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CLERK OF THE BOARD
OF COUNTY COMMISSIONERS
MIAMI-DADE COUNTY, FLORIDA

MEMORANDUM

Agenda Item No. 8(M)(1)

TO: Honorable Chairwoman Rebeca Sosa
and Members, Board of County Commissioners

DATE: March 4, 2014

FROM: R. A. Cuevas, Jr.
County Attorney

SUBJECT: Resolution accepting the Greenprint Progress Report, accepting Greenprint as a framework for taking action on sustainability and directing the Mayor to periodically report on progress and propose revisions
Resolution No. R-226-14

The accompanying resolution was prepared by the Regulatory and Economic Resources Department and placed on the agenda at the request of Prime Sponsor Chairwoman Rebeca Sosa.

R. A. Cuevas, Jr.
County Attorney

RAC/smm

Memorandum

MIAMI-DADE COUNTY

Date: March 4, 2014

To: Honorable Chairwoman Rebeca Sosa
and Members, Board of County Commissioners

From: Carlos A. Gimenez
Mayor

Subject: Resolution Accepting the GreenPrint Progress Report, Accepting GreenPrint as a Framework for Taking Action on Sustainability and Directing the Mayor or Mayor's Designee to Periodically Report on Progress and Propose Revisions

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Recommendation

It is recommended that the Board of County Commissioners adopt the resolution accepting the attached GreenPrint Progress Report, and accepting GreenPrint as a framework for taking action on sustainability and directing the Mayor or the Mayor's designee to provide periodic reporting on progress and propose revisions to the plan to provide for continued relevance.

Scope

GreenPrint is a countywide plan.

Fiscal Impact/Funding Source

All implementation shall be done on an annual basis and as set forth in the annual budgets approved by this Board. Many recommendations in the Plan are low cost or no cost, involving only continued collaboration and leveraging of existing investments.

Track Record / Monitor

Mark R. Woerner, Assistant Director of Planning in the Regulatory and Economic Resources Department, will coordinate and monitor implementation of GreenPrint.

Background

In March 2009, Miami-Dade County was selected as one of three communities nationwide to participate in a sustainability planning toolkit pilot program through ICLEI - Local Governments for Sustainability. GreenPrint: Our Design for a Sustainable Future, released in December 2010, was developed through a fully collaborative process among the many diverse stakeholders of our community: County staff, community groups, experts from the business community and academia, and a wide range of individual Miami-Dade residents. GreenPrint was built upon a foundation of more than 100 actions taken by the Miami-Dade County Board of County Commissioners related to sustainability, environmental protection and climate change. Nearly 100 public meetings were held, and approximately 360 new and existing initiatives were evaluated, with 137 initiatives fully developed in the final plan.

An Interdepartmental Team of experts was a cornerstone in the development of GreenPrint, which integrates the goals of many departments and programs, such as the Comprehensive Development Master Plan, Open Space Master Plan, and Transit Development Plan. With the development of GreenPrint, the County achieved the first three of five key milestones of the sustainability planning toolkit pilot established by ICLEI – Local Governments for Sustainability. The Interdepartmental Team, guided by the administration continues to foster implementation and to weave sustainability into our processes and operations – Milestone 4.

The GreenPrint Progress Report transmitted herein describes advancement of initiatives in the first two years – completing the first phase of Milestone 5 - Evaluate. A central component of GreenPrint is the measure and target associated with each goal, as well as the GreenPrint Scorecard of high level sustainability indicators. Summary of these as well as highlights of successful implementation are provided.

In addition to monitoring, measuring and communicating progress, it is also important to provide for the flexibility that allows GreenPrint to be adapted to County and stakeholder priorities and an evolving economic landscape. A process to periodically update and revise GreenPrint initiatives, including revising, adding and removing initiatives, has been established and recommendations will be provided to the Board for consideration, along with progress reports.

Jack Osterholt
Deputy Mayor

MEMORANDUM
(Revised)

TO: Honorable Chairwoman Rebeca Sosa
and Members, Board of County Commissioners

DATE: March 4, 2014

FROM: R. A. Cuevas, Jr.
County Attorney

SUBJECT: Agenda Item No. 8(M)(1)

Please note any items checked.

_____ **"3-Day Rule" for committees applicable if raised**

_____ **6 weeks required between first reading and public hearing**

_____ **4 weeks notification to municipal officials required prior to public hearing**

_____ **Decreases revenues or increases expenditures without balancing budget**

_____ **Budget required**

_____ **Statement of fiscal impact required**

_____ **Ordinance creating a new board requires detailed County Mayor's report for public hearing**

_____ **No committee review**

_____ **Applicable legislation requires more than a majority vote (i.e., 2/3's ____, 3/5's ____, unanimous _____) to approve**

_____ **Current information regarding funding source, index code and available balance, and available capacity (if debt is contemplated) required**

Approved _____ Mayor
Veto _____
Override _____

Agenda Item No. 8(M)(1)
3-4-14

RESOLUTION NO. R-226-14

RESOLUTION ACCEPTING THE GREENPRINT PROGRESS REPORT, ACCEPTING GREENPRINT AS A FRAMEWORK FOR TAKING ACTION ON SUSTAINABILITY AND DIRECTING THE MAYOR OR MAYOR'S DESIGNEE TO PERIODICALLY REPORT ON PROGRESS AND PROPOSE REVISIONS

WHEREAS, this Board desires to accomplish the purposes outlined in the accompanying memorandum, a copy of which is incorporated herein by reference; and

WHEREAS, Miami-Dade County developed its first ever sustainability plan with the release of "GreenPrint: Our Design for a Sustainable Future" (GreenPrint) in December 2010; and

WHEREAS, GreenPrint was developed through a collaborative process including nearly 100 public meetings among the many diverse stakeholders of our community: County staff, community groups, experts from the business community and academia; and

WHEREAS, GreenPrint was developed as a 5-year roadmap to achieve ambitious sustainability goals and create a resilient community of tomorrow; and

WHEREAS, GreenPrint is an implementing tool for sustainability policies contained in various County plans , such as but not limited to the Comprehensive Development Master Plan, the Open Space Master Plan and the Transit Development Plan; and

WHEREAS, GreenPrint does not provide mandates but rather serves as the framework for the County to integrate environmental, social and economic benefits into policy decisions, programs, initiatives, and services provided; and

WHEREAS, implementation of GreenPrint is guided by an internal implementation team and an external team of community stakeholders, including community groups, experts from the business community, and academia who review initiative progress, GreenPrint Scorecard Indicators, and provide guidance on opportunities for public private partnerships for implementation; and

WHEREAS, all municipalities throughout the County are being invited to adopt GreenPrint and collaborate on implementation,

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MIAMI-DADE COUNTY, FLORIDA, that:

Section 1. The Board hereby accepts the attached GreenPrint Sustainability Progress Report; and

Section 2. The Board hereby accepts GreenPrint as a framework for taking action on sustainability and directs the Mayor or Mayor's designee to periodically report on progress and propose revisions to the plan for consideration by the Board to provide for continued relevance.

The foregoing resolution was offered by Commissioner **Dennis C. Moss**, who moved its adoption. The motion was seconded by Commissioner **José "Pepe" Diaz** and upon being put to a vote, the vote was as follows:

Rebeca Sosa, Chairwoman			**aye**
Lynda Bell, Vice Chair			**absent**
Bruno A. Barreiro	**aye**	Esteban L. Bovo, Jr.	**aye**
Jose "Pepe" Diaz	**aye**	Audrey M. Edmonson	**absent**
Sally A. Heyman	**absent**	Barbara J. Jordan	**aye**
Jean Monestime	**aye**	Dennis C. Moss	**aye**
Sen. Javier D. Souto	**aye**	Xavier L. Suarez	**aye**
Juan C. Zapata	**absent**		

The Chairperson thereupon declared the resolution duly passed and adopted this 4th day of March, 2014. This resolution shall become effective ten (10) days after the date of its adoption unless vetoed by the Mayor, and if vetoed, shall become effective only upon an override by this Board.

MIAMI-DADE COUNTY, FLORIDA
BY ITS BOARD OF
COUNTY COMMISSIONERS

HARVEY RUVIN, CLERK

By: Christopher Agrippa
Deputy Clerk

Approved by County Attorney as
to form and legal sufficiency.

Abbie Schwaderer-Raurell

MIAMI-DADE COUNTY

MIAMI-DADE COUNTY greenPrint

PROGRESS REPORT 001

MIAMI-DADE COUNTY

Carlos A. Gimenez
Mayor

BOARD OF COUNTY COMMISSIONERS

Rebeca Sosa
Chairman

Lynda Bell
Vice Chairwoman

Barbara J. Jordan
District 1

Jean Monestime
District 2

Audrey M. Edmonson
District 3

Sally A. Heyman
District 4

Bruno A. Barreiro
District 5

Rebeca Sosa
District 6

Xavier L. Suarez
District 7

Lynda Bell
District 8

Dennis C. Moss
District 9

Senator Javier D. Souto
District 10

Juan C. Zapata
District 11

José "Pepe" Díaz
District 12

Esteban Bovo, Jr.
District 13

Harvey Ruvin
Clerk of Courts

Carlos Lopez-Cantera
Property Appraiser

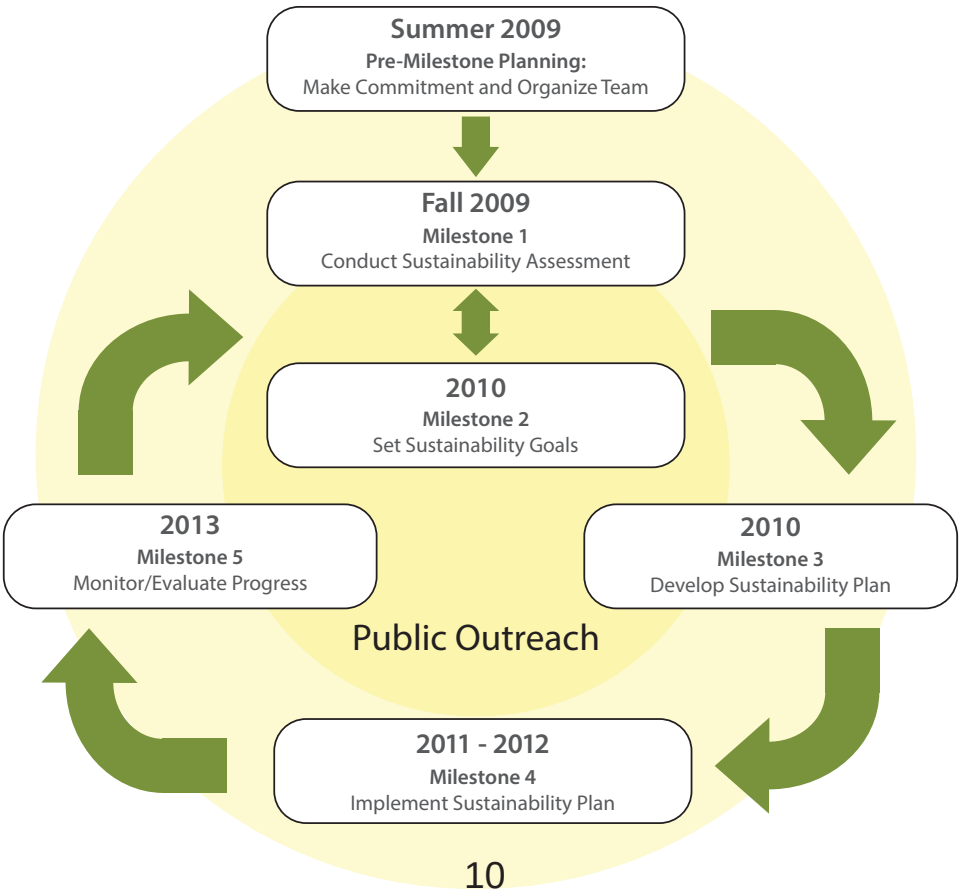
Robert A. Cuevas Jr.
County Attorney

green.miamidade.gov

GreenPrint: Our Design for a Sustainable Future, lays out a vision for a community with a robust economy, a healthy environment, and a better quality of life for the people who live and visit Miami-Dade County. GreenPrint is also an action plan with 5-year cycles, focused on measurable goals and specific targets within its 7 interconnected goal areas and 137 initiatives. It contains many new initiatives, but also aims to elevate and intensify efforts related to existing initiatives and plans. Together, the existing and new initiatives strive to achieve aggressive water conservation, energy, climate change, and greenhouse gas reduction goals to sustain ourselves and our natural resources. GreenPrint was developed in collaboration with many community stakeholders: experts from the business community and academia, individual residents, nonprofit organizations, municipal representatives, and County staff. GreenPrint is a community-wide plan. It is a map to achieving goals that benefit the economy, the environment, and society – because that is what sustainability is all about!

The purpose of this specific report is to highlight the progress of a few key GreenPrint initiatives during the period 2011 - 2012. This was a period of recovery for the economy and housing market in Miami-Dade County, as well as a time of continued population growth. During this challenging time, GreenPrint stakeholders continued their hard work on behalf of our community. One important achievement since the initial release of GreenPrint in 2010, was the creation of an internal web-based tracking tool, developed with the assistance of the County's Information Technology Department. To measure such progress, the tracking tool maintains key information and records updates for each initiative. This tool allows us to more easily report on the progress of each initiative. As initiatives are completed and situations change, initiatives incorporated into GreenPrint will change as well.

Milestones



Dear Fellow Residents of Miami-Dade County:

This Progress Report highlights some of the achievements we have been tracking as part of our community-wide sustainability plan, "GreenPrint, Our Design for a Sustainable Future." It is with great pleasure that I share with you our progress to date.

Over decades, visionary businesses, universities, nonprofits, individuals, and municipal and county agencies have helped shape our region for the better. The GreenPrint difference is to connect all of these individual efforts and weave them together into a strategic framework and plan of action to help ensure that our community attains even better and lasting economic, environmental, and community health. GreenPrint uses a "big picture," collaborative, and long-term approach that is helping us to keep moving in the right direction, as we turn the pressing challenges of today into opportunities for sustainable economic growth and a better quality of life.

Every initiative that you will read about in this report is being achieved through hard work, dedication, and collaboration. I am proud of all of the accomplishments in our community, and look forward to sharing additional achievements from other community stakeholders in the years ahead.

Sincerely,

Carlos A. Gimenez
Mayor

2012 SUSTAINABILITY HIGHLIGHTS

- 110 initiatives completed and in progress to enhance our community's sustainability
- $1.2 million in energy efficiency rebates provided to 140 commercial businesses through the Miami-Dade County Commercial Rebate Program
- 8.3 million additional average annual boardings on County public transit system
- 1.74 million gallons of water conserved per day
- 33.6 miles of new bicycle trails and lanes
- 530 hybrids in our County fleet
- 70 Energy Star certified buildings in our community
- 23,600 acres preserved through our County Environmentally Endangered Lands program, storing over 5 million metric tons of carbon dioxide (CO_2)
- 88% days with an Air Quality Index best rating
- 358.8 pounds recycled per year per household through County curbside recycling

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In Recognition of our GreenPrint Partners

I would like to personally thank the many people who helped us prepare this report. Your passion and dedication are admirable. Each of you, including those who are not specifically on the GreenPrint Implementation Team yet provided important contributions nonetheless, helped ensure that our GreenPrint Progress Report was completed in a thorough and professional manner. I am thankful to have so many colleagues who are collectively committed to our sustainability goals. It is a pleasure to work with all of you and I look forward to our continued collaboration and success!

-Nichole Hefty, Office of Sustainability Chief, Regulatory and Economic Resources Dept.

GreenPrint Implementation Team

Jack Osterholt, Deputy Mayor/Director, Regulatory and Economic Resources Dept.
Lisa M. Martinez, Senior Advisor, Office of the Mayor
Manuel Armada, Division Chief, Regulatory and Economic Resources Dept.
Sarah Ballard, Graphic Designer, Community Outreach and Information
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Margaret Brisbane, Assistant Director, Information Technology Dept.
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Bill Busutil, Senior Business Analyst, Office of Management and Budget
Kelly Cooper, Strategic Planner, Citizens Independent Transportation Trust
Antonio Cotarelo, Assistant Director, Public Works and Waste Management
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Cynthia Guerra, Program Director, Regulatory and Economic Resources
Jerry Hall, Division Director, Internal Services Dept.
Nichole L. Hefty, Sustainability Section Chief, Regulatory and Economic Resources Dept.
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Mark R. Woerner, Assistant Director, Regulatory and Economic Resources Dept.
Patrick Wong, Division Chief, Regulatory and Economic Resources Dept.
Ana Maria Zulueta, Graphic Designer, Community Outreach and Information

Strong Leadership, Connections & Commitment

- **Create the next generation of green leaders**

  Work with more than 100 GreenPrint partners to integrate sustainability into local, regional and national strategic decision-making, policies and operations.

Water & Energy Efficiency

- **Use less water and energy**

  Reduce per capita non-renewable energy use to 20 percent below 2007 baseline by 2015. Reduce water consumption by 1.5 million gallons a day. Reduce government electricity use by 20 percent from 2007 to 2014 in accordance with Board of County Commissioners legislation.

Our Environment

- **Maintain exceptional quality of air, drinking water, and coastal waters used for recreation**

  Continue to achieve the best air quality rating at least 90 percent of the year and exceed drinking water quality standards. Prevent degradation of our Outstanding Florida Waters.

- **Protect and enhance Biscayne Bay, the Everglades, and vital ecosystems**

  Restore and enhance more than 500 acres of coastal habitats and wetlands, and preserve more than 24,000 acres of environmentally endangered lands.

- **Reinvent our solid waste system**

  Reduce or divert 75 percent of our solid waste from landfills by 2020 through reusing, recycling, and generating electricity.

Responsible Land Use & Smart Transportation

- **Use our land wisely, creating and connecting strong sustainable neighborhoods**

  Develop 15 urban center area plans and six multi-modal corridor master plans. Create four transit-oriented developments on heavy rail and bus corridors. Develop level of service metrics to identify resident accessibility to parks and open space areas. Improve access through an interconnected network of shaded and safe bikeways and trails connected to neighborhoods, schools, employment centers, civic buildings, and other community destinations.

- **Provide more transportation options, reducing the time we spend in our cars**

  Add 10 million boardings to our public transportation system through increased services, and enhancing convenience, comfort, and timely service. Increase the percentage of total trips taken by walking or bicycling from 10 percent to 16 percent of all travel trips. Increase resident satisfaction with the availability of sidewalks for pedestrians to 65 percent or more and add 40 miles of bicycle trails and lanes.

Vibrant Economy

- **Create green jobs**

  Cultivate an innovative and sustainable economic infrastructure that creates 20,000 green jobs by 2020 while building on our economic strengths and adding to our competitiveness in the global economy.

- **Build on our international reputation to become a green enterprise destination**

  Increase the percentage of green hotels, eco-tourism, and hospitality related businesses.

Healthy Communities

- **Raise awareness that sustainable living is healthy**

  Decrease our community's lifestyle disease rates such as diabetes and heart disease through healthy eating and exercise. Provide access to fresh, local and/or organic food in all neighborhoods through grocery stores, farmers markets and community gardens supported by local agriculture. Increase the number of short walking and biking trips through safety and other programs. Reduce barriers for disabled and elderly residents.

- **Plant more Florida-friendly and native trees and landscapes**

  Plant half a million trees by 2015 to achieve a 30 perecent tree canopy by 2020 and encourage native, drought-tolerant landscaping to cool our communities, capture greenhouse gas emissions, beautify our neighborhoods, and provide wildlife habitat.

Climate Change Action Plan

- **Understand and respond to current and future climate change impacts**

  Integrate local climate change indicators with existing emergency management, storm water planning, and infrastructure planning.

- **Reduce greenhouse gas emissions**

  Reduce GHG emissions by 10 percent by 2015, working towards 80 percent reduction by 2050 to advance the Cool Counties Program commitment.

Strong Leadership, Connections & Commitment

The leadership goal area has connections to all goal areas, as leadership can make or break the success of an initiative. Leadership, connections, and commitment come into play whenever decision-makers are faced with competing environmental, social, and economic needs. Ideally, informed decisions are made in a way that ensures Miami-Dade County residents will have a sustainable, high quality of life for the long term.

Leadership and community commitment are essential to developing consistent, reliable, and enduring policies that can truly impact the sustainability of our community. Examining problems and potential solutions with the long-term approach and the broad and multi-faceted lens of sustainability is more complicated than normal decision-making strategies. However, the benefits of using this strategy to help make decisions is worth it – because it helps to ensure that solutions will benefit our people (society), planet (the environment), and profit (the economy) far into our future.

Climate change and sea level rise are relatively new challenges that leaders must grapple with in all coastal areas, including Miami-Dade County. Fortunately, decision-makers at all levels in our community have a strong record of environmental leadership and stewardship that dates back to the early 1990's. That rich history and local commitment in a community with obvious vulnerabilities to climate change has given Miami-Dade a voice on a national and international level, and we are there, at the global table, helping to shape policy. We must continue to work, not only at the level of international discussion, but also at the level of individual and personal commitments.

Goal

- ***Create the next generation of green leaders***

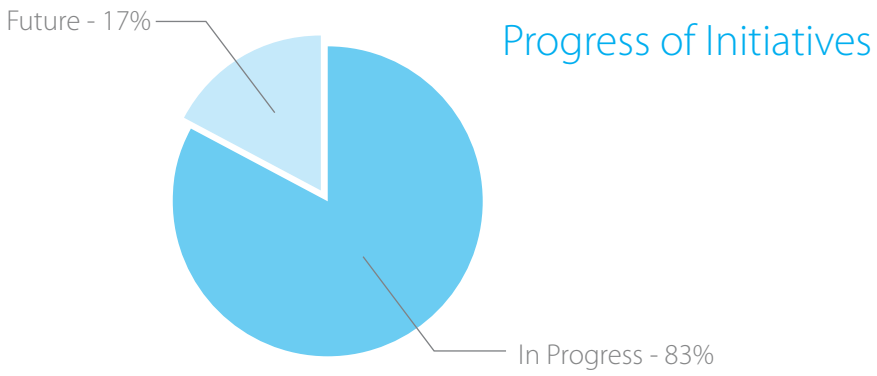
STRONG LEADERSHIP, CONNECTIONS & COMMITMENT

Strengthen regional and local community partnerships *(4 in progress initiatives)*

Integrate sustainability into all leadership systems *(2 in progress initiatives)*

Be green government role models *(3 in progress and 1 future initiative)*

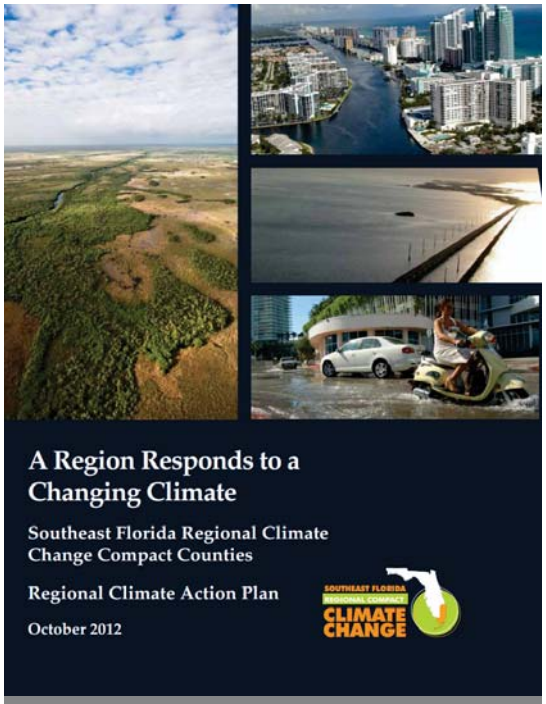
Create ongoing outreach, education, and dialogue with the community about the implications of climate change and the benefits of sustainability *(1 in progress and 1 future initiative)*



Initiative1: Implement the Southeast Florida Regional Climate Change Compact

The Southeast Florida Regional Climate Change Compact (Compact) represents a joint commitment of Miami-Dade, Monroe, Broward and Palm Beach Counties to partner in fostering sustainability and climate resilience at a regional scale. The Compact was formalized following the 2009 Southeast Florida Climate Leadership Summit, when elected officials came together to discuss challenges and strategies for responding to the impacts of climate change. It outlines goals and an ongoing collaborative effort among the Compact counties, and is guided by a Staff Steering Committee with representatives from each of the four counties and a municipality representative from each county. Non-voting advisors include the Institute for Sustainable Communities, the South Florida Water Management District, the South Florida Regional Planning Council and The Nature Conservancy. The efforts of the Compact Counties have garnered attention, collaboration and resources from a variety of local, national and international sources. The following are some of the accomplishments to date:

- Development of a regionally consistent unified sea level rise projection for the coming decades, preliminary inundation mapping, and a regional greenhouse gas baseline, all completed with assistance from local, regional, state, and federal agencies



The four county Regional Climate Action Plan, released in 2012.

- Creation of a Regional Climate Action Plan (RCAP) - the RCAP contains 110 action items aimed at reducing greenhouse gas emissions and adapting to the effects of climate change
- Obtaining a nearly $1 million grant from the Kresge Foundation to implement recommendations in the RCAP through 2015
- Annual coordination and development of joint state and federal legislative policy
- Helping to amend the Florida Energy Act to allow commercial buildings to qualify for energy efficiency program funding through the Local Option Sales Tax

Another important accomplishment of the four-county Compact has been the successful creation of an amendment to Florida law creating "Adaptation Action Area (AAA)" designation for areas that experience coastal flooding and are uniquely vulnerable to climate impacts, including sea level rise. The Compact helped draft and lead joint legislative advocacy efforts to provide for this designation in order to help local governments identify areas that are vulnerable to coastal flooding from sea level rise. The new designation will prioritize infrastructure improvements, improve technical and funding assistance for increasing resilience, and serve as a planning tool. We are working with the State and Compact partners on initiatives to guide designation of Adaptation Action Areas, as called for in the County's Comprehensive Development Master Plan.

Initiative 3: Encourage all municipalities to adopt GreenPrint

Our municipalities continue to be an essential partner in achieving sustainability because neighborhood-level decisions often have the most direct impact on the quality of life of our residents and the success of our businesses. The Miami-Dade County League of Cities (League) has embraced this role with its recent adoption of a resolution encouraging member cities to formally adopt GreenPrint as a planning framework for each of their cities, and to work collaboratively with Miami-Dade County on sustainability initiatives. The resolution also urged members to sign on to the Mayor's Climate Action Pledge, in support of implementation of the Compact's SE Florida Regional Climate Action Plan. We would like to congratulate and thank the five municipalities that have adopted the Pledge as of this Progress Report:

- The Town of Surfside
- The City of Miami Beach
- The Village of Pinecrest
- The City of South Miami
- The Town of Bay Harbor Islands

The League's Energy, Environment and Natural Resources Committee is working in partnership with the County's Office of Sustainability to coordinate much of this increased collaboration, including:

Third annual Miami-Dade League of Cities Best Practices Workshop.

