



City of Doral

GREEN MASTER PLAN

Green Design for a Sustainable Future





ACKNOWLEDGEMENTS

CITY OF DORAL

8300 NW 53rd Street, Suite 100
Doral, Florida 33166
(305) 593-6725
www.cityofdoral.com

City Council

Mayor Juan Carlos Bermudez
Vice Mayor Pete Cabrera
Councilman Mike DiPietro
Councilwoman Sandra M. Ruiz
Councilman Robert Van Name

City Manager

Yvonne Soler-McKinley

Planning & Zoning Director

Nathan Kogon

ILER PLANNING GROUP

11000 Prosperity Farms Road,
Suite 206
Palm Beach Gardens, Florida
33410
(800) 626-7067
www.ipgplan.com

Principal in Charge

Henry B. Iler, AICP

Senior Planner

Jennifer Gomez

Marketing Manager

Zach Graeve

CARBON NEUTRAL PLANNING

Iler Planning Group offsets the company's CO₂ emissions and was the first Florida urban planning firm to become carbon neutral. IPG is a leader in the development of "green" planning initiatives and environmentally sustainable municipal regulations.

All CO₂ emissions stemming from IPG during the development of this Master Plan have been offset with CarbonFund.

This document was printed on 100% recycled paper.





Table of Contents

Introduction	2
Global Warming	3
Local Impact	4
Regional and State Sustainability	5
Cost Savings	6
Financial Incentives	7
Doral's Best Practices	8
Guiding Green Principles	10
Vehicle Travel	11
Landscape and Open Space	13
Energy Efficiency Standards	15
Alternative Urban Energy Sources	17
Interconnect The City's Places	19
Water	21
Reuse & Recycle	23
City Agriculture	25
Carbon Neutral City Government	27
Education and Outreach	29
Getting it Done	31
Additional Resources	39





Guiding Green Principles

- Reduce vehicle travel miles
- Strengthen landscape and open space standards
- Create strong energy efficiency standards
- Incentivize alternative urban energy sources
- Interconnect the City's places
- Conserve water
- Reuse and recycle
- Bring back community agriculture
- Strive to be a "carbon-neutral" City government
- Initiate education and outreach



The goal of the Green Plan is to conserve natural resources, enhance quality of life, bolster economic vitality, and leave a sustainable legacy to future generations of City residents.



Preparing for a future with limited resources is one of the most important planning challenges that decision makers face. Confronted with this challenge, the City of Doral realized the necessity to plan for a sustainable future. The City has signed the U.S. Mayors' Climate Protection Agreement and has developed this Green Master Plan to guide operations and growth in an environmentally responsible manner. This far reaching approach builds on the City's previous environmental efforts with the goal to conserve natural resources, enhance quality of life, bolster economic vitality, and leave a sustainable legacy to future generations of City residents.

The challenges of finite environmental resources, water shortages, dependency on foreign oil, and the eminent threat of climate change face the City in the years ahead. Fortunately the actions necessary to combat these problems will yield economic and environmental gains such as cost savings from the efficient use of resources, healthier and more productive employees and residents, and an attractive community image. Thus, Doral has launched its sustainability initiative, which includes recommendations in the following areas:

- Vehicle travel
- Landscape and open space standards
- Energy efficiency standards
- Alternative urban energy sources
- Interconnectivity of the City's places
- Water
- Reuse & recycle
- City agriculture
- Carbon neutral city government
- Education and outreach

The plan has been organized into Ten Guiding Principles, each intended make the City a model green community. Each guiding principle is to be implemented through "action items" which can be applied through the City's policies, programs and operations. These recommendations are intended to ensure that sustainable principles are integrated into the City's urban development and governmental operations.

The Green Plan presents strategies that will help Doral grow and operate in a manner that preserves the environment, shapes the urban form, and increases the quality of life for current and future residents of Doral. Maintaining and improving the environment is paramount to Doral's vitality and this plan represents the next step in creating a sustainable urban community.



Reasons for Green

- Degraded natural resources
- Climate change
- Rising ocean levels
- More/stronger hurricanes
- Florida's economy
- High energy prices
- Water shortages
- Foreign oil dependence

Benefits to Green Planning

- “Attractive” community image
- Good urban planning principles
- Carbon reduction
- Economic savings
- Smart use of resources
- Environmental enhancement
- Improved employee health
- Greater productivity
- Less dependence on foreign oil

“Florida is more vulnerable to rising ocean levels and violent weather than any other state.”

- Governor Charlie Crist



Why Plan Green?

Population growth and geometric increases in automobile usage have led to the rapid consumption of natural resources in the region. Land development codes have often precipitated the over consumption of raw land by mandating excessive parking, wide streets and sprawling single use, large-lot developments with little consideration given to connectivity.

As growth remains necessary, even amidst decreased availability of land and natural resources, the flourishing combination of urban planning and environmental sustainability has become both welcome and inevitable. Green planning strategies combine thoughtful and deliberate urban planning principles with sound environmental design in a way that reduces consumption of natural resources, decreases the dependency of foreign oil, slashes energy costs and decreases pollution.

Rising temperatures are of particular concern to south Florida, as climate change could result in changes in rainfall and weather patterns, increased hurricane activity, changes in disease and pest distribution, and changes in the sea level. The primary concern for south Florida is the threat of sea level rise. While Doral is not a coastal community, the economic impacts will be felt throughout Florida if left unabated. South Florida's economic future is in jeopardy if there are significant losses in agriculture, fisheries and tourism.

While there remains some disagreement surrounding global warming, the strategies used to combat climate change have other important benefits. For example, constructing energy efficient buildings, maximizing green space and reducing vehicle miles traveled will also increase air and water quality. In addition, the natural environment in south Florida requires careful conservation as sustained population growth in the region is dependent upon the availability of natural resources.



Example Policies

State of Florida

- Executive Order 07-126 requires the State to lead by example.
- Executive Order 07-127 establishes reduction targets for greenhouse gas emissions.
- Executive Order 07-128 establishes the Florida Governor's Action Team on Energy and Climate Change.
- The Florida Energy Bill H.B. 7135 is the comprehensive energy bill.
- H.B. 697 revises the Florida Energy Code for Development. This legislation incorporates consideration of greenhouse gases and energy efficiency into local comprehensive plans by amending Section 163.3177.
- The Green Resources for Energy Efficient Neighborhoods Bill (H.R. 6078) is introduced.

Miami-Dade County

- Resolution 559-06 supports the development of plug-in hybrid electric vehicles.
- Resolution 1200-05 declares sustainable building measures for County buildings.
- Ordinance 05-115 creates an expedited permit review for green buildings.
- Ordinance 05-91 creates tax incentives for "solar jobs" and business building green.

State Policy

Governor Crist has made a commitment to "serve to preserve" declaring environmental protection as a top priority and signing numerous executive orders and international agreements aimed at making Florida a leader in state-wide policy efforts to reduce climate change. The orders will guide Florida to reduce greenhouse gases, increase energy efficiency and pursue more renewable and alternative energy sources, such as solar and wind technologies, ethanol and hydrogen and set greenhouse gas reduction goals.



County Policy

Miami-Dade is early leader for addressing climate change. Miami-Dade has participated in the ICLEI Pilot for Climate Resilient Communities and created a Climate Change Advisory Task Force (CCATF). Miami-Dade was one of the first jurisdictions to adopt a greenhouse gas reduction plan and to calculate its emissions, in order to measure the success of their programs. Miami-Dade has additionally joined the Chicago Climate Exchange (CCX), which was launched in 2003 and is the world's first and North America's only active voluntary, legally binding integrated trading system to reduce emissions of all six major greenhouse gases.

In April of 2008, the County's Climate Change Advisory Task Force recommended that the County partner with municipalities and begin the creation of an intergovernmental, learning network that allows members to work with each other and the County on adaptation/mitigation issues. The Climate Change Panel suggests that a partnership of the County and the municipalities will improve efficiency, conserve resources, reduce duplication of effort, and create synergies that will lead to better opportunities and outcomes than would otherwise be possible.





POTENTIAL SAVINGS FOR DORAL

- According to the U.S. Environmental Protection Agency (EPA), tenants can save about 50 cents per square foot each year by cutting energy use by 30%. This can represent a savings of \$50,000 or more over five years per every 20,000 square feet of building space. This could mean a savings of up to \$109,350/year for Doral's 43,740 square feet of municipal building area.

COST/BENEFITS RESOURCES

- **The Costs and Benefits of Green Buildings**
www.cap-e.com/ewebeditpro/items/O59F3481.pdf
- **Green Roofs - A Municipal Action Guide**
www.nlc.org/ASSETS/D6F7DF268E3848B8880BDEB7A8CBADC4/06_MunAcGuide_Greenroofs.pdf

Costs and benefits of green investments

One of the largest challenges decision makers face when determining whether to invest in green improvements, is evaluating the costs and benefits of green building. On a general level, it remains difficult to evaluate the true cost and benefit of green building. However, the studies continuously estimate long-term cost savings. One of the most frequently cited cost/benefit studies on green building was published by Gregory Kats in 2003. The study showed that although there was a premium on sustainable construction, the the long term benefits of green building far outweigh the up-front cost.

Figure 3
Financial Benefits of Green Buildings
Summary of Findings (per ft²)

Category	20-year Net Present Value
Energy Savings	\$5.80
Emissions Savings	\$1.20
Water Savings	\$0.50
Operations and Maintenance Savings	\$8.50
Productivity and Health Benefits	\$36.90 to \$55.30
Subtotal	\$52.90 to \$71.30
Average Extra Cost of Building Green	(-3.00 to -\$5.00)
Total 20-year Net Benefit	\$50 to \$65

Source: Capital E Analysis

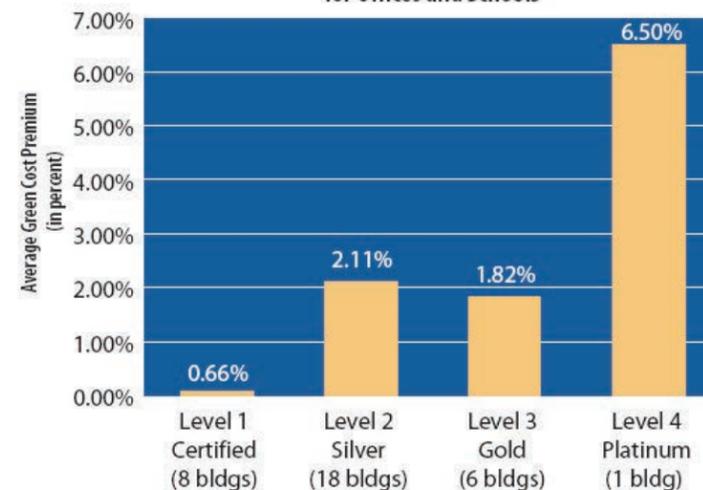
The long-term benefits have come to be widely accepted. In 2004, Turner Construction commissioned a Market Barometer study to gauge the perception that real estate executives had about the costs and benefits of green buildings. The results of that study were dramatic and showed many perceived benefits including:

- Increased health and well-being of occupants (91%)
- Increased building value (84%)
- Increased worker productivity (83%)
- Increased return on investment (74%)
- Increased rents (63%) and occupancy rates (61%)
- Increased sales in retail (41%)

Despite the many perceived benefits, the study also showed that 63% of respondents felt that the lack of awareness of green building was a factor discouraging green building.

In the past years as green building has become more widespread, many architectural and developments teams are gaining the experience necessary to report little to no to no extra costs. Developers are frequently making common sense improvements that add little up-front costs.

