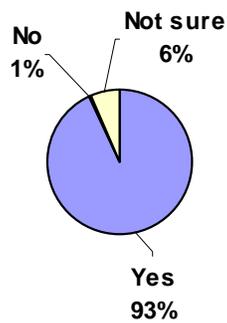
Q7: How would you rate CARTA's existing services?



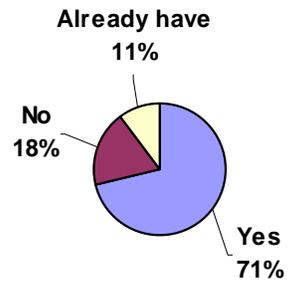
Q8: If you were buying a new home, would you seek out an energy efficient house?



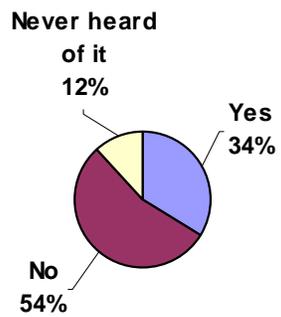
Q9: Would a home energy rating (similar to miles per gallon for automobiles) be beneficial in better understanding the energy efficiency of individual houses?



Q10: Are you interested in a FREE epb energy audit for your home?

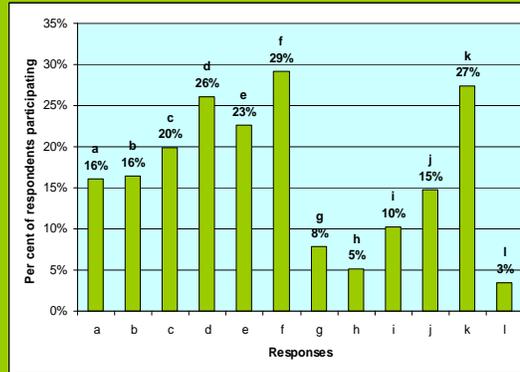


Q11: Have you made the Green Power Switch?



Q12: Which of the following green practices have you completed or do you regularly participate in at home?

- a* Upgraded home insulation
- b* Installed energy efficient windows
- c* Planted trees
- d* Buy local produce
- e* Buy organic food products
- f* Recycle
- g* Car pool
- h* Take transit
- i* Walk or ride a bike to work or school
- j* Renovated an existing home instead of purchasing a new one
- k* Replaced incandescent bulbs with compact fluorescents
- l* Installed rain barrels or planted rain gardens



Draft Implementation Matrix

ACTIONS	LEAD AGENCY	TIMEFRAME			PROJECTED COST	POTENTIAL FUNDING SOURCES	CARBON REDUCTION
		SHORT	MID	LONG			
URBAN FORESTRY & TREES							
Expand the Take Root Initiative to new areas of the community to increase tree canopy.							
Analyze the Landscape Ordinance to increase the number of trees in new developments, renovations and parking lots. (Incentives and number of trees to be determined.)							
Amend the landscape ordinance to create incentives to retain existing trees rather than removing trees and replanting in new developments.							
Re-establish a stock nursery program for urban forestry and development initiatives.							