- Developing a panel for a two-day meeting of the National Energy, Environment and Natural Resources Committee that focused on developing key issues, positions, and legislative language for policy at the national level
- Developing two sustainability-themed speaker panels at the League's Third Annual Best Practices Workshop
- Developing a sustainability survey to inventory green initiatives taken by municipalities. The survey is intended to facilitate sharing of best practices and to target future collaborative opportunities, and therefore may be the achievement with the most long term benefits. The survey results will be posted online on the County's green webpage (http://www.miamidade.gov/green/) and presented in the next progress report.

Initiative 4: Pursue more public-private partnerships to implement policies identified in County plans that improve County services

Public-private partnerships (P3s) are becoming an effective strategy of choice in addressing the challenge of improving our community's infrastructure (such as canals, parks, bridges, public transit stations, and public housing), in the face of ever-shrinking municipal and County budgets. Below are three different examples of our P3 efforts.

Brickell CityCentre, a $1.05 billion privately financed mixed-use development, is currently being constructed in the center of the Brickell financial district in downtown Miami. It has been the catalyst for two public private partnership projects and incorporates several sustainability aspects in the design and planning. Swire Properties and Arquitectonica, the development and architectural firms for the project, have actively worked with Miami-Dade Transit to incorporate the adjacent 8th Street Miami-Dade Transit Metromover station into the Brickell CityCentre project design. The Brickell Metromover station will undergo several modifications, designed and built by these private sector partners, in order to facilitate the use of public transportation by CityCentre residents and businesses, as well by the surrounding community. In addition, Miami-Dade Parks, Recreation, and Open Spaces Department (MDPROS) is developing Brickell Promenade, a linear park along the Metrorail guideway, connecting the Metrorail Brickell Station with the Miami River Greenway in the vicinity of Brickell CityCentre.

Brickell CityCentre is a new public private partnership that will benefit our local economy, public transportation, and parks and open spaces.

Working through public private partnerships, Miami-Dade Parks, Recreation and Open Spaces and the Parks Foundation of Miami, have improved facilities and expanded programming that supports children and adults, seniors, and people with disabilities. MDPROS has over 50 agreements with private for-profit organizations, generating over $6.5 million dollars annually. Additionally, MDPROS has over 40 agreements with nonprofit organizations generating over $150,000 annually. During the reporting period, the Parks Foundation, in partnership with MDPROS, has also successfully pursued and secured revenues from an additional 125 non-governmental sources to support their programs, projects, and special events. Agreements signed in the past two years include a variety of services to enhance the park experience for residents and visitors, including restaurants, mini soccer fields, cable wakeboarding and dry boat storage facilities.

As part of a Coca-Cola Troops for Fitness grant, veterans are being hired to enhance fitness and recreation programming. Army National Guard veteran and amputee Laura Ortiz is among the first veterans hired to help Miami-Dade residents get fit and rediscover the joys of being active.

The Miami-Dade County Clean Diesel Repower Program for local farmers is an example of smaller scale public private partnerships. For this program, local farmers invested their own money to replace their aging diesel irrigation engines with new less-polluting engines of similar horsepower. Working through the Agricultural Manager of Miami-Dade County, the federal Environmental Protection Agency National Clean Diesel Program provided each participating farmer with up to 65 percent of the cost of the new engine and parts. The goals of this successful program were to reduce fuel consumption and air pollutants, and to improve the working environment of farmers and farm workers. In total, the federal government provided $2 million in funding and the private farmers spent $700,000 for the engine upgrades, successfully replacing 227 old engines with 223 new engines.

> *"The new engine's exhaust, compared to the old one that belched black smoke, is incredibly clean and its efficiency saves us thousands of dollars in fuel expenses every year because we simply burn less."*
>
> ***- Eric Tietig, Local Farmer and National Clean Diesel program rebate recipient***

Additional public private partnerships are discussed in the Responsible Land Use and Smart Transportation Goal Area in the discussion of Miami-Dade County's Transportation-Oriented Developments (TODs). Existing Transit Oriented Developments bring the County an additional $3 million in annual revenue that is critical to supporting operations and maintenance of our world-class public transportation system.

Challenges and Opportunities

Because sustainability is a relatively new, and somewhat complex, concept and problem-solving strategy, it will take time for our community to learn to recognize what sustainability is and begin to truly integrate this thinking into existing programs and future planning. An important next step would be for our community to dialogue and develop community consensus about the importance of investing in long-term sustainability-oriented solutions. Arriving at these solutions is rewarding, but can also be challenging because they require people to think and work across sectors, across jurisdictional boundaries, and across generations. This is no small task and can be further complicated if the decisions require tough choices for the present that will result in broader, more beneficial results for the longer term.

This is particularly true during difficult financial times, as we have been experiencing for several years now. However, during adversity, there is also opportunity. By looking at things through a sustainability lens, we can often find additional benefits and opportunities that can be quantified and factored into the overall equation, often justifying a trade-off in the present in order to obtain the additional, longer-term, benefits. GreenPrint provides an excellent platform upon which we can identify and build upon those additional opportunities, and it is through our leadership, connections, and commitment that we will lead the way by further engaging our community stakeholders and thinking outside of the box.

Water & Energy Efficiency

Detailed studies and analyses have proven that the cheapest way to securing a more stable supply of water and energy is by using less energy (fuel and electricity), and water (lowering demand) through efficiency and conservation. While we can and, in some cases, should seek to develop new, environmentally safe, and cost-effective alternatives to increase supply, the basic, common sense approach of using less is a more cost-effective approach that can be accomplished even in communities with growing populations like Miami-Dade County.

Water and energy are also linked to each other in terms of generation, supply and distribution. As we use less water, we use less energy, and vice versa. So, economically, the benefits of reducing demand are magnified whenever we reduce our use of water, energy, or both. Saving water and energy also has environmental and health benefits for our community. Using electricity requires electric companies to burn more fuel, and burning fuel releases pollutants into the air. Therefore, reducing these pollutants by lowering our electricity demand can benefit both public health and the health of our ecosystems on which we depend.

Goal

- ***Use less water and energy***

WATER & ENERGY EFFICIENCY

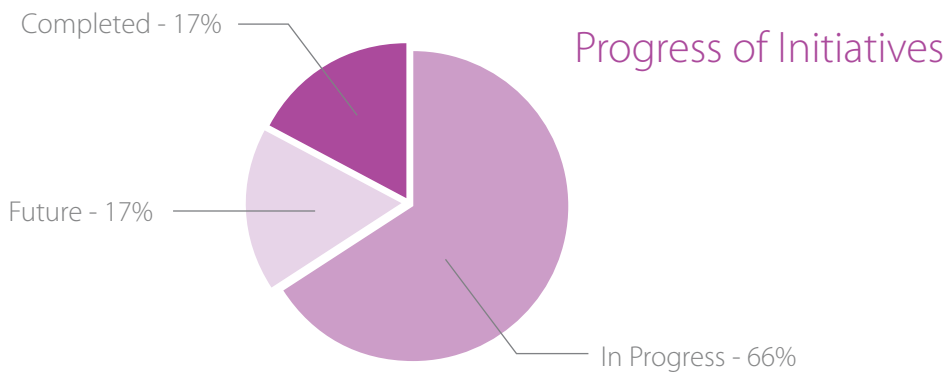
Reduce energy and water consumption through increasing efficiency *(1 completed and 3 in progress initiatives)*

Improve energy planning through public-private partnerships *(1 future initiative)*

Continue water and energy efficiency and conservation campaigns *(1 in progress initiative)*

Expand alternative fuel (bio-diesel/waste-based bio-diesel) and renewable energy industries *(1 in progress and 1 future initiative)*

Be government leaders in energy, fuel and water efficiency *(2 completed, 7 in progress and 1 future initiative)*



Initiative 13: Continue to implement the Water Use Efficiency Plan and the Non-Revenue Water Loss Plan initiatives to meet established reduction targets

Description	Unit of Measure	2015 Target	Quantity to date
Water efficiency reduction	MGD*	1.50	3.66
# of Residential landscape evaluations	number	600	557
# of Multifamily/Commercial landscape irrigation evaluations	number	235	201

* million gallons per day

The County's Water Use Efficiency Plan and Non-Revenue Water Loss Plan are perfect examples of how conservation strategies can help our community use less water and cut costs for individual homeowner and public spending as well. Together, these two plans help the County implement and track different water conservation strategies such as (but not limited to):

- Comprehensive outreach campaigns including in-school education efforts to promote water conservation
- Permanent landscape irrigation restrictions that limit landscape irrigation to two days a week
- New construction standards that codify high efficiency plumbing fixtures in properties built in 2009 or after
- New landscaping ordinances that require the use of drought-tolerant plants
- A tiered water use fee structure which charges more for higher water usage
- High efficiency toilet, faucet and showerhead rebates
- High efficiency toilet and retrofit kits for seniors and low income residents
- High efficiency clothes washer rebates

A high efficiency shower head and lightbulb change for residents

- Exchange program for high efficiency showerheads
- Retrofit kit with high efficiency faucet aerators
- Landscape and irrigation evaluations with rebates for residents, commercial, and institutional entities
- Green restaurant and green lodging evaluations
- Leak detection and repairs in the water supply and distribution systems
- Reduction of water loss from water treatment plants
- Elimination of water theft

Through these conservation efforts and others, Miami-Dade residents have become more efficient in their water use, contributing to an unprecedented drop in water consumption. The current demand for treated water is 44 million gallons per day lower than what was projected in November 2007. Per person, usage has dropped from 158 to 134 gallons per day during the same period of time. Overall, the projected water savings for 2012 has exceeded expectations, with an annual savings of more than 1.74 million gallons per day (MGD). Estimated community-wide annual water savings are 3.2 billion gallons per year, associated with an estimated annual electricity savings of 3.6 million kilowatt hours (kWh) per year and average cash savings of $324,000 in electricity costs alone.

As of now, Miami-Dade is on track to save more than 14.25 million gallons of water per day by 2017. By supplying water in a sustainable manner and reducing and controlling losses, our community will not have to invest in developing expensive new water supply sources. The Water and Sewer Department has been able to cancel or delay costly capital projects to provide alternative water supply. Fixing leaks and similar strategies also provides additional cost savings by decreasing water treatment and distribution costs. Local contractors and retail stores that provide water saving fixtures and devices also benefit economically from conservation programs. The adjacent table reflects the effectiveness of all of MDWASD's water efficiency strategies.

Year	Water Savings (MGD*)	
	Planned	Reported
2007	1.09	1.21
2008	2.24	3.48
2009	3.53	4.90
2010	4.82	6.54
2011	6.10	8.47
2012	--	10.07
2016	11.7	--
2021	15.67	--
2026	19.6	--

* million gallons per day

Miami-Dade's WASD's water efficiency strategies have exceeded expectations.

Initiative 15: Implement EECBG projects

Projects funded by the federal Energy Efficiency and Conservation Block Grant (EECBG) Program jump-started many of our governmental energy-savings initiatives and will continue to benefit the County by saving millions of dollars every year going forward. EECBG funding was coordinated through the Miami-Dade County Office of Sustainability to support twelve projects managed by eight county departments. These projects also aligned perfectly with the County's commitment to reduce electricity consumption in County facilities by 20 percent from 2007 levels by 2014. The complete list of projects benefiting our community, and the associated departments are listed in the table below:

	EECBG Project Name	County Lead Departments
1	Energy Management Systems Upgrade for County facilities	ISD, ITD, CIAO, RER
2	Public Energy Efficiency Education Campaign	CIAO, RER, PWWM, WASD
3	Energy Efficiency Grants to Community and Faith-Based Organizations	OMB, RER
4	Development of Procedures to Facilitate Sustainability in County Capital Investments	RER, ISD, OMB
5	Using Methane to Power Government Facilities	WASD
6	Evaluation Codes and Permitting Processes to Facilitate Energy Efficiency in Buildings	RER, ISD, OMB
7	Daylight Harvesting Project	MDPLS
8	Cool Roof Project	MDPLS
9	Desktop Virtualization Project (Thin Clients)	ITD, RER
10	"Green Roadway" Lighting Project	PWWM
11	Solar Power Installations at Three County Parks	PROS
12	Sustainable Technologies Demonstration Program	ISD

Internal Services Department (ISD), Information Technology Department (ITD), Community Information and Outreach Department (CIAO), Regulatory and Economic Resources Department (RER), Office of Management and Budget (OMB), Water and Sewer Department (WASD), Miami-Dade Public Library System (MDPLS), Public Works and Waste Management Department (PWWM), Parks, Recreation and Open Spaces Department (PROS).

Solar panel roof systems were installed at three Miami-Dade County parks.

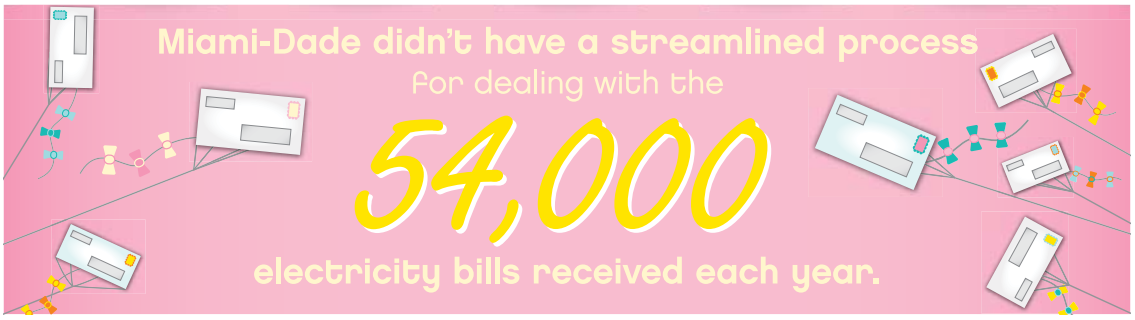
"I wanted to let you know how successful the [EECBG] grant to conserve energy was. In comparison for the same month last year, our electric bill has been reduced by approximately $500 per month. This will result in about a $6,000 reduction in energy costs per year! Again, thank you so much for everything, the program really made a substantial difference in our energy consumption. Hopefully they will fund this type of assistance again."

- Shelley Gottsagen, Center for Independent Living of South Florida, Inc.

The Center for Independent Living of South Florida received an EECBG grant to make their building more energy efficient.

Photographs showing lighting improvements at the gym of the Boys and Girls Club of Miami-Dade, made possible by an EECBG grant.

One of the most successful projects was the installation of utility billing management software across all County departments. This project is anticipated to save the county $2 million in the first two years and to continue saving money and electricity every year from now on. Until this project was completed, Miami-Dade did not have a streamlined and homogenous process for dealing with the thousands of electricity invoices received every month (54,000 electricity bills each year) from our 4,500 electricity meters located at over 1,500 facilities. Miami-Dade is Florida Power and Light's (FPL) largest client in the State of Florida in terms of electricity consumption, with one billion kilowatt hours (kWh) of electricity consumption per year costing over $100 million in annual electricity expenses.



For a solution to take hold, more than 200 employees across 24 County departments were trained on the new billing software. The software, known as EnergyCAP, provides a single billing management system for utility bills, such as electric bills. The software translates and audits the billing data and interfaces with all of the County's financial systems. In addition, EnergyCAP automatically uploads electricity consumption data to a U.S. Environmental Protection Agency's (EPA) system called ENERGY STAR Portfolio Manager, which calculates an energy performance score for registered buildings and sends it back to EnergyCAP. This allows the County to prioritize energy performance improvement projects, use actual data to measure savings resulting from energy performance improvement projects, and seek ENERGY STAR building certification for the highest scoring buildings. In the future, the County is planning to use this new system to track water and sewer utility bills and garbage bills.

Initiative 28: Continue to purchase hybrid-hydraulic diesel garbage trucks

Description	Unit of Measure	2015 Target	Quantity to date
Hybrid-hydraulic diesel garbage trucks	Trucks	126	35

The County has several initiatives related to alternative fuel vehicles that have helped the southeast Florida region to reduce the emission of carbon dioxide pollutants by approximately 3,500 tons over the past two years. Miami-Dade County operates the largest municipal hybrid fleet in the State of Florida and has the third largest municipal hybrid fleet in the United States, according to the U.S. Department of Energy. The county utilizes a variety of electric vehicles, including 441 hybrid-electric sedans, six hybrid pickups, three plug-in hybrid electric sedans, two electric sedans and 43 diesel-electric hybrid buses.

One focus of our fleet efforts has been our garbage trucks. In 2010, the County's Department of Public Works and Waste Management began to purchase hybrid hydraulic-diesel garbage trucks to replace diesel-only trucks. Federal funding from the U.S. Environmental Protection Agency helped to pay for the initial 15 trucks, and the County now owns 35 hybrid garbage trucks that are saving an average of 57,000 gallons of diesel fuel per year. The hybrid system stores energy captured during braking and releases that stored energy during acceleration, allowing the vehicle to run without using fuel. The application is most efficient during frequent stop-and-go use, such as trash pickup. These trucks also require fewer repairs, bringing additional savings into the equation. In addition to cost savings, this initiative also has health and environmental benefits because using less fuel means that these trucks generate less air pollution than traditional diesel-only trucks. These vehicles emit significantly less particulate matter, hydrocarbons, carbon monoxide, and carbon dioxide pollutants, and we estimate that each hybrid hydraulic garbage truck is reducing carbon dioxide emissions by as much as 40 tons per year.

"We still see about a 40% to 45% fuel reduction which allows us to save on our carbon footprint. The trucks run great."

- Daniel Diaz, Miami-Dade Public Works and Waste Management Department

Each garbage truck makes an average of about 1,000 stops per day, which is tough on brakes. A typical garbage truck requires new brakes every three months, but the hybrids only require new brakes once or twice a year. Additional savings are expected for tires.

Challenges and Opportunities

One of the primary challenges of this goal area is to make conservation and efficiency strategies for fuel, electricity, and water a priority, since they have been proven to be the most cost-effective and efficient techniques for reducing usage (demand). Many are unaware of the true advantages of these strategies, and instead tend to focus on repairs using traditional methods, supply-side solutions, such as building new water treatment facilities or looking to alternative fuels with unproven or short-term sustainability benefits. Supply-side solutions are seen as "cutting-edge" and "innovative" and since they require large financial investments, many businesses spend enormous sums of money on lobbying and marketing efforts to try to sway decision-makers to pursue these sometimes costly options. It is important for Miami-Dade to provide more education regarding the benefits of conservation. In addition, savings achieved through conservation should be prudently reinvested in further efficiency and conservation measures,

Technology can change very quickly and this can be both a challenge and an opportunity. Governments are typically very conservative about trying new technologies because of diligence in safeguarding the uninterrupted and consistent delivery of services, taxpayer dollars and reducing liability risks. Most governments do not have the resources to do the comprehensive, complex, multi-faceted analyses that are required to make sure that these new technologies are truly sustainable from an economic, environmental, and social perspective over the long-term. Collaborating with peers and sharing best practice experiences has helped to facilitate the implementation of new conservation techniques; however additional support from decision-makers is also critical.

Our Environment

At the most basic level, plentiful clean water, air, and land, are the foundation of Miami-Dade County's economy. Many businesses and people make Miami-Dade a destination to live, work, and play because of our clean breezes, abundant and clean drinking water, beautiful coastline and beaches, and unique ecosystems. Our ecosystems provide many economic, social, and environmental benefits that are often taken for granted. For example, coastal mangrove habitats help stabilize shoreline sediments, play a critical role as spawning and sheltering areas for many marine species (including those that are important to our commercial and recreational fisheries), and form a protective line of defense against storm surges. In addition to climate change, our natural systems remain vulnerable to other impacts from which they might not be able to recover. That is why many diverse stakeholders in our community are committed to monitoring, restoring, and protecting our invaluable natural resources and ecosystems.

Goals

- ***Maintain exceptional quality of air, drinking water, and coastal waters used for recreation***
- ***Protect and enhance Biscayne Bay, the Everglades, and vital ecosystems***
- ***Reinvent our solid waste system***

Our Environment

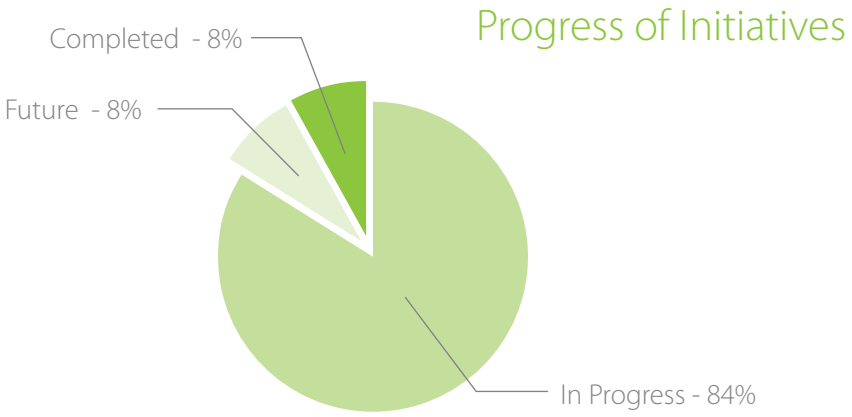
Implement wastewater reuse to provide future water supply and benefit the environment *(1 completed and 2 in progress initiatives)*

Address salt intrusion that threatens drinking water wellfields and sensitive natural areas *(1 completed, 2 in progress and 1 future initiative)*

Protect, enhance, and restore our natural resources *(6 in progress and 1 future initiative)*

Protect environmental and other lands that may be important for ecosystem and community resilience *(2 in progress initiatives)*

Develop a sustainable Solid Waste System and Master Plan, using waste to benefit our economy and environment *(8 in progress initiatives)*



Initiative 35: Monitor the isochlor line and address spatial gaps in salt intrusion data gathering

Description	Unit of Measure	2015 Target	Quantity to Date
Monitoring well installations	Number of wells installed	8	8
Revision and publication of isochlor line	# of projects completed	1	1
Monitor chlorides	# of monthly monitoring events	60	24

In our community, the source of our fresh drinking water lies under our feet. The Biscayne Aquifer, an underground shallow layer of limestone rock, contains enough tiny holes and cracks to hold billions of gallons of fresh water. This water is often referred to as groundwater, or the water table, and it provides virtually all of the fresh water that is used by South Florida residents, visitors, and businesses every day. One way to help protect this critical resource is to monitor potential impacts, which is why the County has been continuously tracking (for over 35 years) the extent that salt water has intruded from our surrounding coastlines into our fresh water supply. The extent of intrusion is known as the salt water front, or isochlor line. Miami-Dade County Water and Sewer Department (MDWASD), in conjunction with Miami-Dade Department of Regulatory and Economic Resources (RER), and the United States Geological Survey (USGS), are currently monitoring a network of 165 monitoring wells to identify movement of the salt front, and to map the location of the saltwater-freshwater interface.

Recent successfully completed efforts have included the installation of eight additional wells to help better track the salt water line, to publish an updated salt front line, and to make sure that monitoring data is accessible for online review by the public (http://www.envirobase.usgs.gov/FLIMS/SaltFront/). In general, there was no significant change between the 2008 and 2011 salt front line in the north and central areas of the County. However, the line has moved further inland in the south, compared to the original 1995 line. Chloride concentrations remained within historical range for most of the sampled stations.

Installation of a monitoring well for salt water front monitoring.

Initiative 45: Continue to acquire important lands through the Environmentally Endangered Lands (EEL) program

Description	Unit of Measure	Target	Quantity
Cumulative Acreage EEL properties	Acres	24,000	23,600

Recognizing the historic loss, fragmentation, and degradation of native ecosystems, Miami-Dade voters approved a referendum in 1990 that established the Environmentally Endangered Lands (EEL) Program. This program works to acquire, restore, and maintain important natural lands for the benefit of present and future generations. Since the program was created, the value of our natural areas has been recognized to provide many other critical public services to our residents and visitors, such as:

- Replenishing our drinking water supply
- Protecting against saltwater intrusion
- Reducing stormwater runoff
- Helping regional restoration efforts
- Conserving native wildlife and habitats and helping species migrate from one part of the world to another
- Supplying services and products such as shading, pollination, and food
- Providing recreational space
- Increasing property values
- Helping maintain options to adapt to climate change effects over the long-term
- Providing carbon sequestration

Participants at an Environmentally Endangered Lands volunteer work day.

As of July 2013, the EEL Program funds active management of over 23,600 acres of natural habitat that have been purchased or designated under the EEL program. In 2004, $40 million was approved for EEL acquisitions as part of the Building Better Communities Bond (GOB). However, the $13 million remaining in the 2004 allocation will not be available until FY 2016-17 at the earliest because other bond funded projects now have higher priority. Therefore, while the 2015 GreenPrint target of 24,000 acres by 2015 may not be met, funding should be available for additional land acquisition in the next 5 to 10 years. Unfortunately the ecosystem, health, and economic benefits of these un-acquired lands remain vulnerable to conversion to other uses or development as long as they are not in public ownership.

Initiative 51: Continue to increase participation in the residential recycling program

Description	Unit of Measure	2015 Target	Quantity to Date
Cumulative tons of recyclables collected	Tons	303,282	167,187
Pounds per household annually 2011	Pounds	375	352
Pounds per household annually 2012	Pounds	375	359

How we manage and treat the waste we generate in our community greatly affects human health and the health of our environment (land, water, and air resources). In 2010, a bill was passed by the Florida Legislature which sets a goal for all counties in Florida to recycle 75 percent of their solid waste by 2020. One of the primary ways to achieve this goal is through our Miami-Dade Public Works and Waste Management (PWWM) recycling programs. In 2008 Miami-Dade introduced a new program that collected all residential recyclable materials mixed together, otherwise known as a single-stream approach. This new curbside residential recycling program has been steadily increasing the amount of our waste stream that is recycled every year. Under this initiative, the County is tracking the total number of tons of materials being recycled by unincorporated areas and the 20 municipalities to which we provide recycling services. In addition, the County is tracking monthly recycling rates per household. During the reporting period, the average pounds of recycled materials being collected per household per month went up from 29.31 pounds in 2011 to 29.90 pounds in 2012.