Figure 1
Average Green Cost Premium vs. Level of Green Certification
for Offices and Schools



Source: USGBC, Capital E Analysis





Financial Incentives

- Congress is currently deliberating over funding for the Energy Efficiency & Conservation Block Grant (EECBG) to fund green initiatives. If approved, there will be a \$2 billion annual appropriation, 68% of which will go to cities & counties (\$1.36 billion). www.usmayors.org/climateprotection/documents/eebghandout.pdf
- Department of Energy - Renewable Energy Loan for alternative energy projects www.energy.gov/news/6377.htm
- Florida Renewable Energy Technologies and Energy Efficiency Act - partial reimbursements for new solar energy systems. Funding for FY 2008-2009 is exhausted, but applications are still being accepted and placed on a waiting list until funding is approved. www.dep.state.fl.us/energy/energyact/solar.htm
- Florida Green Building Loan Pool - Low cost financing to assist non-profit developers build green certified affordable housing, supportive housing, and community facilities. www.fclf.org/recentNews.cfm?newID=229
- Florida Incentives for Renewables and Efficiency www.dsireusa.org/library/includes/map2.cfm?CurrentPageID=1&State=FL&RE=1&EE=1
- Federal Incentives for Renewables and Efficiency www.dsireusa.org/library/includes/genericfederal.cfm?CurrentPageID=1&state=us&ee=1&re=1
- SFWMD- Alternative water funding https://my.sfwmd.gov/portal/page?_pageid=1874,4164635,1874_13062096&dad=portal&schema=PORTAL
- SFWMD - WaterSIP funding for water saving technologies https://my.sfwmd.gov/pls/portal/docs/PAGE/Common/PDF/SPLASH/WATER_SIP.PDF

- University of Florida IFAS Extension - Low cost rain barrels http://miami-dade.ifas.ufl.edu/environment/natural_resources.shtml
- University of Florida IFAS Extension "Florida Yard Recognition Program." http://miami-dade.ifas.ufl.edu/environment/natural_resources.shtml
- Miami Dade - rebates for water saving technologies www.miamidade.gov/conservation/homeowner.asp



Financial Incentives

As the emerging green building movement progresses, new funding streams continue to become available for green initiatives. The federal and state governments, as well as many local agencies, offer financial incentives to encourage "green" upgrades. Cities with significant environmental achievements are more competitive when seeking grants of all nature. In addition, projects with green components become eligible for previously untapped funding sources.





On the Right Track...

Doral is gaining recognition as one of the most visionary and vibrant communities in south Florida. It was recently ranked by CNN Money 51st on a list of the top 100 cities with the best mix of business advantages and lifestyle appeal. Citing low taxes and surrounding scenic beauty, U.S. News and World Report chose City of Doral as one of the 10 best places to retire in the United States. Sustaining a high quality of life is already part of the City's goal and therefore sustainability practices have naturally been incorporated in the City's every day operations.

Land Development

The City is equipped with a new Comprehensive Plan and Land Development Code that capture the latest planning innovations such as mixed use and high quality development standards. The City, always known for a thriving office and light industrial market, now also has a rapidly expanding residential sector. In response to the growing population and need to reduce vehicle trips, the Future Land Use Map converted significant areas of industrial property to mixed use in and around the downtown core. Studies show up to 15% reductions in VMT associated with mixed-use projects. With these land uses in place, Doral already has a land use foundation fertile for sustainable development.

The Urban Forest

Doral's Landscape Code requires extensive interior landscaping and promotes sustainable landscaping techniques such as Xeriscape, drought-tolerant landscape species, grouping of plant material in hydrozones, and the use of water conserving irrigation systems.

The City has increased the Level of Service for park space from the existing required 2.75 square feet per resident to 4.25 square feet by 2015. This will mean that the City will have a total of 252 acres of park space by 2015.

Doral's ongoing commitment to the urban forest has been recognized by the Arbor Day Foundation and the City has been given the honorable distinction as a "Tree City USA"

Solid Waste

According to the Miami-Dade Office of Strategic Business Management (OSBM), the Resource Recovery Facility located within Doral is one of the largest and most technologically sophisticated waste-to-energy facility in the world, capable of processing more than 1.2 million tons of trash and garbage annually. The Facility has a Recyclable Trash Improvement (RTI) plant on site, where clean wood trash is shredded to produce a clean burning biomass fuel, the largest single component of the County's Department of Solid Waste Management's recycling program. The plant produces an estimated 178,000 tons of biomass fuel per year, which is then transferred and used by energy plants in central Florida.



TREE CITY USA

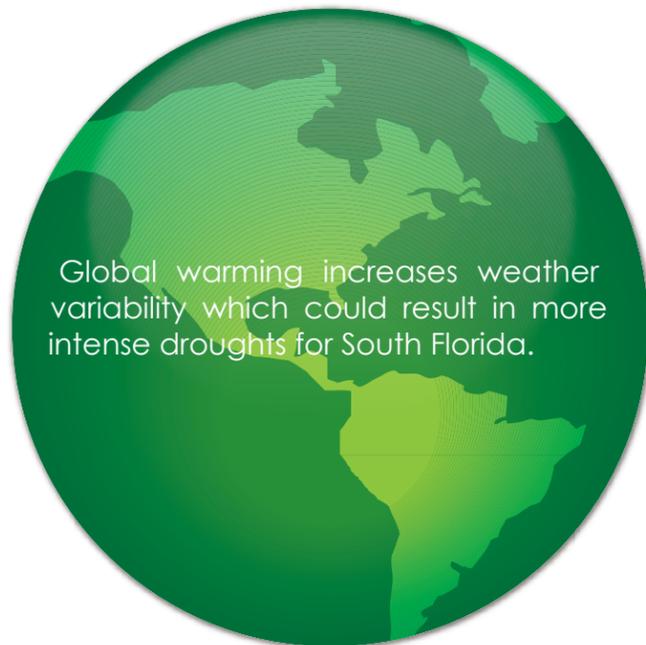




Getting it Done...

The Green Plan will build from the carbon reducing initiatives the City has already begun. Recognizing the business case behind green improvements, the City, businesses and residents are expected to see demonstrable life-cycle economic savings from efficiencies in energy, lighting, water and materials, increased employee productivity and health, and reductions of waste going into landfills.

This plan is only the first step. As Doral and other communities successfully incorporate green policies that demonstrate economic and environmental benefits, new opportunities will present themselves. With these recommendations, the City of Doral is empowered with practical solutions to reduce the City's carbon footprint, save real dollars and strengthen the City's natural environment for current and future generations.



Global warming increases weather variability which could result in more intense droughts for South Florida.

“I applaud cities for embracing policies and programs that help preserve our natural resources and our environment. Doral is proud to be a leader in this effort in Miami-Dade County. We are making every effort to sustain and improve our environment through a combination of green initiatives that we feel will improve and maintain the quality of the lives of our residents.”

- Mayor Juan Carlos Bermudez

Transportation

Miami-Dade County Transportation provides service to Doral but does not service inner Doral. In response, Doral recently initiated a pilot Trolley program to transport Doral's residents throughout the City. The trolley services all Doral area public schools (with the exception of Doral Academy Charter School) and many businesses and retail locations throughout the City.

The Transportation Element of the City's Comprehensive Plan establishes goals for public transportation, increased vehicle occupancy rates, pedestrian and bicycle activity.

In addition, the City has begun to purchase hybrid vehicles for official City use in order to decrease the City's carbon footprint.

Vision

The Doral Environmental Advisory Board (DEAB) meets regularly and completes research on environmental issues facing the City. The DEAB has also become involved in activities such as the 2008 Earth Day festivities.

The City has embarked on a Keep Doral Beautiful Campaign that includes the installation of new trash cans, an Adopt a Street Program, Student Clean up Day, a Clean Business Recognition Program, a Street Tree Master Plan and other community based initiatives.

Doral's Mayor Bermudez signed the U.S. Mayors Climate Protection Agreement, pledging to address global climate change at a local level.





GUIDING GREEN PRINCIPLES

- 1) Reduce vehicle travel miles
- 2) Strengthen landscape and open space standards
- 3) Create strong energy efficiency standards
- 4) Incentivize alternative urban energy sources
- 5) Interconnect the City's places
- 6) Conserve water
- 7) Reuse and recycle
- 8) Bring back community agriculture
- 9) Strive to be a "carbon-neutral" City government
- 10) Initiate education and outreach





Action Strategies

- Provide density and height bonuses for green buildings.
- Establish a goal and objectives and policies in the Transportation Element of the Comprehensive Plan stating that the City will actively work to decrease the vehicle miles traveled in the City.
- Incorporate goals, objectives and policies in the Transportation Element that address transportation related greenhouse gas emissions.
- Incorporate a goal and objectives and policies in the Land Use Element for energy efficient land use patterns accounting for existing and future electric power generation and transmission systems. Add greenhouse gas reduction strategies in the Land Use Element
- Allow accessory live/work spaces by right in all residential and mixed use districts.
- Include a provision for the “transfer of development rights” into the Land Development Code. Select areas where increased or decreased density is desired.
- With Special Exception Approval, allow cluster single family developments. Homes are to be built on small lots with narrow front setbacks, large backyards. and dense landscaping.
- Require a minimum percentage of a building’s square footage in the downtown mixed use areas to have active uses such as retail and restaurants on the first floor.
- Create unique places by encouraging and funding public art in streetscape elements such as benches, fences, bus shelters, and garbage cans.
- Require all new streetscape improvements in mixed use areas to increased pedestrian comfort and interest.
- Require all new public facilities to have clearly defined and dedicated public spaces.
- Provide “wayfinding” in the downtown mixed use areas.
- Use tree canopy to increase the sense of enclosure.

Smart Growth

INCENTIVES

- Density/height bonuses for green buildings
- Live/work space
- Cluster single family development

Doral’s population is currently 34,541 (BEBR, 2007) with an estimated 100,000-125,000 individuals traveling into the City daily for work. Doral, always known for a thriving office and light industrial market, now also has a rapidly expanding residential sector. According to

the City’s Comprehensive Plan, the population is projected to almost double by 2015. In response to the growing population and need to reduce vehicle trips, the City amended the Future Land Use Map and converted significant areas of industrial property to mixed use. As mixed use is one of the principles proven to decrease automobile travel, Doral already has a land use foundation fertile for sustainable development.

A study by Reid Ewing, a leading Smart Growth expert, found that residents residing in compact areas drive approximately 26% less than residents in sprawling areas. According to Ewing, if an effort is made to proliferate compact development, the world could see a potential reduction in carbon emissions by 7%-10% by 2050.

Recognizing the role that planning plays in reducing greenhouse gas emissions, the U.S. Green Building Council created the LEED-ND (Neighborhood Development) standard which incorporates smart growth into the certification process. This plan recommends that the City continue to support sustainable land use patterns that will reduce auto dependency, protect open space areas and reduce emissions.

COMPACT DEVELOPMENT

- Medium to high densities
- Mixed uses
- Centered development
- Interconnected streets
- Pedestrian and transit friendly design

SPRAWL

- Low densities
- Single uses
- Strip development
- Poorly connected streets
- Auto-oriented design

Pedestrians First



Streets that are **active**, **aesthetically pleasing** and designed to a **human scale** will increase the comfort, interest and perception of safety for pedestrians. This will increase the likelihood that residents and visitors will choose to leave the car behind. Doral’s Building Architecture Regulations already

encourage pedestrian friendly features with provisions for pedestrian connections, visually organized building envelopes and distinctive entry features. Doral’s public realm can be further invigorated by increasing street activity, designating public spaces and using public art and materials, color and texture to provide points of interest for pedestrians.

FLORIDA’S DEPENDENCE ON CARS

Urban sprawl became prevalent after World War II as automobile ownership increased and a mass exodus from central cities began. Land Development regulations were developed on the assumption that individuals would utilize cars to access most destinations and the distance between uses and housing types was increased. According to Growing Cooler: The Evidence on Urban Development and Climate Change, land is being consumed for development at a rate almost three times faster than population growth. Improvements in fuel efficiency and reduction in the amount of carbon content in fuel, cannot alone successfully reduce the transportation related emissions if land use changes are not made to decrease the dependency on the automobile for all travel needs. Without decreasing vehicle dependency, technological improvements are likely to be offset by increases in vehicle miles traveled.





Action Strategies

- Conduct a Workforce Housing Needs Study to ensure affordable housing opportunities for current and future residents.
- Determine the appropriateness of density bonuses to encourage workforce housing.
- Determine areas for increased density.
- Examine methods to encourage workforce housing such as land banks, community land trusts, linkage fees for workforce housing, and reduced impact fees for workforce housing.
- Complete a survey to determine City employee commuting habits.
- Allow City employees free use of the Circulator
- Consider instituting a four day work week.
- Incorporate goals, objectives and policies to the Housing Element aimed to increase energy efficiency and renewable energy sources in the design and construction of new housing.
- Identify energy conservation in the Future Land Use Map Series.



Job/Housing Balance

Housing prices rose 77% in south Florida between 2002 and 2005. Wages on the other hand, grew only 1.4%. Many Floridians can no longer afford to live in the same city they work, thereby placing additional demand on the region's roadways.

Doral currently has almost four times its population traveling into the City to work. The City could capture some of the thousands of people who drive into the City daily, by creating a better job/housing balance (ratio of available housing to available jobs). Mixed use developments with **workforce housing** increase the spectrum of housing choices and opportunities available. This will enable additional populations to be able to afford to live in Doral and decrease the emissions released from vehicles currently commuting into Doral.

