

V. BROWARD COUNTY GOVERNMENT OPERATIONS – CURRENT GREENHOUSE GAS EMISSION REDUCTION ACTIONS



Current Greenhouse Gas Emission Reduction Actions

In efforts to reduce energy consumption from electrical and fossil fuel use, and increase the efficiency of our operations, the County has implemented a variety of programs over the past several years. As a positive consequence of these actions, the County has already started the move toward reducing greenhouse gas (GHG) emissions consistent with established climate change efforts.

The following are actions already being taken by various County agencies for which there is a demonstrable reduction in GHG emissions. For specifics regarding energy savings, tonnes of eCO₂ reduced, and annual monetary savings, refer to **Table 1** at the end of this section.



Actions in the Buildings/Facilities Category

Install window film on western-exposed glass at W. Regional Courthouse to reduce heat gain from afternoon sun

Installed solar reflective film covering 10,000 square feet of tempered glass windows at the West Regional Courthouse, keeping 2,000,000 Btu/Hr (200 Btu/Hr/sq. ft.) of heat from the sun from entering the building.

Insulation improvements in selected County buildings

Several facilities improved insulating values in ceilings and walls resulting in energy savings and rebates from our utility. The reduced amount of heat penetrating the spaces lowers the air conditioning bills every year, provides for a more comfortable environment for employees and patrons, and extends the life of business equipment and furnishings.

Leadership in Energy & Environmental Design-New Construction Certification Project for the South Regional Library

In October 2007, the South Regional Library became the first building in Broward County to earn Leadership in Energy and Environmental Design – New Construction (LEED-NC) certification from the United States Green Building Council. The project's final LEED rating reflects 35 documented and approved points, which corresponds to the Silver certification level under the LEED for New Construction. A total of 5 points were earned under the Energy and Atmosphere category with annual energy savings documented to be 317,800 kWh/year.

Plant trees around selected County buildings to provide shading and use native plants to reduce irrigation

The Facilities Maintenance Division (FMD) has been participating in Broward County's NatureScape program since 2004. Through this program, landscapes are recognized for their conservation of water and use of appropriate plants for energy savings. The FMD obtained certification for 37 facilities and seeks to certify a total of 76 facilities by 2013. By planting trees around buildings to provide shading and using native plants to reduce irrigation and maintenance needs, FMD anticipates a significant reduction in GHG by reducing the amount of electrical power needed to maintain building operations. The use of native plants is also expected to reduce the amount power mowing and trimming necessary. It is estimated that 325,000 kilowatt-hours will be saved each year upon project completion. The total project budget is \$325,900.

Install building/office occupancy sensors in selected County buildings

All types of occupancy sensors (ultrasonic, infrared, dual-technology, etc.) have been installed in ceilings and on walls in numerous office spaces, conference rooms, and hallways in various facilities (where applicable) in order to limit the unnecessary use of electricity.

Install energy efficient electric motors in air handlers and elevators

Installed energy efficient electric motors in chillers under the energy performance contract in the Main Courthouse and other facilities.

Install energy efficient exit sign lighting

More than 4,050 exit signs in the buildings supported by general fund operations have been replaced/retrofitted with energy efficient/energy star qualifying signs (exit signs operate 24 hrs/365 days). Standard incandescent exit signs use around 40 Watts; the replacements average around 5 Watts.

Install variable frequency drives for motors that have part load usage

Through the energy performance contracts, variable frequency drives were installed on air handler electric motors in the Governmental Center, the Main Courthouse, the Midrise, and the Main Jail.

Optimize Heating, Ventilation and Air Conditioning system efficiency by renovating chillers at the Fort Lauderdale-Hollywood International Airport

Broward County Aviation Department (BCAD) is in the process of implementing several improvements to increase HVAC system efficiency efficiency at the Fort Lauderdale-Hollywood International Airport. BCAD recently replaced 55 of the existing air handler units in terminals 2, 3, 4, and the commuter terminal. BCAD is currently upgrading the existing HVAC controls for terminals 2, 3 and 4 to include a state-of-the-art METASYS control system. Further, BCAD is in the process of upgrading chillers and towers in terminals 3 and 4. These chiller and control upgrades are anticipated to be completed by mid-2008.

Perform energy-efficient building lighting retrofits

More than 4 million square feet of County facilities have received lighting upgrades from standard T12 fluorescent lamps and ballasts to T8 fluorescent lamps and electronic ballasts. Also, incandescent luminaires/lamps have been replaced or retrofitted with compact fluorescent lamps. Work was done under energy performance contracts for larger facilities and on a contractual basis for smaller facilities.

Perform heating, cooling and ventilation system retrofits (e.g., chillers, boilers, fans, pumps, belts, fuel-switching from electric to gas heating)

Over the past 10 years, the majority of County facilities have received air conditioning mechanical system upgrades to more energy efficient options as well as new construction systems being specified with efficient equipment. Work was done under energy performance contracts for larger facilities and on a contractual basis for smaller facilities.

Split Packaged/Direct Expansion air conditioning systems

Over the past 10 years, the majority of County facilities have received split/package direct expansion air conditioning system upgrades (for buildings with smaller cooling loads) to a more energy efficient option as well as new construction systems being specified with efficient equipment. Work was done under energy performance contracts for larger facilities and on a contractual basis for smaller facilities.



Actions in the Vehicle Fleet Category

Conversion to use of Ultra Low Sulfur Diesel fuel for buses

In FY2007, Broward County Transit (BCT) transitioned from the use of low sulfur diesel fuel for its fleet operations to ultra low sulfur diesel fuel (ULSD). The transition was a result of the U.S. Environmental Protection Agency (EPA) requirements for fleets to use ULSD. BCT's fuel costs increased as result of the conversion from low sulfur diesel to ULSD; however, there were environmental benefits. In addition, 42 replacement buses with newer pollution control technology (2007 engines) are in the process of being tested and incorporated into BCT's fleet. According to the U.S. EPA, these newer technology engines combined with ULSD will be up to 95% cleaner than previous models.

Use of B20 biodiesel instead of normal diesel

Beginning in FY07, Fleet Services Division began purchasing and dispensing Biodiesel for the general purpose fleet at numerous locations. The 20% blend (B20) does not require any machinery alterations for diesel engines. To date, 173,330 gallons of B20 has been introduced.

Use of compressed natural gas vehicles instead of gasoline

Since 1988, Broward County has had an alternative fuel and advanced technology vehicle program. Currently there are 47 bi-fuel (compressed natural gas(CNG)/gasoline) vehicles, 13 CNG vehicles, and five CNG refueling sites.

Use of electric vehicles instead of gasoline vehicles

As part of the County's alternative fuel and advanced technology vehicle program, there is currently one electric vehicle in the fleet.

Use of hybrid electric vehicles instead of gasoline vehicles

As part of the County's alternative fuel and advanced technology vehicle program, there are currently 51 hybrid electric vehicles in the fleet.

Use of Liquefied Propane Gas vehicles instead of gasoline vehicles

As part of the County's alternative fuel and advanced technology vehicle program, there are currently 8 liquefied petroleum vehicles (LPG) in the fleet and there is one LPG refueling site.