Challenges and Opportunities

One of the main challenges in this area is simply lack of awareness. Many people in our community take our natural resources for granted and do not understand that they are the basis for the livability and sustainability of our community and economy. Our population continues to grow steadily, thereby increasing pressure on these natural resources that support our region's unique quality of life. Our natural systems have historically been impacted over the years by flood control canals and other infrastructure that have altered natural freshwater flow and ecosystem functioning. Our porous high quality aquifer is vulnerable to sea-level rise and contamination, and if weather patterns become much drier, freshwater supply in the aquifer could be depleted. Our natural ecosystems must contend with invasive species and piecemeal protection. Our solid waste management system is challenged by an ever increasing waste stream (exacerbated in the aftermath of tropical storms and hurricanes), that must be responsibly and effectively managed. A renewed focus on waste reduction and reuse would benefit County residents, businesses, and natural resources. Therefore, as we continue implementation of GreenPrint, a primary need and opportunity will be to provide more effective education and outreach to all sectors and stakeholders in the community, about the multi-faceted value of our unique natural resources.

Responsible Land Use & Smart Transportation

As our population continues to grow, so does our desire for a livable and vibrant community. The U.S. Dept. of Transportation estimates that most trips (72 percent) are not work-related, but are personal trips such as those for errands, shopping, socializing, or recreation. A third of these personal trips are a mile or less, making them ideal for shifting to walking or biking trips given supportive infrastructure and design. Through its Comprehensive Development Master Plan (CDMP), the County designates urban centers, which serve as hubs for development intensification in Miami-Dade County, around which a more compact and efficient urban structure will evolve.

The CDMP also establishes mixed-use corridors connecting the designated urban centers. We are witnessing the fruits of almost 20 years of this effort in land use planning policies. Our urban core is developing at a breakneck pace: more people are living, working and playing in an area that stretches roughly from Midtown down to Brickell, between Biscayne Bay and I-95. And this unprecedented growth is also beginning to spread around the balance of the County's infill area and along the urban centers and mixed-use corridors located on the eastern side of the County. The importance of community design in shifting automobile trips to transit, walking and biking trips can not be overstated, and the inclusion of complete streets supportive policies in the CDMP, as well as a current study are laying the groundwork for formalizing guidance and advancing our progress in this area. The initiatives in this goal area aim to plan, design, and prioritize walkable, affordable communities supported by multimodal transportation options.

Goals

- ***Use our land wisely, creating and connecting strong sustainable neighborhoods***
- ***Provide more transportation options, reducing the time we spend in our cars***

RESPONSIBLE LAND USE & SMART TRANSPORTATION

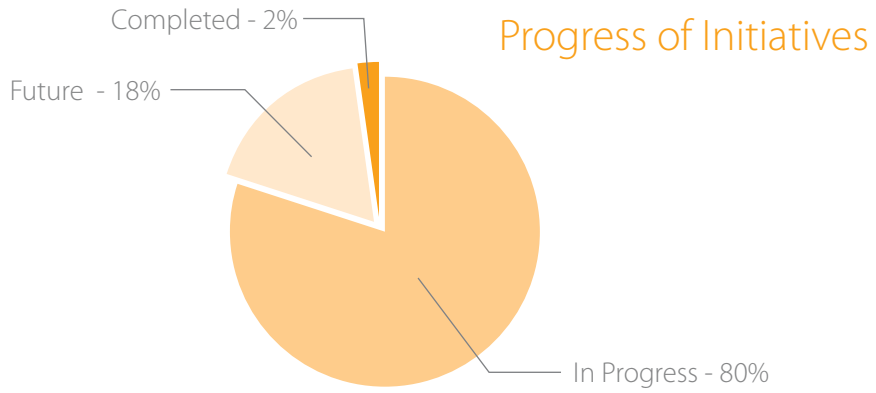
Better integrate planning and prioritize investments *(6 in progress and 2 future initiatives)*

Support existing communities and value neighborhoods *(9 in progress and 1 future initiative)*

Increase bicycling & walking *(12 in progress and 2 future initiatives)*

Increase transit ridership (*1 completed and 6 in progress initiatives)*

Improve connectivity and mobility on the existing system *(3 in progress and 3 future initiatives)*



Initiative 56: Increase transit-oriented development (TOD)

The County is recognized nationally for it's model of leasing land to create mixed-use developments around Metrorail and South Miami-Dade Busway stations. This type of development is commonly known as Transit Oriented Development (TOD), due to the relationship between a public transit facility and the surrounding development. TODs provide our residents and visitors with "one-stop-shops" – where they can live/stay, work, shop, recreate, and socialize. Roadways, landscaping, building orientation and building features within TODs establish the framework to support a higher density mix of land uses to create a bicycle and pedestrian friendly environment.

TODs provide more travel choices, save time, reduce household transportation costs, increase safety, reduce traffic congestion, and support our unique economic engines. A mix of housing, centers of employment, and shopping around transit allows residents to walk or bike for some short trips and encourages transit use to reach other destinations. Increasing populations living along these major transit corridors also helps support the cost of premium transit improvements. Zoning regulations specific to areas around transit hubs also promote the building of TODs by private developers, such as we see in areas like Downtown Dadeland and Brickell (see description of the CityCentre project in the Leadership Connections and Commitment Section).

Brownsville Transit Village residents benefit from their proximity to Metrorail.

Miami-Dade County, through its Transit Department, has been actively promoting Transit Oriented Development for over 27 years. As a whole, the County has twelve developments near transit stations that are either complete or currently under construction. Two of the four Transit Oriented Developments identified in the first 5-year cycle of GreenPrint are nearing completion or are under construction. The Brownsville Transit Village is a 5.8-acre joint development project that currently includes more than 400 workforce-housing units, with mid-rise apartment buildings, townhomes, a parking garage, ground-floor commercial space, and Metrorail station improvements. Residents benefit from immediate access to Metrorail and on-site amenities such as a community center, a computer lab and an exercise room. In addition, on-site community programs offer literacy training, health and nutrition classes, and first-time homebuyer seminars. The fifth and final project phase of the Brownsville Transit Village includes the addition of 65 more workforce-housing units.

Trip boardings at the Brownsville Metrorail station have increased by 29 percent.

Initiative 77: Fund and construct priority non-motorized multi-use trails

This initiative focuses on bringing enjoyable recreational areas and open spaces into more neighborhoods to help create closer-knit neighborhoods that are pedestrian and bicycle friendly. By making bicycling and walking viable options for everyday travel, we can cost-effectively improve our mobility, protect our climate, enhance energy security and improve public health. Multiple County and municipal agencies have designed and built many trails that lace our community together. Trails are one of the elements to creating a proper bicycle network which typically consists of bicycle lanes, bicycle boulevards, shared streets and off-street paths or trails. Bicycle mode-share is not likely to increase without a sufficient network in place.

Our Parks Recreation and Open Space Department, through the Open Space Master Plan, has built several miles of trails in the last few years, with10 more miles planned by 2015. One such neighborhood improvement is the recent construction of the Snake Creek Trail, a 3.4 mile paved multi-use trail with enhanced landscaping designed for non-motorized use by cyclists, skaters, wheelchair users, walkers, runners, and people pushing baby strollers. This project is located on the south side of Snake Creek (C-9) Canal running from NE Miami Gardens Drive to Florida's Turnpike. The new trail is composed of a linear park and two mini-parks, each containing adult fitness stations, play climbers for tiny tots, bicycle racks, trash receptacles, a rain shelter, and benches. The new Snake Creek Trail connects to an existing 2 mile trail in North Miami Beach and to six other proposed trails. Investing in bicycling and walking projects like Snake Creek Trail offers unique opportunity to integrate physical activity into our daily routines.

The Miami-Dade Metropolitan Planning Organization's (MPO's) Complete Streets study will develop a Complete Streets Manual as well as apply the Complete Streets concepts to three corridors within the County.

Community members enjoying the newly opened Snake Creek Trail.

Challenges and Opportunities

One of the principal challenges in this goal area is the existing physical structure of our community. Like many regions across the United States, the advent of the automobile in combination with the availability of open land changed the urban form of our community to one of low density sprawling urban development. Although County policies and programs are beginning to re-institute sensible community designs of prior generations, vehicle trips are expected to increase by 47 percent over the next 25 years and there is a real need to alleviate congestion on our roads. However, projects to increase capacity by putting more cars on the road are the type receiving the majority of funding. Therefore, long term multi-modal mobility solutions are going to be essential in successfully accommodating our growing population.

In addition, new funding models are needed. Direct revenue streams are declining, primarily because gas tax collections in Florida were down $1.2 billion as of 2012 and $8 billion cumulatively since 2006. People are buying more fuel efficient vehicles, which is good in terms of air pollution emissions but not so good for infrastructure projects that rely on gas tax collections for funding. Another funding related challenge is the multi-year federal surface transportation bill known as Moving Ahead for Progress in the 21st Century, or MAP-21, which has significantly changed the way funding is provided for bike and pedestrian projects. Overall funding is 33 percent less than the funding previously provided for these types of programs.

While there are many challenges, there are also some positive trends that may begin impacting the types of infrastructure projects we fund. The first positive trend is the projections of where people will live versus where new jobs are expected. To understand the transportation needs of the county and identify and prioritize projects, the Long Range Transportation Planning (LRTP) process includes developing projections of where population and employment growth is expected to occur over the next thirty years. The recent projections show a considerable difference compared to those completed during the last planning cycle, five years ago. It conveys a shift in population growth to the urban core and other areas, indicating there may be fewer people than anticipated taking longer trips to work. Our transportation projects, including modes and locations, should be prioritized according to this shift in where we expect people to live and work.

Millennials are returning to walkable cities with multiple transportation options.

One of the causes of this shift, and the second "positive" trend, could be the new lifestyle preferences that are developing in our community. In addition to people seeking a generally more active lifestyle, the new generation, 'millennials" favor an urban lifestyle. Respondents to a recent APTA survey described their generation as "financially strapped", and "happy with biking or walking, and see public transit as a way to meet people, connect, and have extra time to do work while commuting…and with smartphones it's easy to figure out bus schedules and keep connected while commuting" (American Public Transportation Association 2013).

Government by itself simply can't provide the multi-modal system these trends demand; federal dollars are drying up and the County is already doing more with less. Therefore, we should look for opportunities to collaborate and leverage resources, such as the Seven50 Prosperity Plan, a seven-county visioning plan for economic prosperity over the next 50 years. Another example is the recent "Compact" adopted by Miami-Dade, Broward and Palm Beach Counties, which formalized an agreement to work together on the issues of Transportation, Economic Development, Climate Change, and Everglades Restoration. Partnering with the private sector and other local governments in the region will help to deliver more efficient and effective solutions for our community.

Miami is ranked the 5th most congested metropolitan area in the nation, costing $3.7 billion a year in time and fuel. $250 million would be added to the cost of congestion if public transportation were not in place (Texas A&M Transportation Institute 2012).

Vibrant Economy

Global, national and local demand for green products and services, green buildings and infrastructure, green economic growth and green jobs is already impacting the business models and practices of Miami-Dade's businesses and industries. The local businesses and industries that drive Miami-Dade's economy can contribute to a more sustainable community through material selection, supply–chain management, businesses practices, and production of goods and services.

In addition to improving the sustainability of our community through its own procurement of environmentally preferable goods and services, government policies also have a direct impact on industry as well. For example, the County's Comprehensive Development Master Plan directs land development towards a more compact urban form, and we must effectively work with industry to implement that vision. These emerging trends that build local demand for sustainability will likely have a permanent impact on how businesses perceive their role in contributing to the welfare of the larger society beyond their own financial bottom line.

Goals

- ***Create green jobs***
- ***Build on our international reputation to become a green enterprise destination***

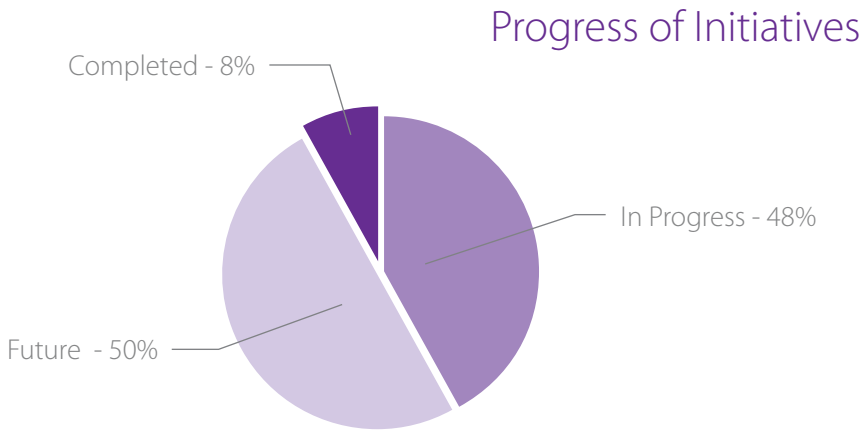
VIBRANT ECONOMY

Build a sustainable economy and promote green business *(1 completed, 1 in progress and 2 future initiatives)*

Expand our successful tourism and trade industries *(2 in progress and 2 future initiatives)*

Support educational institutions in their initiatives to develop a workforce for a sustainable economy *(2 future initiatives)*

Increase the sustainability of agricultural practices *(2 in progress initiatives)*



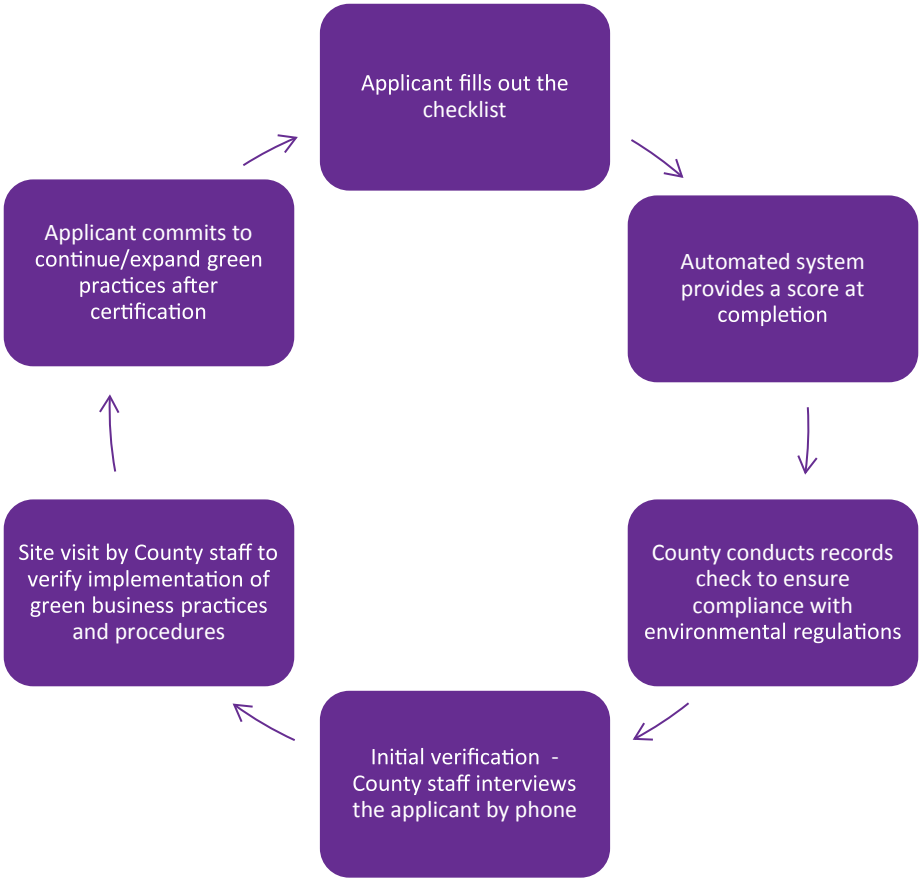
Initiative 101: Develop a Green Business Certification Program

Description	Unit of Measure	2015 Target	Quantity to date
# of businesses certified	# of businesses	750	15

The Miami-Dade County Green Business Certification (GBC) Program is a voluntary program designed to help and recognize local businesses that are comprehensively incorporating environmental stewardship into their operations. The program was launched the first quarter of 2011 with the goal of offering the Miami-Dade business community an opportunity to examine their current business practices and to implement green initiatives, such as minimizing waste, energy and water consumption, that will save money and increase their marketability while protecting natural resources (often referred as minimizing their ecological footprint). Certification from Miami-Dade's Green Business Program serves as an indicator that a particular business is considered to be a leader in developing more sustainable operations. Further benefits to going through the certification process include:

- Helps ensure efficient operations, thereby strengthening financial bottom line
- Improves employee morale, health, and productivity
- Provides a marketing edge over the competition
- Fosters compliance with current regulations and commitment to continue green practices after certification

The program's emphasis is on day-to-day operations and policies. The program's application involves an online, user-friendly process, and certification is based on a checklist of sustainability-related actions. At the end of the pilot program period, two hundred ninety-four (294) complete applications have been reviewed, and of these, 15 businesses qualified and were granted certification through our comprehensive process. Currently the Certification Program is designed for the restaurant, hotels, retail, office, and garment cleaning business sectors, but is anticipated to expand to other sectors during full-scale implementation.



Miami-Dade Green Business Certification steps

Cliffhanger Janitorial was proudly certified as a Miami-Dade Green Certified Business in 2012.

"We chose to set up our business and invest in Miami-Dade and raise our families here, so we think it is important to help protect the environment where we live and work. For example, our company uses rags that can be washed and reused instead of paper towels. Our decision helps the environment, but also helps to save us money. Going green and getting our certification is helping us to build on our success because it sets us apart from our competition."

-Yvonne Estrada, President Cliffhanger Janitorial

Initiative 107: Make our Airport and Seaport sustainability leaders

In size, the Miami International Airport (MIA) and PortMiami resemble small cities, meeting the needs of hundreds of thousands of travelers and the movement of thousands of tons of freight that pass through them each day. As two of the County's primary economic engines they can have a huge impact on the sustainability of our County. While both of these ports have achieved many green accomplishments over the years, this progress report focuses on activities implemented since 2010. However, our ports are not islands, therefore those who plan and build the roads and rail that connect our ports to our communities, and the private industries that move goods through them, are key partners in this endeavor.

Airport

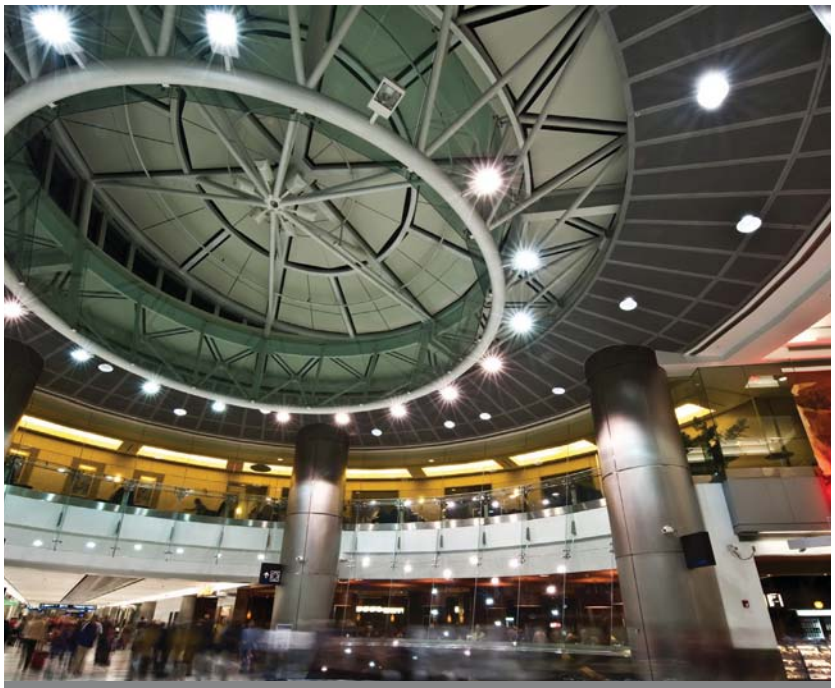
Several recent projects have increased the sustainability of airport operation, as well as reduced the emissions produced by the people and goods that move through it. The NW 25th Street Viaduct project is improving the movement of trucks carrying freight between Miami International Airport (MIA) and off-airport freight facilities, such as warehouse,and truck transfer stations. The project includes constructing a new viaduct (an elevated bridge) for dedicated air cargo transport. The first (eastern) phase of the project is completed and includes roadway improvements and partial viaduct construction. The second phase includes additional roadway improvements along the western part of the project and completes the viaduct construction. Phase 2 is expected to be complete by 2016.

The NW 25th street viaduct is expected to reduce carbon emissions by more than 19,000 tons and save the freight industry $630,000 annually in fuel costs. By 2035, this is expected to increase to 21,400 tons of carbon emissions reduced, with an associated fuel cost savings to the freight industry of $705,000.

Several advancements in the development of the Miami Intermodal Center (MIC), located just east of MIA, took place during this reporting period. The MIC is a massive $2 billion ground transportation hub being built by the Florida Department of Transportation. The MIC consists of several components including the MIA Mover, the Rental Car Center, and the Miami Central Station (MCS). The MCS includes the AirportLink Metrorail extension, a Metrobus terminal, a Tri-Rail / Amtrak terminal, and an intercity bus terminal. The MIA Mover became operational in September 2011 and connects MIA to the MCS and the Rental Car Center. It is the first U.S. transit project to receive a Leadership in Energy and Environmental Design (LEED) Gold certification by the U.S. Green Building Council in March of 2012. The Mover has the capacity to transport more than 3,000 passengers per hour and eliminates more than half a million shuttle bus trips each year, reducing carbon emissions from Airport roadways by 30 percent.

Another accomplishment is the completion of the AirportLink, a 2.4-mile extension of Miami-Dade Transit's Metrorail system to Miami International Airport. It was built using County and State funds and opened to the public in July 2012. This project provides our community with an affordable, car-free, and carefree option to travel to the airport, including the Airport's almost thirty-eight thousand public and private employees.

Construction of the AirportLink is estimated to have created over 2,000 jobs (95 percent in the private sector) and injected $561 million into our local economy. Since opening in July 2012, the AirportLink Metrorail station is the gateway for over 1,300 additional daily Metrorail boardings.



Over the past ten years Miami-Dade Aviation Department has saved over $12 million through energy performance contracting

The new AirportLink Metrorail Station

"We were impressed with the new MIA Metrorail extension. The train and station were clean and felt very safe. The trip was fast and we were able to relax and use the free Wi-Fi which performed well. The cost was a big savings compared to overnight parking. After returning from modern airports abroad I used to feel embarrassed by the lack of public transportation offered to visitors. Now I feel like Miami has finally taken a step toward becoming a modern world-class city."

-Daniel Benavides, Miami-Dade County resident

PortMiami

Several projects to facilitate freight movement were underway during this reporting period, including a $50-million rail reconnection project funded in part by a $23 million U.S. Department of Transportation grant (Transportation Investment Generating Economic Recovery - TIGER 2). Historically, a rail line was in use at the port since the 1960s, but was damaged in 2006 by Hurricane Wilma, and abandoned. Today shippers must rely solely on trucks to move containers in and out of the port. The rail reconnection project has three components, the first of which was completed in 2012. This phase involved upgrading a 4.5 mile long segment of a 12 mile long track line that leads from the port to the Hialeah intermodal rail yard terminal, owned by the Florida East Coast Railway LLC (FEC). Through the Hialeah intermodal rail yard terminal link, the completed project will have access to rail yards in Jacksonville, providing a tie-in to the national rail system. The second phase of the project will repair a damaged bascule bridge and the third phase will be to construct a new intermodal rail yard on the port island. This project is expected to be completed in 2014, contributing to several sustainability goals:

- Adding 822 construction jobs to the local economy
- Avoiding 34 million gallons of fuel and 200,000 tons CO_2 over the next 20 years
- Increasing container traffic by 15 percent through improved access
- Improving local redevelopment through increased pedestrian traffic and overall activity
- Increasing transportation choices with the potential future passenger rail service on the FEC corridor and linkage to the Metrorail

Florida East Coast Railway line entering Port Miami

PortMiami's newly retrofitted cranes are helping to reduce local air pollution.

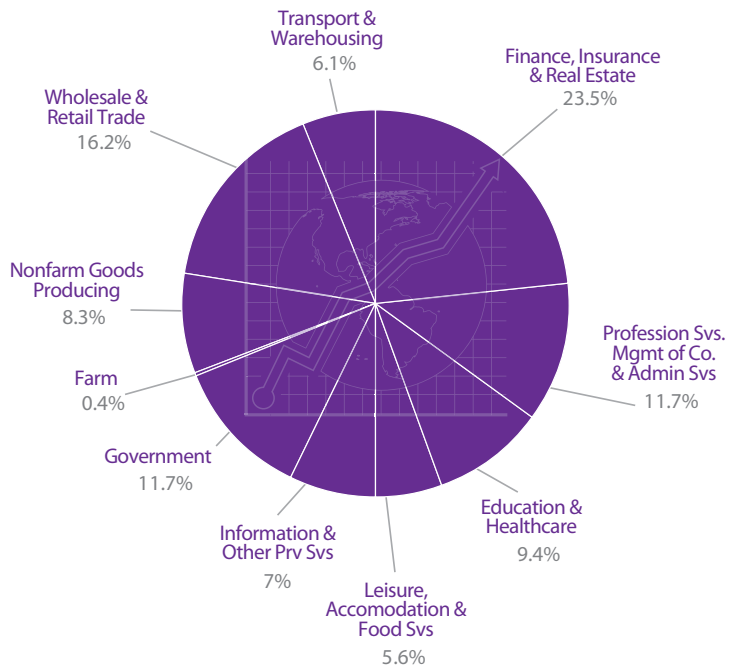
Other freight related accomplishments during 2011 and 2012 were led by PortMiami and made possible by a partial grant from the National Clean Diesel Funding Assistance Program from the Environmental Protection Agency (EPA). The first project was the repowering of four existing Port gantry cranes that handle cargo containers. The diesel engines powering those cranes were removed and the units retrofitted to be run on electricity. In addition to the emissions benefit from eliminating diesel use by 100 percent, the project provides health benefits by reducing exposure to air pollutants and noise. An additional economic benefit is the reduced maintenance costs associated with diesel engines. The second project involved a partnership with Seaboard Marine, the Port's largest cargo tenant, to install diesel particulate filters (DPF) on twelve cargo container handler vehicles, known as mules. These are designed to achieve a 90 percent reduction in particulate matter from diesel emissions.

Challenges and Opportunities

Standard business plans project three to five years into the future. Sustainability planning uses lifecycle approaches and considers resources well into the future. Typical business plans focus on the financial bottom line. Sustainability plans focus on a triple bottle line that considers social, environmental, and economic factors. Reconciling the two models can be difficult.