VMT RESOURCES

- **Smart Growth Network**
www.smartgrowth.org/
- **Growing Cooler: The Evidence on Urban Development and Climate Change**
<http://dnr.wi.gov/environmentprotect/gffgw/documents/GrowingCoolerEs.pdf>

INCENTIVES

- Green Building Loan Pool- Incentive to build green affordable housing, supportive housing, and community facilities.
- If/when the City is eligible to receive Community Development Block Grant (CDBG) funds, give priority to energy efficient or green developments.
- Allow City employees to use Doral circulator at no charge.
- Provide transit subsidies, vanpools, or cash in lieu of parking to City employees.

Employee Travel



The roadways in southeast Florida are the 5th most congested in the nation among major metropolitan areas. Doral should promote behavior that **decreases single occupancy travel**, and reduces emissions of transportation-related greenhouse gases.

Commuter incentives can increase carpooling and public transit use. Commuter benefits that have demonstrated the largest reduction on greenhouse gas emissions are transit subsidies, vanpools, and cash in lieu of parking.

Did you know?

The average mid-size car emits 9,500 pounds of carbon dioxide annually.

The transportation sector is responsible for 46% of the state's CO₂ emissions.

The Florida Department of Environmental Protection passed an anti-idling law for heavy-duty trucks.

Governor Crist's Action Team estimates that the state's vehicle miles traveled will increase by 240% between 2006 and 2050.



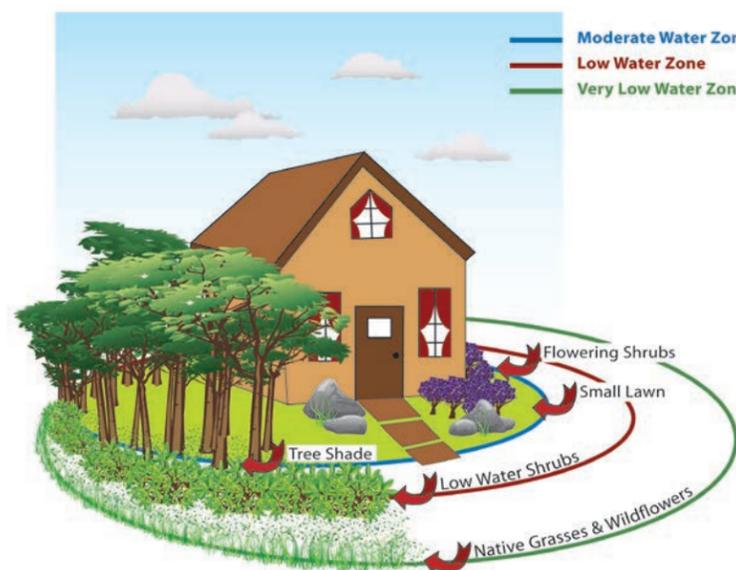
Action Strategies

- Tree removal and relocation permits are currently processed by the Miami-Dade Department of Environmental Resources Management (DERM), while the landscape code is administered by the City. Doral should consider writing, adopting and administering a Tree Preservation Ordinance that is equal to or more stringent than the County’s current ordinance.
- Remove palms from the list of acceptable street trees. Palms in the right-of-way would be considered ornamental.
- Ensure proper root structure development. Coordinate street trees and utilities and use root barriers as needed to remove potential conflicts.
- Encourage the City’s golf courses to incorporate sustainable practices.
- Require tree coverage to shade a minimum of 50% of parking spaces at maturity.
- Increase required tree calliper to 3” at time of planting, instead of the 2.5” current requirement.
- Encourage residents to take advantage of the Miami-Dade tree giveaway program or create a Doral tree giveaway program.
- Survey large exposed paved surfaces, and start a City/ developer partnership to plant shade trees in and around these areas.
- Encourage residents to submit “Florida Friendly” yards for recognition from the University of Florida IFAS Extension “Florida Yard Recognition Program.”
- An Urban Ecosystem Analysis was completed for Miami-Dade County. The study quantifies the urban tree canopy’s ability to slow stormwater runoff, mitigate air and water pollution, and sequester and store carbon. This data can be locally tailored for Doral to provide a baseline measurement of the City’s pervious surfaces and tree canopy, and the calculated economic benefit of the urban forest.

Tree Canopy

The urban forest is one of a city’s most valuable economic and environmental resources. Trees offer beauty and distinctness to communities, raise property values, decrease energy costs, cleanse the air and reduce carbon content in the air. A recent EPA study found that carbon sequestration from **forests, urban trees and agricultural soils offset approximately 15% of total U.S. CO₂ emissions** from energy, transportation and other sectors. Trees absorb carbon slowly and it would take more than a century for a growing tree to recover all of the CO₂ released in the air when another tree is cut down. Therefore tree preservation is a crucial consideration for carbon sequestration.

The City’s land development code is already progressive and includes features such as large landscape islands and “conservation zones” to optimize a tree’s ability to cool the neighboring residence. In addition, Doral’s Code requires the use of xeriscape, hydrozones and water efficient irrigation. The recommended action strategies will provide additional provisions to preserve the existing urban forest and to continue establishing a dense tree canopy.



Heat Islands



Heat islands are excessive heat temperatures and thermal radiation in urban areas with temperatures as much as **2-10 degrees consistently higher** than surrounding areas. Heat islands are formed by high concentrations of buildings, concrete and asphalt.

Detrimental impacts associated with heat islands include increased energy demand, increased air condition costs and heat related illness.

The heat island effect can be reduced by increasing the number of trees and amount of pervious surfaces in a community. Other strategies include replacing hard surfaces with “cool” paving materials that have a high solar reflectance, porous and permeable paving surfaces and green roofs.

FLORIDA FRIENDLY LANDSCAPE PRINCIPLES

- Right plant, right place
- Water efficiently
- Fertilize Appropriately
- Mulch
- Attract Wildlife
- Manage Yard Pests Responsibly
- Recycle Yard Waste
- Reduce Stormwater Runoff
- Protect the Waterfront

INCENTIVES

- Miami-Dade County tree giveaway program or create a Doral tree giveaway program.
- University of Florida IFAS Extension “Florida Yard Recognition Program.”





Action Strategies

- Incorporate green roofs and rain gardens into the landscape code and allow vegetated surfaces on rooftops and in rain gardens to be applied towards a percentage of the open space requirement.
- Reduce the stormwater impact fee assessed by the Public Works Department for those developments that utilize vegetated surfaces for stormwater management.
- Encourage a well-maintained grass swale for on-site drainage systems over curb and gutter where practical.
- Encourage the use of permeable materials for driveways, parking areas, walkway and patios and other low-use areas when feasible. Provide specifications of acceptable permeable and porous paving surfaces.
- Reduce the required paving width for local residential streets. Coordinate with the Fire Prevention and Emergency Management to reduce potential code emergency management conflicts.
- Decrease the standard parking space size to 9' x 18'
- Create a parking cap for mixed use projects.
- With Special Exception Approval, allow cluster single family developments. Homes are to be built on small lots with narrow front setbacks, large backyards, and dense landscaping.

INCENTIVES

- Allow green roofs and rain gardens to be counted as open space.
- Reduce the stormwater fee for developments that use vegetated surfaces for storm-water management.
- Reduced parking space size

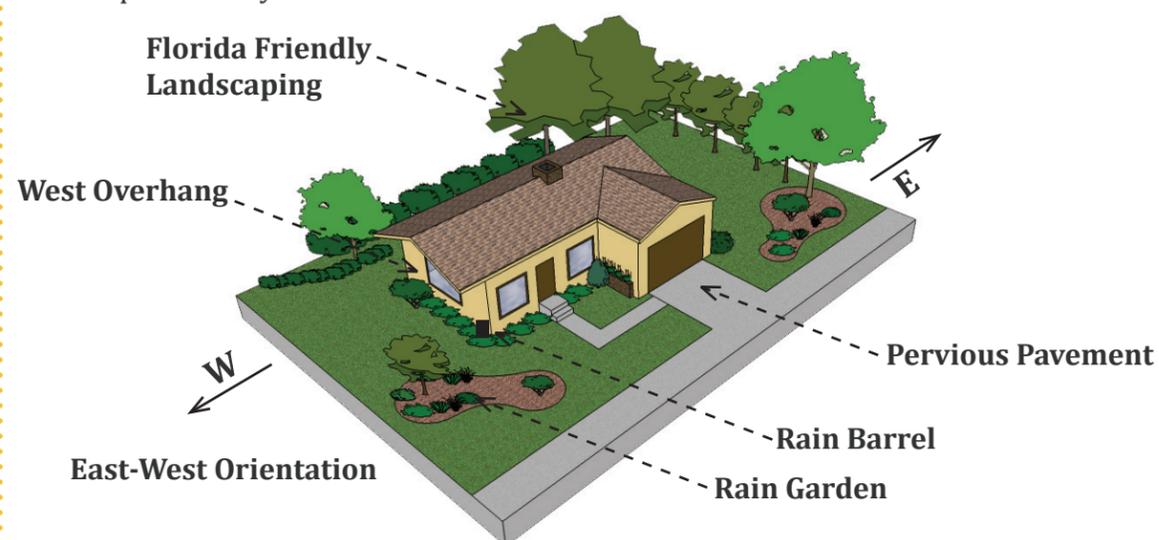
Low Impact Development

Low Impact Development (LID) is a cost-effective stormwater management approach that is modeled after nature and strives to allow natural infiltration as close as possible to the original area of rainfall. Low-impact developments protect natural resources from pollutants, reduce unnecessary consumption of land and increase the preservation of natural open space.

Porous and permeable paving materials can restore permeability and infiltration in an urban environment. This type of paving can be used in parking lots, alleyways, driveways, fire lanes, parking lanes and other low-impact travel areas.

Rain gardens are planted depressions that serve to absorb and filter rainwater, therefore preventing pollution from collecting into the local canals and waterways. A rain garden will fill with several inches of water and the water will slowly filter into the ground, rather than running off into a storm drain. **Bioswales** are very similar to rain gardens but are generally linear in design.

Green roofs consist of a vegetated roof cover with a water proofing membrane. A green roof may also include additional layers for a root barrier and irrigation. Major cities such as Chicago and Atlanta have made a visible commitment to sustainability by placing a green roof on top of the City Hall.



Fewer Impervious Surfaces

Minimizing the size of parking spaces and the paved width of streets and driveways can increase green space and control potential runoff. In addition, narrow roadways, combined with smaller front setbacks and narrow driveways will also reduce the length and costs of water and sewer lines. Narrowing residential streets and setbacks has the side effect of increasing the backyard size, allowing for additional landscaping and gardening space. Narrow streets also act as a traffic calming tool that can contribute to pedestrian and bicycle safety and provide a safer environment for children.

LANDSCAPE/OPEN SPACE RESOURCES

- **Portland Green Streets**
<http://portlandgreenstreets.org>
- **Florida Friendly Landscaping**
<http://www.floridayards.org/>
- **Low Impact Development Center**
<http://www.lowimpactdevelopment.org/links.htm>

Did you know?

Deforestation is responsible for 20% of CO₂ emissions.

A healthy tree can remove up to 48 pounds of CO₂ from the air every year.

Trees can add between 10% - 20% to property values.

A study of three neighborhoods in Boulder, concluded that the added value for properties near a greenbelt created an additional \$500,000 of annual tax revenue.



Action Strategies

- Require a percentage of homes in new subdivisions to be oriented to minimize solar exposure.
- Encourage windows to be placed on opposite sides of homes to optimize natural ventilation.
- Require shading for south and west facing buildings.
- Encourage new developments to include breezeways and courtyards to increase natural ventilation.
- Encourage natural lighting whenever possible.
- Require “cool roofs” for all rooftops which are not planned for a green roof or solar panels.
- Actively encourage green roofs or solar panels
- Require all developments over 50,000 square feet to provide a minimum percentage of solar power.
- Count green roofs as open space.

ENERGY EFFICIENCY RESOURCES

- **Case studies of green roof regulations in North America 2006**
http://commons.bcit.ca/greenroof/publications/2006_regulations.pdf
- **Miami Dade County**
www.miamidade.gov/building/popupdatareader.asp?blobtopop=188

BEST PRACTICES

- NYC provide tax abatements to encourage construction and maintenance of green roofs in the City
- In 1994, Georgia passed the “Georgia White Roof Amendment”
- The Utah City Olympic Oval utilizes cool roof technology.
- Chicago and Austin offer Floor Area Ratio (FAR) bonuses for Green Roofs.
- Orange County offers “Green Carpet Service” to developers who build green.
- Charlie Crist recently passed Executive Order 07-126, declaring that the State will strive for Platinum Level certification for any new building constructed for or by the State of Florida.
- Miami-Dade County and Miami both require LEED Silver certification for government construction.