Provide fixed route bus service

As the population in Broward County has grown since 1997, so has the number of passengers using fixed route bus service. In 1997, the County's population was 1,506,376 individuals and by 2007 that number had grown to 1,765,707 (17.2% or an average rate of 1.56% annually). In FY 1997, BCT provided 25.1 million annual passenger trips and that number has grown to 39.2 million annual passenger trips in 2007 (56% or an average rate of 5% annually.) The largest growth spurt in transit ridership occurred between FY1999 and FY2005 (54%, or an average rate of 10.8% per year) and resulted from increased funding to the transit system for major system enhancements and the better allocation of existing resources for service improvements such as increased peak hour service. The improvements included the addition of 30 buses to the fleet, more frequent service on weekdays and weekends, additional routes, extended routes, additional evening hours and weekend service. The funding increases were from the two cent gas tax increases levied for mass transit improvements in 2000 and 2001, as well as increased funding from the general fund and transit concurrency impact fees. BCT buses operate regionally in Southeast Florida with connections in and to Palm Beach and Miami-Dade transit systems and to Tri-Rail. In FY1997, there were 202 buses in the fleet, 36 weekday routes and 25.1 million passenger trips were provided on fixed-route. In FY2007, BCT had grown to 289 buses in the fleet, 43 weekday bus routes in operation, and provided 39.2 million passenger trips annually.



Actions in the Employee Commute Category

Carpooling to the Governmental Center and Annex

The carpool program for Governmental Center and Annex employees was established in 1996. The purpose of the program is to mitigate traffic congestion at peak hours and reduce air pollutants. Incentives for carpoolers include preferential parking and participation in the emergency ride home program through South Florida Commuter Services.

Carpooling to the Main Courthouse

Due to parking constraints at the Courthouse garage and prior success at the Governmental Center, the County's carpool program was extended to Courthouse employees.

Overnight Vehicle Assignments in Pollution Prevention & Remediation Division

The use of Overnight Vehicle Assignments (OVAs) as mobile offices has been an integral part of the EPD Pollution Prevention & Remediation Division's e-inspection programs since January 2003. Currently eight field staff use OVAs from their homes (using their vehicles for offices with printers, laptop computers, and other necessary equipment) and the on-call team share an OVA to provide 24-hr customer service/complaint response from their homes. The eight OVAs alone save the county over 2,000 miles per year of travel.

Employee Mass Transit Riders

Broward County, provides a half price discount on 31-day bus passes for County employees. These half-price bus passes can only be acquired through payroll. In addition to using Broward County Transit, employees also use Tri-Rail to commute to work.



Actions in the Street Lighting Category

Install energy-efficient traffic signals

Approximately 26,000 red and green incandescent traffic signals at 135 Watts each have been replaced with light emitting diode traffic signals at 12 Watts each.



Actions in the Water/Sewage Category

Fine bubble diffusers in 'C' module at the North Regional Wastewater Treatment Plant

The liquids treatment at the North Regional Wastewater Treatment Plant (NRWWTP) consists of four secondary treatment modules (A, B, C & D), each with a design capacity of 20 million gallons per day. Secondary treatment includes aeration and clarification. Initially, the aeration process was accomplished in each module with four 300 HP mechanical aerators. On the average at the NRWWTP, each module would utilize 900 HP for normal aerator operation. This project replaced the mechanical aerators (900HP) with fine bubble diffusers, which operate with 500HP blowers resulting in an energy savings of 400HP or 2.628 million kWh per year. This savings was achieved at a capital cost of about \$4,500,000.

Reclaimed water usage as process water

A 10 million gallon per day reclaimed water plant was added at the North Regional Wastewater Treatment Plant (NRWWTP) to further polish the treated effluent to allow its use for landscape irrigation and process water. This reclaimed water plant includes filtration and disinfection at a cost of about \$10,000,000, which replaces potable drinking water from the Broward County District 2A Water Treatment Plant for these uses and results in an average energy savings of 4.599 million kWh per year.



Actions in the Waste Category

Provide recycling service to all unincorporated area single family and multifamily residences (mixed recyclables and paper-household)

The unincorporated County's residential recycling program began in 1989 and services all single family and multifamily residential units through various franchise agreements with collection contractors. Program materials include newspaper and the traditional cans, bottles (glass, plastic, and metal), and other containers in a dual stream collection system. Mixed paper has been added to the program in 2007. Due to annexation, the recycling tonnage has decreased by nearly 80% during the report period 1997-2006. Average collection costs are in the \$2.50 / home range, which is partially offset through avoided disposal and material revenue credits.

Provide recycling services at Broward County offices, facilities, and parks

The governmental recycling program began in 1992 and it includes the majority of county office buildings, libraries and other facilities. Old cardboard and office paper comprise the majority of materials. Some sites have established bottle and can recovery systems and more recently a program was re-instituted to collect bottles and cans at county regional park sites – picnic areas, campgrounds, etc. Collection and processing costs (\$250/ton) have increased significantly due to fuel costs and other factors.

Provide recycling services at Broward County schools, offices, facilities, and community colleges

The recycling program was extended to all public schools and community colleges through the State Recycling Grants or more recently through interlocal agreements with the Broward County School Board and the Community College Administration. Old cardboard and office paper comprise the majority of materials. Some sites have established bottle and can recovery systems. Collection and processing costs (\$250/ton) have increased significantly due to fuel costs and other factors.

Example of the Broward County Waste Reduction Program (paper reduction): Broward Metropolitan Planning Organization

Agenda packages for the Broward Metropolitan Planning Organization (MPO) were reduced from 120 to 85 in 2004 and from 85 to 55 more recently. The Broward MPO is a decision-making board of local elected officials, including some of the Broward County Board of County Commissioners, that meet approximately ten times per year. The average number of sheets of paper in an agenda package was estimated to be 95. Agenda packages for the Community Involvement Roundtable (CIR) were reduced from 55 to 35. The CIR is an advisory committee to the Broward MPO. The CIR meets approximately ten times per year. The average number of sheets of paper in an agenda package was estimated to be 95. Agenda packages for the Broward MPO Technical Coordinating Committee (TCC) were reduced from 95 to 80. The TCC is an advisory committee to the Broward MPO. The TCC meets approximately ten times per year. The average number of sheets of paper in an agenda package was estimated to be 95.

Recycling at the Fort Lauderdale-Hollywood International Airport

The airport recycling program began in 1989, wherein an onsite facility, Airport Recycling Specialists (ARS), separates out the recyclables from the waste hauled from the terminal areas and airlines, as well as various on-site offices. Cardboard, plastic bottles and aluminum cans are separated, baled and marketed. Pallets and scarp metal are recycled when feasible. ARS recycles over 1,000 tons per year, which equates to over 30% recycling rate.

The GHG emissions inventory model generated outputs based on the data collected for all the existing actions described above, by source category. **Table 1** provides a summary of the outputs, including the measure, energy reduction, emissions reduction in tonnes of eCO₂, and annual monetary savings.

Table 1: Current Greenhouse Gas Emission Reduction Measures Implemented from 1997 - 2007

Source Category	Measure	Energy Reduction (kWh/yr)	Emission Reduction (tonnes eCO ₂ /yr)	Cost Savings (U.S. \$/yr)
Buildings	Install window film in select County buildings	88,000	47	\$8,580
	Insulation improvements in select County buildings	291,000	156	\$28,373
	Leadership in Energy & Environmental Design – New Construction certification project for South Regional Library	317,800	170	\$30,986
	Plant trees around selected County buildings	325,000	174	\$31,688
	Install building/office occupancy sensors in select County buildings	150,000	80	\$14,625
	Install energy efficient motors in air handlers and elevators	80,250	43	\$7,824
	Install energy efficient exit sign lighting	1,240,000	663	\$120,900
	Install variable frequency drives for motors that have part load usage	762,000	407	\$74,295
	Optimize Heating Ventilation and Air Conditioning system efficiency by renovating chillers at the airport (Terminals 2, 3 and 4)	260,695	139	\$25,418
	Perform energy efficient building lighting retrofits	11,355,000	6,070	\$1,107,113
	Perform heating, cooling and ventilation system retrofits (e.g., chillers, boilers, fans, pumps, belts, fuel-switching from electric to gas heating)	12,764,000	6,823	\$1,244,490
	Split Packaged/Direct Expansion Air Conditioning Systems	527,000	282	\$51,383
Vehicle Fleet	Conversion to use of Ultra Low Sulfur Diesel Fuel for buses	0	0	\$0
	Use of B20 Biodiesel instead of normal diesel in special fleet	0	259	-\$13,190
	Use of Compressed Natural Gas vehicles instead of gasoline vehicles	139,002	84	\$44,823
	Use of electric vehicles instead of gasoline vehicles	5,724	1	\$463
	Use of hybrid electric vehicles instead of gasoline vehicles	216,147	57	\$18,266
	Use of Liquid Propane Gas vehicles instead of gasoline vehicles	69,633	27	\$19,535
	Provide fixed route bus service	58,090,055	14,889	\$0
Employee Commute	Carpool to Courthouse	314,040	83	\$0
	Carpool to Governmental Center and Annex	1,216,906	322	\$0