The long-term perspective embraced by sustainability considers more factors including long-term livability, viability and prosperity of the community. But due to the newness of sustainability concepts and analysis, and general aversion to change, there is a tendency for business and government to continue to make short-term decisions and prioritize actions, without fully accounting for all benefits, even though these decisions may have long-term consequences. Therefore, one of the primary challenges is to transform the standard notion of economic impact, so that there is a broader understanding of the basic connections between the health of our natural resources and the health of our economy and people. Once this recognition becomes widespread, it can foster a culture of change that will transform the economy. In terms of opportunities, Land use and zoning activities are also contributing to the sustainability of the airport area. In September of 2013, the Miami-Dade Board of County Commissioners rezoned a 220-acre area to create the Palmer Lake Metropolitan Urban Center (PLMUC). The Center will include the joint-development portion of the MIC and will contain a mix of residential, retail, hotel, office, and industrial uses.

The Airport and Seaport will continue to be hubs of increased economic development and will provide connectivity via various modes of transportation making regional travel for passengers and cargo easier.



Diversification of the Miami-Dade Economy

Healthy Communities

Being green is healthy, and this plan includes a focus on our daily quality of life as individuals. The growing cost of health care, especially preventable conditions associated with obesity and lifestyle disease, is an expensive problem for our community, and our nation. This plan also focuses on overall neighborhood-level health through community design initiatives that incorporate an abundance of trees and gardens, parks and open spaces, safe paths for biking and walking, and access to healthy foods. Focusing on and investing in the social aspects of personal health and quality of life are also beneficial to our local environment and economy. Diet and exercise have a clear link to reducing greenhouse gas emissions, by promoting walking and biking over driving, and by increasing consumption of locally grown food that requires little transportation for shipment.

Goals

- ***Raise awareness that sustainable living is healthy***
- ***Plant more Florida-friendly and native trees and landscapes***

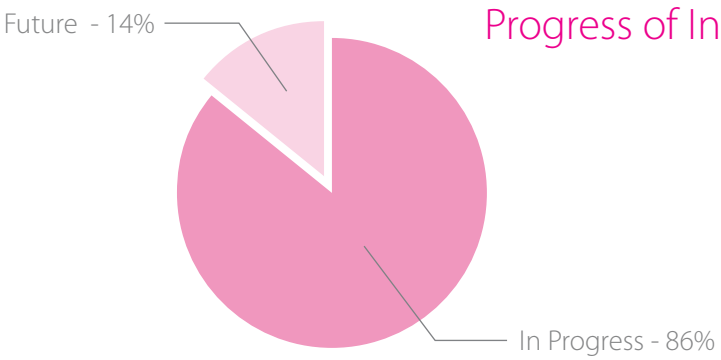
Amy McInerny of Studio Serendipity

HEALTHY COMMUNITIES

Facilitate active and safe lifestyles for residents through the Open Space Master Plan and other community initiatives *(5 in progress and 2 future initiatives)*

Plant more trees *(3 in progress initiatives)*

Promote fresh, local, organic food in all neighborhoods through grocers, farmers' markets, and community gardens *(4 in progress initiatives)*



Initiative 116: Increase safe walking, bicycling and driving behaviors through educational, public awareness and social marketing programs

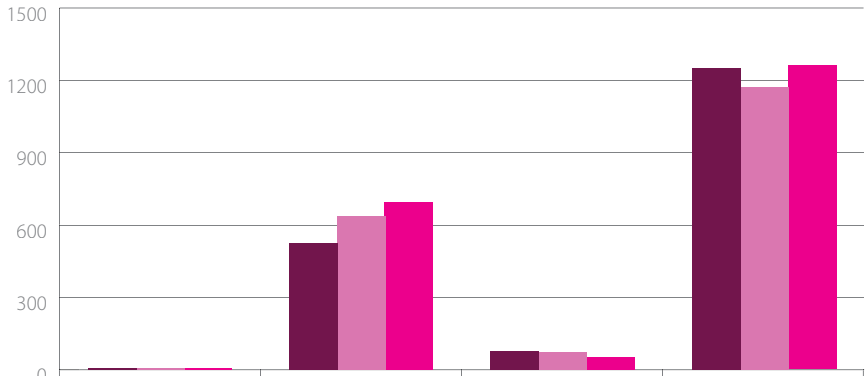
Description	Unit of Measure	2015 Target	Quantity to Date
Residents served through MDPD bike/ pedestrian educational programs	# of residents	599,000	308,149
Annual average number of schools served	# of schools served (average)	130	130

A community with safe, walkable and bikeable streets is a healthier community. These kinds of streets are still not the norm in Miami-Dade, which were built with the car in mind, and our culture still gives priority to cars for transportation. Fortunately, there are many stakeholders in our community advocating for pedestrians and bicyclists, such as the South Florida Bike Coalition and Miami Bike Scene. Novel ways to encourage more biking are being tried such as the 2013 New World Symphony's partnership with the Green Mobility Network and Emerge Miami to create a cycling-themed evening at the symphony, including complimentary valet bicycle parking! There are also many community partners providing education and outreach on bike and pedestrian safety, primarily to school age children, such as the University of Miami School of Medicine, the Miami-Dade Public School system, the Federal Department of Transportation, the U.S. Department of Health and Human Services, the Miami Dade Health Department, the Miami-Dade Police Department and the Miami-Dade Parks, Recreation and Open Space Department.

The Miami-Dade Police Department has three separate programs that provide bicycle and pedestrian safety trainings to students in private and public elementary schools and daycare centers, as well as to the general public. In addition, they provide school crossing guards at elementary schools and support pedestrian and bicyclist safety programs managed by other community partners such as local participation in International Walk to School Day. This type of education can encourage our community to participate in activities that can help combat hypertension, diabetes, and other medical conditions. In addition, every time our residents choose to walk or bike to a destination instead of driving, tail-pipe emissions are avoided.

Miami-Dade Police Department and other community organizations provide bicycle and pedestrian safety training to County residents.

Bike and Pedestrian Injuries and Fatalities



	Bike Fatalities	Bike Injuries	Pedestrian Fatalities	Pedestrian Injuries
2010	7	525	76	1252
2011	6	635	73	1170
2012	5	693	52	1257

Bike and Pedestrian injuries and fatalities data (Florida Department of Highway Safety and Motor Vehicles 2013)

Initiative 121: Promote landscaping and gardening suitable for South Florida

Description	Unit of Measure	2015 Target	Quantity to date
Classes about South Florida friendly gardening & landscaping	# of classes	1,585	974
Participation in classes referenced above	# of attendees	55,000	18,416
Educational contacts	# of contacts	150,000	125,969

Planting more vegetation and taking care of our existing trees, landscapes, and gardens is another important initiative in this goal area. The Miami-Dade County Cooperative Extension is a partnership between the County's Department of Regulatory and Economic Resources and the University of Florida/Institute of Food and Agricultural Sciences Extension. It is an excellent community resource that educates homeowners about how to design, install, and maintain healthy landscapes in our South Florida climate by using a minimum of water, fertilizer, and pesticides. The result: low-cost, low-maintenance, attractive landscapes that add value to the sustainability of our community in the following ways:

- Plants make the outdoor environment shadier and cooler
- Landscaping can increase property values
- Cooler streets attract more neighbors to the outdoors which lowers crime rates
- Consumers spend more money and return more frequently to shopping areas with street trees
- Plants help retain rain water and reduce surface water runoff and erosion
- Vegetated areas help replenish our aquifer and help filter out some pollutants
- Vegetated areas create habitat for wildlife, including food pollinators
- Gardening activities provide cardiovascular exercise benefits

Teaching county residents about Florida-friendly landscape care

Summer daytime air temperatures can be 3–6 degrees cooler in tree-shaded neighborhoods compared to treeless areas (U.S. Department of Energy 2007).

The Cooperative Extension has many programs that serve a wide range of audiences including homeowners, commercial landscapers and nurseries, municipal departments, developers and builders, and pest control operators. Over one million website users accessed online educational materials provided by the Miami-Dade Cooperative Extension Service during the reporting period. A survey conducted by the Extension Service (University of Florida Institute of Food and Agricultural Sciences Extension 2013) indicated that interest in backyard vegetable gardens has increased significantly in recent years. The most important reason cited by the survey respondents was a desire for safe and healthy food.

Challenges and Opportunities

Miami-Dade County Extension staff educates homeowner about gardening techniques that save water

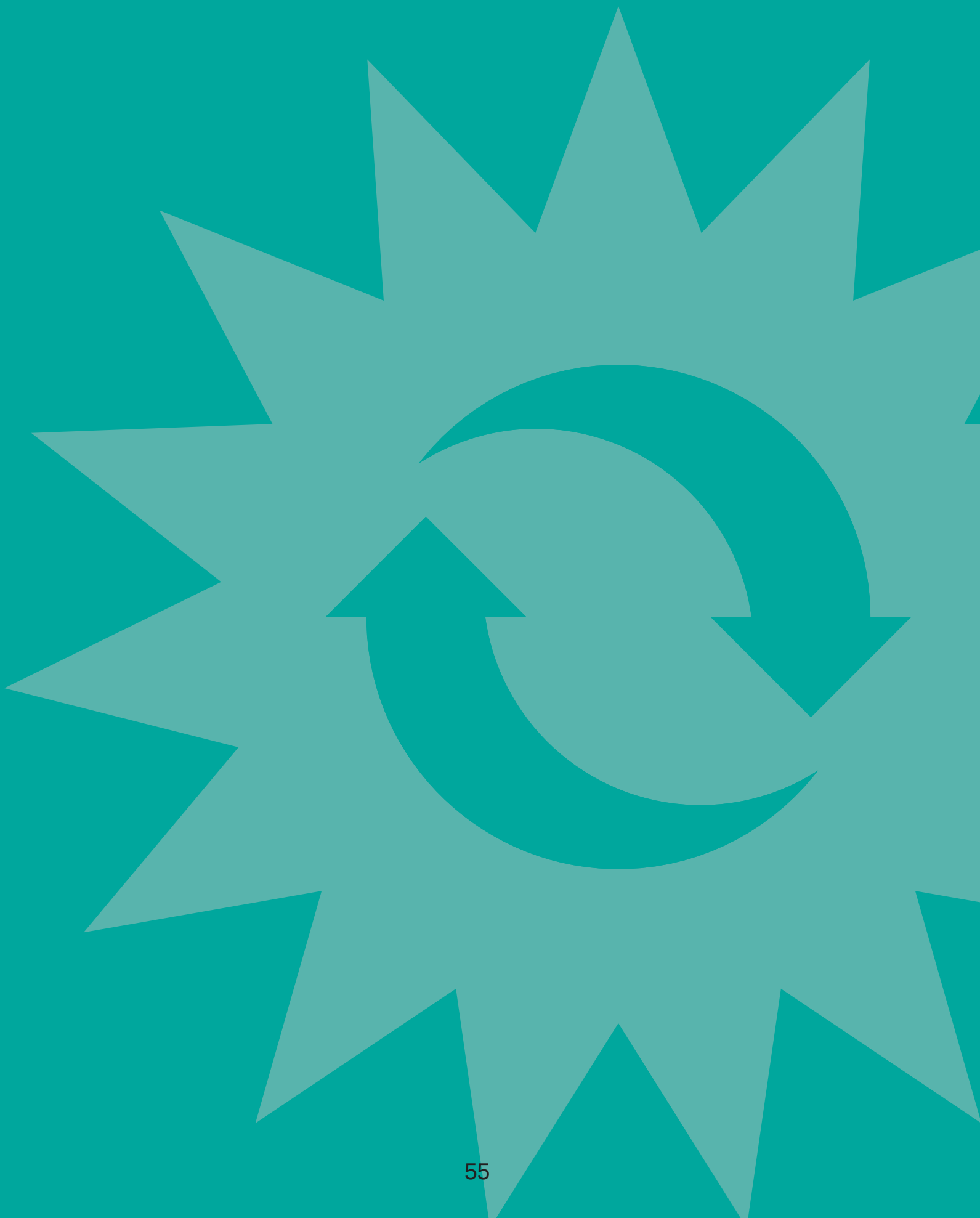
Carefully positioned trees can save up to 25% of the energy that a typical household uses for cooling (U.S. Department of Energy 2007).

One of our primary challenges in this goal area is tracking the progress of our initiatives. This is because many of the initiatives are led by nonprofit or community-based organizations that do not have the staff or technological resources to track the data needed to assess the progress. In addition, often there is not a designated entity that has been historically responsible for collecting data of interest.

For example, there is no individual group or entity in our community that tracks bike and pedestrian education and outreach activities that are conducted by all of the different individual organizations who coordinate them. Even though some initiative-specific data is hard to come by, we have other data that help us to understand our overall progress. For example, we can look at broader data that is collected on pedestrian and bicyclist accidents to see whether injuries and fatalities are diminishing. This can be used as an indicator as to whether our community is successful in prioritizing pedestrian and bicyclist safety. Unfortunately, the South Florida metropolitan area (including Miami-Dade, Fort Lauderdale, and Pompano Beach) was ranked as the fourth most dangerous place to walk in the United States in 2011 (Transportation for America 2011), demonstrating that we need to make more progress in this area. Other important statistics to look at are the percent of local food production that stays local, currently assessed at less than 10 percent, and the percent of local food production that is organic, currently assessed at 1 percent (LaPradd 2013).

In 2012, Miami-Dade County's Office of Sustainability, nonprofit "ioby" (which stands for "in our back yards"), and the Health Foundation of South Florida partnered together and obtained grant funding from the Funders' Network for Smart Growth and Livable Communities. As part of the grant, ioby established a Miami office to bring a web-based crowd-resourcing platform that supports community-led, neighbor-funded projects such as the creation of community gardens, farmers markets, and mini parks for stronger, more sustainable neighborhoods. This organization's online tools allow a much broader audience (crowd) to see and access the projects via a web page, facilitating contributions of needed resources such as funds, supplies, and volunteer time. It is anticipated that this partnership will facilitate more community projects and involvement in support of the Healthy Communities goal area.

The Opa Locka Community Development Corporation has partnered with ioby to help develop a Kaboom! Playground at this location.



Climate Change Action Plan

Our community has long been recognized as one of the most vulnerable to the impacts of climate change. Some of our greatest challenges include sea level rise, more frequent extreme weather events, and changes in rain patterns and intensities. The good news is that Miami-Dade County is already familiar with planning for and addressing damages from severe thunderstorms, tropical storms, and hurricanes, and as a result, existing programs and initiatives position us well for addressing the challenges that climate change brings. Yet there is much more to do. As a community built essentially at sea level, rain and tidal events are current stressors that will worsen with rising seas, changing precipitation patterns, and extreme weather events. This Climate Action Plan was developed in recognition of the need for continued and coordinated action on this front. It was designed to help us use science as a foundation for planning, to fortify partnerships, and to lay the groundwork for well-informed and responsible capital, operational, and land use decision-making by both government and the business community.

As discussed in the Leadership, Commitments, and Communication Goal Area, there has been quite a bit of focus on organizing regionally and developing a framework that complements and enhances the actions of individual cities and counties. Much of the earlier efforts of task forces, advisory committees and plans from individual counties, such as this Miami-Dade Climate Action Plan, have been woven into the work being done at the regional level.

The initiatives presented here focus on adapting to change and building resiliency. Many of the initiatives highlighted in other GreenPrint goal area sections contribute to reducing our emissions. Both types of strategies are critical to a comprehensive Climate Action Plan.

Goals

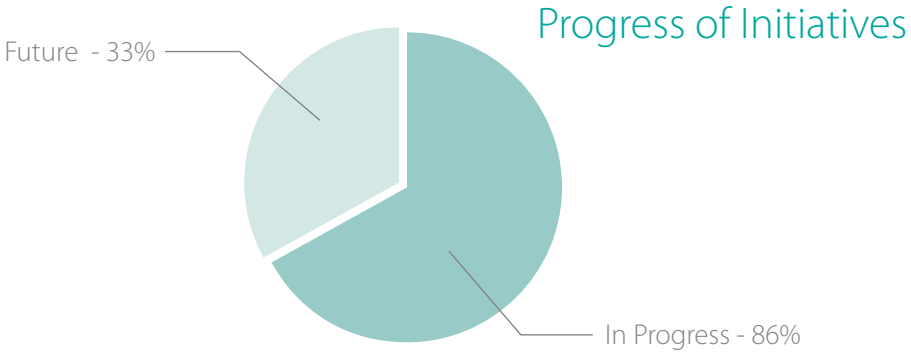
- ***Understand and respond to current and future climate change impacts***
- ***Reduce greenhouse gas emissions***

CLIMATE CHANGE ACTION PLAN

Track local and regional climate change indicators and trends *(2 in progress and 3 future initiatives)*

Develop local and regional climate change scenarios depicting various impacts and time frames *(3 in progress initiatives)*

Integrate future climate change impacts into community and government decision-making for capital, operational, and land-use issues *(3 in progress and 1 future initiative)*



Initiative 133: Continue existing local surface water, ground water, and salt water intrusion modeling projects, incorporating expected climate change impacts (i.e. changes in temperature, precipitation, sea level rise, etc.) and integrating with regional water modeling projects from the South Florida Water Management District and other SE FL Climate Change Compact partners.

This initiative captures the need for more robust modeling to better guide our responses as we continue to experience the effects of climate change. Our County has great expertise and skill in addressing flooding impacts, primarily through the development of our Stormwater Master Plan. Because maintenance of our stormwater infrastructure and the preservation of our coastal habitat play such a critical role in minimizing flooding impacts, they are both addressed in the Stormwater Master Plan. Saltwater intrusion, accelerated by sea level rise, is another concern that the County is already addressing because it affects the source of our drinking water, the Biscayne Aquifer.

The County has continued to work with local, regional, and federal partners to make progress on this initiative. As discussed briefly in the Leadership, Commitments and Connections Section, a preliminary analysis of vulnerability to sea level rise was developed in August 2012 through the four-county SE Florida Regional Climate Change Compact partnership. This analysis and others only take land elevation into account, and do not consider drainage systems or surface and groundwater interactions with rising seas or rain events. The preliminary analysis has value in identifying low-lying areas that are vulnerable to tidal influence and sea level rise. However, models that also incorporate interactions of surface water and ground water and their impacts on our infrastructure (canals, pump stations, drains) are necessary in order to better assess projected impacts. It is these projections that we need in order to guide capital investment decisions and develop long-range plans for providing services.

Miami is ranked number one in the world in terms of assets exposed to coastal flooding projected by 2070, and among the top ten for populations exposed to coastal flooding (Organisation for Economic Co-operation and Development 2007).

Severe local flooding from natural high tides will be exacerbated by sea level rise.

Typical canal salinity structure.

The United States Geological Survey (USGS), in partnership with the County, is in the final stages of developing such a model – one that assesses existing and future impacts on water resources in South Florida. The model, which is currently undergoing a rigorous peer review process as required by USGS, will more accurately represent surface water flow though the regional canal network and canal-aquifer interactions in future model scenarios. Studies indicate that rain will be concentrated in more storm events, with longer and drier periods in between, producing a considerable impact on water availability, drainage, and canal operations. The model was developed at a total cost of over three million dollars, and with the input of many organizations to ensure that it meets the expectations of the County, regulatory agencies, and other interested stakeholders. Once fully developed, the tool will become available for anyone to use. Some of the outputs, uses, and benefits of this project include:

- Modeling the effect of sea level rise on saltwater intrusion into the Biscayne Aquifer, our primary source of fresh drinking water
- Modeling canal system function and response that might change with different rain patterns and groundwater levels
- Identification of canals and structures at risk of exceeding operational capacity
- Evaluation of adaptive techniques that can be used on canal structures, such as increasing pump size, to compensate for impacts
- Evaluating how land use (agricultural, suburban, and urban) affects the model scenarios and outputs
- Providing a scientific basis for establishing new groundwater level conditions for use in the County's Storm Water Master Planning process
- Integrating with models being developed in Broward County, to better coordinate regional water resource planning.

Initiative 136: Develop mechanisms for organizations to integrate potential climate change impacts into capital and operational decision making

After policy analysis in 2011, the County completed a public engagement and policy analysis process known as Evaluation and Appraisal Report (EAR)-Based Amendments to address the issue of climate change in October 2012. The EAR Report maintains that issues known to impact the development and infrastructure investments of and within the County should be addressed, or at least duly considered, in the formulation of the County's policy statements regarding development. While there are some early examples of County departments factoring future sea level rise into planning and designing projects, this practice became official County policy on October 2, 2013, with the adoption of these amendments to the County's Comprehensive Development Master Plan (CDMP) by the Board of County Commissioners. Therefore, the following policies addressing climate change have been integrated throughout the CDMP in order to institutionalize its consideration:

- Analyze impacts on the built environment
- Address development standards and regulations to be used to guide investments in public infrastructure development, redevelopment, and operations in hazard prone areas
- Analyze the vulnerability of public infrastructure, such as public buildings, water utility facilities, roads, bridges, ports, and transit stations
- Determine the feasibility of designating areas as Adaptation Action Areas (AAA), a voluntary designation available in Florida Statutes that can be used by local governments in their coastal hazard management program for areas at risk for of coastal flooding and tidal inundation
- Engage and educate the public as well as use advocacy, and incentives to shift residents' everyday transportation decisions and housing choices to support transit-oriented development
- Consider climate change and sea level rise in public investment processes and decisions, specifically in fiscal decision-making and in project review, design, and funding prioritization

- Require all County departmental master plans and strategic business plans to include and prioritize different strategies to address climate change impacts and to create plans with longer time-frames (i.e. 30, 50, 75-year plans)
- Redirect future population concentrations away from vulnerable areas
- Continue active participation in the Southeast Florida Regional Climate Change Compact

These CDMP changes are the County's first formal step toward institutionalizing climate change considerations into County planning and operations, and are an important move toward developing a sustainable community.

A newly constructed earthen plug along Card Sound Road will help limit salt water intrusion

Challenges and Opportunities

The impacts of climate change are not always obvious, and our response to climate change might not be obvious either. Walls to keep out rising seas will not work in our community due to our porous geology. Therefore, we must adapt using different approaches. We can build resiliency into our landscape in more subtle ways, and weave it into policies, programs and practices, for example, continuing and enhancing acquisition and restoration of coastal wetlands and exploring refinements of the building code or flood criteria. In order to do so strategically, we must have a better understanding of the cost and timing of adaptation strategies, as well as the cost of taking delayed or no action at all.

A 2005 study found that on average, a dollar spent by the Federal Emergency Agency on hazard mitigation (actions to reduce disaster losses) provides the nation about $4 in future benefits (Multihazard Mitigation Council 2005).

In terms of preventing further climate change effects (known as mitigation), our greatest challenges are to develop compact neighborhoods, replace old cars and trucks with more efficient models, move from car trips to walking, biking and transit trips, and shift to renewable energy sources for fuel and electricity generation. All of these changes will be difficult because of funding deficiencies and/or existing infrastructure in our built environment. Despite the difficulty, all of these strategies need to be addressed quickly and with intensity because our two greatest sources of greenhouse gas emissions come from our use of cars and electricity.

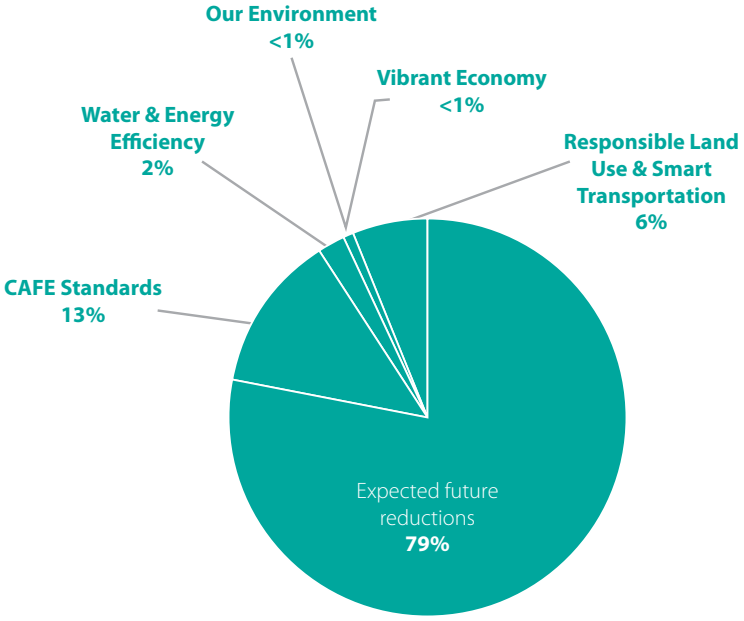
Our community's desire to see "action" is a positive indication that there is a growing understanding and eagerness to engage on the topic of climate change. However, one of our greatest challenges is that there remains a need for broader community awareness. Another struggle in this goal area is identifying forums for engagement of various stakeholders. We want our community to be inspired toward hopeful action and understanding their direct role in shaping our future. Finally, limited resources remain a challenge. While the County and our region have been very fortunate in obtaining grant and technical assistance from many state and federal partners, the costs of a sustained and effective response are daunting and will require innovative collaboration and investments of money, time, and commitment at all levels of our community.

As is commonly said, with challenges, come opportunities. Many solutions have co-benefits including economic development opportunities, energy independence, and health benefits. This may help us progress toward resolution more quickly, given the proper framing and partnerships. After all, it's not the reason behind action that really matters, it's the collective result.

Mangrove restoration at Oleta River State Park helps restore resiliency into our built environment by restoring more natural shorelines and coastal wetlands.

GreenPrint Emissions Reductions

2015 Targets: 2.1 million metric tons of CO_2e**
(including 670,000 metric tons of CO_2e from new CAFE* standards)



*Corporate Average Fuel Economy (CAFE) Standards are gas mileage standards (in miles per gallon or MPG) for a manufacturer's passenger cars and light trucks sold in the United States for any given model year. The purpose of CAFE is to reduce energy consumption by increasing the fuel economy of cars and light trucks. These standards, set by the federal government, were last updated in August 2012.

**Carbon Dioxide Equivalents (CO_2e)

LOOKING FORWARD

In our next report, we hope to focus more on initiatives being led by non-governmental organizations and highlight stories of how people in our community have been positively affected by GreenPrint initiatives. In addition, we will be ramping up for our next version of GreenPrint, which is due to be released in 2016. Part of this effort will consist of identifying which initiatives should be modified, deleted, or added. For example, lead organizations may need to change, or the indicators that we are tracking might need to be revised. As always, key community stakeholders will continue to be engaged in our GreenPrint efforts, as we strongly feel that sustainability cannot succeed without community dialogue and commitment.