Energy Efficient Design



South Florida’s climate is one of the hottest in the country and efficient cooling is an essential consideration for all buildings. By designing to the local climate, landscape and architecture can be utilized to naturally cool surrounding properties. Tree placement, light colors, the location of windows

and doors, reflective roofing, building orientation, shading and cross ventilation offer opportunities for natural cooling. Buildings should be positioned to maximize insulating and cooling capacities, ultimately reducing energy usage and greenhouse gas emissions.

Buildings should be designed with the longest side on an **east-west axis**, and with a large percentage of the windows on the north side, so that the house minimizes solar exposure. **Shading devices** such as awnings, overhangs, porches and trellises can both provide aesthetically pleasing architectural features while saving energy and reducing costs. Solar orientation may not be necessary for infill sites as the adjacent buildings serve to block sun and naturally cool buildings. A recent study in the San Jose area concluded that proper solar orientation of new homes produced an 11% to 16% savings in total energy and up to a 40% savings in space cooling.

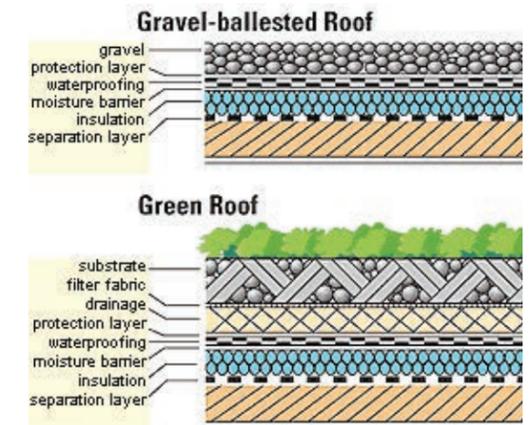
Rooftop Design

According to the EPA over 90% of the roofs in the United States are dark-colored. Dark colored roofs can reach temperatures of 150 to 190°F (66 to 88°C) and contribute to higher cooling costs, increased energy use and increased contribution to the heat island effect.

A **cool roof** reflects and emits the sun’s heat back to the sky instead of transferring it to the building below. The effectiveness of a cool roof is measured by a roof’s albedo (the natural ability to reflect light) and thermal emittance. Reflective roofs reflect sunlight away the same way the polar caps do. Painting roofs and buildings with white, light or reflective materials can increase the albedo of a roof to provide a simple solution that create a large impact. The EPA claims that a cool roof can reduce annual cooling energy use between 20–70% in California and Florida.

Green roofs or ecoroofs

have a water proofing and root repellent system, a drainage system, filter cloth, a lightweight growing medium and plants. These roofs offer extensive insulation for buildings and can also cool the urban environment, reducing the presence of heat islands.



Environmental Protection Agency

Solar Panels harvest or collect the sun’s rays to convert it to electricity. Solar Cells, or photovoltaic cells, are arranged in a grid-like pattern on the surface of the solar panel. Individual cells are used for powering small devices such as calculators.



Action Strategies

- Create a “sustainable points” system and grant a height or density bonus, for any development that clearly incorporates specified sustainable design techniques such as passive and active solar energy, low-water landscaping and fixtures, green roofs, bioswales and rain barrels. This will reward sustainable buildings and sites that are not seeking full green certification.
- Require green building certification in order to receive the height and density bonuses currently granted for Creative Excellence.
- Lower the height, density and F.A.R. requirements in the Comprehensive Plan in order to encourage intensity bonuses that are linked to green building.
- Reduce building permit fees by 50% for LEED or FGBC certified buildings. To fund green incentives, raise all or some, of the other building permit fees.
- Publicly recognize green buildings. Use construction signs to designate project sites and promote projects on the City’s website, in newsletters and in press releases.
- Create an annual “Green Award” for innovation.
- *For consideration:* Mandate green building certification for private buildings over 50,000 square feet. LEED Silver certification is recommended for buildings over 30,000 square feet.
- LEED Silver or FGBC certification is recommended for City owned civic and office buildings. LEED Silver certification is recommended for buildings over 30,000 square feet.

Figure 2

Reduced Energy Use in Green Buildings as Compared with Conventional Buildings

	Certified	Silver	Gold	Average
Energy Efficiency (above standard code)	18%	30%	37%	28%
On-Site Renewable Energy	0%	0%	4%	2%
Green Power	10%	0%	7%	6%
Total	28%	30%	48%	36%

Source: USGBC, Capital E Analysis

Certification

Buildings in the United States account for 70 percent of electricity consumption, 39 percent of total energy usage, 39 percent of all CO₂ emissions, 40 percent of raw material use, 30 percent of waste output and 12 percent of potable water usage. U.S. buildings alone are responsible for more CO₂ emissions than those of any other country in the world except China.

Green buildings incorporate environmentally sensitive practices in all aspects of construction, renovation, operation, maintenance and demolition. Green buildings provide environmental, social and economic benefits. Third party certification is a way to ensure that buildings will be a high-performance, energy efficient and socially responsible structure.



LEED is the U.S. Green Building Council’s third party certification program and the nationally accepted benchmark for the design, construction and operation of high performance green buildings. LEED which stands for Leadership in Energy and Environmental Design, indicates a property’s overall sustainability by awarding points for just about any sustainable feature

imaginable, from bike racks and rainwater collection and reuse systems, to energy-efficient lighting and low-flow plumbing fixtures. LEED has three levels of certification, Silver, Gold and Platinum.

The **Florida Green Building Coalition (FGBC)** is a nonprofit Florida corporation dedicated to promoting green building. The FGBC standard is geographically specific to Florida, so it uses approximately 80% of LEED standards, but is locally tailored to incorporate requirements for pools, waterfronts, and disaster mitigation. While FGBC is an excellent standard for small construction, LEED certification is recommended for commercial structures 30,000 square feet or greater. Unlike LEED, FGBC does not have different levels of certification. FGBC certification is roughly equivalent to LEED Silver certification.



COST SAVINGS

- According to U.S. Environmental Protection Agency (EPA) research, tenants can save about 50 cents per square foot each year by cutting energy use by 30%. This can represent a savings of \$50,000 or more over five years per 20,000 square feet. This could mean a savings of \$109,350/year for Doral’s 43,740 square feet of municipal building area.
- A study of LEED buildings in the State of California found that an up-front investment of 2% in green building design, on average, results in life cycle savings of 20% of the total construction costs – more than ten times the initial investment.

INCENTIVES

- Use “sustainable points” to allow an increase in intensity for new projects with sustainable features.
- Reduce building fees for green buildings.
- Expedite building permits for green buildings.
- Publicly recognize green buildings.
- Create an annual “green award” for innovation.
- Count green roofs as open space.

DID YOU KNOW?

- A 2007 study found that in 2004, there were only 36 municipal green building programs and by 2007 this number was increased to 113.
- The EPA advises that a cool roof can reduce annual cooling energy use between 20 – 70% in California and Florida.
- There are 1,585 LEED certified projects in the U.S.
- Approximately 46% of LEED certified buildings are government owned.

ALTERNATIVE URBAN ENERGY SOURCES



Action Strategies

- Create goals, objectives and policies in the Conservation Element to address factors affecting energy conservation
- Create a technical advisory committee to ensure that existing codes are green friendly and to eliminate any conflicting regulations between codes. The committee will be comprised of members from departments such as Planning and Zoning, Building, Finance and Public Works. The committee will identify and remove regulatory obstacles that restrict green building practices.
- Add solar energy systems as permitted accessory uses in all zoning districts.
- Allow small wind turbines in all commercial, industrial and multi-family areas, subject to noise specifications.
- Allow modest encroachments into building setback areas to facilitate placement of solar facilities.
- Create a special building permit fee for solar panels that only covers the estimated cost of staff time and is not based on the cost of the expensive solar panels.
- Require all developments over 50,000 square feet to provide a minimum percentage of solar power.



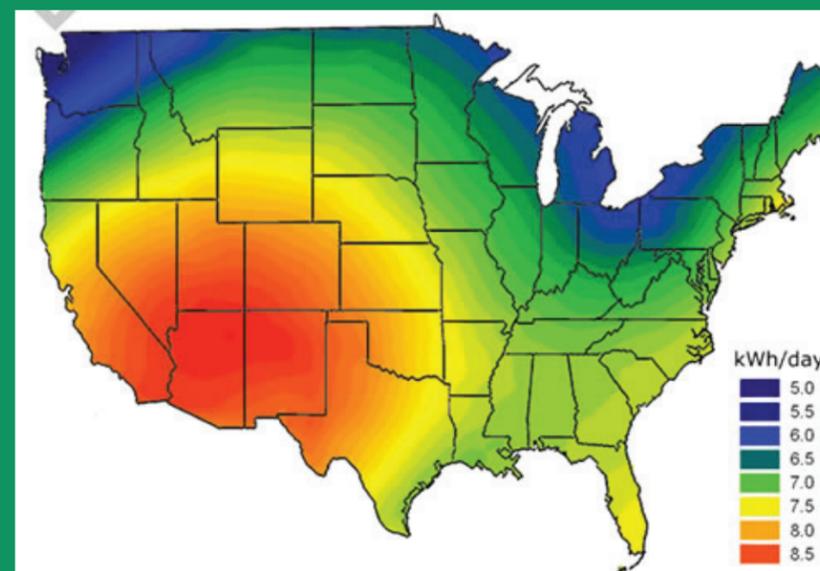
Alternative Energy in South Florida

Largely due to the year round hot weather, Florida's energy use per household is one of the highest in the United States. As fuel prices such as coal, oil and gas continue to rise, leaders are turning to alternative energy sources to harness the power of the sun. Investments in alternative energy will save dollars, reduce emissions of greenhouse gases, and reduce dependency on foreign oil.

The Florida Energy Center conducted a study measuring the performance of 2-kWh photovoltaic systems across the country. The research showed that Florida has 85% of the maximum photovoltaic (PV) resource available (7.2 kWh/ day out of a maximum of 8.5 kWh/ day) making Florida a cost effective location for solar energy.

Wind is another option for alternative energy in Florida. There may be some wind capability along the coasts of Florida, however currently solar energy is the more efficient option. For more information on wind resources in Florida, contact the U.S. Department of Energy

SOLAR CAPABILITIES IN THE SUNSHINE STATE



Source: Florida Energy Center

INCENTIVES

- Reduced permit fees and expedited permits for developments that utilize alternative energy.
- Reduced building permit fee for solar panels
- Energy Efficiency & Conservation Block Grant (EECBG) to fund green initiatives
- Department of Energy - Renewable Energy Loan for alternative energy projects
- Florida Renewable Energy Technologies and Energy Efficiency Act - partial reimbursements for new solar energy systems. Funding for FY 2008-2009 is exhausted, but applications are still being accepted and placed on a waiting list until funding is approved.





ALTERNATIVE URBAN ENERGY SOURCES

FP&L Alternative Energy

Doral residents with renewable energy sources can participate in FP&L's "net metering" program. Net metering allows users to "bank" any surplus electricity their personal energy system generates on the electric grid.

Florida Power & Light recently selected Rothenbach Park in Sarasota as the site for its first solar array, which is to consist of 1,200 photovoltaic solar panels. FP&L estimates this will prevent 680,000 pounds of carbon dioxide from being released into the atmosphere each year. FP&L has announced plans for a small wind project. near St. Lucie County.