Source Category	Measure	Energy Reduction (kWh/yr)	Emission Reduction (tonnes eCO ₂ /yr)	Cost Savings (U.S. \$/yr)
Employee Commute	Overnight Vehicle Assignments in Pollution Prevention & Remediation Division	56,429	15	\$0
	Employee Mass Transit Riders	5,343,174	1,392	\$0
Streetlights	Install energy-efficient traffic signals	13,539,000	7,238	\$1,320,053
Water / Sewage	Fine bubble diffusers in 'C' module	2,628,000	1,405	\$256,230
	Reclaimed water usage as process waters	4,599,000	2,459	\$448,403
Waste	Provide recycling service to all unincorporated area single family and multifamily residences (mixed recyclables)	N/A	7,411	\$324,880
	Provide recycling service to all unincorporated area single family and multifamily residences (paper-household)	N/A	11,791	\$573,965
	Example of Broward County Waste Reduction Program: Paper Reduction: Broward MPO, CIR and TCC agenda packages reduced	N/A	4	\$759
Total		114,278,355 kWh/yr	62,491 tonnes eCO₂/yr	\$5,739,862

Figure 4 shows the Broward County Government Operations GHG emissions for the 1997 baseline year, GHG emissions projected by 2015 with and without existing measures, and emission reduction target of 7% below 1997 levels.

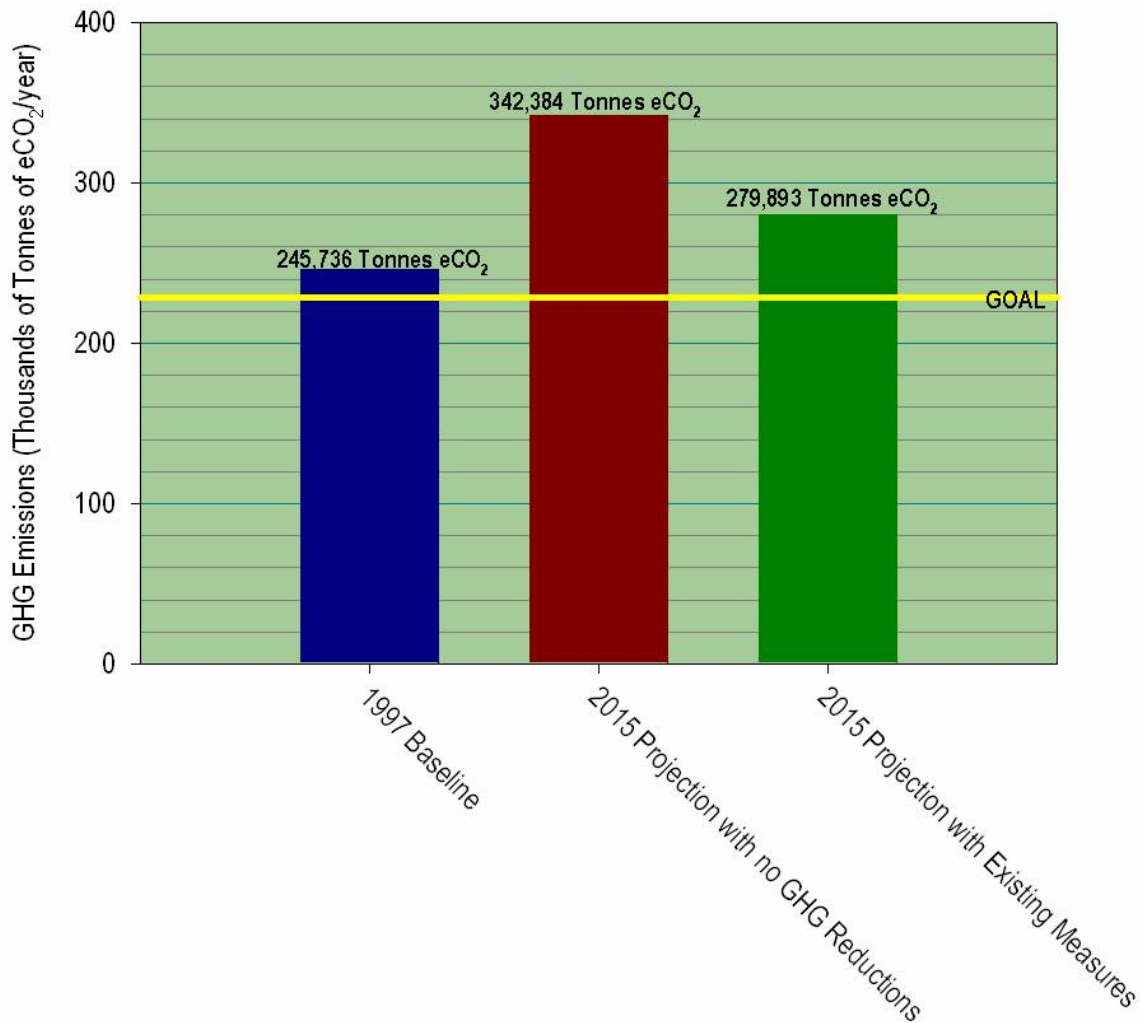


Figure 4. Greenhouse gas emissions for the 1997 Baseline Year, projection by 2015 with and without existing measures, and emission reduction target.

The following are actions being taken by various County agencies for which there is currently insufficient data available to adequately measure an impact on GHG emission reductions. However, these actions represent best practices and demonstrate environmental stewardship. In future updates of the Broward County Government Operations Climate Change Report, staff will work to track more comprehensive data to develop a data linkage between these actions and GHG emission reductions.



Actions in the Buildings/Facilities Category

Energy-efficient equipment in cruise terminals and office buildings at Port Everglades

The Port Everglades Department retained an independent consultant, Trane South Florida, to complete a comprehensive energy performance project costing approximately \$4.4 million, to install energy-efficient equipment in cruise terminals and office buildings. The annual energy conserved from the project will result in an annual reduction in greenhouse gas emissions of approximately 4,445 tonnes eCO₂ and a savings of more than \$4.55 million in energy costs over the next 10 years.

"Lights out at night" policy

Cleaning crews are instructed to turn off lights at night upon completion of work on each floor/space.

Photocells or time clocks to operate outdoor lighting

All outdoor lighting is controlled by building automation systems, photocells, or time clocks to ensure they do not operate in adequate daylight hours. Some outdoor lighting around exits to buildings is required to be on 24 hours per local fire codes and others only operate at night or when needed.

Programmable thermostats and building automation control systems to operate air conditioning only when needed

Large facilities operate the air conditioning systems with a centralized building automation system and incorporate "nighttime setbacks" to save energy. Smaller facilities utilize programmable thermostats to accomplish the same energy savings.