Sustainability Scorecard

Tracking the progress of initiatives is an important component of our data driven results-oriented sustainability plan. Measuring progress is crucial to GreenPrint's success. Other high-level key performance indicators were selected to be included below in some instances where initiative-specific data is not available, in order to better assess current progress. Stoplight indicator colors are included to provide an understanding of progress relative to targets and/or intermediate milestones.

Strong Leadership, Connections, and Commitment

• Create the next generation of green leaders

Indicators	2015 Target	2011/2012	Progress
County sustainability legislation	>100	>100	
Stakeholder meetings	Quarterly	<4	
Sustainability grant funding related to GreenPrint initiatives and scorecard measures (number of grants)	Based on availability	118	

Water and Energy Efficiency

• Use less water and energy

Indicators	2015 Target	2011/2012	Progress
Community water conservation (in Million Gallons per Day)	1.5 million gallons	2011-1.92 MGD 2012-1.74 MGD	
County government energy use (in Mega Watt Hours)	20% reduction	2011 – 1,202, 970,695 MWh 2012 – 1,243,609,792 MWh	
Renewable energy produced from County government operations	5% increase	CY 2011 – 301,603 MWh CY 2012 – 330,159 MWh	
Community Energy Star facilities	>132	70	
Combined Greenhouse Gas Emissions Reduction (metric tons) for the Energy Efficiency Block Grant (EECBG) in Carbon Dioxide Equivalents	54,000 mt CO_2e	36,442 mt CO_2e	
Energy Efficiency Block Grant (EECBG) funding	$12,523,700	$12,523,700	

Our Environment

• Maintain exceptional quality of air, drinking water, and coastal waters used for recreation

Indicators	2015 Target	2011/2012	Progress
Air quality index best rating	90%	2011 – 91% 2012 – 88%	
Drinking water quality rating	100%	2011 – 100% 2012 – 100%	
Biscayne Bay water quality rating	95% to 100%	2011 – 100% 2012 – 100%	

• Protect and Enhance Biscayne Bay, the Everglades, and vital ecosystems

Indicators	2015 Target	2011/2012	Progress
Coastal habitats and wetlands restored	525 acres	FY2011 – 560 FY2012 – 577	
Environmentally endangered lands preserved (cumulative)	24,000 acres	23,600 acres	

• Reinvent our solid waste system

Indicators	2015 Target	2011/2012	Progress
Household curbside recycling	375 lbs	2011 – 351.69 lbs 2012 – 358.77 lbs	

Responsible Land Use and Smart Transportation

• Use our land wisely, creating and connecting strong sustainable neighborhoods

Indicators	2015 Target	2011/2012	Progress
Urban center area plans	15	4	●
Multi-corridor master plans	6	2	●
Transit-oriented developments	4	1	●
Enhanced Bus Corridors and transit line improvements	4	0	●
Park and ride lots	6	4	●
Park and open spaces accessibility metrics	Develop	New Equity Access Criteria Developed	●

• Provide more transportation options, reducing the time we spend in our cars

Indicators	2015 Target	2011/2012	Progress
Transit ridership (Additional annual boardings)	10 million boardings	2011 – 7.1 million 2012 – 9.5 million	●
New bicycle trails and lanes	40 miles	2011 – 20.6 miles 2012 – 13.6 miles	●

Vibrant Economy

• Create Green Jobs

Indicators	2015 Target	2011/2012	Progress
Green Business Certifications	750	15	
Unemployment rate	<12.5%	2011 – 11.10% 2012 – 9.3%	
Educational attainment	Improve	2011 – 78% 2012 – 80.4%	

• Build on our international reputation to become a green enterprise destination

Indicators	2015 Target	2011/2012	Progress
Green hotels	132	2010 – 48 2011 – 49 2012 – 50	

Healthy Communities

• Raise awareness that sustainable living is healthy

Indicators	2015 Target	2011/2012	Progress
Diabetes rate	Decrease	2007 – 9.1% 2012 – 10.8%	
Heart disease death rate	Decrease	2009 – 211.3 per 100K 2012 – 201.4 per 100K	
Adult obesity rate	Decrease	2008 – 22.3 per 100K 2012 – 24.8 per 100K	
Farmers Markets	Increase	2010 – 15 2012 – 16	
Community Gardens	Increase	2012 – 18	

• Plant more Florida-friendly native trees and landscapes

Indicators	2015 Target	2011/2012	Progress
Tree plantings (cumulative)	500,000	135,000	

Climate Change Action Plan

• Understand and respond to current and future climate change impacts (Adaptation)

Indicators	2015 Target	2011/2012	Progress
FEMA flood rating	5	5	
Local & regional Sea Level Rise Maps for planning	Complete by 2012	Completed	
Initial sea level rise vulnerability assessment using agreed upon Climate Change Compact parameters	Complete by 2011	Completed	
Groundwater modeling projects	Complete by 2012	In Progress	

• Reduce greenhouse gas emissions (Mitigation)

Indicators	2015 Target Reduction (mt CO_2e)*	2011 & 2012 Reduction (mt CO_2e)*	Progress
Strong Leadership, Connections, and Commitment	17,000	0	
Water and Energy Efficiency	574,000	28,402	
Our Environment	20,400	4,888	
Responsible Land Use and Smart Transportation	532,000	125,387	
Vibrant Economy	326,000	958	

Note: There were no emissions reductions initially projected for the GreenPrint Healthy Communities Goal Area, so it is not represented in this table.

* Metric Tons Cabon Dioxide Equivalents (CO_2e)

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Check out the complete

GreenPrint Sustainability Plan

and list of initiatives at:

green.miamidade.gov

HELP US KEEP MOVING FORWARD!

Check out GreenPrint along with a complete list of initiatives at www.green.miamidade.gov

MIAMI-DADE COUNTY

MIAMI-DADE COUNTY greenPrint

Our Design for a Sustainable Future

MIAMI-DADE COUNTY

greenPrint

Our Design for a Sustainable Future

Printed on Recycled Paper

MIAMI-DADE COUNTY

Carlos Alvarez
Mayor

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Released December 2010

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I would like to thank the participants in the *GreenPrint* planning process for their time, dedication and professionalism. The core planning team worked tirelessly to ensure that *GreenPrint* captures the key sustainability priorities of our government, community and economic partners, as well as concerned residents. During the process, I was struck by the passion and thoughtfulness of all participants to preserve and improve Miami-Dade County for generations to come. It is their unique and collective commitment to *GreenPrint*'s development and implementation that will lead all of us to accomplish our comprehensive and inclusive sustainability goals.

Susanne M. Torriente, Sustainability Director

Mayor's Sustainability Advisory Board

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GreenPrint Interdepartmental Team

All County departments played a vital role in developing this plan and will be essential for implementation.

ICLEI Local Governments for Sustainability

Cyrus Bhedwar, Southeast Regional Director

Climate Change Advisory Task Force

Honorable Harvey Ruvin, Chair and Members

In addition to the institutions referenced above, additional research and implementation partners include:

Americans with Disabilities Act (ADA) Office
Audubon Society
Beacon Council
Builders Association of South Florida (BASF)
Building Owners and Management Association (BOMA)
Chicago Climate Exchange (CCX)
Citizens Independent Transportation Trust (CITT)
Civic Organizations
Clean Cities Coalition
Climate Leadership Initiative, Steve Adams
Community bicycling enthusiasts
Community Image Advisory Board (CIAB)
Dade Community Foundation Miami Fellows Initiative
Dade County Farm Bureau
Dream in Green
Environmental Education Providers
Earth Learning
Environmental Protection Agency (EPA)
Fairchild Tropical Gardens
Federal Transportation Authority (FTA)
Financial Institutions
Florida Department of Environmental Protection (FDEP)
Florida Department of Transportation (FDOT)
Florida Fish and Wildlife Conservation Commission (FWC)
Florida Highway Administration (FHWA)
Florida Power and Light (FPL)
Greater Miami Chamber of Commerce
Greater Miami Convention and Visitors Bureau
Human Services Coalition
Leadership Miami
Marine and Estuarine Goal Setting for South Florida (MARES): University of Miami
Metropolitan Planning Organization (MPO)
Miami Dade Expressway Authority (MDX)
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Miami-Dade County Development Coordinator
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Miami-Dade County Senior Advocate
Miami-Dade Department of Health (State)
Municipalities
National Oceanic & Atmospheric Administration (NOAA), Sandy Eslinger
National Park Service (NPS)
Socio-economic Development Council (SEDC)
South Florida Commuter Services (SFCS)
South Florida Regional Transportation Authority (SFRTA)
South Florida Water Management District (SFWMD)
South Florida Workforce
Southeast Diesel Collaborative (US SEDC)
Southeast Florida Regional Climate Change Compact: Broward, Monroe, Miami-Dade, and Palm Beach counties
Southeast Florida Regional Partnership
UM Initiative on Excellence in Public Service
United States Geological Survey (USGS)
University of Florida Institute of Food and Agricultural Sciences (IFAS) Cooperative Extension
US Army Corps of Engineers (USACE)
And you!

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Written July 2010-October 2010; Released December 2010

"In Miami-Dade, global warming and climate change, these are local issues to us – as local as public safety, affordable housing and public transit. We are among the world's most forward-thinking on matters related to our environment, land-use planning, natural resources, and energy consumption."

Mayor Carlos Alvarez, Mayors' Green Initiatives for Economic Growth Workshop and Trade Fair, August 28, 2010

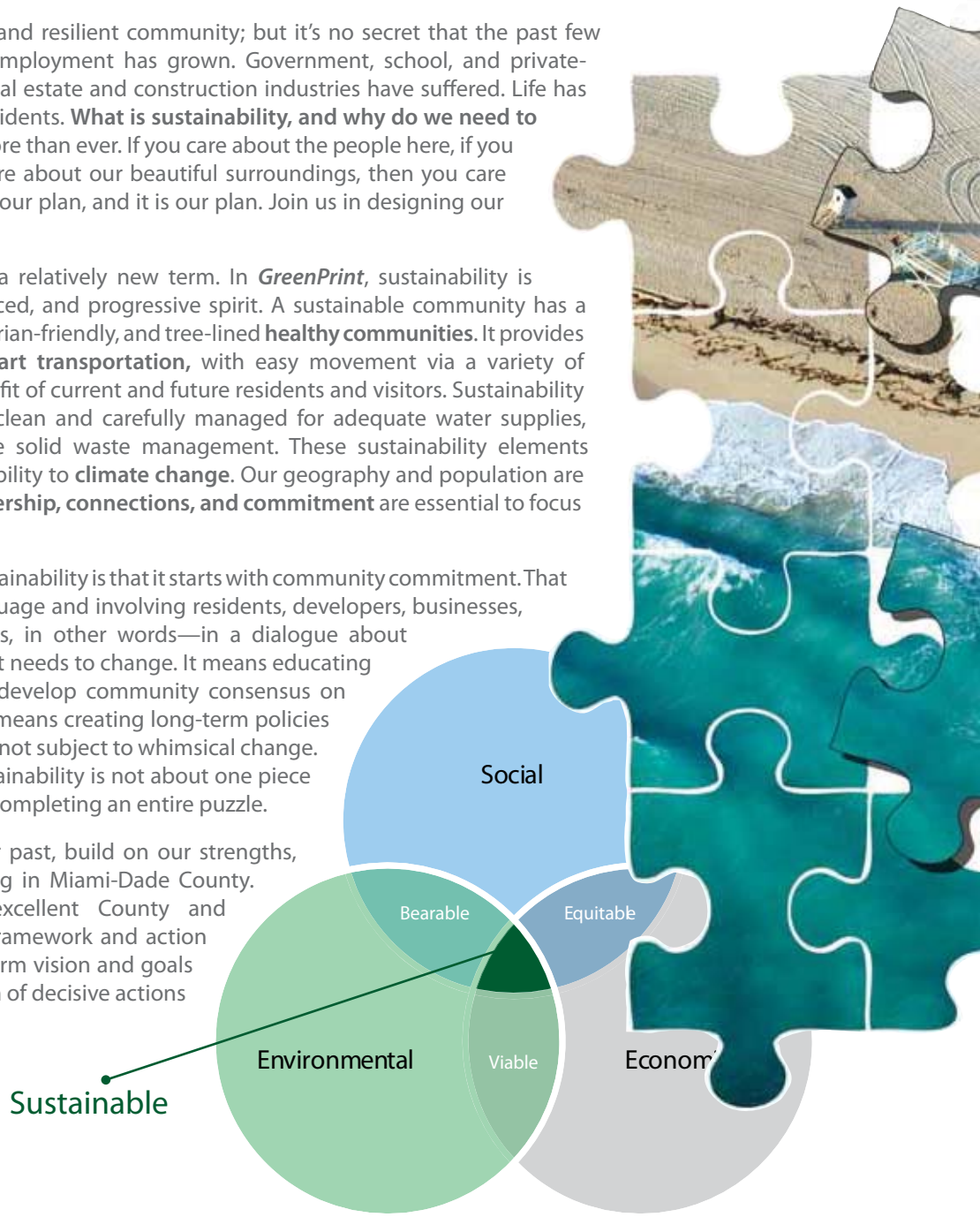
What does sustainability mean to Miami-Dade County?

Miami-Dade County is a beautiful and resilient community; but it's no secret that the past few years have been challenging. Unemployment has grown. Government, school, and private-sector budgets have shrunk. The real estate and construction industries have suffered. Life has been a struggle for many of our residents. **What is sustainability, and why do we need to plan for it now?** We need it now more than ever. If you care about the people here, if you care about your finances, if you care about our beautiful surroundings, then you care about sustainability. ***GreenPrint*** is your plan, and it is our plan. Join us in designing our sustainable future.

Sustainability, or being "green," is a relatively new term. In ***GreenPrint***, sustainability is offered in a comprehensive, balanced, and progressive spirit. A sustainable community has a **vibrant economy** and clean, pedestrian-friendly, and tree-lined **healthy communities**. It provides for **responsible land use and smart transportation,** with easy movement via a variety of transportation options for the benefit of current and future residents and visitors. Sustainability ensures that **our environment** is clean and carefully managed for adequate water supplies, ecosystem health, and sustainable solid waste management. These sustainability elements directly help us reduce our vulnerability to **climate change**. Our geography and population are expansive and diverse. **Strong leadership, connections, and commitment** are essential to focus our actions as one community.

The most important principle of sustainability is that it starts with community commitment. That means developing a common language and involving residents, developers, businesses, environmentalists—all stakeholders, in other words—in a dialogue about why change must happen and what needs to change. It means educating stakeholders and asking them to develop community consensus on what needs to change and how. It means creating long-term policies that are consistent and reliable and not subject to whimsical change. And it means recognizing that sustainability is not about one piece of community building, but about completing an entire puzzle.

It is critical that we learn from our past, build on our strengths, and wisely define sustainable living in Miami-Dade County. ***GreenPrint***, along with other excellent County and municipal plans, will provide the framework and action plan to do this, focusing on long-term vision and goals and a manageable five-year horizon of decisive actions to move toward those goals.



Our history of progress and resilience

A century ago the first Miamians built railroads, drained the Everglades, and established a tropical tourism destination. What we are now is a metropolis of 2.5 million people, and growth is projected at 30,000 per year. We have benefited from our unique global position and extraordinary environment. Known as the "Gateway to the Americas", Miami-Dade County hosts one of the busiest international seaports and airports in the United States.

We are home to two renowned national parks, Everglades and Biscayne Bay, as well as miles of beaches and hundreds of thousands of acres of wetlands and environmentally sensitive lands. We minimize damage from development to our environment through regulatory, restoration and acquisition programs. Our hydrology is unique. A man-made drainage system is critical for stormwater management and is linked to a porous aquifer that supplies excellent quality drinking water. The Comprehensive Everglades Restoration Plan is a major federal project underway to restore the ecological function of the "River of Grass." Our beaches, populated by luxury hotels and homes, require vigilant renourishment. Our beautiful weather is also intense with heat, hurricanes, floods, and droughts. We survived and rebuilt after Hurricane Andrew, the second most destructive hurricane in U.S. history. As a result, our building codes are now the nation's most stringent for wind-resistant construction. While we benefit from excellent air quality courtesy of our location and wind patterns, carbon emissions from our homes and vehicles travel to neighboring counties and impact those with sensitive health.

Miami-Dade County has a fairly well diversified economy. The economy is not overly dependent upon a few industries. Its largest industry groups are finance, insurance and real estate which together account for 26 percent of the Gross Domestic Product (GDP), followed by commerce, which accounts for 20 percent of GDP and is comprised of wholesale trade, retail trade, and transportation and warehousing services. Professional and business services produce 12 percent of the County's GDP. Goods-producing sectors, such as manufacturing and construction, and education and healthcare each account for eight percent of the economy. Hotel accommodations, food service and leisure businesses, which are significantly affected by overnight visitors, together represent seven percent of the County's economy (Dr. Robert Cruz, Miami-Dade County Chief Economist). Agriculture is important, providing an economic impact of over $2.57 billion to the local and state economy (Dade County Farm Bureau).

Similarly, the County has a diverse employer base that is not dominated by a few large employers. Eighty-one (81) percent of the private business establishments have fewer than 10 employees, while 18 percent have 10 to 249 employees. Approximately 84 percent of payroll employment in the County is found in the private sector, while state, local and federal agencies employ approximately 16 percent of the workforce.

"Sustainability means staying in business forever, whatever your business is. If you run a ski resort, that means you have to address climate change while also cultivating your business in many ways. If you're in the business of parenting, to keep that practice viable forever means ensuring clean water, a healthy environment for your children to grow up in, financial security, stable climate and lots more. "

Auden Schendler, Getting Green Done

Why should we be concerned about climate change?

Miami-Dade County is progressive and resilient, but is also one of America's communities most vulnerable to climate change. We are a coastal community at sea level, located at the tip of the Florida peninsula with many low-lying areas. We have a large, dense population. Key economic drivers, tourism and agriculture, are weather dependent. Our population growth could be exacerbated at any time by a segment of mass migration. According to a recent study by the National Academy of Sciences, "As many as 7 million Mexicans could migrate to the U.S. by 2080 as climate change reduces agricultural production in Mexico" (Gorman). Could Miami-Dade County be host to climate refugees given our international positioning and immigration history?

Now is the time to focus as a community on how to turn science into action. The **Climate Change Action Plan** contained within ***GreenPrint*** charts the steps necessary to do this.

A "new normal"

The recent downturn in the economy has the hidden benefit of creating a positive impact in individual household sustainability. Residents and businesses are focused on cutting costs. We are producing less solid waste, lower fuel emissions, and less water use. A tougher economy has also forced behavioral changes: less spending, more saving and a shift from consumerism to a more frugal or minimalist lifestyle. The challenge and opportunity is to take advantage of an otherwise negative situation and allow it to become the new normal. How do we as a society and as a government avoid the temptation to grow, build and pollute again when our fortunes improve? How do we manage growth, consume only what we need, recycle more and conserve water and energy?

These are the questions *GreenPrint* seeks to address and our community is called to answer.

Strong Leadership, Connections & Commitment

- **Create the next generation of green leaders**
  Work with the more than 100 GreenPrint partners to integrate sustainability into local, regional and national strategic decision-making, policies and operations.

Water & Energy Efficiency

- **Use less water and energy**
  Reduce per capita non-renewable energy use to 20 percent below 2007 baseline by 2015. Reduce water consumption by 1.5 million gallons a day. Reduce government electricity use by 20 percent from 2007 to 2014 in accordance with Board of County Commissioners legislation.

Our Environment

- **Maintain exceptional quality of air, drinking water, and coastal waters used for recreation**
  Continue to achieve the best air quality rating at least 90 percent of the year and exceed drinking water quality standards. Prevent degradation of our outstanding florida waters.
- **Protect and enhance Biscayne Bay, the Everglades, and vital ecosystems**
  Restore and enhance more than 500 acres of coastal habits and wetlands, and preserve more than 24,000 acres of environmentally endangered lands.
- **Reinvent our solid waste system**
  Reduce or divert 75 percent of our solid waste from landfills by 2020 through reusing, recycling, and generating electricity.

Responsible Land Use & Smart Transportation

- **Use our land wisely, creating and connecting strong sustainable neighborhoods**
  Develop 15 urban center area plans and six multi-modal corridor master plans. Create four transit-oriented developments (TODs) on heavy rail and bus corridors. Develop level of service metrics to identify resident accessibility to parks and open space areas. Improve access through an interconnected network of shaded and safe bikeways and trails connected to neighborhoods, schools, employment centers, civic buildings, and other community destinations
- **Provide more transportation options, reducing the time we spend in our cars**
  Add 10 million boardings to our public transportation system through increased services, and enhancing convenience, comfort, and timely service. Increase the percentage of total trips taken by walking or bicycling from 10 percent to 16 percent of all travel trips. Increase resident satisfaction with the availability of sidewalks for pedestrians to 65 percent or more and add 40 miles of bicycle trails and lanes.

Vibrant Economy

- **Create green jobs**
  Cultivate an innovative and sustainable economic infrastructure that creates 20,000 green jobs by 2020 while building on our economic strengths and adding to our competitiveness in the global economy.
- **Build on our international reputation to become a green enterprise destination**
  Increase the percentage of green hotels, eco-tourism, and hospitality related businesses.

Healthy Communities

- **Raise awareness that sustainable living is healthy**
  Decrease our community's lifestyle disease rates such as diabetes and heart disease through healthy eating and exercise. Provide access to fresh, local and/or organic food in all neighborhoods through grocery stores, farmers markets and community gardens supported by local agriculture. Increase the number of short walking and biking trips through safety and other programs. Reduce barriers for disabled and elderly residents.
- **Plant more Florida-friendly and native trees and landscapes**
  Plant half a million trees by 2015 to achieve a 30 perecent tree canopy by 2020 and encourage native, drought-tolerant landscaping to cool our communities, capture greenhouse gas emissions, beautify our neighborhoods, and provide wildlife habitat.

Climate Change Action Plan

- **Understand and respond to current and future climate change impacts**
  Integrate local climate change indicators with existing emergency management, storm water planning, and infrastructure planning.
- **Reduce greenhouse gas emissions**
  Reduce GHG emissions by 10 percent by 2015, working towards 80 percent reduction by 2050 to advance the Cool Counties Program commitment.

"More importantly, focusing on sustainability is about confronting one of our generation's great moral imperatives. Facing that challenge will carry us for much, much longer. I congratulate every one of you for being a part of this historic evolution in the way public business is done, and I call upon every one of you to be relentless in pursuing the next steps. Together, we will continue to achieve the extraordinary."

County Manager George M. Burgess, message to County employees, 2010

Why and how was *GreenPrint* developed?

In March 2009, Miami-Dade County was selected as one of three communities nationwide to participate in a sustainability planning toolkit pilot program through ICLEI-Local Governments for Sustainability (ICLEI). Miami-Dade's plan will be used as a model by local communities worldwide. It is quite an honor to have been chosen as a pilot community, but with it comes great responsibility.

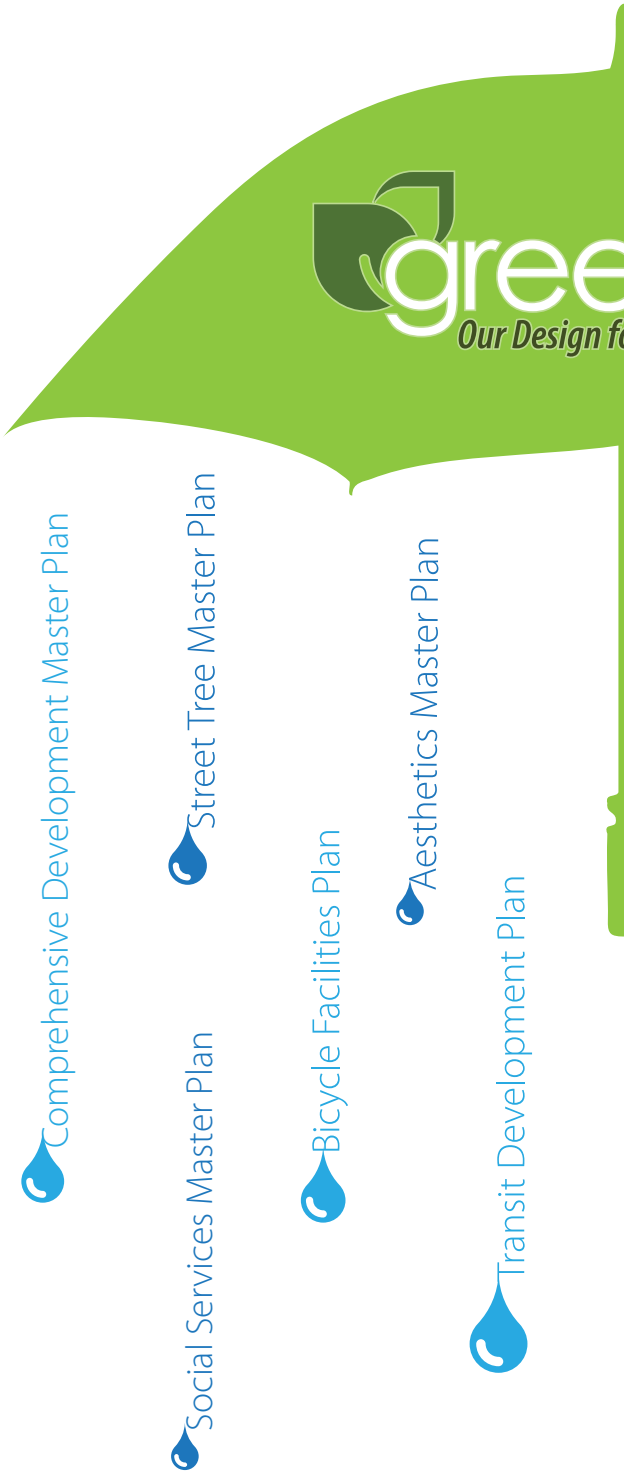
For years the Miami-Dade Board of County Commissioners (Board) and County departments have been implementing policies and initiatives to address climate change and other important sustainability issues. Many municipalities in Miami-Dade County have made sustainability a priority as well, and have existing plans or are developing plans.

Through this planning process we have learned from our partners, who have strong initiatives to build upon. Now is the time to elevate and intensify our efforts, better coordinate our plans and resources, and raise awareness in our community for a sustainable future. ***GreenPrint*** will be the framework to integrate environmental, social and economic benefits in the policy decisions we make, programs and initiatives we implement and services Miami-Dade County delivers.