Wind Power



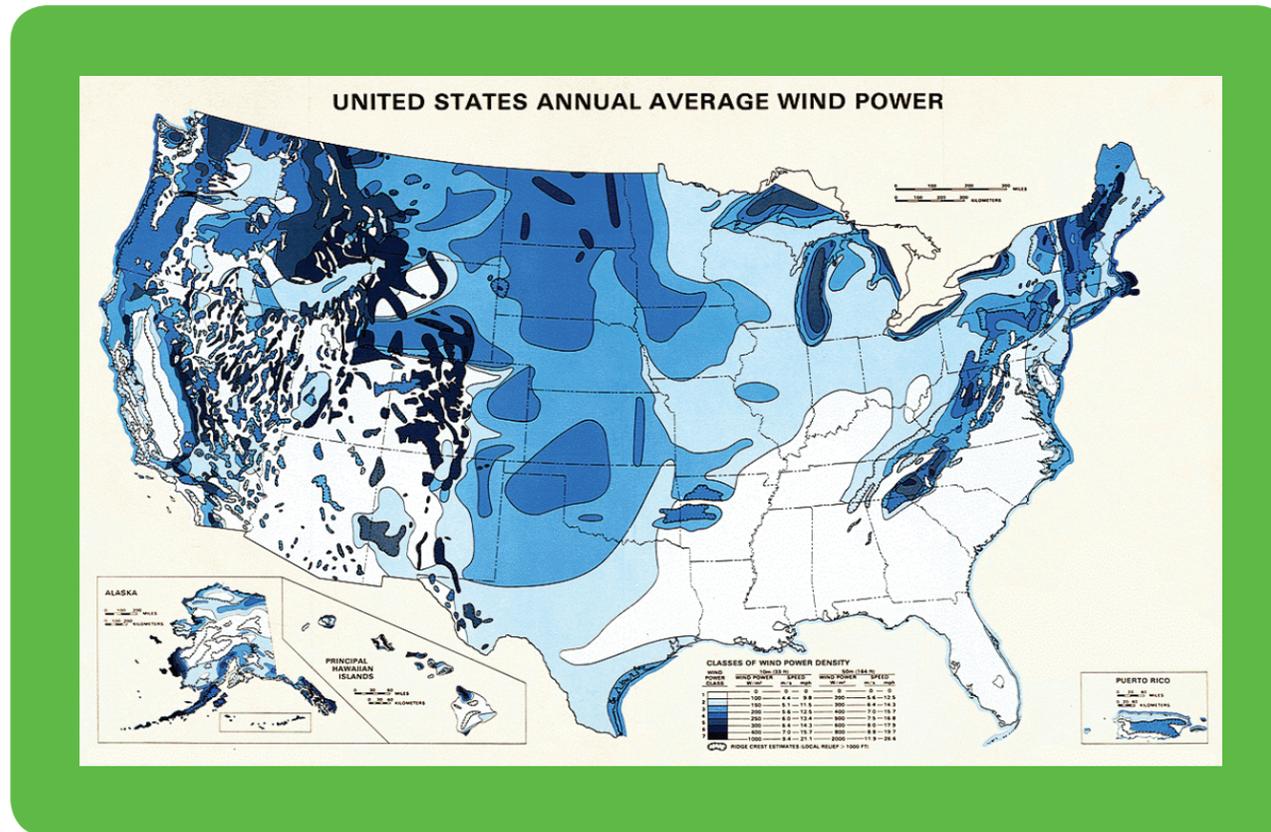
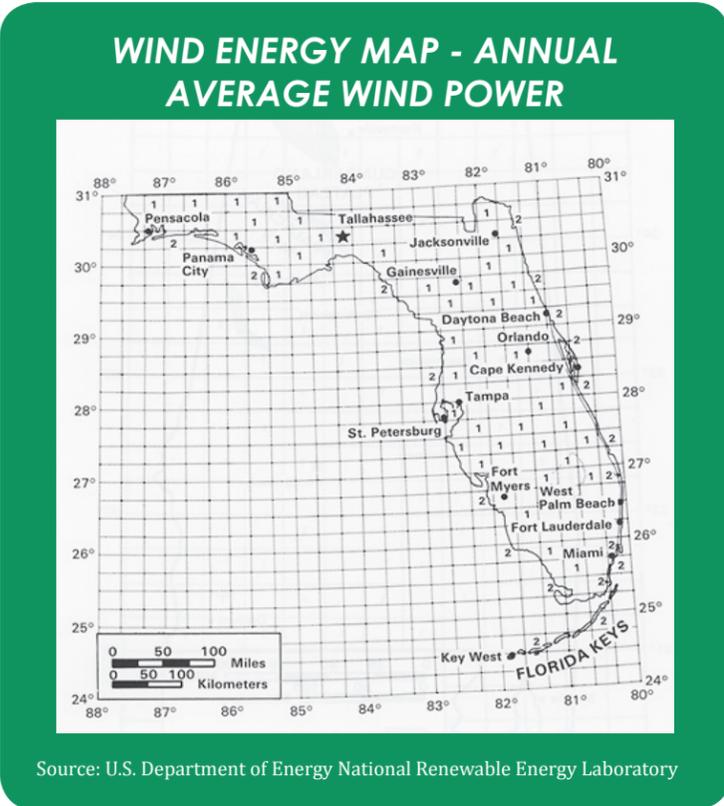
Height is an important consideration when using wind power. The wind increases with additional height above the ground. The wind power available at 100 feet is typically twice the power available at 30 feet.



Did you know?

Renewable energy is responsible for approximately 9% of electricity in the United States.

The City of Miami recently placed solar panels on the south lawn of the City Hall.



- ### ALTERNATIVE ENERGY RESOURCES
- Florida Solar Energy Center
www.fsec.ucf.edu
 - U.S. Department of Energy Wind Powering America
www.windpoweringamerica.gov/wind_maps.asp
 - EPA - Green Communities
www.epa.gov/greenkit/q5_energ.htm
 - U.S. Department of Energy Solar Energy Technologies Program
www1.eere.energy.gov/solar/about.html

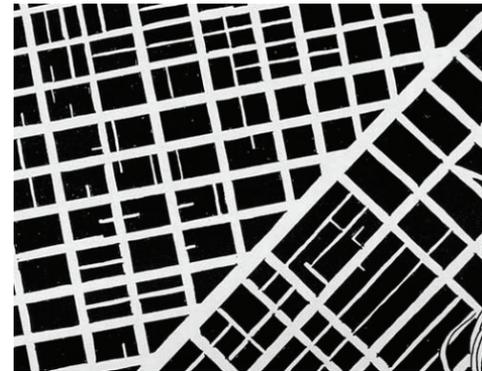




Action Strategies

- Establish a goal in the Transportation Element of the Comprehensive Plan, stating that the City is to consider the connectivity of street networks in all site plan, platting and right-of-way vacation applications. New streets should be constructed in a traditional grid pattern.
- Plan public open spaces so that they are linked to greenways/bikeways.
- Designate “receiver sites” to receive open space and send density with a Transfer of Development Rights. Receiver sites will be areas that the City would like to preserve for the purposes of open space in order to provide linkages and create greenways that will increase connectivity and mobility for pedestrians and bicycles.
- Expand the bicycle infrastructure by constructing bikeways as described in the City’s bicycle master plan.
- Require new development to install bike racks in downtown mixed use districts.
- Create a Safe Routes to School Program, with designated routes for children to walk or bike to school.
- Establish a hierarchy of sidewalks and set standards for arterial, collector and local roadways. In mixed use areas, require large sidewalks with adequate room for street furniture such as park benches, planters, trees, lighting, trash receptacles and awnings.
- Require public sidewalks and walkways to be shaded.

Connectivity



Connectivity is not limited to compact, mixed use areas but can also be incorporated into suburban single family areas. Doral can increase connectivity in single family areas by ensuring that all new streets are connected to existing streets, decreasing reliance on major arterial roads for all travel.

Connecting the City’s places is one of the most important ways to reduce automobile related greenhouse gases, and increase both social and economic health. A well connected street network increases the ease of travel, decreasing the lengths that automobiles must drive to access goods and services.

Bicycle and Pedestrian Facilities

Increased bicycling and walking constitute a behavioral change that residents can make to reduce personal greenhouse gas emissions. Studies suggest that by walking to work twice a week, individuals can prevent up to 1,590 pounds of carbon dioxide emissions per year. Well designed pedestrian and bicycle networks will promote and facilitate active transportation.

INCENTIVES

- The Transfer of Development Rights (TDR) can provide developers with an incentive and provide the City with greater control of both densities and open space.
- A Safe Routes to School program will encourage walking and biking.



INTERCONNECT THE CITY'S PLACES



Action Strategies

- Increase transit links, frequency and comfort.
- Strive to provide public transit service within a 1/4 mile of all major developments.
- Place a multi-modal map on the City's website to inform residents of pedestrian and bicycle trails, transit routes and stops, parking lots and garages and locations of bike racks.



Transit Links

In Florida, the transportation sector is responsible for 46% of carbon emissions. Utilizing public transportation is one of the quickest and easiest ways to reduce personal contribution to global warming. Doral should continuously evaluate and improve public transportation options to ensure that the City is providing routes and schedules that meet residents' needs.

INTERCONNECTION RESOURCES

- **npGREENWAY**
www.npgreenway.org/
- **Congress for New Urbanism**
www.cnu.org/
- **City of Colorado - Multimodal Corridors**
www.bouldercolorado.gov/index.php?option=com_content&task=view&id=355&Itemid=1624

Residents who live in walkable neighborhoods are reported to drive approximately 26 fewer miles per day than those in sprawling areas. **Did You Know?**

3,000 pounds of carbon dioxide per year can be saved by replacing your car with one that gets only 3 miles more per gallon.

According to the Pew Research Center, in 2005, the miles driven per motorist dropped in 2005 for the first time since 1980 due to rising gas prices.





Action Strategies

- Examine the feasibility of coordinating with Miami-Dade County to use reclaimed water to irrigate the City's parks and golf courses. Approach SFWMD about the possibility of receiving Alternative Water Funding.
- Encourage residents to contact the Miami-Dade University of Florida IFAS Extension to receive a rain barrel and training workshops for a small fee.
- Encourage residents to take advantage of the Miami-Dade WASH water conservation resources such as the Single Family and Multi-family Plumbing Fixture Retrofit Kit, the Shower head Exchange Program, as well as the myriad of other programs and incentives already offered by Miami-Dade and SFWMD.
- Apply for funding from the SFWMD (WaterSIP) Water Savings Incentive Program, to fund conservation initiatives such as a leak detection, retrofit fixture installation, or a rain-sensor shutoff retrofit program.
- Encourage Miami-Dade WASH to provide extensive water information on utility bills so that customers may compare their current water consumption to their previous usage, as well as the water consumption of their neighbors.

Recycled Water

Water consumption is vital to a human's and a City's survival. The conservation of this limited resource is of special importance for southeast Florida as population growth, depleting water sources, droughts, and wildfires have increased in prevalence. Florida receives 52 inches of water per year, most of which is washed over lawns and carried into the local waterways. Cities across the United States are looking for ways to "recycle" water so that it may be reused in another form, most commonly for irrigation. Cities across Florida such as Pompano Beach, Key Biscayne and Jacksonville have begun using reclaimed water.

A popular method of water conservation is rainwater harvesting. This practice refers to the collection and storage of rainwater from a non-pervious area to be reused in some other form. Currently, the Department of Environmental Protection does not permit gray water (non-industrial domestic wastewater) systems for homes. However rain barrels are a simple technique that residents may utilize to capture and reuse water. Rain barrels can be easily installed in the backyards of homes and used to collect rainwater that can be reused later to water lawns and plants. These rain barrels are non intrusive and provide the added benefit of keeping stormwater on site, rather than collecting pollutants that run off into neighboring streets and properties.



Water Efficiency

There are many simple programs that can be utilized, created and funded to decrease water consumption without significantly adjusting personal behavior. A simple first step to water conservation is the installation of water efficient fixtures such as low-flow water faucets, low-flush and dual-flush toilets, waterless urinals, and high efficiency shower heads.

"Purple Pipes" can deliver reclaimed water to cities for irrigation purposes. Several cities throughout southeast Florida such as Pompano Beach and Plantation have begun to create or expand "purple pipes" systems.



Doral is currently home to approximately 109 acres of parks and open space, located throughout Doral Park, J.C. Bermudez Park and Doral Meadow Park, in addition to the many acres of private golf courses. The City's Comprehensive Plan aims to increase park space to up to 252 acres of park land by 2015. While the parks and golf courses are some of the City's most valued economic resources and public amenities, they are also major consumers of water. According to Miami-Dade WASH, the City's per-capita water consumption is 195 gallons per capita per day, more than almost every other municipality that is a retail user of Miami-Dade Water and Sewer Department.



Action Strategies

- Allow rain barrels to encroach into side and rear setbacks.
- Allow water storage tanks as a permitted accessory use in all districts.
- Require porous pavement and/or open cell concrete blocks for a minimum percentage of low use areas such as walkways and overflow parking.
- Adopt conservation strategies in maintaining the City’s rights-of-way. For example, reduce the use of irrigation in median plantings and parks whenever it is not necessary for the survival of the plants and trees. Or use moisture sensors as part of existing systems.
- Create a recognition program for businesses that engage in large scale water conservation efforts.