Energy audit of County facilities

Investment-grade energy audits have been performed for county facilities that have taken part in an energy performance contract (Judicial Complex, Government Center and satellite courthouses, Public Safety Complex, Libraries, Detention Facilities, and Port Everglades). Walk-thru energy audits have been performed by Energy & Building Automation energy engineers and FPL has performed more than 100 Business Energy Evaluations for Broward County locations.

Implemented an energy tracking and management system

Through a central database, energy usage and cost is tracked and reported for more than 800 separate electric utility accounts. Anyone with access to the bc-net can review the monthly bill amounts and graphs tracking usage/cost at <http://bc-net/energy/welcome.htm>

Participate in EPA's Green Lights and Energy Star programs

As partner with the U.S. EPA and the U.S. Department of Energy in the Energy Star Buildings program, Broward County garnered the 1999 Government Partner of the Year award. Broward County was one of 14 organizations chosen by U.S. EPA for its success in global climate protection through the voluntary installation of energy-efficient technologies in its buildings. The first ENERGY STAR label for a public facility in Florida was awarded to Broward County's North Regional Courthouse in January 2000 and the Governmental Center Annex subsequently earned the label in 2002.

Leadership in Energy & Environmental Design (LEED) certified buildings

The South Regional Library was the first LEED-NC certified building in Broward County. Numerous other buildings are in the LEED-NC process, including the Pompano Beach Library, the Environmental Protection and Growth Management Department's Environmental Laboratory, the Edgar Mills Multi-Purpose Health Center, and the Children's Reading Center in Deerfield Beach. In addition, the South Regional Courthouse is in the process of being certified under the LEED-EB standard.

Encourage/Sponsor County staff to become LEED Accredited Professionals

Broward County joined the U.S. Green Building Council in September of 2002 and sponsored the 1st LEED workshop in South Florida in March, 2003 at the Broward County Convention Center. Currently, more than 10 employees are LEED accredited professionals in the County, including staff within Energy & Building Automation, Construction Management, Facilities Maintenance, and Port Everglades.

Ozone Protection Policy: phase out hydrochlorofluorocarbon and hydrofluorocarbon refrigerants

The Facilities Maintenance Division, in conjunction with its current project to obtain LEED-EB certification at the South Regional Courthouse, is also in the process of developing an Ozone Protection Policy to control the use of ozone-depleting substances in all county facilities. The primary focus of this policy will be to follow best management practices to reduce refrigerant emissions to less than 3% of charge per year and to phase out and replace refrigeration equipment that uses chlorofluorocarbon (CFC) and hydrochlorofluorocarbon (HCFC) type refrigerants. Chemical manufacturers will not be allowed to produce these types of refrigerants beyond 2030. This action will also coincide with new developing technology as industry catches up with producing equipment that uses alternative hydrofluorocarbon (HFC) refrigerants that are considered "greener" than either CFCs or HCFCs. The County currently uses approximately 29,100 pounds of refrigerants in its HVAC equipment. By controlling the use of these refrigerants and ultimately eliminating the use of CFC/HCFC type refrigerants, the risk of inadvertently releasing these harmful gases in to the atmosphere will be reduced.



Actions in the Vehicle Fleet Category

New Rental Car Center

The Rental Car Center (RCC) at Fort-Lauderdale International Airport (FLL) was opened on January 27, 2005. The total cost of the project was \$247 million. The RCC is a nine story building designed to bring together, under one roof, nearly all the firms providing rental cars at FLL and to provide 5 levels of additional public parking for airport customers. It consolidates ten rental car companies that write 95% of the rental agreements on the Airport in one easy to find location. Before the RCC, there were several return lots scattered around, both on and off the airport. Due to the consolidation of the rental car agencies at the RCC, the common shuttle busses operated by the Aviation Department have eliminated nearly four million miles of bus trips in and around the airport each year, reduced road congestion in the terminal area, and conserved three million gallons of fuel. Hybrid diesel-electric busses used by Shuttleport further reduce fuel consumption and emissions. Consolidation of the car rental companies into the new RCC complex also serves to reduce potential impacts to the environment. Historically, petroleum related impacts to the soil and groundwater at airports from leaking fueling facilities or maintenance activities represent a significant source of environmental degradation and liability. As each car rental company duplicates these activities at various sites across most airports, the potential for impacts is great over time. The RCC consolidated the facilities required for maintenance and fueling operations into one state-of-the-art, self-contained, indoor complex which is managed and maintained by an independent professional fueling contractor. By taking the process inside and ensuring that the systems are managed and maintained, the potential for impacts to the underlying soil and groundwater, surface water bodies and surrounding wetlands is greatly reduced.

FLL's Pay-On-Foot Program

To improve customer service, reduce delays, and to minimize infrastructure and toll booth staffing needs, FLL initiated electronic parking payment programs in the summer of 2006. With Pay-On-Foot (POF) programs, drivers receive a ticket upon entering the parking facility. Upon leaving the facility, drivers can utilize machines conveniently located in the terminal exit areas or parking garages to pay their fees prior to exiting. The machines typically allot thirty minutes of additional time so that users have ample time to exit the parking facility. POF machines are currently located on each level of the Cypress parking garage and in the elevator vestibules of the Hibiscus Garage, including near the pedestrian bridge to Terminal 1. FLL is also working with SunPass to see if these devices can be integrated to register parking fees and yield a combined bill for toll road and parking charges. POF and automated parking payment programs will improve air quality by improving traffic flow and reducing congestion.

Cell phone lot

In warm-weather climates like Fort Lauderdale, private motorists and commercial fleets can reduce pollution and save money by turning off their engines when they plan to remain idle for thirty seconds or more. Post 9-11 security requirements have limited the incidence of long-term idling at airport curbsides. Vehicles idling on highway shoulders do, however, contribute to airport emissions and can pose a traffic hazard. To address this problem, FLL opened a cell phone lot in the fall of 2006. This lot accommodates up to 70 vehicles and is located alongside the parking garage under the airport's access roadway system. Monitors

provide timely information on flight arrivals. Since this facility opened, FLL has prohibited shoulder idling and idling in the cell phone lot.

Bus and taxi holding lot

In August 2006 FLL implemented a new program to reduce the queuing of ShuttlePort operated biodiesel and hybrid- electric buses at the General Transit Areas (GTAs). To minimize vehicle congestion and idling under this program, a ShuttlePort holding area was established at the former Dollar Rent-a-Car ready return area. During slower periods, the supervisor directs buses to this area where, weather permitting, drivers turn-off their buses until they are dispatched back into operation. Typically, three buses stage in the Dollar lot during slower periods. The idling of commercial buses and shuttles is also prohibited by the General Transit Administrators that monitor these passenger loading areas. Similarly, FLL maintains a remote taxi holding lot east of Taylor Road. Taxis remain in this facility until they are requested and dispatched to the terminal areas. This minimizes empty circuitous miles, and decreases emissions and congestion caused by taxis trolling for fares.

Biodiesel and Hybrid Electric shuttles at FLL

Through a management agreement with BCAD, Shuttleport operates one of the largest Biodiesel and Hybrid-Electric bus fleets in the nation at FLL. This fleet includes 56 Biodiesel vehicles, 3 Biodiesel Trams and 5 Hybrid-Electric Vehicles which are used to transport airport passengers to and from the terminals, parking garages and rental car center facility. The use of the alternative fuels by Shuttleport is mandated through the management agreement by BCAD. This action results in improved emissions and the decrease in dependency on traditionally high GHG emitting fuel sources.