GreenPrint is a community plan… developed and implemented by all

GreenPrint is not a Miami-Dade County government plan. It is a community plan for all residents, organizations and businesses. As an institution, Miami-Dade County produces three percent of the community's total carbon emissions. Residential and commercial uses account for most of the energy consumption; clearly we must become more efficient together. According to Florida Power and Light's (FPL) Ten Year Power Site Plan, 2009-2018, our collectively increasing energy use is driving FPL's plans to increase energy supply. This will result in greater electricity costs and higher demand for scarce resources such as water. Our homes, hospital systems, universities, colleges, and public school systems can all have a significant sustainability impact. We all have a role.

The ***GreenPrint*** planning team recognized this from the beginning, and partners have been crucial in plan development every step of the way.



The Mayor's Sustainability Advisory Board

Mayor Carlos Alvarez created the Sustainability Advisory Board to provide expertise and guidance from a practical and local perspective. Throughout the process, the Advisory Board has provided a reality check on the sustainability challenges facing the community and has offered strategic direction and advice for ***GreenPrint***'s development. Katy Sorenson, former Chairperson of the Board of County Commissioners' Budget, Planning and Sustainability Committee, chaired the Advisory Board. It included representatives of academia, cities, construction, commerce, energy, the environment, health, property insurance, municipal government, sustainable development, property management, the State Climate and Energy Commission, tourism, and organized labor.

Interdepartmental Sustainability Partners

Sustainability is important to County leadership and employees. The Interdepartmental Sustainability Partners were identified early in the process as a network of department directors and key staff to develop ***GreenPrint***. Our County departments understand the complexities and details of delivering services such as water and wastewater, solid waste collection and disposal, mass transit such as rail and bus, recreation and culture, parks and libraries. In addition to this team, experts throughout County government have given much time and energy to help develop ***GreenPrint*** through analyzing initiatives. They will also be implementation partners.

Department directors and staff have been weaving sustainability initiatives into their operations for years and seek to continually learn and improve how they do business. County directors are skilled professionals in their fields; their input and ability to grasp and integrate ***GreenPrint*** into their operations has been invaluable.

Climate Change Advisory Task Force

In July 2006, the Board established the Miami-Dade County Climate Change Advisory Task Force (CCATF), through the adoption of Ordinance 06-113, sponsored by Commissioner Natacha Seijas. This unanimous action by the Board further cemented Miami-Dade County's commitment to continuing its greenhouse gas reduction efforts and established the County as a leader in climate change adaptation planning.

The CCATF is chaired by Harvey Ruvin, Miami-Dade's Clerk of Courts, and serves in an advisory capacity to the Board. It is charged with identifying potential future climate change impacts to Miami-Dade County while providing recommendations regarding mitigation and adaptation measures to respond to climate change. The ***GreenPrint*** planning team attended CCATF meetings throughout the planning process with the goal of incorporating its recommendations into ***GreenPrint***. Many of the recommendations and their concepts are reflected in the ***GreenPrint*** strategies and initiatives.

Core Planning Team

When the County was selected as an ICLEI pilot program, the County Executive Office selected key staff from the Office of Sustainability, the Department of Environmental Resources Management, the Planning and Zoning Department, and the Office of Strategic Business Management to develop ***GreenPrint***. In addition to their existing professional responsibilities, this small dedicated group spearheaded the sustainability research, the assessment, plan development, outreach, initiative analysis, and plan writing.

Cities

Early in the process the ***GreenPrint*** planning team established a collaborative network with municipalities. Municipalities are in different stages of actual planning and implementation. We have linked existing sustainability plans to the ***GreenPrint*** website in order to share best practices. Most cities are interested in the subject, and we have agreed to continue meeting in the coming year to work on common initiatives.

Stakeholders, Partners, and Collaborators

During the planning process, the ***GreenPrint*** core planning team reached out to experts within the community such as Miami-Dade County Public Schools and the South Florida Water Management District. They have consistently embraced ***GreenPrint's*** development and have impressed the planning team with their own sustainability leadership, further reflecting the notion of ***GreenPrint*** as a community plan. They will be integral implementation partners.

Southeast Florida Regional Climate Change Compact

Southeast Florida is addressing climate issues beyond the borders of individual jurisdictions. The 5.6 million residents of our four counties exceed the population of 30 states and represent 30 percent of Florida's population. Commissioners representing each County announced the regional compact in October 2009 at the Southeast Florida Regional Climate Leadership Summit. The compact commitments include federal and state policy coordination on climate related issues, development of a Southeast Florida Regional Climate Change Action Plan, and annual participation in regional summits to mark progress. The second annual summit was held in Miami-Dade County in October 2010. The development of a Regional Climate Action Plan builds on the individual work of each County to address climate change. As of January 2010, each County commission adopted the compact with unanimous votes. Since adoption, each County has assigned staff resources to support implementation of the compact under the direction of a Compact Steering Committee.

The South Florida Water Management District is an invited partner to the compact process and is represented on the Compact Steering Committee. The University of Oregon's Climate Leadership Initiative is providing technical assistance to the regional climate action planning process as part of its national climate preparedness program. By working collectively at the regional level, the counties seek to enhance their individual efforts to mitigate emissions associated with the built environment, regional transportation and land use. The counties seek also to actively incorporate adaptation considerations into the regional action plan.

SOUTHEAST FLORIDA
REGIONAL COMPACT
CLIMATE CHANGE

The regional action plan will be developed in two phases, starting with completion of a regional greenhouse gas emissions inventory (with a particular focus on emissions from inter-County travel and commerce) and the development of regional climate impacts planning scenarios incorporating sea-level rise and other anticipated impacts. This first phase is scheduled to be completed by October 2010. The second phase of the process will feature the development of climate mitigation and adaptation measures for each of the three sectors included in the compact: land use, regional transport, and the built environment. Measure development will be assigned to work groups composed of experts from each county, regional entities, state agencies and federal agency staff working in the region.

The technical work products of the Compact are integrated with ***GreenPrint's*** implementation plan and will greatly contribute to achieving climate change adaptation goals.

Milestones

The planning process has been supported by the ICLEI Southeast Regional Office. The process itself is comprised of ICLEI's five key milestones. The milestones are designed to evaluate and integrate the environmental, social and economic benefits of our policy decisions, programs, initiatives, and services.

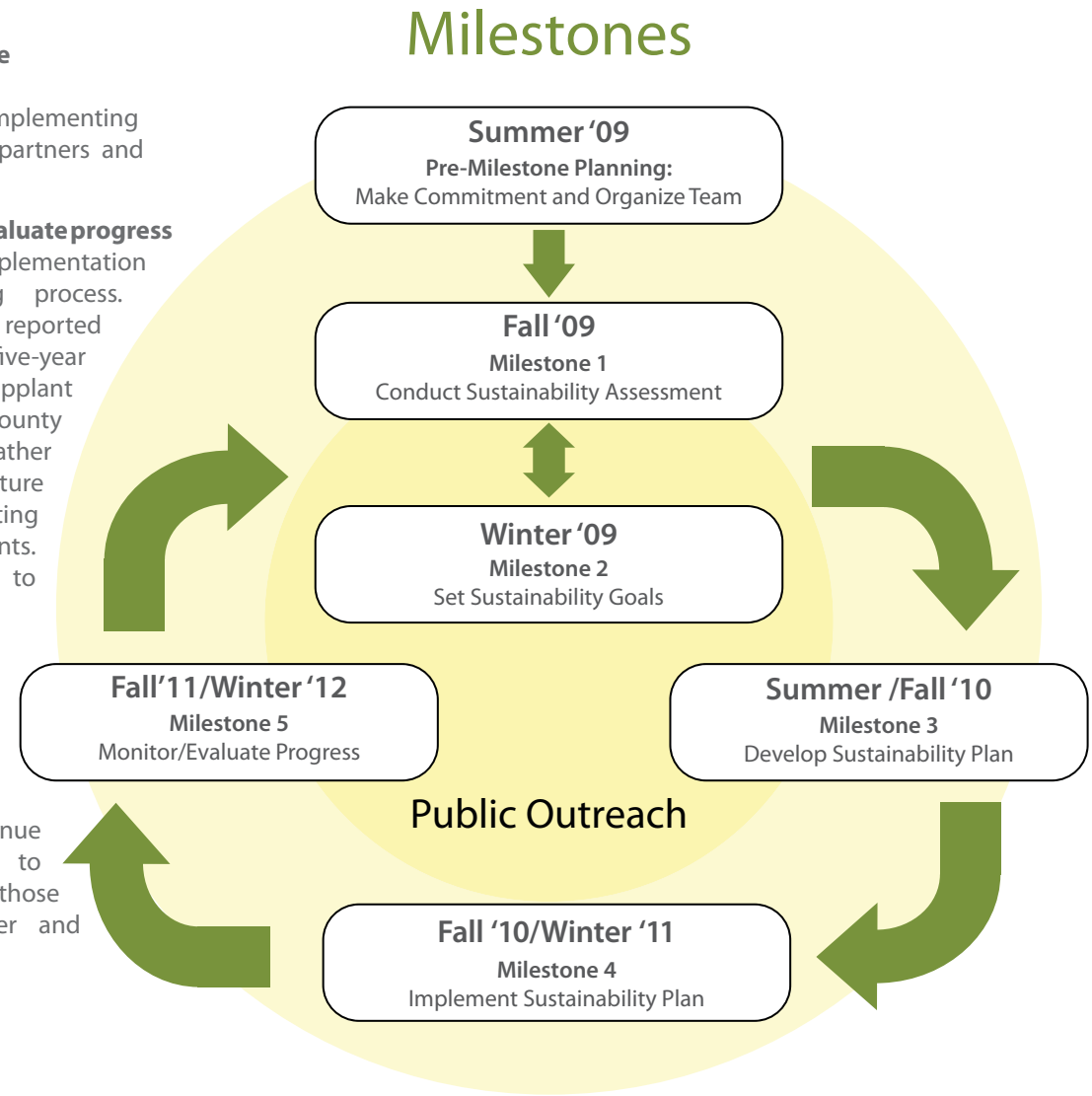
- **Milestone One: Conduct a sustainability assessment**
  To begin the planning process, we researched and assessed 13 areas linked to sustainability to help define environmental, economic and social equity baselines and challenges, and existing programs to address these issues. The assessment was conducted in the fall of 2009. The planning process and the assessment report are located at http://green.miamidade.gov.

- **Milestone Two: Set sustainability goals**
  The sustainability goals define the overarching objectives and scope of the sustainability plan. The purpose of the goals is to address the challenges identified in Milestone One. For ***GreenPrint***, there are seven main goal areas and 13 aspirational yet achievable goals.

- **Milestone Three: Develop a sustainability plan**
  Through the planning process, more than 360 initiatives were collected and analyzed for potential inclusion in ***GreenPrint***. The planning team and partners used a systematic and rigorous analysis to understand the ownership, costs, benefits, impacts, emissions, and key implementation steps associated with each initiative. Today, ***GreenPrint*** has 137 initiatives. The plan details the action steps to achieve our goals, as well as main indicators to evaluate our progress.

- **Milestone Four: Implement the sustainability plan**
  We are responsible for implementing ***GreenPrint*** along with our partners and stakeholders.

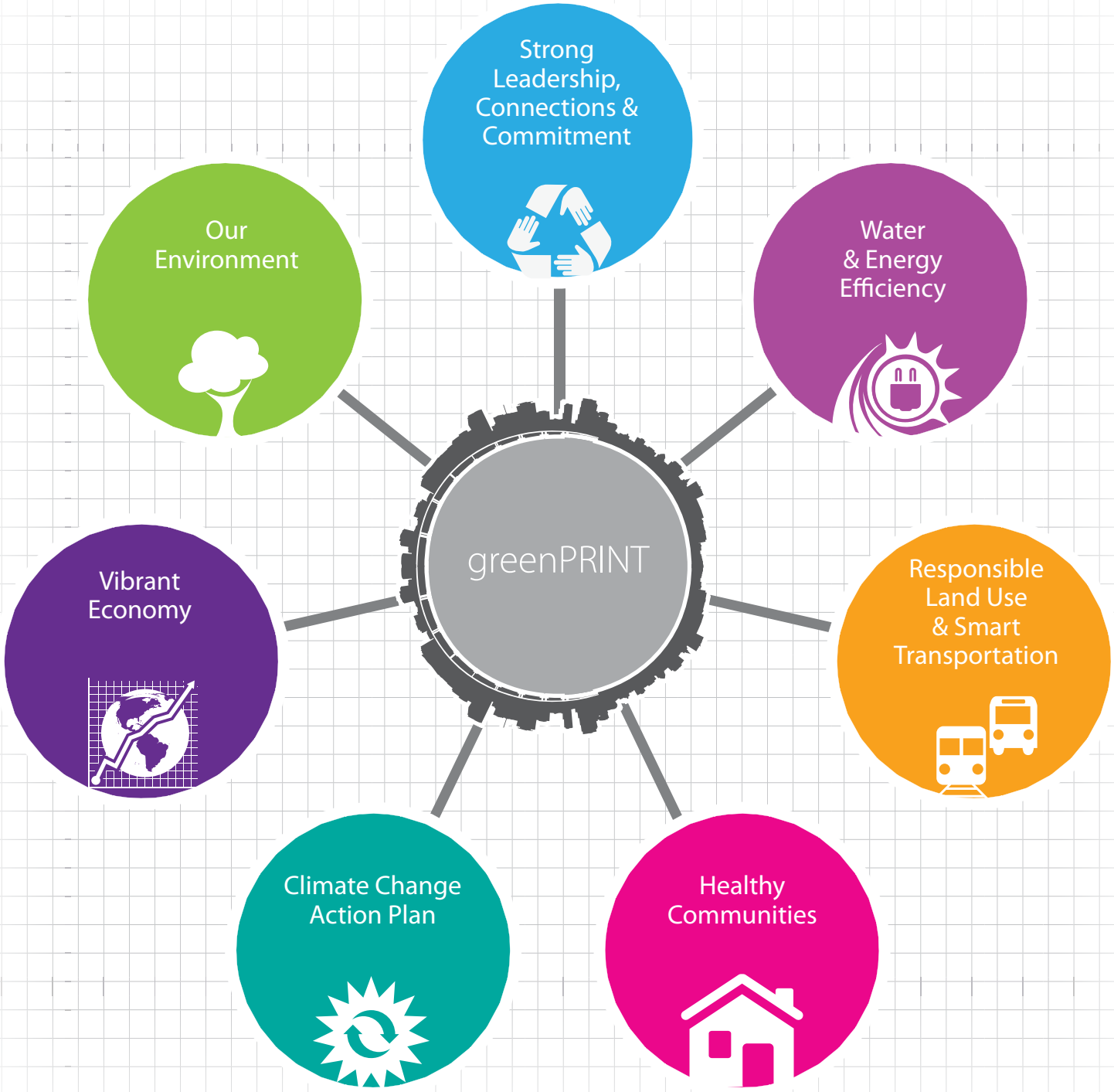
- **Milestone Five: Monitor and evaluate progress**
  Monitoring and verifying implementation progress is an ongoing process. ***GreenPrint*** progress will be reported on annually. ***GreenPrint*** is a five-year action plan. It does not supplant other Miami-Dade County planning documents, but rather it is a green umbrella to capture and build upon their existing sustainability components. ***GreenPrint*** tackles barriers to achieve the sustainability goals of existing plans and addresses issues within the County such as climate change and energy use. It also highlights our many existing programs that continue to significantly contribute to our sustainability, such as those surrounding drinking water and natural resource quality.



GreenPrint also makes a special effort to include concrete strategies and actions to help achieve the sustainable development vision laid out by a 30-year Comprehensive Development Master Plan (CDMP) in light of climate change considerations. The CDMP provides for sustainable development, adjusting developable land capacity to meet projected needs, preservation of wetlands and agricultural areas and protection of drinkable water well fields. It expresses the County's general objectives and policies, addressing where and how development or conservation of land and natural resources will occur during the next 10 to 20 years, as well as the delivery of County services to accomplish the Plan's objectives.

During the development process, 14 plans were reviewed and their relation to sustainability considered. When appropriate, sustainability components were integrated into ***GreenPrint*** as goals or within the goal area text. These components are included as initiatives if deemed critical to achieving a ***GreenPrint*** strategy. A brief summary of each plan's purpose is included for reference within Appendix D: Existing Planning Documents.

Inherent to its mission as an overarching community plan, ***GreenPrint*** has been created to build on existing knowledge, enhance existing initiatives and engage existing stakeholders. Its success is not dependent on creating an entirely new framework or forcing partners into compliance; to the contrary, the goals of ***GreenPrint*** will live in its ability to unify and standardize this community's growing commitment to a sustainable future.


Strong Leadership, Connections & Commitment
Water & Energy Efficiency
Responsible Land Use & Smart Transportation
Healthy Communities
Climate Change Action Plan
Vibrant Economy
Our Environment
greenPRINT

Strong Leadership, Connections & Commitment

Miami-Dade County has a strong record of environmental leadership and stewardship that dates back to the early 1990's. That rich history and local commitment in a community with obvious vulnerabilities to climate change has given Miami-Dade a voice on a national and international level. Miami-Dade County is shaping policy at the global table. We must continue to work at all these levels, from the international discussion to the individual and personal commitments.

Goals

- ***Create the next generation of green leaders***
  Work with the more than 100 GreenPrint partners to integrate sustainability into local, regional and national strategic decision-making, policies and operations

STRONG LEADERSHIP, CONNECTIONS & COMMITMENT

"We have a blueprint for staying green and sustainable… called "***GreenPrint***". It's getting noticed….We are at the forefront of green initiatives, but we need to make sure our efforts stretch beyond the confines of County government by forming partnerships with businesses, industries and residents. Commissioners, I need your help in shaping these proposals and turning them into policy."

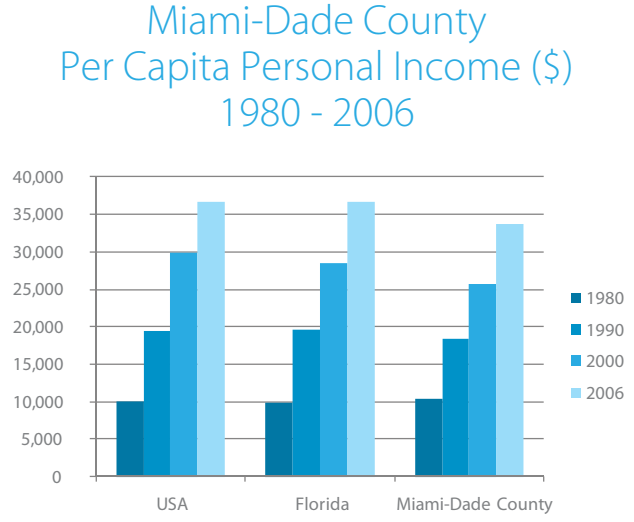
- Mayor Carlos Alvarez, State of the County, February 24, 2010

Strengths & Accomplishments…Opportunities & Actions

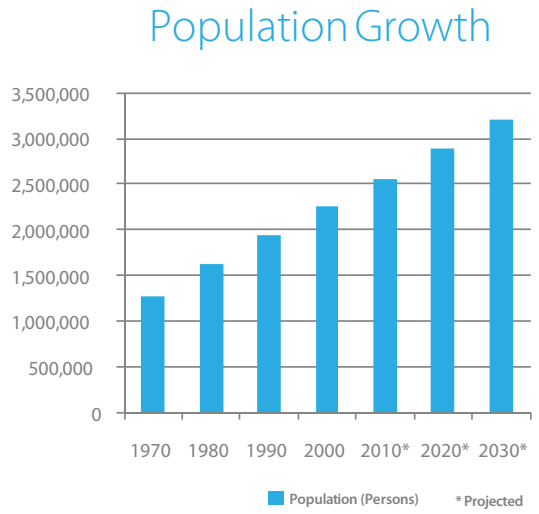
This goal area is unique to Miami-Dade County in comparison to other local government sustainability plans. It is here to reinforce the notion that this is not just a government plan, and it is not a plan for the bookshelf. This is an action-oriented, community-based, quality-of-life plan for a sustainable design for our future. It requires leadership to make tough decisions and change the status quo; connections to partners, because we are not alone in this and we do not have all the resources in the world; and commitment to persevere from generation to generation.

In order to create the next generation of green leaders, there must be willingness and a commitment to create interest, imagination, and innovation for investments in sustainability; craft a common language to communicate the importance of investments in sustainability to all segments of our rich and diverse community; become a role model for green government best practices; encourage and foster civic engagement and personal commitment; and incorporate sustainability into all levels of decision making by community leaders in all sectors.

This is important because today we already face significant challenges. Miami-Dade County has a per-capita income falling further below the national average. Our unemployment rate continues to rise. We trail the state and the nation in the share of our residents with high-school diplomas. The Miami-Dade County Planning and Zoning Department continues to forecast population growth by 30,000 people per year. And while 49 percent of the population in the County is registered to vote and this number continues to steadily rise, the quality of life of our community as a whole could greatly improve with more participation in the public decision making process.



Rene Dubos was a French-American Pulitzer Prize winner credited with coining the phrase, "think globally, act locally" (Schendler n. pag.). In Southeast Florida we have inserted "work regionally" into that equation. Southeast Florida is already addressing climate issues beyond the borders of individual jurisdictions. The 5.6 million residents of our four counties (Broward, Miami-Dade, Monroe, and Palm Beach) exceed the population of 30 states and represent 30 percent of Florida's population. Commissioners representing each County announced a regional compact in October 2009 at the Southeast Florida Regional Climate Leadership Summit. The compact commitments include federal and state policy coordination on climate related issues, development of a Southeast Florida Regional Climate Change Action Plan, and annual participation in regional summits to mark progress. The development of a Regional Climate Action Plan builds on the individual work of each County to address climate change. This is leadership, connections and commitment in action.



To make progress towards our strategies, initiatives must be critical, supported by our partners, and successful. Many of the following initiatives have their foundation in building upon existing relationships and developing new ones. A recent study of chief executives worldwide reinforced this notion: "Across the board, the CEOs we spoke to confirmed that partnerships and collaboration are now a critical element of their approach to sustainability issues." (UN Global Compact: Accenture CEO 2010).

Sustainability Timeline

Opened Solid Waste Resources Recovery Facility, one of the most technologically advanced waste-to-energy facilities in the world

Environmentally Endangered Lands Program (EEL) approved by Miami-Dade voters

Founding member of ICLEI, an international organization supporting climate protection and sustainability planning and initiatives for local governments

Urban CO_2 Reduction Plan adopted

1982 1990 1991 1993

1980 1985 1990 1995

- First hybrid Metrobuses placed into passenger service
- First fuel-efficient hybrid waste collection vehicle placed into service
- Became a National Oceanic and Atmospheric Administration (NOAA) case study and pilot program and hosted the "Roadmap for Adapting to Coastal Risks" workshop led by the Coastal Services Center in South Carolina
- Hosted the White House Council on Environmental Quality and the Interagency Climate Change Task Force Listening Session (one of six sessions nationwide)
- Received the "Most Outstanding Green Government" award by the U.S. Green Building Coalition South Florida Chapter
- Received the "Leadership Award for Process Innovation" by ICLEI Local Governments for Sustainability for the Southeast Florida Regional Climate Compact

- Expanded Office of Sustainability with the award of the Energy Efficiency and Conservation Block Grant
- Established goal of reducing County government's energy consumption by 20 percent by 2014
- Began the process of developing our community's sustainability plan, ***GreenPrint***
- Established the Southeast Florida Regional Climate Change Compact
- Replaced 75,000 traffic signal bulbs with LED modules, saving $2 million
- Purchased first biodiesel fuel blends for use in County fleet and equipment

- Created of the Office of Sustainability
- Joined Cool Counties, committed to reducing CO2 emissions 80 percent by 2050
- Implemented a Single-Stream Recycling Program

- Joined the Chicago Climate Exchange
- Adopted the Sustainable Buildings Ordinance

Initiated Energy Services Performance Contracting

- Miami-Dade Climate Change Advisory Task Force established by the Board of County Commissioners
- Adopted the Water Use Efficiency Plan

- Created internal Resources Conservation Committee
- Purchased first hybrid fleet vehicles

1998 2003 2006 2007 2008 2009 2010

2000 2005 2010

Strategies

- Strengthen regional and local community partnerships
- Integrate sustainability into all leadership systems
- Be green government role models
- Create ongoing outreach, education, and dialogue with the community about the implications of climate change and the benefits of sustainability

Leadership, Connections and Commitment Initiatives:

1. Strengthen regional and local community partnerships

- Implement the Southeast Florida Regional Climate Change Compact
- Codify the sustainability planning process and create a formal leadership structure for ***GreenPrint*** implementation
- Encourage all municipalities to adopt ***GreenPrint***
- Pursue more public-private partnerships to implement policies identified in County plans that improve County services

2. Integrate sustainability into all leadership systems

- Continue to participate in and influence sustainability policy formulation and decision-making at the national and international level through partnerships, conferences, and legislation
- Integrate sustainability knowledge into existing leadership programs and new elected official orientations countywide

U.S. Department of Commerce Under Secretary for Oceans and Atmosphere, Dr. Jane Lubchenco, and Miami-Dade County Mayor, Carlos Alvarez, at the Federal Interagency Climate Change Adaptation Task Force Public Meeting held June 23, 2010 in Miami-Dade County. The meeting provided an opportunity for White House officials to listen to local and regional ideas, questions and concerns about climate change adaptation, and to describe federal efforts already underway to plan for climate change adaptation.

3. Be green government role models

- Integrate and prioritize climate change and sustainability in local government strategic planning, business planning and in fiscal decision making
- Develop an interagency working group to ensure implementation of the CDMP by tackling conflicts between different County plans and within the development process
- Work with local Board of Rules and Appeals and other stakeholders to maintain the Florida Energy Code and to better define and set forth responsibilities of each trade in order to improve compliance with and enforcement of the Code (Within the Florida Energy Code and 2010 Florida Statutes, Chapter 468, Part XII)
- Adopt existing draft County Ordinance (per Resolution R468-06) requiring water efficiency retrofits at point of home resale (prior to changing ownership) and later update the ordinance to require additional retrofits focusing on energy efficiency

Miami-Dade County Clerk of the Courts, Harvey Ruvin, and Miami-Dade County Commissioner Natacha Seijas, at the first ever Southeast Florida Regional Climate Leadership Summit on October 23, 2009.

4. Create ongoing outreach, education, and dialogue with the community about the implications of climate change and the benefits of sustainability

- Develop and implement ongoing community outreach about sustainability and climate change
- Estimate the Costs of Action vs. Inaction and communicate implications to key decision-makers

"Our survey found widespread agreement among CEOs about what the next era of sustainability will look like: It is one where sustainability is not only a separate strategic initiative, but something fully integrated into the strategy and operations of a company. As one emerging economy CEO told us, 'Currently, the burning issue is how to better incorporate sustainability into daily practice.'"