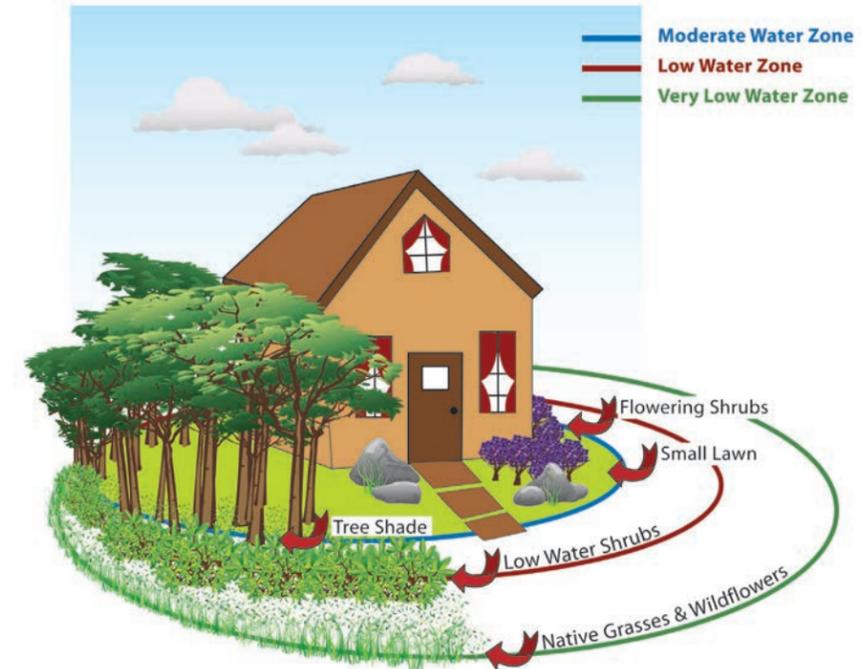
INCENTIVES

- SFWMD Alternative water funding
- SFWMD WaterSIP funding
- SFWMD rebates for water conserving fixtures
- Rain barrels from University of Florida IFAS



Facilitate, Regulate and Incentivize

Doral’s Landscape Code requires extensive interior landscaping and promotes the use of Xeriscape, drought-tolerant landscape species, grouping of plant material in hydrozones, and the use of irrigation systems that conserve the use of potable and non-potable water supplies and contain moisture and rain sensor shut-offs. Doral can strengthen the existing land development regulations and City policies to ensure that a sustainable and high quality water supply is available for current and future City residents.



WATER CONSERVATION RESOURCES

- **South Florida Water Management District - Water Conservation**
www.sfwmd.gov/portal/page?_pageid=3074,20103213&_dad=portal&_schema=PORTAL
- **Miami Dade - Water Conservation**
www.miamidade.gov/conservation/

Did you know?

Up to 50% of water usage is used to irrigate lawns.

Global warming increases weather variability which could result in more intense droughts for South Florida.

The EPA has found that in Miami-Dade County, two out of three gallons of waste water are treated and piped out to the ocean.





Action Strategies

- Make it easy for residents and businesses to recycle by placing large dumpsters on the lot of a public building. People without access to recycling programs may have a designated area to drop off their recyclable waste.
- Place recycle bins in the City's parks and downtown areas.
- Ask residents to use the City's website to submit recommendations with ideas for ways that the City can make it easier for residents to recycle.
- Work with DSWM to expand recycling options in the City's commercial and industrial areas.



Reuse & Recycle

Recycling reduces global warming by avoiding the need to extract and refine new raw resources. Recycling organic material also means that there is less emissions of methane gas, a powerful greenhouse gas produced in landfills.

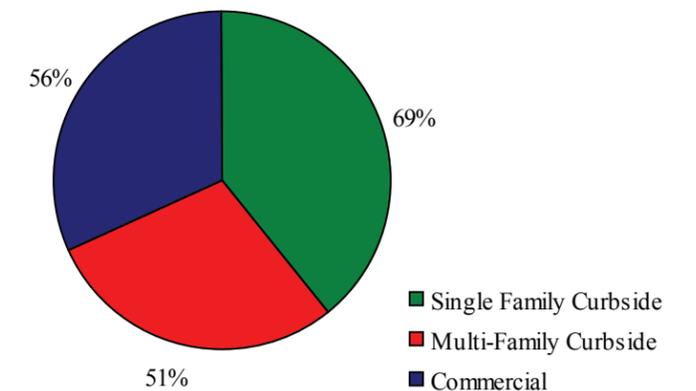
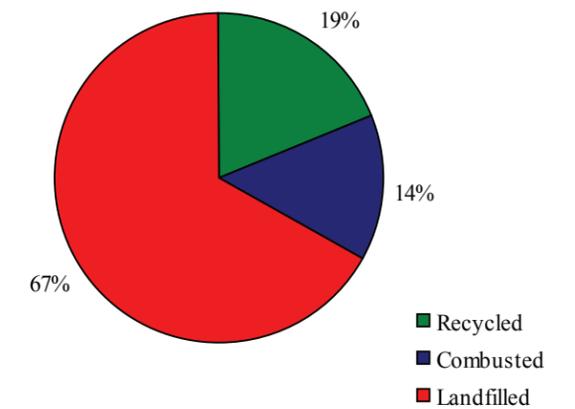
Recycling in the City is currently provided by Miami-Dade Department of Solid Waste Management (DSWM). The contract with the County currently accepts newspaper, corrugated cardboard, aluminum, ferrous metals, glass containers, aseptic packages, plastic, household batteries and telephone books. The County-wide recycling rate is approximately 20%, still below the 30% minimum State requirement. In 2006, 13% of Miami-Dade's municipal solid waste was composed of yard waste. Much of this yard waste goes into landfills when it could be composted. Encourage composting and provide education and technical assistance.

Reducing usage and reusing items is the most effective way to reduce waste because unlike recycling, reused items does will not be reprocessed.



City-wide Recycling

Doral should continuously review the collection system in the County and provide recommendations to the DSWM as to how recycling efforts can be adjusted to meet resident's needs.





Action Strategies

- To encourage deconstruction, the City should create a “deconstruction” permit, separate from the traditional demolition permit. The City can incentivize deconstruction by waiving or reducing building permit fees, or providing expedited permitting.
- Utilize the Florida Department of Environmental Protection’s recommendations on reducing waste at the work place.
- Expand recycling within City Hall to include the collection of glass and plastic bottles and ensure that products such as paper, cardboard, phone books, magazine, and toner cartridges, are being recycled.

INCENTIVES

- Reduce building permit fees and expedite “deconstruction” permits.



FDEP’s Recommendations for Office Recycling

- Reuse file folders (reverse or re-label)
- Keep mailing lists current.
- Eliminate unnecessary reports.
- Make note/scratch pads from used paper.
- Proof documents on computer screen before printing.
- Select products with long warranties.
- Buy products that have recycled content.
- Buy products that have recyclable packaging.
- Rent equipment that is only used occasionally.
- Return toner cartridges for refilling/rebuilding.
- Practice preventive maintenance on all equipment.
- Buy products that have minimized packaging (bulk).
- Reuse envelopes or use inter-office envelopes.
- Use central files to reduce number of hard copies retained.
- Store documents on computer, instead of creating hard copies.
- Route or post memos instead of making multiple copies.
- Double-side (duplex) photocopies-to save paper, trees, and postage costs.
- When possible, use electronic mail (e-mail) for correspondence -- rather than sending paper or making expensive long distance phone calls.
- Share technical journals, magazines, newspapers and phone books, rather than receiving multiple subscriptions.
- Sell or give old furniture and equipment to other businesses, schools, community groups, charitable organizations, etc.
- Buying locally reduces protective packaging and costly transport.
- If it’s recyclable, remember to put it in the RECYCLE BIN.

REUSE AND RECYCLE RESOURCES

- **The Southern Waste Information eXchange, Inc.**
www.wastexchange.org/
- **Environmental Protection Agency Recycle City**
www.epa.gov/recyclecity/
- **University of Miami Green U**
www.miami.edu/ftp/umgreen/initiatives_recycle.html

Deconstruction

Currently, for LEED certification, 50% of demolition debris must be recycled from the demolition site. This can be achieved by “deconstruction,” a practice where the building is disassembled piece-by-piece, so that much can be recycled and many materials can be salvaged from the site for later reuse.



According to the Florida Department of Environmental Protection, only 19% of municipal solid waste is recycled.



Action Strategies

- Facilitate the creation of a farmers' market
- Allow farmers' markets in commercial zoning districts.
- Create a specification in the landscape code that city gardens are to be counted as open space
- Allow the raising of up to six hens to be permitted as a Special Exception Use in single family residential zoning districts.
- Create a goal in the Land Use Element of the Comprehensive Plan to support the growing, processing and distribution of food and animal husbandry.
- Allow urban gardens in all zoning districts.
- Set space aside for community gardens in the City's parks.
- Create an "Adopt-a-garden" program to enable local residents to develop gardens on vacant land and public parks.
- Encourage and promote composting to both avoid yard and food waste going into landfills and providing a natural fertilizer for gardens.

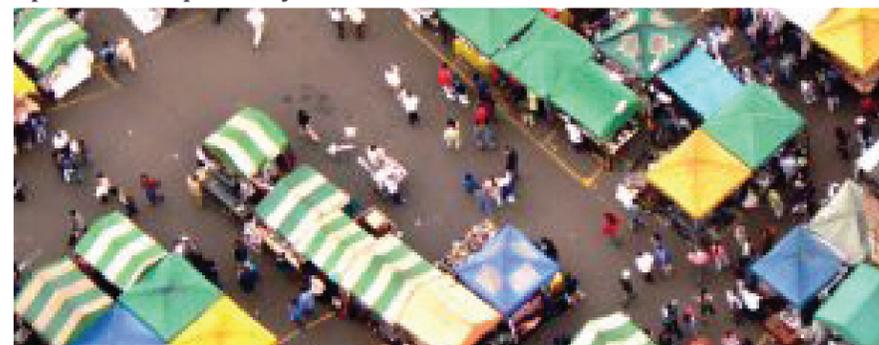
Farmers' Market

Farmers' markets or **green markets** have increased in popularity and can be found in cities throughout southeast Florida's from Boca Raton to Homestead. Farmers' markets are food markets, typically outdoors, where farmers and producers bring their produce for sale directly to the public. Farmers' markets are known for bringing locally grown and extremely fresh food to cities and for positively contributing to the vitality of the local community.

Farmers' markets bring an abundance of economic benefits including a high multiplier effect (measure of the number of times money circulates in the local economy before leaving), increased sales for nearby businesses, increased tourism, local jobs, and can also spur business start ups and expansion opportunities for local businesses.

One study reports that an average of 22% of farmers' crops could not be marketed if farmers' markets were not available. There is much less wastage as the food has very little or no packaging. The markets are typically sold in outdoor venues during the day, so less is spent on lights, AC, and freezers. Above all, the food does not have to be transported across the country and then shipped between distant warehouses, distribution centers, and grocery stores. Since fewer miles are driven, there is a decreased need for packaging and preserving, as the produce does not need to survive long journeys.

Establishing a farmers' market for Doral will further signify the City's commitment to the responsible use of local resources. While farmers' markets typically have a Board of Directors to govern the activities, the City of Doral can ensure a permanent location, assist with start-up costs and publicity.



City Agriculture

For the purposes of this plan, City Agriculture refers to the growing, processing and distribution of food and animal husbandry. City agriculture is directly tied to a community's sustainable development through, economic, environmental, health and social benefits.

"Locavors"

The term locavor refers to a person who buys and grows local produce. Locally grown fruits and vegetables are much fresher and reduce truck travel.





CITY AGRICULTURE



It is estimated that the average food item travels 1,500 miles before making it to the dinner table.

The United States is losing two acres of farmland every minute.

The Community Food Coalition estimates that 14% of London's and 44% of Vancouver's residents grow food in their gardens.