Transit Oriented Concurrency

On April 26, 2005, the County Commission adopted Transit Oriented Concurrency (TOC), including a County Transit Program (CTP) and a Resolution adopting detailed provisions in the Administrative Code. Previously, concurrency assessments that were charged to developers were used to offset costs for road and intersection improvements when traffic congestion was increased as a result of the developer's project. Under the new ordinance, the developers concurrency fees will be used to make transit improvements, and by doing so, will help relieve traffic congestion. Transit infrastructure, community bus, neighborhood transit centers and route improvements have been implemented using Concurrency assessments, and include:

- New routes and route enhancements;
- Other transit related capital improvements;
- Bus stop upgrades (increased accessibility, benches, shelters, etc.);
- Neighborhood Transit Centers;
- Pedestrian improvements linked to transit routes; and
- Expansion of community bus service in partnership with municipalities in Broward County (additional routes and buses).

Reductions from individuals riding transit

A study conducted for the American Public Transportation Association with funding provided through the Transit Cooperative Research Program on "Public Transportation's Contribution to U.S. Greenhouse Gas Reduction" found that one of the most significant actions that household members can take to reduce their carbon footprint is to use public transportation where it is available. According to the June 2007 report by Science Applications International Corporation, the annual use of an automobile driven an average of

12,000 miles per year and with an average fuel efficiency of 22.9 miles per gallon (MPG) consumption emits 4.6 metric tonnes of CO₂ per year (one metric ton is equivalent to 2,205 pounds). Households that have a sport utility vehicle or light duty truck drive an average of 14,500 miles per year with an average MPG of 16.2 emit 7.9 metric tonnes per year. The carbon footprint of a typical U.S. household is about 22 metric tonnes per year. Reducing the daily use of one low occupancy vehicle and using public transit can reduce a household's carbon footprint between 25-30%. A solo commuter switching his or her commute to existing public transportation in a single day can reduce their CO₂ emissions by 20 pounds or more than 4,800 pounds in a year. A BCT Ridership survey found that approximately 80% of BCT riders did not have a vehicle. Assuming 20% of the annual passenger trips were from choice riders (those who opted for mass transit vs. using their cars), significant reductions in GHG emissions can be assumed. With additional funding of mass transit for increased service levels and frequencies of service, the increasing costs of owning a car, and additional marketing of transit, those GHG reductions will increase through 2015.

Partner with 22 cities for community bus services

The County provides capital and operating assistance to 22 municipalities, and technical staff support and assistance (including training, scheduling, printing of bus route timetables, bus stop signs, etc.) to provide Community Bus Service. Community bus vehicles are wheelchair accessible and their smaller size enables vehicles to provide better access to city neighborhoods than larger traditional buses. The participating cities are Coconut Creek, Cooper City, Coral Springs, Dania Beach, Davie, Deerfield Beach, Fort Lauderdale, Hallandale Beach, Hillsboro Beach, Lauderdale-By-The-Sea, Lauderdale Lakes, Lauderhill, Lighthouse Point, Margate, Miramar, North Lauderdale, Oakland Park, Pembroke Pines, Plantation, Pompano Beach, Tamarac, and Wilton Manors. The increased city participation in the community bus service means shorter neighborhood trips, better connections to neighboring cities and increased connections to traditional fixed bus routes. The Community Bus program began in 1991 with Cooper City operating the first bus. The number of partnering community bus cities has grown in the past 10 years from 8 participating municipalities to 22 due to additional funding contributions by the County. Funding sources included the addition of two cent gas tax increases levied for mass transit improvements in 2000 and 2001, as well as increased general funding and funding from transit concurrency impact fees. Annual ridership on Community Bus has increased significantly since 1997, from 504,858 to 2,396,195 annual passengers - (374% or an average of 37.4% annually). Many of the community bus routes cater to the needs of senior citizens and include destinations such as senior centers, medical facilities, and shopping centers. The routes also provide connections to BCT's fixed route service. Community bus routes typically provide hourly service while some communities provide service at intervals between 10- and 45-minutes. The span of service for Community Bus is typically between an 8- or 12-hour day from 6:00 a.m. through 1:30 a.m. Although the emissions were not quantifiable because this service is contracted, there are emission reduction benefits associated with residents using community buses instead of driving single-passenger vehicles.

Bus replacement program: purchase of 12 new hybrid buses

A total of 12 hybrid-diesel/electric buses have been ordered and are expected to be delivered by June 2008. The newer technology hybrid buses should get approximately 20% to 30% better fuel economy and will be much quieter than conventional buses. BCT's current 40 ft. diesel buses average 3.5 miles per gallon fuel economy. In addition to the fuel efficiencies from the newer hybrid technology buses, they also have a much better effect on our environment; specifically air quality, as they are cleaner and emit 50% to 70% less hazardous air pollutants (particulate matter), less greenhouse gases, and less ozone (smog) forming pollutants. According to the manufacturers, hybrid-electrics also require less maintenance. This is because they operate more cleanly utilizing regenerative braking power, whereby the energy used in operating the brakes is recycled. As a result, the engine and brake life increase substantially. Staff is in the process of seeking additional grant resources to fund the incremental cost of replacing buses.

Provide Paratransit transportation services

Broward County provides specialized paratransit transportation within Broward County and into adjacent counties, in compliance with the Americans with Disabilities Act. The County began operating paratransit services in 1972 and has contracted them out since 1983. The Paratransit Services section of BCT is responsible for administering all contracts for paratransit services provided by multiple transportation providers who all operate by equal standards and are known to the rider as TOPS or Transportation Options. The current contracts provide assisted door-to-door transportation for persons who, due to age, disability, or socioeconomic disadvantage, are unable to use public or private transportation. Innovative features such as enhanced service standards responsive to customer input, and partnering with other local community agencies have resulted in an award-winning paratransit service. TOPS currently operates 301 paratransit vehicles and provides approximately over 800,000 trips annually.

Electric lifts and Gem Cars

Port Everglades operates 25 electric forklifts indoors. The use of electric forklifts results in a economy of 240 gallons of propane per year per lift, for a total of 6,000 gallons of propane gas.

Seven electric Gantry Cranes in Southport

Port Everglades operates seven electric gantry cranes in Southport. These cranes weigh 1500 tons and stand over 151 feet when fully assembled. Each crane costs approximately \$10,000,000.

Electric scissor lifts

Port Everglades operates eight small electric scissor lifts. The scissor lifts are used outdoors and indoors. Because of the indoor operation, the Port purchased electric lifts. The use of electric lifts results in a economy of 360 gallons a year per lift, for a total of 2,880 gallons of diesel gasoline.

Restrict idling of county vehicles

Fleet Services Division has had success with idle limiters on medium and heavy equipment vehicles within solid waste operations. The computer program that allows for the idle limitation is a standard feature for certain vehicles and it is programmed by Fleet Services technicians or the dealership.



Actions in the Street Lighting Category

Install energy-efficient street lights (e.g. high pressure sodium)

Street lights are generally the responsibility of cities. Broward County is responsible for unincorporated areas and pays FPL for the street light service (including operating and maintenance costs). The street lights within Broward County control are energy-efficient high pressure sodium.



Actions in the Water/Sewage Category

Port Everglades water conservation

In May 2007, at the height of water shortage restrictions for South Florida, Port customers were asked to achieve a measurable level of water reduction over a six-week time frame by aggressively cutting back their consumption. The result was a 2 million gallons reduction (in the 6-week timeframe).

Recover fuel value of digester off gas

The operation of North Regional Wastewater Treatment Plant's (NRWWTP) anaerobic digesters generates about 285 million cubic feet per year of off gas. To improve this digestion process, the digester sludge is heated utilizing propane fired boilers. This project replaces the propane used in the boilers with digester off gas at a rate of 57 million cubic feet per year (about 20% of the total off gas generated), which results in a fuel savings of 11.135 million kWh per year. This savings has been realized with an estimated project capital cost of \$700,000.