-UN Global Compact- Accenture CEO Study 2010

Sustainability and the implications of climate change bring a different managerial twist to any organization. Learning and communicating with each other as government entities, businesses and major institutions will help to facilitate this change. Eventually, it will be integrated into how we do business. Public Management magazine, a publication from ICMA, drove this home: "Educating residents about sustainability is important. When speaking to them, it may be good to refer to sustainability as being about local people, local places and local prosperity. To bankers, speak about living off the interest not the principle. To farmers, speak about not eating your seed corn. To the elderly, speak about their grandchildren. To veterans speak about our nation's security. To scout groups, speak about leaving your campsite better than you found it… speak out" (Reid). We need to keep speaking.

The Mayor's Sustainability Advisory Board is comprised of a diverse group of community experts from many different sectors. It was created to provide guidance in the development of Miami-Dade County's community-wide ***GreenPrint*** Sustainability Plan.

Water & Energy Efficiency

Water and energy are vital to all communities and are intricately linked in terms of generation and supply. We can seek and develop new resources to increase supplies, but the simplest and cheapest way to secure a sustainable future is by decreasing demand through efficiency and conservation. As we use less water, we use less energy, and vice versa. Some strategies are simple: using more efficient light bulbs, programmable thermostats and low-flow plumbing fixtures. We can also introduce smart energy systems that allow for more effective monitoring and control of an entire office building. We can even pursue alternative and renewable sources, such as solar energy. What's most important is that, as a growing community, we simply use less. This nearly always leads to more money in our pockets. It's the essence of common sense.

Goals

- ***Use less water and energy***

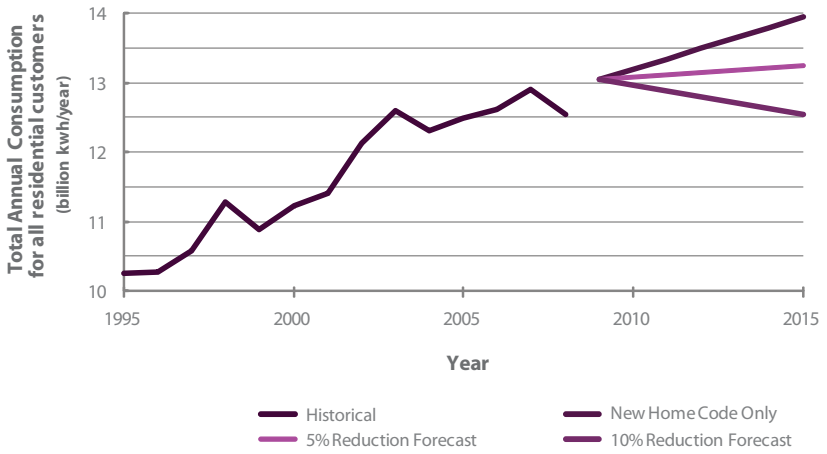
  Reduce per capita non-renewable energy use to 20 percent below 2007 baseline by 2015. Reduce water consumption by 1.5 million gallons per day. Reduce government electricity use by 20 percent from 2007 to 2014 in accordance with Board of County Commissioners legislation

WATER & ENERGY EFFICIENCY

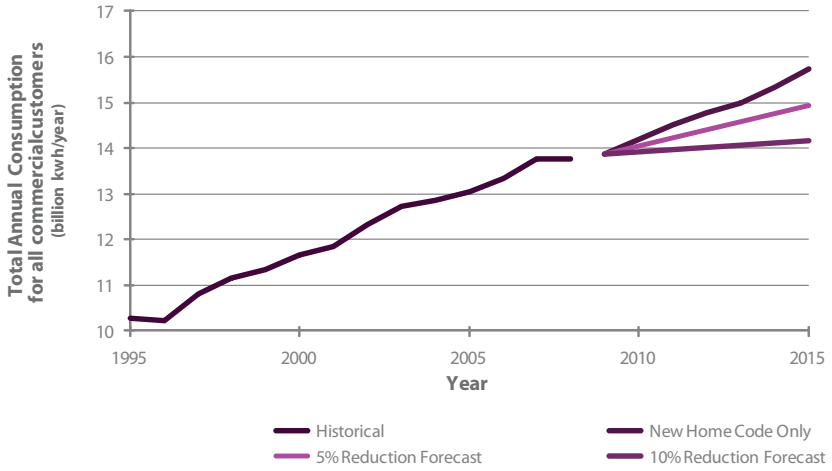
"The Block Grants are a major investment in energy solutions that will strengthen America's economy and create jobs at the local level. The funding will be used for the cheapest, cleanest, and most reliable energy technologies we have—energy efficiency and conservation—which can be deployed immediately. The grants also empower local communities to make strategic investments to meet the nation's long-term clean energy and climate goals."

- U.S. Secretary of Energy Steven Chu

Miami-Dade County Residential Consumption Projections



Miami-Dade County Commercial Consumption Projections



Improving the energy performance of our buildings can have important impacts on our electricity consumption. As illustrated by the graphs, exceeding code requirements has the potential to change the trajectory of our growth trends.

The water and energy connection

Energy and water are related in just about every imaginable way, from the production of electricity and potable water, to the lights and water in our homes that we too often take for granted. The water-supply industry uses large amounts of energy to transport, treat and deliver water. On the flip side, vast quantities of water are required for all stages of energy production, from extraction, to processing and refining, to transportation, to power generation itself. Understanding this relationship highlights the importance of conserving water and practicing energy efficiency. For every kilowatt saved, water is also saved. For every gallon of water not used, energy demand is reduced. Investments in and incentives for energy and water conservation must be high priorities, and progress in one area will be reflected in the other.

Efficiency versus conservation

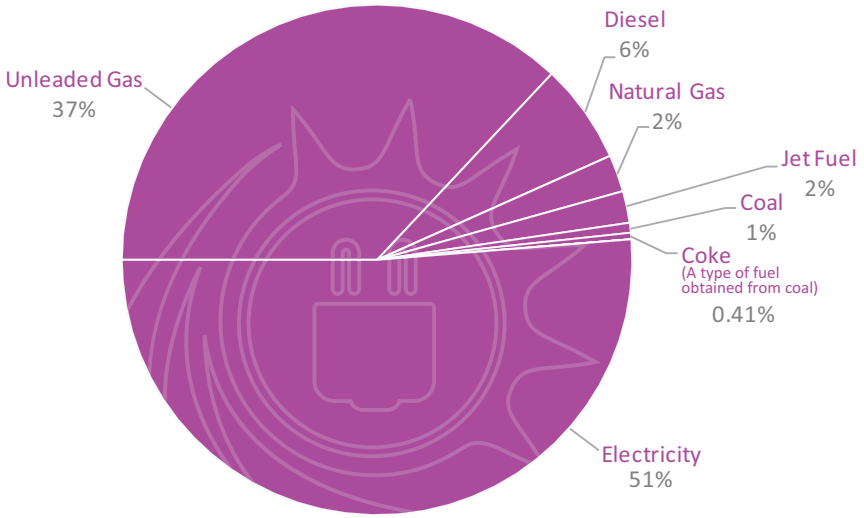
It is important to note the difference between efficiency and conservation. Efficiency is getting the most productivity out of each usable unit of energy or water. In contrast, conservation normally refers to actions taken by consumers to reduce their resource use (i.e. turning off the lights when leaving a room, or turning off water while brushing teeth). The promotion of efficiency aims to reduce the amount of kilowatt-hours or gallons needed to satisfy a consumer's demand for end-uses such as cooling and hot-water heating; in other words, to get more out of each unit consumed. Consumers generally need to make upfront investments, such as more expensive, higher efficiency appliances and products, such as low-flow faucets, windows and insulation.

The benefits of becoming more energy efficient

Uninterrupted access to reliable energy is critical to operating the buildings, equipment and vehicles that we depend upon every day. Sustaining our current lifestyle, absent a critical and deliberate effort to increase efficiency and use alternative sources, will only become more challenging due to economic costs, geo-political instability, and the changes in natural environment (i.e. climate change, air pollution, natural resources extraction). These costs have long-term ramifications for the quality of life we want to maintain and pass along to future generations.

On average, electricity accounts for 75 percent of the cost of producing municipal water, primarily for capturing, treating, distributing, and using the water. After the water is used, more energy is required to treat the wastewater.

Miami-Dade County Community Fuel Emissions by Type (2005)



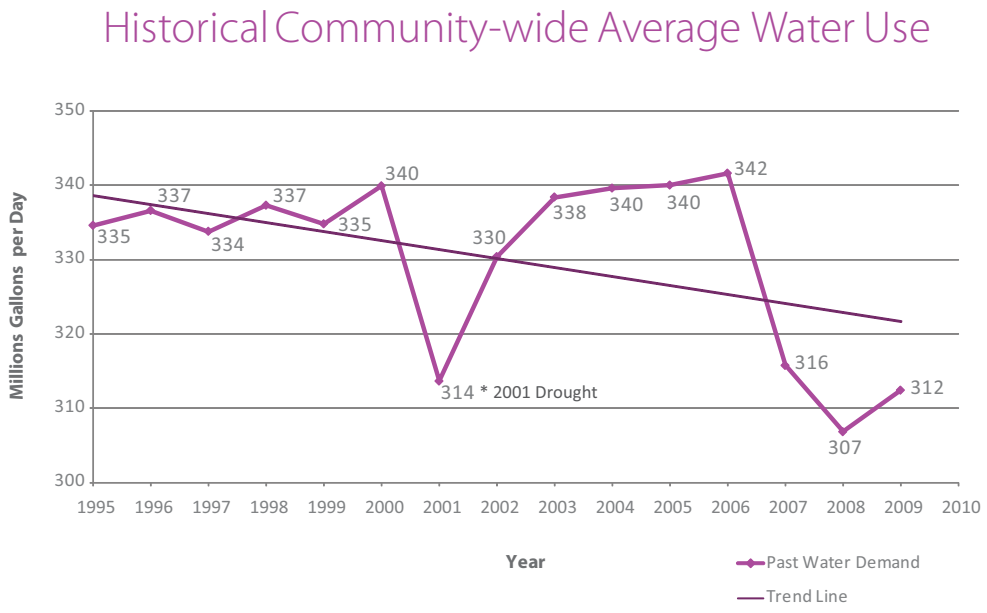
Our current energy supplies – nearly 90 percent of which go toward transportation and electricity generation – are unsustainable in numerous ways. Environmentally, the extraction, transport and combustion of fossil fuels can hazardously impact human health and natural ecosystems. Our community does not have local supplies of oil, natural gas and coal, requiring the added expense, environmental impact and geo-political implications involved with importing those fuels from other states and countries. Nuclear energy, despite its smaller emissions footprint, consumes vast quantities of water, and creates the long-term challenges associated with disposing of contaminated waste. The key then, to meeting sustainability goals related to climate change, is to work collaboratively to reduce dependence on these supplies.

We are using less water

Developing efficient practices and using water wisely is paramount to preventing future water shortages and protecting water quality. Efficient water use ensures the sustainability of the Biscayne aquifer to meet future demand. Our strong water conservation efforts have been successful, helping us reduce and defer infrastructure costs and meet future water demands without causing harm to our water resources and surrounding natural systems.

For Miami-Dade County, conservation has proven to be the most economically feasible water management approach. Our per-capita use in 2009 was 139.6 gallons of water per day, down from 158 gallons four years prior. In 2009, the County produced an average of 312.5 million gallons per day (MGD) and served a population of more than 2.2 million customers.

Miami-Dade has excellent drinking water quality, and its protection is addressed in the ***Our Environment*** goal area of ***GreenPrint***.



In 2006 the Miami-Dade Board of County Commissioners adopted the Miami-Dade Water Use Efficiency Plan. Since then, Miami-Dade residents have responded to the call to be more efficient in their water use, contributing to a drop in consumption of over 28 million gallons per day. It is important that Miami-Dade County residents continue this trend in order to sustain the Biscayne aquifer water supply.

Leveraging funding opportunities

In 2009, Miami-Dade County was awarded a $12.5 million federal grant through the U.S. Department of Energy's Energy Efficiency and Conservation Block Grant program (EECBG). The program, initially funded under the American Recovery and Reinvestment Act, has provided $3.2 billion in funding to more than 2,300 cities, counties, states, and Indian tribes nationwide to assist in improving energy efficiency, reducing energy use and fossil-fuel emissions, and creating green jobs locally. It has also empowered local communities to make strategic investments to meet the nation's long-term goals for energy independence and leadership on climate change.

The award of EECBG funds has enabled the County to jump start energy efficiency projects that otherwise would not have been implemented. Thirteen grant-funded activities, which include a mix of energy-management projects, citizen outreach and education opportunities, sub-grants, pilot/demonstration programs, construction projects, and incentive programs, are being implemented across eight County departments. This mix of projects showcase and demonstrate the additional energy-efficient projects the County can undertake.

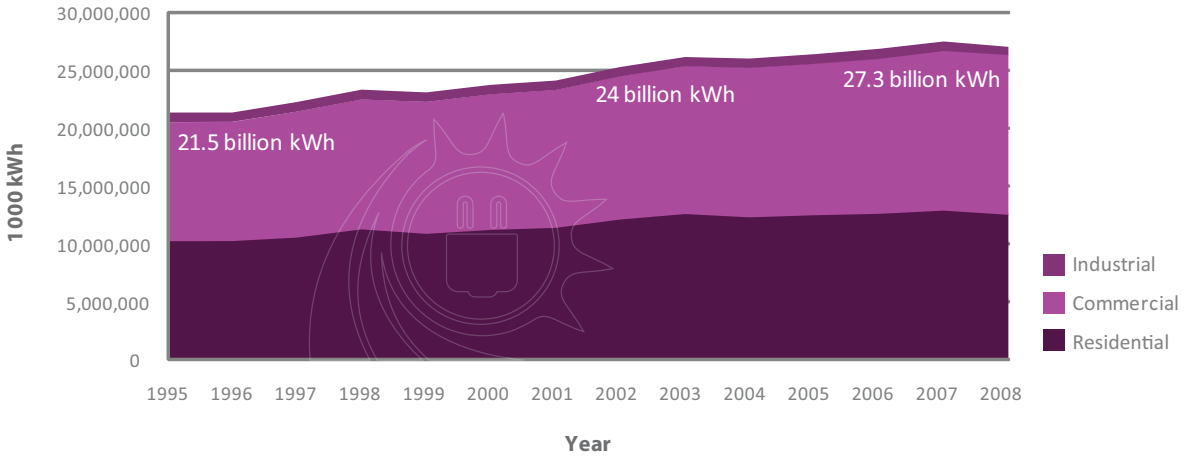
Those activities complement the County's integrated Energy Efficiency Conservation Strategy which aims to:

- Improve our ability to manage and reduce energy use across our government operations
- Enable, demonstrate, and evaluate the performance of energy-efficiency and renewable-energy retrofits of facilities and other energy-consuming government assets
- Provide targeted community-wide financial assistance and industry-based financial incentives for energy efficiency and renewable energy
- Target behavior change community-wide for energy conservation

The Office of Sustainability is managing the EECBG program over its three-year term. Specific activities include:

1. Enterprise-wide and facility-based energy management systems upgrade and coordination at the Stephen P. Clark Government Center and Gerstein Justice Building.
2. Community-wide energy efficiency campaign aimed at achieving long-term behavior changes to reduce energy. Elements include, but are not limited to, energy workshops, light bulb exchange program, and an energy savings challenge for businesses and residents.
3. Grants to Green Nonprofits (G2GN) Program which offers grants to local nonprofit and faith-based organizations to perform energy audits and energy-efficient building retrofits, replacements and upgrades.
4. Development of sustainable capital improvement procedures and guidelines to ensure that the County's capital improvement process maximizes energy conservation for new construction and building renovations.
5. Methane sequestration from the South Dade Landfill combined with digester gases to power water and sewer operations at the South District Wastewater Treatment Plant.
6. Energy efficient and sustainable buildings evaluation of building/zoning codes and permitting processes to identify recommended changes to remove energy-efficient and climate change obstacles to land use and development.
7. Cool roof retrofit project at Homestead Library which replaces the existing roof with a high-reflective Cool Roof system.
8. Daylight harvesting demonstration which sets programmable lighting controls tied into daylight coming in from outside at the Naranja and Kendale Lakes libraries.
9. Pilot desktop virtualization project which replaces nearly 1,800 personal computer workstations with more energy-efficient virtual desktops utilizing "thin client" technologies to reduce power consumption and environmental waste.
10. Energy-efficient lighting on "Green Roadway" demonstration to promote people-friendly movement by including high-efficiency lights, and pedestrian-friendly access while reducing energy use and air pollution.
11. Solar power systems demonstration which installs solar panels on the roofs of recreational buildings at the Country Village, Martin Luther King, Jr. Memorial and Westwind Lakes parks.
12. Energy-efficiency revolving loans will be offered to all Miami-Dade businesses to perform energy audits and energy-efficient building retrofits, replacements and upgrades.
13. Sustainable technologies demonstration to identify and test equipment, technologies and services that can enhance building sustainability at existing County facilities.

Total Electricity Consumption of Miami-Dade County 1995-2008



Source: Florida Power & Light, 2009

The following strategies reflect the common-sense pairing of water and energy. They are designed to conserve and improve efficiency through innovative approaches.

Strategies

- Reduce energy and water consumption through increasing efficiency
- Improve energy planning through public-private partnerships
- Continue water and energy efficiency and conservation campaigns
- Expand alternative fuel (bio-diesel/waste-based bio-diesel) and renewable energy industries
- Be government leaders in energy, fuel and water efficiency

Miami-Dade County policy requires all County-owned building projects, both new construction and renovation, to be certified at the LEED (Leadership in Energy and Environmental Design) Silver level. Pictured above: the General Services Administration Trade Shops were designed to meet rigorous standards for energy and water efficiency.

"Our most promising energy resource lies not in some new fuel or yet-to-be-invented technology, but rather in the potential to reduce demand through improvements in energy efficiency."

-Center for Housing Policy

Per Capita Electricity Consumption of Miami-Dade County 2000-2007

Year	Electric Consumption				Total Miami Dade County Electric Customers	Residential Customers	County Population
	Annual Countywide Consumption (Thousands kwh)	Annual Residential Consumption (Thousands kwh)	Average Annual Residential Consumption (kwh)	Per Capita Residential (kWh)			
2000	23,951,899	11,234,637	14,242	4,986	896,736	788,839	2,253,362
2001	24,328,587	11,411,103	14,285	4,992	908,597	798,815	2,285,869
2002	25,512,650	12,122,334	14,975	5,242	920,563	809,506	2,312,478
2003	26,379,216	12,593,363	15,298	5,368	936,083	823,210	2,345,932
2004	26,251,400	12,311,664	14,739	5,173	951,090	835,301	2,379,818
2005	26,637,264	12,494,972	14,727	5,159	966,906	848,446	2,422,075
2006	27,092,059	12,614,845	14,684	5,176	979,084	859,113	2,437,022
2007	27,733,222	12,889,040	14,715	5,223	998,204	875,901	2,467,583

Source: Florida Power & Light; Miami-Dade County, Department of Planning and Zonning, 2008

Electricity use is closely linked to population growth, however the rate of increase in Miami-Dade County's electricity use is outpacing that of its population. To determine how efficiently electricity is being used, we can look at per capita electricity consumption. While the growth rates should correlate, the per capita use should ideally remain stable or decrease as efficiency standards and awareness improves. Despite this, between 2000 and 2007, per capita electricity use has increased, in large part, due to increased square footage, demand for air conditioning, as well as popularity of technology such as large screen televisions and digital video recorders, which now account for more electricity use in the U.S. than refrigerators. The GreenPrint goal is to reduce electricity consumption per capita by 20 percent.

The water and energy efficiency initiatives include both new and existing approaches to accomplishing our strategies and stimulating advances in commercial, private and government arenas. They truly reflect a community approach with a focus on public-private partnerships for implementation. As such, this goal area beneficially overlaps the Vibrant Economy goal area.

Water & Energy Efficiency Initiatives

1. Reduce energy and water consumption through increasing efficiency

- Continue to implement the Water Use Efficiency Plan and the Non-Revenue Water Loss Plan initiatives to meet established reduction targets
- Incentivize energy efficient development prioritizing walkable, transit-oriented areas
- Implement EECBG projects
- Promote and create innovative financing for energy efficiency

2. Improve energy planning through public-private partnerships

- Create a Miami-Dade Energy Alliance with a diverse group of stakeholders to implement sustainable energy and building management system retrofits and practices that conserve energy, natural resources, and provide reinvestment savings

3. Continue water and energy efficiency and conservation campaigns

- Continue to implement current campaigns and pursue additional funding

4. Expand alternative fuel (bio-diesel/waste-based bio-diesel) and renewable energy industries

- Explore partnerships with large public and private landowners/entities to implement alternative fuel/energy parks and incentivize public and private use
- Incentivize local and sustainable alternative energy/fuel industries, and enact legislation to remove obstacles and stimulate the industry

5. Be government leaders in energy, fuel and water efficiency

- Develop and implement a government energy efficiency master plan
- Continue to implement Energy Star Portfolio Manager Benchmarking of County facilities
- Develop incentives for County employees to save energy through the Idea Machine
- Create a countywide energy reinvestment fund to capture savings from energy efficiency projects and reinvest in new energy efficiency projects, making the EECBG program financially sustainable
- Retrofit government facilities according to water efficiency audit recommendations
- Continue fuel reduction and monitoring programs such as Chicago Climate Exchange
- Continue to transition fleet to hybrid electric vehicles
- Continue to purchase hybrid-hydraulic diesel garbage trucks
- Create a process to purchase biodiesel that complies with Environmental Protection Agency's biodiesel protocol which requires a minimum 50 percent GHG lifecycle reduction
- Develop a process that facilitates delivery of diesel fuel to Miami International Airport from Port Everglades through existing aviation fuel pipeline

In September 2010, Miami-Dade County acquired the first of what is to become a fleet of six hybrid hydraulic diesel waste collection vehicles.

Our Environment

Miami-Dade County is internationally recognized for its beaches and pristine waters. Beyond the beaches are ecosystems that are unique, diverse and directly linked to water management. So valuable are these critical resources that two national parks, a National Marine Sanctuary, State of Florida aquatic preserves and water conservation areas have been created. Underlying all of South Florida is the Biscayne Aquifer, a shallow, porous limestone formation that has historically provided all urban and agriculture supply of fresh water.

Vulnerable natural resources have been altered throughout the years. Progressive environmental programs seek to protect, restore, and minimize harm to these resources, but major paradigm shifts are upon us, and we must continue to act.

Goals

- ***Maintain exceptional quality of air, drinking water, and coastal waters used for recreation***
  Continue to achieve the best air quality rating at least 90 percent of the year and exceed drinking water quality standards. Prevent degradation of our outstanding florida waters
- ***Protect and enhance Biscayne Bay, the Everglades, and vital ecosystems***
  Restore and enhance more than 500 acres of coastal habits and wetlands, and preserve more than 24,000 acres of environmentally endangered lands
- ***Reinvent our solid waste system***
  Reduce or divert 75 percent of our solid waste by 2020 through reusing, recycling, and generating electricity

Our Environment

"Practically without exception, areas that have been turned over to the Service as national parks have been of superlative value with existing features so outstanding that if the Service were able to merely retain the status quo, the job was a success. This will not be true of the Everglades National Park. The reasons for even considering the lower tip of Florida as a national park are 90 percent biological ones, and hence highly perishable. Primitive conditions have been changed by the hand of man, abundant wildlife resources exploited, woodland and prairie burned and reburned, water levels altered, and all the attendant, less obvious biological conditions disturbed."

Daniel B. Beard, Wildlife Reconnaissance: Everglades National Park Project, 1938

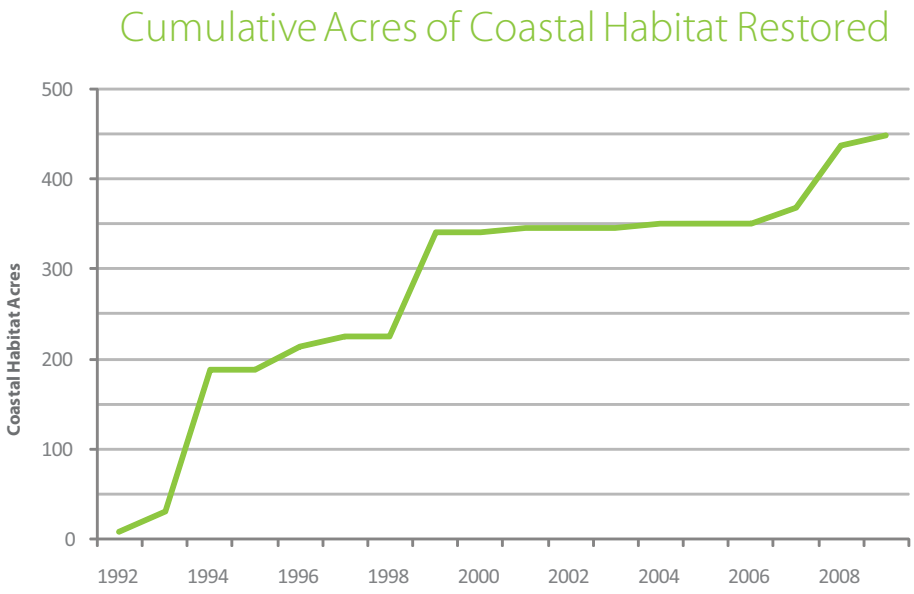
Miami-Dade is a leader in environmental protection

Our drinking water, drawn from the shallow Biscayne Aquifer, is of exceptional quality and rated among the best nationally. It has been protected through strong land use regulations, other legal protections and a community culture of preservation. To assure that there is an adequate supply of fresh water to meet the needs of both the natural system and human uses, strong water conservation, wastewater reuse, and development of alternative water supply are growing priorities. In spite of continuous significant population increases bringing increased pollution potential and other pressure on natural resources, our beaches remain swimmable, and portions of Biscayne Bay seagrass communities and mangrove shorelines remain largely undisturbed. Twenty miles of our barrier island beaches, once severely eroded, are now continually renourished through federal, state and local efforts, including restored coastal dune systems and sea turtle nesting habitats. Our air quality is excellent.

"Clean air, clean drinking water, swimmable waters, and quality ecosystems are fundamental for our future. They are the backbone of a healthy community. They support our economic system. Without a doubt, environmental protection costs less than treatment, restoration, or irreparable loss."