CITY AGRICULTURE RESOURCES

- **City of Portland Food Policy and Programs**
www.portlandonline.com/osd/index.cfm?c=41480
- **Community Gardens of Baltimore City**
www.mastergardener.umd.edu/Success%20Stories%20with%20Impacts/Community%20Gardens%20of%20Baltimore%20City.cfm
- **Farming from the City Center to the Urban Fringe**
www.foodsecurity.org/FarmingCitytoFringe.pdf



CARBON NEUTRAL CITY GOVERNMENT



Action Strategies

- Make a visible commitment to green practices by modifying the City's mission statement to incorporate green goals. This mission should be incorporated into several elements of the City's Comprehensive Plan and Strategic Business Plan.
- Use ICLEI's Clean Air Climate Protection (CACP) to measure levels of city government emissions and develop a baseline inventory of emissions.
- Develop greenhouse gas reduction targets.
- Create a position for a Green Coordinator in the City Manager's Office.
- Actively support local, county and state efforts to increase energy programs such as the proposed Energy and Environmental Block Grant (EEBG) Program that will provide funding to local and state governments to create energy efficiency and climate protection activities and programs.
- When possible, purchase carbon credits to offset the amount of carbon emitted by the City.
- Apply for FGBC Green Local Government Certification.
- Establish an Environmentally Preferred Procurement Policy. Prioritize bid preferences for suppliers of green products.
- Study the top ten items that are most frequently purchased by departments and provide information as to the most resource and cost efficient brands and products.
- Purchase Energy Star office equipment such as computers, fax machines and photocopiers.
- Prioritize capital improvement projects that incorporate green principles.

Both Miami-Dade County and the City of Miami have hired staff members to spearhead and monitor sustainability efforts

Leadership

Leadership is the single most important factor for successful implementation of a sustainability program. The City of Doral is a major employer, landowner, service provider and consumer of goods and services and increased sustainability must begin with the City's internal operations. As the City refines its development guidelines and conservation practices to become more environmentally responsible, the City must also re-prioritize operations in order to become a more sustainable city.

Carbon Neutrality is achieved by balancing carbon released with carbon that is offset. While reducing carbon emissions is the goal to any climate change strategy, carbon offset programs have been developed so that businesses, residents and governments may pay to offset the emissions that they cannot eliminate. According to the U.S. Department of Energy, the average U.S. per capita carbon emissions is 20.14 tons per year. Assuming a carbon offset price of \$22 per ton and a population of 34,541, it would cost \$15.5 million to completely offset the City's 695,655 tons of carbon produced annually by Doral. Fortunately, the systematic and successful implementation of the recommendations provided in this plan will substantially reduce the carbon emitted by the City each year.



Environmentally Preferred Purchasing



Doral should increase the use of energy efficient materials, renewable resources, alternative energy sources, increase water conservation, and reduce waste wherever possible. Consider the long term benefits of products, such as increased life cycle and efficiencies, when making green purchasing decisions. Doral must incorporate climate change into all public

investment, processes and decisions, including those concerning city infrastructure.

BEST PRACTICES

The City of Taramac is a Silver certified FGBC Green Local Government. The City's achievements include water conservation projects and the creation of a green fleet.





Action Strategies

- Analyze the efficiency of the City's fleet.
- Begin using biofuels in some of the City's vehicles.
- Implement a "no idling" policy for City vehicles.
- All new City construction should receive either LEED Silver or FGBC certification.
- Lead by example with a City sponsored demonstration project.
- Conduct energy audits on City-owned buildings and implement retrofits. Proper insulation and sealing can reduce energy costs by as much as 30%, Double paned windows and occupancy sensors can also provide high impact energy savings.
- Replace traffic lights with energy efficient light-emitting diodes (LED). In addition, school crossing signs and pedestrian signals should also be considered for an LED upgrade.
- Use energy efficient light bulbs and fixtures with timers that automatically shut off in all street lamps. Consider adding solar panels to provide electricity to the street lights.
- Synchronize traffic lights to reduce unnecessary idling. This can also improve a roadway's level of service.
- Use the City's 51 acre environmental park a sustainable site and demonstration project.

Fleets in cities throughout Florida including Miami, Titusville, Cocoa, Fort Lauderdale, Jacksonville, Gainesville, Pensacola and Tampa, have begun to incorporate hybrids and biodiesel.

Green Fleet



Doral should evaluate the efficiency of the City's fleet in order to determine the cost savings produced by purchasing hybrid vehicles.

To determine gas efficiency, multiply the vehicle's MPG by the average annual mileage.

The City's annual mileage is

an estimated 3,233,388 spread over 151 vehicles. Complete the same equation for a hybrid and compare the difference in gasoline use per year and the costs of the vehicle. If found to be cost effective, the City should purchase hybrid cars when retiring current vehicles. Though these vehicles have a higher up-front cost, the City will recover much of the cost through savings on fuel costs over the life of the car.

Since the City has recently purchased new vehicles for the fleet, Doral can explore the use of low-carbon fuel, such as biodiesel and ethanol for the City's fleet, school buses and public transit. More aggressive efforts could include purchasing fuel cell plug-in hybrids. The City of Miami has recently pledged to have 1,000 City vehicles operating on hybrid technology or alternative fuels by 2012. Miami-Dade has also converted part of the fleet to biodiesel. If pursuing biofuel options, the City may consider coordinating with Miami-Dade County for wholesale purchasing of bio-fuels. Biodiesel is safe, biodegradable, and it reduces air pollutants such as soot, particulates, carbon monoxide, hydrocarbons, and air toxins. Biodiesel and ethanol are both renewable, domestically produced fuels that can create new economic opportunities for the region's farmers and present a new local production and distribution industry. The increased use of biofuels can be an attractive investment as certain blends do not require any new investment to retrofit vehicles and will work in existing trucks and cars.

LEED by example

Doral will soon be planning a new City Hall. This new public facility offers an opportunity for the City to "lead by example" construct a green certified City Hall. At minimum, the City should incorporate energy efficient lighting fixtures, and install low-flow water fixtures, low-flow toilets and waterless urinals in the restrooms. Other options include installing solar photovoltaic systems or a green roof on the City Hall or in other government facilities. While upgrades will require an initial investment, they will offer cost savings and a healthy return on investment over the course of several years.

The City should consider incorporating community demonstration gardens on the City Hall lawn that utilize and properly identify a variety of water conserving landscaping techniques including xeriscaping, the use of drought tolerant plants and native vegetation, a rain garden for drainage and a rain harvested irrigation system. The City may also consider constructing a "green street" outside of City Hall or at another prominent location that utilizes Low Impact Development techniques such as permeable and porous paving materials and water efficient collection mechanisms.

The City of Doral will soon gain a 51 acre environmental park on the northeast corner of NW 107th Avenue and NW 58th Street. This wetlands site could become an environmentally sustainable site. The site could serve as a demonstration project by adding a zero impact community building that can be used for community purposes such as photography or botany. A project of this nature would require partnerships with local universities or major employers and significant grant funding.

CITY GOVERNMENT RESOURCES

- **City of Portland**
www.portlandonline.com/osd/
- **Florida Green Building Coalition**
www.floridagreenbuilding.org/db/
- **Miami- Dade County Office of Sustainability**
www.miamidade.gov/oos/
- **City of Tamarac**
www.tamarac.org/green-initiatives.aspx



Action Strategies

- Incorporate all sustainability related information into a single prominent location on the City's website and in the City Hall. Describe in detail the City's current green initiatives, incentives and tools. The website should include links to other informational sites.
- Include an inter-modal map on the City's website. The map will inform residents of pedestrian and bicycle trails, transit routes and stops, parking lots and garages and locations of bike racks.
- Show "Safe Routes to School" on the City's website.
- Use the City's website to promote environmental programs occurring in the Doral area.
- Challenge the City departments to create a department-energy reduction plan. Competition fosters department pride and employee interaction. Offer a prize and recognize the department that shows the most verifiable energy reductions.
- Work with the Miami-Dade School Board to incorporate climate change into the school's curriculum at an elementary level.



Green Resources

The local government should become the premier resource in the City for information relating to green building and conservation. The City should be supplied with ample information and publications on Leadership in Energy and Environmental Design (LEED), Florida Green Building (FGBC), National Association of Home Builders (NAHB) and EnergyStar programs as well as brochures on simple upgrades that can easily be made to make homes more "green" by increasing water savings and energy efficiency, selecting environmentally sensible materials and enhancing indoor environmental quality.



Internal Initiatives

Education should begin inside the City Hall walls. If a Green Coordinator is hired, that person can work with City Departments to ensure that the departments and employees are using energy efficiently and reducing the waste they produce. Until a time that a Green Coordinator can be hired, the Environmental Advisory Board and the Human Resources Department are good sources to take an active role in the promotion of climate change activities.

School Curriculum

Schools spend more on energy than on computers and textbooks combined. Reducing energy use is an effective way to help schools funnel more money into the classroom instead of into utility bills. The concept of energy efficiency provides multidisciplinary learning opportunities in math, science, and language arts.





Action Strategies

- Hold a “visioning session” with the City’s residents to gain community input for the prioritization of projects
- The proposed Green Coordinator should work with local non-profits and coordinate education resources with agencies such as SFWMD, Miami-Dade, and FP&L to disseminate information regarding the benefits and availability of sustainable resources and techniques. Other partners include the City’s large employers such as Walmart and Carnival.
- Distribute pamphlets to businesses and residents with conservation information.
- Encourage Doral residents to submit suggestions to enhance the City’s green efforts.
- Link a Green Blog to the City’s website to provide a forum for Doral residents to share ideas, resources and support. A staff person should monitor the blog to ensure that it remains a positive and useful tool for idea sharing.
- Post the City’s energy and water usage online so that residents can see the City’s progress.
- Utilize the City’s website and newsletters to share the City’s green successes.
- Publicly recognize green businesses and developments.
- Encourage residents to submit “Florida Friendly” yards to the University of Florida IFAS Extension “Florida Yard Recognition Program.”
- Create an annual “Green Award.”
- Apply for FGBC Local Government Certification.



Civic Engagement



Global warming pollution comes from everyday actions by the people, households, businesses and other institutions that constitute the City of Doral. Consequently, reducing global warming will ultimately rely on the combined effort of every resident, household and

business to make the behavioral changes to carry out energy and water reducing activities.

The economic and environmental benefits of green improvements has started to gain mainstream acceptance. With the increased exposure of green products and practices, Doral residents are becoming more aware of innovative and often simple ways to lead an environmentally responsible lifestyle. Whenever possible, the City should facilitate the communication of those interested in both learning and sharing new ideas.

Green Recognition

As Doral incorporates eco-friendly policies, the City should actively work to acknowledge stories of success. This recognition will provide an incentive for businesses to incorporate green practices, and provide “best practice examples,” foster community pride, and inspire others to act.



EDUCATION & OUTREACH RESOURCES

- **City of Sarasota- Road map to Sustainability**
www.scgov.net/Sustainability/
- **City of Portland**
www.portlandonline.com/osd/
- **South Florida Water Management District Education and Publications**
www.sfwmd.gov/portal/page?_pageid=2434,10518775&_dad=portal&_schema=PORTAL
- **Dream in Green Foundation**
www.dreamingreen.org/

Did you know?

The City of Miami partners with a local non-profit organization to incorporate energy efficient technologies into the school's operations and curriculum. Students measure carbon saved with a “green-o-meter.”

The City of Sarasota published the “Environmental Points of Pride” pamphlet to publicly show all of the steps that City departments have taken to incorporate eco-friendly practices.