Actions in the Waste Category

Operate household hazardous waste program to safely recycle or dispose of potentially hazardous materials

The countywide household hazardous waste (HHW) program was initiated in 1991 and has grown from an annual event to weekly service at three sites and periodic "remote" events in communities that are not close to the three sites. In recent years, the HHW program has exhibited continued growth, more users and more tons. Nearly 80% of all materials are recycled (especially latex paints) or utilized as industrial boiler fuels. Over the last few years, the HHW contract costs were \$0.90/lbs (which is comparable to other major programs on a national level).

Collect, recycle or safely dispose of end-of-life electronics (e-waste) such as old computers, telephones, etc.

The countywide electronics recycling program was established in 2002 as a proactive measure to remove heavy metals (especially lead in televisions and computer monitors) from the waste stream. The program is run in conjunction with the HHW program events coupled with certain special collection events co-sponsored by retail outlets (such as Best Buy, Circuit City, Whole Foods, etc.). Services are extended to all residents, governmental agencies and small businesses, and the program has exhibited exceptional growth, handling nearly 1 million pounds in 2007 at a cost of \$0.46/ lb.

Recycling at Port Everglades

Port Everglades has recycling programs for employees and tenants. The Port's program includes paper, printer cartridges, batteries, steel, fluorescent lamps and paint. The sorting and separating facility, operated by an on-site tenant, historically has achieved recycling rates of 30% or greater of all processed materials.

Use recycled motor oil and coolants (antifreeze) in vehicles, and environmentally-friendly cleaning solvents and/or grease monkey water in garage operations

Fleet Services Division uses 9,000 gallons of recycled motor oil per year. Antifreeze is also recycled and a grease monkey system (water) is used for cleaning parts. Puradyn kits are installed in many vehicles, reducing the number of oil changes. These initiatives earned the Division an Emerald Award in 2001.

Incineration to convert solid waste to electricity thereby decreasing use of fossil fuels, reducing carbon dioxide generation per megawatt, and reducing the amount of material sent to landfills

In 1991 and 1992, two waste-to-energy plants began operation, annually converting over 1 million tons of solid waste into electricity. The plants generate over 134 megawatts annually, effectively powering 75,000 homes and reducing oil imports by 1.2 million barrels per year. Research indicates that electricity derived through these waste-to-energy plants produce 50% to 63 % less carbon dioxide emissions than fuel oil or coal-fired electrical generation. Average cost for solid waste disposal at the waste-to-energy plants is approximately \$62/ton.

Process residential recycling materials for Resource Recovery System communities

The Materials Recovery Facility (MRF) opened in 1993 and receives residential recyclables from most Broward County cities and commercial and institutional customers. The County manages residential MRF contract services for the unincorporated area and for Resource Recovery System (RRS) cities. RRS cities delivered an average of more than 68,500 tons of residential recyclables to the MRF during the review period with a processing cost of \$27/ton. Recycling eliminates the GHG emissions associated with raw materials extraction and reduces emissions from energy consumption during manufacturing processes.

Office Paper Waste Reduction Program/E-Government Initiatives

In September of 2000, the Environmental Protection and Growth Management Department (former Department of Planning and Environmental Protection) created an Office Paper Waste Reduction Team, which, among other accomplishments, created a paper waste reduction guideline, initiated the use of electronic letterhead, created an Office Paper Waste Reduction website, and integrated paper reduction

information into the New Hire Orientation for all new County employees. Countywide, additional paper reduction and e-government initiatives have taken place, including electronic Commission Meeting agendas and minutes, ensuring that many County-generated planning documents and reports are “born digital,” and electronic field inspections by regulatory agencies. A 2006 survey of Broward County employees found that 93.9% of respondents thought paper reduction was important and 65.5% were familiar with paper reduction techniques.



Actions in the Sustainability Category

Operate flares at county landfills consistent with Title V Clean Air Act provisions and reducing methane emissions

In 1993 and 1996, active landfill gas collection and control systems commenced operations at the Broward County Sanitary (Davie) Landfill and Broward Interim Contingency (BIC) Landfill, respectively. Methane (one of the primary components of landfill gas) is captured by the collection systems and incinerated through the associated flares. For the time period of 1997 through 2006, the average volume of methane incinerated per year from both landfills was approximately 44 million cubic feet which equates to over 9,400 tons of methane incinerated over the last 10 years.

Training and certification/recertification of Florida Master Gardeners of Broward County

Over 50 New Master Gardeners receive 96 hours of intensive classroom lectures, laboratory exercises and testing, 36 hours of informal lectures and hands-on demonstrations, and 75 hours of volunteer troubleshooting work with sustainable landscape and Integrated Pest Management under the direction of Horticultural Extension Programs. Over 130 Master Gardeners are recertified through 36 hours of intensive instruction concomitant with a minimum of 35 hours of volunteer troubleshooting work with sustainable landscape and Integrated Pest Management under the direction of Horticultural Extension Programs. Master Gardeners respond to over 10,000 residents annually, through calls made to Public Answer Hotline, walk-ins at the Extension Office and to inquiries received at Mastergardener@broward.org, promoting planting of native species, sustainable landscaping, water and soil conservation and Integrated Pest Management, thereby reducing water consumption, fertilizer and pesticide runoff by residents and their associations. At local, municipal and County environmental events and tree giveaways, Florida Master Gardeners of Broward County assist nearly 21,000 residents annually by presenting programs and distributing planting guides, UF-IFAS publications and BMP literature produced by Extension Agents and UF-IFAS scientists on sustainable landscaping, water/soil conservation and Integrated Pest Management.

Grass parking areas

Stabilized grass parking areas for lower frequency use areas, such as parks, museums, and performing arts venues reduce paved areas and increases green areas for absorption of carbon dioxide and oxygen generation.

Restrictive covenants on park lands

Restrictive Covenants are placed on current park land to prohibit future change in land use.

New trees planted in parks

New trees are planted in County Parks each year, contributing to the County's ability to sequester carbon.

Park land acres added

Through the 2000 Safe Park and Land Preservation Bond Program, 110 acres of park land have been added. These sites will not be used for commercial development, and will remain predominantly green.

Land Use Amendments and Development of Regional Impacts Review

Land Use Amendments are reviewed to determine if the change in land use designation will impact the air quality. There are two types of amendments: regular and small-scale. The regular amendments are processed two times per year. The small-scale amendments are submitted quarterly. The Broward County Planning Council is in charge of the approval process which includes collection of staff comments that include recommendations that encourage the use of transportation demand strategies and promote the implementation of transit and pedestrian oriented development, holding public hearings, review by the Department of Community Affairs and the South Florida Regional Planning Council, and comments from local agencies.

Land Preservation Bond Acquisition Program

Through the 2000 Safe Parks and Land Preservation Bond Program, the County has acquired nearly 1,000 acres of natural lands and open spaces to provide passive recreation areas while retaining representatives of Southeast Florida's unique natural communities. Many of the sites that were acquired were proposed for intense commercial or industrial development. By acquiring these sites, and the associated development rights, GHG emissions generated by vehicles that would have been driven to the sites, as well as those emissions associated with electric needs of the proposed building will be reduced. Additionally, the undeveloped lands will provide opportunities for "carbon sequestration," an important asset against climate change impacts.