ACTION ITEMS	REFERENCE PAGE	LAND DEVELOPMENT CODE	COMPREHENSIVE PLAN	INTERDEPARTMENTAL COORDINATION	INTER-AGENCY COORDINATION	PUBLIC/PRIVATE/NON-PROFIT PARTNERSHIP	ORDINANCE	RESOLUTION	WEBSITE	RECOGNITION PROGRAM	CITY BUDGET	GRANT	RECOMMENDED LEAD DEPARTMENT
DEVELOPMENT REGULATIONS AND GUIDELINES													
• Amend the DIA and the GOPs of the Comprehensive Plan outlined in this plan	See summary table p 34		•	•	•		•				•		PZ/CC
• Update the Land Development Code to include the changes outlined in this plan	See summary table p 36	•		•			•				•		PZ/CC
• Establish a Green Building Program	15			•					•		•	•	CC
• Adopt a tree preservation ordinance	12	•	•		•		•						CC/PZ
PUBLIC REALM													
• Replace traffic lights and crossing signals with LED lights	27			•							•	•	PW
• Use energy efficient light bulbs with timers and auto-shut off for street lights	27			•							•	•	PW
• Examine traffic signal timing and coordinate where inefficient	27			•									PW
• Place recycle bins in the City's parks and downtown areas	22										•	•	PW
• Place large dumpsters for recycling near a public building	22				•						•	•	PW
• Provide "wayfinding" in the downtown areas	18					•					•	•	PZ/PW
• Create a public arts program	18					•	•				•	•	PZ/PW
• Actively encourage and facilitate the formation of a farmers' market	24		•	•					•		•	•	CC/PZ
• Continue to build bicycle trails	18			•		•					•	•	PW/PZ
• Establish a hierarchy of sidewalks	18	•	•										PZ
• Conduct a transportation study	19											•	PZ
• Install bike racks in downtown and mixed use districts	18					•					•	•	PW
• Survey large exposed paved surfaces	12				•	•		•				•	PW
• Start a public/private partnership to plant trees	12			•	•	•					•	•	CC/PZ
• Examine the feasibility of using reclaimed water	20		•		•			•			•	•	PW





ACTION ITEMS	REFERENCE PAGE	LAND DEVELOPMENT CODE	COMPREHENSIVE PLAN	INTERDEPARTMENTAL COORDINATION	INTER-AGENCY COORDINATION	PUBLIC/PRIVATE/NON-PROFIT PARTNERSHIP	ORDINANCE	RESOLUTION	WEBSITE	RECOGNITION PROGRAM	CITY BUDGET	GRANT	RECOMMENDED LEAD DEPARTMENT
INTERNAL POLICIES AND PROGRAMS													
• Conduct a visioning session	29										•	•	PZ
• Complete an Urban Ecosystem Analysis	12							•					PR
• Establish an interdepartmental advisory committee	16			•									BD/PZ
• Conduct a greenhouse gas baseline assessment	29												PZ
• Establish targets to reduce greenhouse gases	29							•					CC
• Create a inter-department challenge for energy reduction	28			•									HR
• Utilize FDEP’s recommendations for reducing waste at the workplace	22			•									HR
• Conduct a Workforce Housing Needs study	11		•	•							•		PZ
• Expand recycling in City Hall to include items such as glass, bottles, phone books, etc.	22			•									HR
• Create an Environmentally Preferred Products policy	26			•				•					CC/FNC
• Study top ten (10) most frequently purchased office items	28			•									FNC
• Determine most cost and environmentally beneficial products/brands	28			•									FNC
• Conduct energy audits on City-owned buildings and implement retrofits where feasible	27					•					•	•	PW
• Increase fuel efficiency in the City’s fleet	27							•			•		PW
• Institute a “no-idling” policy for City vehicles	27							•					CC
• Resolve to make City owned buildings Silver LEED/FGBC certified	27						•				•	•	CC
• Fund incentives for green building	15			•				•			•		CC/PW
• Reduce building permit fee for solar panels	16			•					•		•		CC/BD
• Reduce stormwater impact fee for low-impact development	13			•							•		CC/PW
• Create a deconstruction permit	23	•		•				•			•		BD
• Administer tree removal and relocation	12	•		•				•					PZ
• Create a “Cool Roof” policy	14		•				•		•				CC/PZ





ACTION ITEMS	REFERENCE PAGE	LAND DEVELOPMENT CODE	COMPREHENSIVE PLAN	INTERDEPARTMENTAL COORDINATION	INTER-AGENCY COORDINATION	PUBLIC/PRIVATE/NON-PROFIT PARTNERSHIP	ORDINANCE	RESOLUTION	WEBSITE	RECOGNITION PROGRAM	CITY BUDGET	GRANT	RECOMMENDED LEAD DEPARTMENT
• Encourage the City’s golf courses to incorporate sustainable practices such as Florida Friendly Landscaping	12					•		•					CC
• Survey employee commuting habits	11			•									HR
• Allow City employees to use the Doral circulator at no charge	11			•									CC/HR
• Create commuter incentives	11			•								•	CC/HR
• Hire a full-time Green Coordinator	20												CC/CM
• Ensure that the new City Hall is equipped with the latest in green design and construction	27			•							•	•	CC/CM
• Create demonstration projects	27								•		•	•	CC/CM/PW
• Support and facilitate the creation of a zero-impact building on the 51 acre environmental park	27			•	•	•			•		•	•	CC/CM/PW/PZ
• Actively support local, county and state efforts to increase energy programs					•								CC/CM/PZ
• Purchase carbon credits to offset City’s carbon emissions (when possible)	26										•		CC/CM/FNZ
• Apply for FGBC Local Government Certification	29			•							•	•	CC/CM/PZ
EDUCATION AND OUTREACH													
• Create a green resource website	28, 29			•	•	•			•			•	PIO
• Distribute pamphlets to residents and businesses on energy and water conservation	29										•	•	PZ/BD/PW
• Encourage residents to take advantage of Miami-Dade tree “give away” and/or create a City tree giveaway program	12					•			•			•	PW/PZ
• Inform residents of programs offered by SFWMD, Miami-Dade County and the University of Florida IFAS Extension	20				•				•				PZ/PW/PR/BD/GC
• Work with Miami-Dade County to incorporate climate change into school curriculum	12			•	•	•							CC/PZ





ACTION ITEMS	REFERENCE PAGE	LAND DEVELOPMENT CODE	COMPREHENSIVE PLAN	INTERDEPARTMENTAL COORDINATION	INTER-AGENCY COORDINATION	PUBLIC/PRIVATE/NON-PROFIT PARTNERSHIP	ORDINANCE	RESOLUTION	WEBSITE	RECOGNITION PROGRAM	CITY BUDGET	GRANT	RECOMMENDED LEAD DEPARTMENT
PUBLIC PROGRAMS													
• Create a “green” award	29					•				•		•	CC/CM
• Create an Adopt a Garden Program for vacant land and public parks	24		•		•	•		•	•		•	•	PZ/PW
• Encourage and promote composting	24								•				GC/PW
• Create a Safe Routes to School program	18, 28								•		•	•	CM/PZ
• Place a multi-modal map and a Safe Routes to School map on the City’s webpage	28								•				PIO
• Apply for WaterSIP funding to fund a conservation program	20				•				•		•	•	PW
• Encourage Miami-Dade County WASD to provide informational billing	20				•								CC
• Create a recognition program for green buildings, water efficient projects and yards	21, 29									•			CC/GC

- City Commission CC
- City Manager CM
- Planning and Zoning PZ
- Public Works PW
- Building Department BP
- Parks and Recreation PR
- Finance FNC
- Human Resources HR
- Public Information Officer PIO
- Green Coordination GC





**LAND DEVELOPMENT CODE AMENDMENTS
SUMMARY TABLE**

REFERENCE PAGE

Density and height bonuses for green buildings	10
Accessory live/work spaces by right in all residential and mixed use districts	10
Provision for the “transfer of development rights” in the Land Development Code	10
Cluster single family homes with Special Exception approval. Homes will be built on small lots with narrow front setbacks, large backyards and dense landscaping.	10
Minimum percentage of buildings in the downtown mixed use areas to have active uses on the first floor	10
Public facilities with clearly defined and dedicated public spaces	10
Sidewalks and walkways to be shaded	10
Tree Preservation Code	12
Palms in the right-of-way to be designated as ornamental	12
Proper root structure development.	12
Tree coverage to shade a minimum of 50% of parking spaces	12
Tree caliper 3” at time of planting	12
Vegetated surfaces on rooftops and in rain gardens	13
Well-maintained grass swale for on-site drainage systems over curb and gutter	13
Permeable materials for low-use areas	13
Narrow width for local streets	13
9’ x 18’ parking spaces	13
Parking cap for mixed use projects	13
Percentage of homes to be oriented to minimize solar exposure	14
Natural ventilation	14
Cool roofs	14
Minimum percentage of solar power in new subdivisions	14





**LAND DEVELOPMENT CODE AMENDMENTS
SUMMARY TABLE**

REFERENCE PAGE

Green roofs as open space	14
“Sustainable Points”	15
Green building certification for Creative Excellence	15
Solar energy systems as accessory uses	16
Small wind turbines	16
Permitted encroachments to facilitate placement of solar facilities	16
Large developments must have a minimum percentage of solar power	16
Bike racks in downtown mixed use developments	18
Rain barrels permitted in the side and rear setbacks	21
Water storage tanks as a permitted accessory use	21
Porous pavement and/or open cell concrete blocks in low use areas	21
Farmers’ markets	24
Vegetable gardens	24
Raising of up to six hens as a Special Exception Accessory Use	24
Urban gardens	24





COMPREHENSIVE PLAN AMENDMENTS SUMMARY TABLE

COMPREHENSIVE PLAN AMENDMENTS SUMMARY TABLE	LOCATION
LAND USE ELEMENT	
Goals, objectives and policies for energy efficient land use patters accounting for existing and future electric power	10
Consideration - Lower the height, density and FAR requirements in the Comprehensive Plan in order to encourage intensity bonuses that are linked to green building.	15
Objective and policies to grant density and height bonuses for green buildings	10
Policy to consider the connectivity of street networks in all site plan, platting and right-of-way vacation applications	18
Policy to plan public open spaces to be linked greenways/bikeways	18
Policy to designate “receiver sites” in areas the City would like to preserve for the purposes of open space to provide linkages and greenways/ bikeways.	18
Goal, objectives and policies to support the growing, processing and distribution of food and animal husbandry	24
Objective and policies to create an “Adopt-a-garden” program that will allow residents to develop gardens on vacant land and in public parks.	24
Goal, objectives and policies to establish a farmers’ market	24
Energy conservation in the Future Land Use Map Series	10
TRANSPORTATION ELEMENT	
Goal, objectives and policies to decrease the vehicle miles traveled in the City	10
Goals, objectives and policies in the Transportation Element to address transportation related greenhouse gas emissions and incorporate greenhouse gas reduction strategies in the Land Use Element	10
Policy to establish a hierarchy of sidewalks with specific streetscape/street furniture standards	18
HOUSING ELEMENT	
Goals, objectives and policies to incorporate energy efficiency and renewable energy sources in the design and construction of new housing	11





**COMPREHENSIVE PLAN AMENDMENTS
SUMMARY TABLE**

LOCATION

CONSERVATION ELEMENT

Goals, objectives and policies to address factors affecting energy conservation	14
Policy to require green roofs or solar panels for all new developments	14
Policy to acquire LEED Silver or FGBC certification for City owned civic and office buildings (LEED Silver for buildings over 30,000 square feet)	15
Objective and policies to ensure public transit service within a 1/4 mile of all major developments	19
Policy to examine the feasibility of using reclaimed water for irrigation	20
Objective and policies to convert the City's 51 acre environmental park into a sustainable site demonstration project	27
Consideration: Policy to require green building certification for private buildings over 50,000 square feet. LEED Silver certification is recommended for buildings over 30,000 square feet.	15



ADDITIONAL RESOURCES

American Society of Landscape Architects – ASLA Sustainable Sites

<http://www.sustainablesites.org/>

Climate Communities

<http://www.climatecommunities.us/>

FAU’s Center for Urban and Environmental Solutions

<http://www.sfclimatechange.org/>

Energy Star

<http://www.energystar.gov/>

Environmental Protection Agency - Climate Change Home Page

<http://www.epa.gov/climatechange/ipcc2007.html#wg2>

Florida Department of Community Affairs

<http://www.dca.state.fl.us/>

Florida Department of Energy

<http://www.energy.gov/florida.htm>

Florida Department of Environmental Protection - Florida Climate Change

<http://www.floridadep.org/climatechange/eo.htm>

Florida Energy Center

<http://www.fsec.ucf.edu/en/>

ICLEI Local Governments for Sustainability

<http://www.iclei.org/index.php?id=800>

IPCC Intergovernmental Panel on Climate Change

<http://www.ipcc.ch/>

International Code Council - Green Building

<http://www.iccsafe.org/news/green/index.html>

NAHB’s Model Green Home Building Guidelines

http://www.nahb.org/publication_details.aspx?publicationID=1994§ionID=155

New Partners for Smart Growth

<http://www.newpartners.org/>

Pew Center on Global Climate Change

<http://www.pewclimate.org/>

Smart Growth Partnership

<http://www.smartgrowthpartnership.org/>

South Florida Regional Planning Council

<http://www.sfrpc.com/>

Sustainable Communities Network

<http://www.sustainable.org/>

Urban Land Institute Growing Cooler

<http://dnr.wi.gov/environmentprotect/gtfgw/documents/GrowingCoolerEs.pdf>

U.S. Department of Energy - Energy Efficiency and Renewable Energy

<http://www1.eere.energy.gov/cleancities/>

U.S. Green Building Council

<http://www.usgbc.org/>

The United States Conference of Mayors - U.S. Mayors Climate Protection Center

<http://www.usmayors.org/climateprotection/>





The U.S. Mayors Climate Protection Agreement

(As endorsed by the 73rd Annual U.S. Conference of Mayors meeting, Chicago, 2005)

- 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 1) includes 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 bio-diesel;
 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.