NatureScape certification of Broward County facilities and parks

As a result of this program, landscapes at 85 Broward County facilities have been certified as NatureScapes. NatureScape certification reflects adherence of landscape design and maintenance practices to NatureScape Broward program principles, including integration of native and drought tolerant trees and plants, efficient landscape irrigation, plating for energy efficiency, and best management practices that reduce use of fertilizers and pesticides. Annual NatureScapes certifications: FY 2004: 55 FY 2005: 10 FY 2006: 10 FY 2007: 10 Total: 85

NatureScape certification community-wide

As a result of this program, 1,854 landscapes throughout Broward County have been certified as NatureScapes. These include backyards, schoolyards, workplaces, public properties, and homeowner communities. Annual NatureScapes certifications: Total 1,854
 2001: 238 2002: 75 2003: 145 2004: 340 2005: 403 2006: 286 2007: 367

NatureScape Irrigation Service

The Broward NatureScape Irrigation Service (NIS) was established in 2005, as an expanded water conservation service provided to local utilities, municipalities, and Broward County facilities. Modeled after Mobile Irrigation Labs throughout Florida, California, and Texas, the NIS is staffed by trained irrigation specialists who evaluate the design and performance of irrigation systems and recommend improvements based on these evaluations. The primary goal of an irrigation evaluation is to determine the capacity and efficiency of an irrigation system. Based on the site assessments, NIS operators are able to quantify current water consumption and estimate the water savings that would be possible by implementing operational or equipment modifications, many of which are often very simple and cost-effective. As a result of design and operation improvements resulting from NIS evaluations, substantial water savings have been achieved. Reductions in energy demands are achieved by: 1) minimizing irrigation pump operations where systems are supported by irrigation wells; and, 2) reducing the volume of potable water produced by water utilities where potable water is used as irrigation water. Annual Program Cost (paid via contract with cost share partners) - \$200,000.

	FY 2006	FY 2007
% Water Reduction:	28%	18%
# of gallons saved annually:	228 Million	87.4 Million
# of site evaluations:	202	236

Waste Tire Removal - donated berth space

In June 2007, Port Everglades Department donated berth space to assist a tire salvage and recycling pilot program, which when fully realized will clean up approximately 700,000 tires from the seafloor and turn them into energy.

Replanting Marinelli Garden at Port Everglades

Port Everglades Department Public Works staff renovated the Marinelli Garden area by clearing debris, replanting trees, adding shrubbery such as crotons, and repainting. The fountains, long defunct because they were difficult to maintain and wasted water, were converted to planters to attract butterflies and add color. New picnic tables, made from recycled materials, finished the project.

Increase use of synthetic oils/transmission fluid

Synthetic fuels are a new generation of near zero sulphur and aromatics transport fuels made from natural gas, coal, or biomass. GHG emissions associated with synthetic fuels produced from biomass can contribute to GHG reduction of up to 90%. As synthetic fuels can be used neat or blended in existing diesel engines, distribution and refueling infrastructure, they are the most cost effective solution to reducing petroleum dependency. Synthetic fuels can provide significant local air quality improvement by reducing tailpipe emissions (particulate matter, nitrogen oxides, carbon monoxide and hydrocarbons). The Office of Transportation is increasing the use of synthetic oils and transmission fluids as a result of newer bus engine requirements.



Actions in the Outreach & Educational Programs Category

Provide planting guides encouraging native species

Planting Guides formulated by Extension Agents to ensure "right native plant, right place" are distributed at Water Matters Day, Earth Day, County, municipal and local tree giveaway events.

Provide training to land managers to promote use of native plant species

Underexploited native species cultivation requirements are elucidated and best management practices (BMPs) are formulated by Extension Agents and taught to County, municipal, commercial and residential land managers in order to bring more native species into nursery trade and landscaping practice.

Respond to pest infestations and provide training on Integrated Pest Management

Commercial and Urban Horticulture Agents respond with federal and state authorities to major pest infestations, instructing commercial and residential communities on Integrated Pest Management without the use of high impact pesticides.

Provide Mobile Extension Offices in 26 cities

Mobile Extension Offices operated by Local Master Gardener Coordinators have opened in 26 Broward County cities to educate members of the public at condominiums and homeowners associations as well as local and municipal events regarding energy, water, and soil conservation, Integrated Pest Management, and Florida-Friendly sustainable landscaping.

Commercial and urban Horticulture Agents educational demonstrations

Commercial and Urban Horticulture Agents conduct educational demonstrations, plant clinics, and plenary seminars at trade shows, garden shows, re-development, home design and remodeling shows, economic development events, and other regional forums to promote sustainable landscaping, Integrated Pest Management, Hurricane Preparedness, and water and soil conservation.

Commercial Horticulture Program educates Green Industry and Pesticide Professionals for licensing
Commercial Horticulture Extension Program trains County, Municipal and private sector tree trimmers, landscapers and pesticide applicators in sustainable landscaping, proper tree planting, pruning and maintenance, fertilization and irrigation BMPs developed by the Program for Broward in collaboration with researchers from Environmental Horticulture Department of the University of Florida-IFAS, resulting in substantial water and soil conservation and significant decrease in fertilizer and pesticide runoff.

Trees distributed in the community

Staff from the Broward County Parks and Recreation, Extension Education Section coordinate participation by Master Gardeners at Tree Giveaway events.

University of Florida, Institute of Food and Agricultural Sciences Best Management Practices (BMPs)

University of Florida, Institute of Food and Agricultural Sciences researches, publishes and establishes BMPs for use by all irrigation managers on commercial and public properties, then disseminates results via Electronic Data Information Source and Extension Publications, websites, seminars and workshops.

University of Florida, Institute of Food and Agricultural Sciences (IFAS), Extension's new conservation technologies

University of Florida IFAS research scientists in the Department of Agricultural and Biological Engineering are creating new irrigation technologies, distributing them to Commercial Horticulture Extension Offices, who in turn train County, Municipal and Green Industry private sector professionals in their use, thereby saving significant amounts of water and fertilizer used in commercial and municipal irrigation programs.

Memberships/Partnerships: Southeast Air Coalition for Outreach (SEACO)

In 1998 SEACO was formed as an initiative of the Florida Department of Environmental Protection Southeast District Office and the local air quality programs. As a result, a partnership of public and private organizations was formed to improve air quality through public outreach within Palm Beach, Broward and Miami-Dade Counties. SEACO promotes outreach programs by exchanging ideas, pooling resources, producing joint educational documents, developing presentations and jointly participating in events and programs. The coalition recognizes the importance of air pollution public awareness and education, and firmly believes that if the three counties work together for this goal a greater number of people can be reached more effectively.

Memberships/Partnerships: Community Transportation Initiative

The Air Quality Division along with other Broward County agencies promotes alternative fuel and hybrid technology vehicles. Broward County promotes the use of environmentally beneficial alternative fuels and advance technology vehicles by managing more than 100 cars and trucks that run on fuels other than gasoline and diesel. Advance technology vehicles are vehicles with a range of nearly 60 miles per gallon of gasoline (MPG). These vehicles are available to environmentally conscious employees that are committed to preserving a healthy environment for county residents.

Memberships/Partnerships: Gold Coast Clean Cities Coalition

The Florida Gold Coast Clean Cities Coalition is a public/private advisory board composed of state legislators, local government representatives, federal and state agencies, and private sector representatives concerned with alternative fuel programs. The role of the Coalition is to provide a fuel neutral policy direction to maximize the use of vehicles operating on clean alternative fuels throughout the five county area. This area is composed of Broward, Martin, Miami-Dade, Monroe and Palm Beach counties. The Broward County Air Quality Division has been an active member of the Coalition since 1999 in promoting the benefits of the use of alternative fuels. In May 2004, Broward County co-sponsored and hosted the National Clean Cities Conference in Fort Lauderdale.

Car Care Month

Car Care Month takes place each April. This tri-county educational campaign in coordination with local air quality programs and community partners designed to increase awareness of Southeast Florida's air quality issues by educating the public on how regular car maintenance can save money, improve safety on our roads and reduce air pollution.

Clean Air Month

Clean Air Month takes place each May. This national campaign in collaboration with the U.S. EPA and local community partners to increase awareness of Broward County's air quality issues by promoting alternative modes of transportation and encouraging residents to take simple steps to help keep the air clean. As part of Clean Air Month, since 1999, Broward County has sponsored an annual Transportation Choices Day highlighting the alternatives to driving in single occupancy vehicles.

Air quality outreach to civic associations, publications, displays, educational materials, website

The air quality outreach program provides educational resources, workshops and presentations to schools, civic and professional organizations, the regulated community, and Broward County residents on issues related to climate change, alternative fuels, air pollution and health effects, air regulations, green buildings, and energy conservation.

Water Matters Programming and Workshops

The Water Matters Program is the County's umbrella water conservation and educational outreach campaign designed to produce long-term water demand reductions and improvements in water quality through the actions of individuals, businesses and government. The Water Matters Program has focused largely on community outreach and education; the delivery of formal training and certification of program volunteers and professionals; the establishment of partnerships with government, businesses, and schools; and the creation of water conservation demonstrations projects to serve as models within the community. Individual initiatives implemented as part of the Water Matters program include NatureScape Broward, Know the Flow, Water Matters Day, and the NatureScape Irrigation Service. Workshops delivered: FY06: 93 FY07: 191

NatureScape Broward Programming and Workshops

The goals of NatureScape Broward are to protect water quality and quantity, and create wildlife habitat through appropriate landscaping practices, the prudent use of water resources, and planting native, non-invasive, and drought tolerant plants in Broward County. It is estimated that 50% of household water use in Broward County is used outdoors for irrigation, and landscape runoff is identified as major source of surface water pollution. NatureScape Broward is designed to help residents, governmental leaders, businesses, and landscape professionals learn about, create, and maintain attractive, low maintenance, low impact, healthy landscapes that reflect and help protect Florida's natural resources. The benefits of this program to the County's climate change initiative include reduced nitrogen oxide production as a result of less Nitrogen-containing fertilizer applications, and reduced energy consumption associated with overall landscape maintenance and the providing of water for landscape irrigation. This is accomplished by encouraging minimal use of irrigation in the maintenance of turf grass in order to establish drought tolerance, the replacement of turf grass with drought tolerant trees and shrubs, and minimized use of fertilizers as part of landscape maintenance. Program goals are accomplished through the delivery of programs, the creation of NatureScape certified sites, and partnerships with municipalities. The annual cost of the program is \$100,000. Annual program delivery: 2006: 47 programs 2007: 79 programs

Know the Flow training to professional property managers

Know the Flow is a water management course presented monthly and geared towards property managers, municipal employees, homeowner associations, landscape service providers, and community groups. The Know the Flow program encourages participants to adopt environmentally-sound landscape practices and to implement BMPs relating to the maintenance of stormwater systems to help protect the County's water resources while maintaining essential drainage needs. BMP training includes education in NatureScape principles, planting for energy efficiency, efficient irrigation, and minimized use of pesticides and herbicides. The benefits of this program to the County's climate change initiative include reduced nitrogen oxides production as a result of fertilizer application, and reduced energy consumption associated with overall landscape maintenance and the providing of water for landscape irrigation. The annual cost of the program is \$70,000. Monthly participants/ Annual courses:

2004: 143 / 8 2005: 179 / 9 2006: 174 / 10 2007: 168 / 10

Water Matters Day tree and plant giveaways

Water Matters Day is an annual community outreach event that educates homeowners about the role they play in managing water resources in their homes, yards and communities and encourages greater environmental stewardship. The event is supported by a number of sponsors including various municipalities, drainage districts, and the South Florida Water Management District. Water Matters Day features several water related educational booths, giveaways, workshops and family entertainment to help residents understand the importance of protecting our water resources and learn how to maintain beautiful yet environmentally friendly yards, addressing issues such as proper irrigation, landscaping, fertilization, and integrated pest management. A major component of the Water Matters Day event is the Tree/Plant Giveaway. After visiting a minimum of 10 educational booths and learning about the proper planting and establishment of featured drought tolerant and other native trees/plants, residents can take home these same plants in order to initiate, or build upon, their own NatureScapes. It is estimated that an average tree can store 50 lbs of CO₂/year over lifetime. Replacement of sod with drought tolerant trees and plants reduces overall need for irrigation and lawn maintenance/mowing. Water Matters Day Tree/Plant Giveaway Annual Cost - \$35,000. Trees and plants distributed annually/total trees and plants:

2003: 600 / 600 2004: 2,500 / 2,500 2005: 1,815 / 3,645 2006: 407 / 2,800
2007: 3,114 / 3,958 Total = 8,536 / 13,503

Outreach efforts to encourage employees to use energy wisely

To increase awareness to County employees, Energy & Building Automation (E&BA) created a quarterly electronic newsletter. It is distributed to employees via the e-mail system and made available on BC-Net. E&BA works closely with the Office of Public Communications to ensure its latest achievements are promoted through the Countyline, Sun-E News, and press releases. E&BA also develops and distributes paycheck flyers to all county employees that include energy efficiency tips to encourage conservation. Through improvements and updates to the Energy & Building Automation Section Internet WebPages (www.broward.org/energy/welcome.htm), information regarding our programs and investments in new technologies reaches the entire world.

Waste and recycling services public education and outreach

Broward County's Waste and Recycling Services offers a wide range of free public education programs that explore how residential garbage is disposed of in Broward County and why it is so important to dispose of it properly. Cooperative educational ventures have been developed with local cultural institutions: the Museum

of Discovery & Science and Young At Art Children's Museum. These institutions house permanent interactive exhibitions that educate school children and families about the importance of recycling (including proper disposal of household hazardous waste), as well as explaining in a "fun way" Broward County's environmentally-friendly waste-to-energy and landfill operations. Advertisements distributed through media outlets promote the importance of recycling and educate residents about Broward County's environmentally-friendly waste disposal system. Presentations throughout the year to schools and community groups reinforce these messages. Events, presentations and advertisements promoting "Earth Month" (April) and "America Recycles Day" (November) encourage "earth-friendly" activities and give residents opportunities to make a direct impact by providing them with information on how to participate in curbside recycling and special electronics/household hazardous waste drop-off events. Since these efforts began, the Division has noted a 45 percent increase in residential participation for household hazardous waste (FY02-FY07) and 919,000 lbs. of used electronics were collected in FY07 (28 percent increase over FY06).



Actions in the Green Procurement/Green IT Category

Purchase only ENERGY STAR equipment and appliances and incorporate such language in County's Administrative Code

From Broward County Administrative Code (Procurement Section): 21.24. Energy Efficient Policy. The Purchasing Division will, at intervals, revise purchasing and procurement documents and specifications to assure that, when cost effective and consistent with operational needs, equipment purchased will be energy efficient. Energy efficient is defined as meeting Energy Star specifications or criteria that place products such as appliances, equipment and components in the upper 25% of energy efficiency, as well as meeting quality performance and durability requirements. The Energy Management Section of the Office of General Services will assist in implementing and monitoring compliance with this section of the Code.

Utilize environmentally friendly cleaning solvents and paints

99% of paint used by Facilities Maintenance Division meets environmentally-friendly "green" standards. Upon renewal of cleaning contracts, environmentally-friendly products will be required.

Install new carpet that is certified "green"

Facilities Maintenance Division implements a program to install "green"certified carpet in facilities.



Actions in the "Other" Category

Eliminate aerosol spray cans at Fleet Services

Fleet Services eliminated the use of aerosol spray cans for maintenance including brake fluid. Liquids are now filled and sprayed using compressed air.

Utilize retread tires

Fleet Services uses retread tires when applicable. Retreads require 6 gallons less oil than a new tire.