-Carlos Espinosa, Department of Environmental Resources Management Director

Much of our now-developed land was historically pine rockland forests or part of the greater Everglades ecosystem, made up of wetlands that allowed flow of freshwater from sawgrass prairies to coastal wetlands and estuaries. In other words, today's built environment has replaced much of our native, natural and wet areas. Flood control canals and structures were built to allow for agriculture, residential development and water supply but altered the natural patterns of freshwater flow. This canal system does provide effective drainage, and with additional improvements, we now rank in the top five percent in the nation for flood control efforts according to the Federal Emergency Management Agency's Community Rating System. We have approximately 148,200 acres of wetlands remaining within Miami-Dade County borders, important for recharging our aquifer. Since 1990, our County has acquired and preserved more than 23,000 acres of environmentally endangered lands and restored more than 450 acres of degraded coastal ecosystems. In addition, the state and federal governments have preserved 80,000 acres within Miami-Dade County in addition to Everglades National Park, the Everglades Wildlife Conservation Area and Biscayne National Park. These preserved areas provide habitat for native fish and wildlife, as well as threatened natural forest, wetlands and tropical plant communities. Agriculture, open lands, and environmental protection areas in south and west Miami-Dade help to provide a "green" buffer between the national parks and urban development.



We cannot credit these accomplishments to luck. The keys have been leadership, commitment, careful County stewardship and governance achieved through strategic planning and successful programs, as well as collaborative efforts with federal, state, other local government and non-governmental resource-management organizations.

The Environmentally Endangered Lands (EEL) Program was established in 1990 through a countywide referendum which approved a two-year tax increase to acquire, restore, and maintain environmentally endangered lands. Acquisition ensures that these lands are shielded from development and will continue to thrive as natural habitats. Current acquisitions exceed 20,000 acres and include rockridge pinelands, tropical hardwood hammocks, freshwater wetlands, coastal wetlands, coastal wetlands, and scrub habitat.

In spite of these efforts, we face several concerns

New water-treatment technologies promise more sustainable alternative water supplies through the beneficial reuse of wastewater, but they are expensive and energy intensive. Our low-lying terrain and porous aquifer are especially vulnerable to contamination and to potential impacts from sea-level rise and other climate change factors. As sea levels rise, movement of saltwater further inland and through the aquifer threatens coastal water supply wellfields and may overwhelm protective coastal dunes and mangroves. Gravity-based drainage infrastructure and canals will not perform as effectively as groundwater levels increase in the future. Populations of native plants and animals are increasingly threatened by invasive exotic species, which reduce the ecological, economic and lifestyle benefits that the natural communities provide. Conservation and restoration of natural resources will create a healthier and more resilient environment more adaptable to climate change.

In response to the effects caused by development, a multi-billion dollar federal and state program, the Comprehensive Everglades Restoration Plan (CERP), was approved by Congress in the Water Resources Development Act (WRDA) of 2000. It includes more than 60 elements to restore the South Florida ecosystem by improving water quantity, quality and delivery to more closely resemble natural patterns. Successful implementation of CERP is expected to improve conveyance of water quantity and quality to South Florida. Although CERP will not create new supplies of water for human consumption or increase flood protection, additional freshwater may help to reduce the effects of saltwater intrusion and increase the resilience of the natural system to climate change and development impacts.

The topography and meteorological patterns of South Florida help remove harmful air emissions from our community, but we produce greenhouse gas emissions that impact our neighbors. The Environmental Protection Agency (EPA) is strengthening its air-quality standards, which will result in reduced ratings in the near future. Initiatives to reduce emissions will provide benefits for both air quality and climate change mitigation.

Developing a sustainable solid waste system

Our Environment is not only composed of the natural beauty described above, but also the management of the resources we use. The amount and type of waste generated by a community – and the strategies employed to manage or treat that waste – contribute to the many facets of a sustainable community: human health, the environment, land use, and economic development. Our solid-waste system is at a crossroads and must be reinvented for the most effective use of our land resources and out of economic necessity. A new solid waste master plan is under development, and its operational and financial foundation is sustainability. This plan should provide the highest and

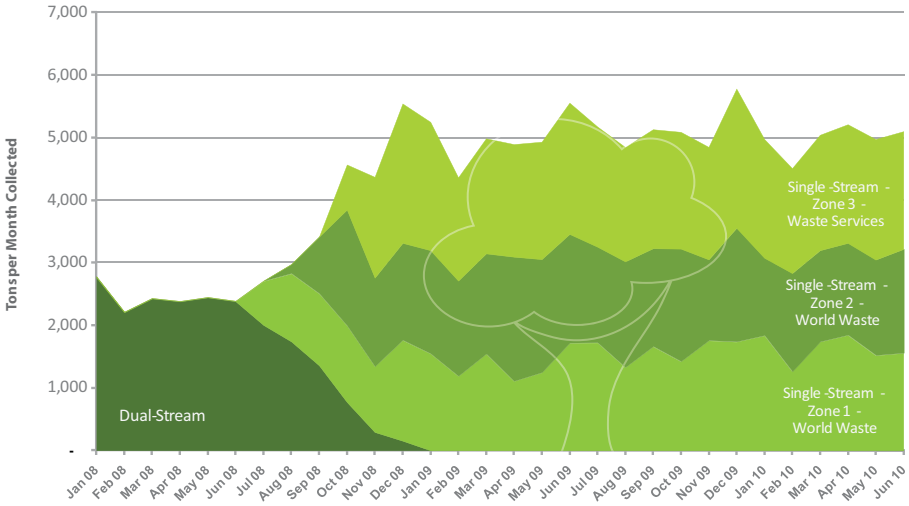
In 2008, 21 percent of our solid waste was recycled, 20 percent was converted into energy through incineration, and 59 percent was landfilled. Through incineration, we converted waste into nearly 305 million kWh, enough energy to power approximately 21,000 homes in that same year.

best value for waste-stream components. The planning process will address several realities, including decreasing landfill capacity, expiring customer contracts, disposal tonnage that is significantly impacted by the economy and hurricane activity, and a new statewide goal to divert the bulk of solid waste from landfills. The master plan will explore more waste-to-energy opportunities, mulching and composting alternatives, examine a "pay-as-you-throw" collection system, and consider rate structure options for the disposal system, all within the context of the entire solid waste management system. It will also address how to reinvent the current business model, which relies on waste for disposal revenue.

The master plan is an opportunity to build upon many strengths. Since 2008, residential recycling increased 88 percent with the introduction of an easy and convenient single-stream approach. Recently, the County has begun the process to sequester methane gas from the South Dade landfill to help power the Water and Sewer South District Wastewater Treatment facility.

The following strategies and initiatives within ***GreenPrint*** outline specifically how we will maintain drinking water quality, protect and restore our natural environmental resources, and meet our waste system needs now and in the future.

Recycling Conversion from Dual-Stream to Single-Stream Tons Collected per Month - Cumulative



Strategies

- Implement wastewater reuse to provide future water supply and benefit the environment
- Address salt intrusion that threatens drinking water wellfields and sensitive natural areas
- Protect, enhance, and restore our natural resources
- Protect environmental and other lands that may be important for ecosystem and community resilience
- Develop a sustainable Solid Waste System and Master Plan, using waste to benefit our economy and environment

Waste Production

	2003	2004	2005	2006	2007	2008
Tons of Waste/Person	1.79	1.73	1.88	2.08	1.86	1.61
percent Change in Waste/Person	-0.5 percent	-3.5 percent	8.7 percent	10.6 percent	-10.6 percent	-13.44 percent

(Annual Tonnage - Wastestream/Population) • (FDEP 2008 Report/Calendar year/grosstons)

The initiatives in this goal area build upon our conservation success. Together, they illustrate the connections of the natural environment to protect and preserve our water supply. And, of course, these actions steps address and highlight the management and treatment of waste within the context of sustainability.

At the end of the day, this is Miami-Dade, and it's all about the water: protecting it, conserving it and preserving it.

Our Environment Initiatives:

1. Implement wastewater reuse to provide future water supply and benefit the environment

- Implement Wastewater Reuse Projects consistent with the 20-Year Water Use Permit and the Miami-Dade Water and Sewer Department (WASD) Master Plans to recharge the Biscayne Aquifer
- Develop a water and wastewater utility and municipal working group to identify and implement wastewater reuse opportunities at both the utility and municipal levels
- Assess the feasibility of using highly treated wastewater to rehydrate wetlands and Biscayne Bay

South Florida historical natural communities are restored on publicly owned lands through the cooperative efforts of federal, state, and local agencies. In the photo above, red mangroves (Rhizophora mangle) were planted by community volunteers at an 85 acre wetlands restoration site at Bill Baggs Cape Florida State Park.

2. Address salt intrusion that threatens drinking water wellfields and sensitive natural areas

- Formalize an interagency working group to evaluate and address issues associated with salt water intrusion
- Monitor the isochlor line and address spatial gaps in salt intrusion data gathering
- Construct a water control structure on/near the Florida City Canal to isolate this canal from South Florida Water Management District's dry season agricultural drawdown
- Construct a earthen plug at the Card Sound Road Canal

3. Protect, enhance, and restore our natural resources

- Continue to minimize the impact of development on natural resources such as air, wetlands, Biscayne Bay and coastal habitats, natural forest communities, and trees through regulatory programs
- Identify dedicated funding sources for beach renourishment projects to maintain quality beaches and minimize the negative impacts of storm events
- Continue to enhance and restore coastal habitats important for the health of Biscayne Bay
- Develop appropriate indicators of the status and health of the resources of Biscayne Bay, through a collaborative approach with academic, governmental, nongovernmental organizations, and stakeholder entities
- Continue to support the Comprehensive Everglades Restoration Plan (CERP)
- Report the air quality benefits of mass transit use and reduced vehicle miles traveled
- Continue to pursue funding for government and private diesel retrofit projects in partnership with the EPA Southeast Diesel Collaborative

4. Protect environmental and other lands that may be important for ecosystem and community resilience

- Continue to acquire important lands through the Environmentally Endangered Lands (EEL) program
- Explore alternative funding sources for the EEL program such as a carbon offset sequestration program

Estimated Facility Capacity by Year

	Facility Estimated to Reach Capacity by Year:
North Dade Landfill	2012-2014
South Dade Landfill	2017-2020
Resources Recovery Ash Landfill	2020-2023

5. Develop a sustainable Solid Waste System and Master Plan, using waste to benefit our economy and environment

- Continue to develop a sustainable Solid Waste Master plan
- Use waste as energy at the WASD South District Wastewater Treatment facility
- Explore a residential composting program
- Explore a private sector development of a local soil/compost industry
- Continue to increase participation in the residential recycling program
- Partner with community leaders, and private entities to elevate commercial and multi-family recycling
- Mandate recycling in all local government buildings
- Explore a pilot composting and mulching program for County operations such as the Park and Recreation and Public Works departments

The environment is one of the three pillars of sustainability, and ***GreenPrint*** is a plan about balance. We have been successful in prioritizing the environment in Miami-Dade, and continuing to balance the environment with our society and our economy will make us stronger and more resilient for years to come.

It is estimated that over 80 percent of the economic benefits from beach renourishment are from storm damage reduction. During Hurricane Andrew in 1992, the project prevented more than $20 million in storm damage, based on U.S. Army Corps of Engineers computer models. In the original project design, the Corps estimated a 10.5:1 benefit-to-cost ratio for the project. Subsequent development of the Miami-Dade shoreline has likely increased that ratio significantly. Domestic and international tourism provides regional and national benefits. For every dollar invested in nourishing Miami Beach, the nation's economy earns $1,470 in foreign exchange (U.S. Army Corps of Engineers 3).

Baynanza is one Miami-Dade's ways of celebrating our Bay. This shoreline cleanup event was created in 1982 in an effort by Miami-Dade County to save Biscayne Bay, one of South Florida's most important natural resources. At the time, the Bay was being threatened by various sources of pollution like sewage runoff, marine debris, and other contaminants. The event was born with the idea to involve the community in its rescue efforts. Through the years, Baynanza has become the largest shoreline cleanup in South Florida with an average of 7,000 community participants and 30 tons of trash collected annually.

Responsible Land Use & Smart Transportation

America benefits from great quantities of land, which is reflected in suburban land development patterns across our country. Our population continues to grow, but so does our understanding of sustainable development. As a nation, we are trying to shift from unsustainable sprawl to a more compact, efficient, and urban paradigm that increases our individual and collective quality of life while reducing greenhouse gas emissions. Transit and other alternative modes of transportation such as walking or biking, must support these land-use patterns. Miami-Dade County is no different than fellow cities and counties struggling with how to transform existing land development and transportation infrastructure to meet a more sustainable standard of design. Along with the rest of the nation, we are struggling with how to creatively fund mass-transit improvements. This goal area acknowledges new federal livability priorities and lays forth a plan to address local challenges both internal to County operations and external for municipalities and our development industry. It lays out a vision but understands the realities that we face, taking gradual steps to move us in the right direction. Change is difficult, but progress is necessary if we are to provide for quality of life through walkable communities, long-term housing solutions, affordable housing and transportation costs, and preservation of open lands that provide water, natural resources and resistance to climate change.

Goals

- ***Use our land wisely, creating and connecting strong sustainable neighborhoods***

  Develop 15 urban center area plans and six multi-modal corridor master plans. Create four transit-oriented developments (TODs) on heavy rail and bus corridors. Develop level of service metrics to identify resident accessibility to parks and open space areas. Improve access through an interconnected network of shaded and safe bikeways and trails connected to neighborhoods, schools, employment centers, civic buildings, and other community destinations

- ***Provide more transportation options, reducing the time we spend in our cars.***

  Add 10 million boardings to our public transportation system through increased services, and enhancing convenience, comfort, and timely service. Increase the percentage of total trips taken by walking or bicycling from 10 percent to 16 percent of all travel trips. Increase resident satisfaction with the availability of sidewalks for pedestrians to 65 percent or more and add 40 miles of bicycle trails and lanes.

RESPONSIBLE LAND USE & SMART TRANSPORTATION

"Historically, we have rebuilt our nation every 50 to 60 years…The choice is ours: either a society of homogeneous pieces isolated from one another in often fortified enclaves, or a society of diverse and memorable neighborhoods organized into mutually supportive towns, cities and regions"

- Suburban Nation, Andres Duany, Elizabeth Plater-Zyberk and Jeff Speck

Recent studies have analyzed the direct relationship between land use practices and greenhouse gas emissions, estimating that the five "Ds" of compact development— density, diversity, design, destination, and distance to transit—can lead to 12 to 18 percent reductions in vehicle miles travelled by 2050. (Urban Land Institute 20)

It is up to us to use our land wisely

Miami-Dade County encompasses more than 2,000 square miles of land, including 418 square miles of urban development, cradled between two national treasures: Biscayne National Park and Everglades National Park. The County establishes, through its Comprehensive Development Master Plan (CDMP), general objectives and policies addressing where and how land development and conservation should occur during the next 10 to 20 years. The CDMP provides a framework for sustainable development by providing land capacity to meet projected needs while preserving wetlands and agricultural areas, and protecting wellfields for drinkable water.

The CDMP calls for the establishment of a more compact and efficient urban form within the County's Urban Development Boundary (UDB). More specifically, the CDMP states that "the location and configuration of Miami-Dade County's urban growth through the year 2025 shall emphasize concentration and intensification of development around centers of activity, development of well-designed communities containing a variety of uses, housing types and public services, renewal and rehabilitation of blighted areas, and contiguous urban expansion when warranted, rather than sprawl." Successful implementation of this and other visionary objectives of the CDMP require a heightened level of coordination between all County agencies. The CDMP also calls for a better integration of land use development and the transportation system, recognizing the need to effectively link neighborhoods, urban centers, employment centers and other major destinations.

"The surburban model is not sustainable"

- Marc LaFerrier, Director, Miami-Dade Department of Planning and Zoning

How are the Comprehensive Development Master Plan and *GreenPrint* connected?

Miami-Dade County is in the process of adopting its Evaluation and Appraisal Report (EAR) for the CDMP. The EAR adoption process is expected to be completed in early 2011. It contains an analysis of goals, objectives, policies and major issues, as well as, recommendations to amend the CDMP. Many of these amendments, such as those related to climate change, increasing transit ridership and directing infrastructure to urban centers, will establish new policies or modify existing polices to further initiatives in ***GreenPrint***.

Transportation must support our land use patterns

An effective transportation network is a cornerstone of a livable and sustainable community. It determines the mobility of the community and is one of the main considerations when choosing a place to live. Access to public transportation and the ability to bike and walk as a transportation option have been identified by many public surveys as indicators residents use to assess the quality of life within a community. Because passenger cars are one of the greatest contributors to air pollution and greenhouse gas (GHG) emissions in Miami-Dade County, the overall health of our community is intimately linked to the movement of people and goods throughout the network. In addition, all indicators regarding congestion and the amount of time we spend in our cars continue to climb.

According to the 2009 Urban Mobility Report, Miami-Dade is the fifth most congested metropolitan area in the nation in terms of travel time. In 2007 the financial cost of congestion experienced by County residents amounted to approximately $3.0 billion, and resulted in excess fuel consumption of 102 million gallons. As the population of Miami-Dade County continues to grow, so does the demand on the existing transportation system, which requires innovative investments and collaborative strategies to curtail the rising cost of congestion (MPO, "Near Term Transportation" 1).

Currently, the primary tool for implementing these development strategies is through the adoption of transit oriented development (TOD) plans and rezonings in areas designated as urban centers. Miami-Dade County's TOD process has been in place for only 11 years and has already had considerable success. Over 7,600 dwelling units and 1.3 million square feet of commercial development have been approved in urban centers that were part of this planning effort.

Another critical piece of the formula, the efficiency of vehicles operating on our roads, is set by federal fuel efficiency standards. While these standards set the minimum allowable fuel efficiency, opportunities remain to encourage the purchase of more efficient vehicles for both government and private use. Other elements of a strong network, such as the structure and functioning of our roadways and public transportation, are directly addressed by the County through the institution of policies, goals, objectives, and measures set forth in several County plans.

Our Transportation System and Priorities

Miami-Dade Transit (MDT) is the largest transit agency in Florida, providing 40 percent of the trips taken on public transit in Florida last year. The system consists of a 22-mile heavy rail rapid transit system, a downtown people mover system, a South Dade Busway, which is the longest Bus Rapid Transit system in Florida, an extensive bus system with more than 900 buses operating on 90 routes, and a Special Transportation System. Together these modes comprise an integrated system that carries more than 326,000 daily passenger boardings.

Connecting People to Transportation Options

Corridors

With limited funding for new capital projects and increasing operation and maintenance costs, the current transit priority is improving services and developing ridership within major corridors so that premium transit service such as bus rapid transit or a rail transit system can be implemented successfully when feasible. An example of this incremental approach to premium transit is in the recent improvements on the Kendall Corridor. In June 2010 MDT implemented enhanced bus service with articulated hybrid buses, improved transit stops, Wi-Fi, Traffic Signal Priority, future park and ride lots and improved headways. Major corridors targeted for improvements are presented in the map at the end of this section.

Focusing on Centers

The CDMP calls for development and redevelopment to occur along transit corridors and designated urban centers. Urban centers are designed to contain businesses, employment, civic, and/or high-or moderate-density residential uses within walking distance from transit stations. Roadways and other structures within the centers are designed to encourage pedestrian activity, safety and comfort. The proximity of housing and retail allows residents to walk or bike for some daily trips and encourages transit use for commuting. Ultimately, these centers are hubs for development intensification in Miami-Dade County, around which a more compact and efficient urban structure will evolve. Designated urban centers are illustrated by map at the end of this section.

Rapid transit station sites and their vicinity are developed as urban centers. The developments in these areas are termed transit-oriented development (TOD). Types of TOD projects include large commercial and market-rate residential projects, such as at Dadeland South and Dadeland North Metrorail stations, government office buildings at four Metrorail stations,

Florida East Coast Railway rail line entering the Port of Miami

and residential, mixed-use developments (affordable, workforce, or elderly housing units with retail spaces). Current and future housing TOD projects are identified by a star in the map at the end of this section.

Connecting our economic engines

The efficient movement of goods and people into and out of our ports, both airports and seaports, is critical to our economic growth and to reducing our local GHG emissions. Miami International Airport (MIA) is the largest U.S. gateway for Latin America and the Caribbean and is one of the leading international passenger and freight airports in the world. The Port of Miami (POM) is geographically the first major Atlantic port in the U.S. for shippers using the Panama Canal and is expected to be a preferred port of call for larger New Panamax vessels following the widening of the canal by 2014. The projects below will improve freight movement thereby reducing freight congestion and GHG emissions from local roads.

"If you build near it, they will ride."
-Debbie Griner, GreenPrint planning team

Passenger boardings at the Santa Clara Metrorail Station increased in excess of 90 percent following the full occupancy of housing units completed in 2006. The project included a nine-story and a 17-story building with a total of 412 affordable rental apartments.

Connecting Port and Rail

Federal funding was recently awarded that will allow for movement of freight by rail. The project has a total estimated cost of $47 million. It includes reconstructing the existing underutilized rail line from the POM to the main Florida East Coast (FEC) Railway line, and the construction of an on-port intermodal yard. The new rail link will provide access to the Hialeah intermodal rail yard terminal, which connects to rail yards in Jacksonville, providing a tie-in to the national rail system. This project is expected to be completed in 2014 contributing to several sustainability goals :

Miami-Intermodal Center

- Avoiding 34 million gallons of fuel and 200,000 tons CO2 over the next 20 years
- Increasing container traffic by 15 percent through improved access
- Adding 822 construction jobs to the local economy
- Improving local redevelopment through increased pedestrian traffic and overall activity
- Increasing transportation choices with the potential future passenger rail service on the FEC corridor and linkage to the Metrorail

The Port Tunnel

The Port Tunnel between the POM and the MacArthur Causeway will remove much of the truck traffic from downtown streets, and will provide direct freeway access to and from the POM, improving its competitive advantage among other ports. The tunnel will serve as a dedicated roadway connector linking the seaport with the MacArthur Causeway and Interstates 395 and 95. Twin tubes, each 3,900 feet long and 41 feet in diameter, will reach a depth of 120 feet below the water. Construction on the project, which began in 2010, includes roadway work on Dodge and Watson Islands and widening the MacArthur Causeway Bridge. The project is expected to be completed by spring 2014 at a cost of $610 million.

Viaduct

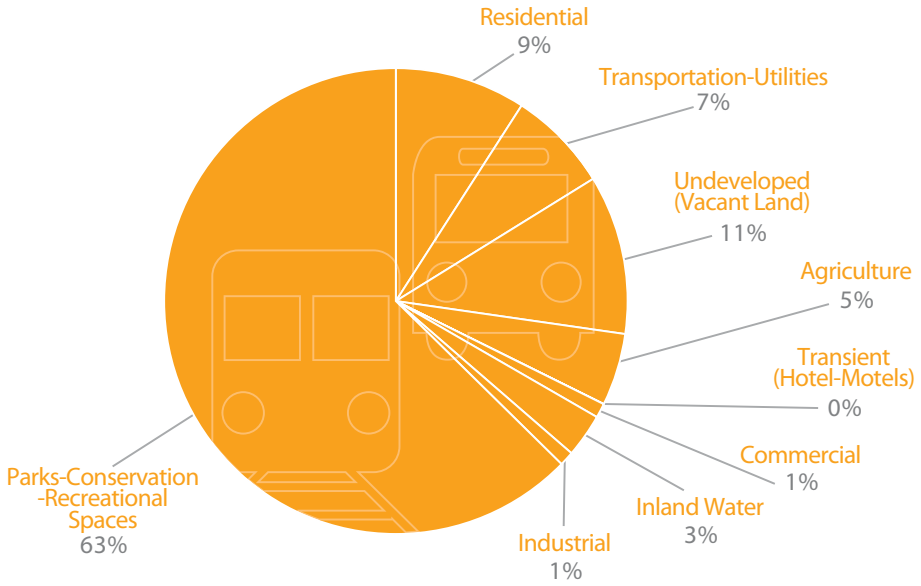
The NW 25th Street Viaduct project will improve the movement of trucks carrying freight between MIA West Cargo Area (WCA) and off-airport freight distribution and consolidation facilities, such as warehouses, bonded warehouses, and truck transfer stations. The two main project components along an approximately two-mile corridor are (1) reconstructing and widening the NW 25th Street roadway, including intersection and signalization improvements and (2) constructing a new viaduct (an elevated bridge) for dedicated air cargo transport. The first (eastern) phase of the project is under construction and includes the roadway improvements and viaduct construction from MIA's WCA to the Palmetto Expressway (SR-826). The second phase extends the roadway improvements to NW 87th Avenue and completes the viaduct construction west from the Palmetto Expressway to NW 82nd Avenue. Phase 1 is expected to be completed in 2011 at a cost of $117.7 million. Phase 2 is expected to be completed by 2016 at an estimated cost of $85 million. The project is expected to achieve an overall reduction of more than 19,000 tons of carbon emissions and a fuel cost savings to the freight industry of $630,000 annually, rising to 21,400 tons of carbon emissions and a fuel cost savings to the freight industry of $705,000 by 2035.

The Miami-Intermodal Center

The Miami Intermodal Center (MIC) is a massive transportation hub being developed across from MIA by the Florida Department of Transportation (FDOT) and upon completion will be the largest surface transportation investment made by the federal government. It will provide connectivity among all forms of ground transportation available in the County, while decongesting the streets in and around the airport. The MIC Program consists of major roadway improvements which were completed in May 2008, the Rental Car Center (RCC) which opened for business on July 13, 2010, the MIA Mover, set to be operational in the fall of 2011, and the Miami Central Station, scheduled to be completed by 2013. The Miami Central Station, Miami's version of the Grand Central Station, will provide choices and connections for transportation customers between: Amtrak and regional rail systems; Greyhound and city buses; and shuttles and taxis. The facility will also provide seamless transfers for travelers in private passenger vehicles, bicycles and for pedestrians. A key element in the MIC Program is its Joint Development strategy. The Joint Development component of the MIC Program consists of public and private ground lease development opportunities for offices, hotel and meeting space, parking, ancillary retail, and restaurants.

Sustainability benefits will be multiple. Vehicle trips will be avoided due to mass transit connections, and RCC will reduce pollution from the airport's core. Rental car shuttles will be replaced by the MIA Mover, eliminating more than half a million shuttle bus trips to off-site rental car companies each year. With rental cars and their shuttles absent from the airport's arrival deck, curbside traffic will be reduced by 30 percent.

Miami-Dade County Existing Land Uses



Source: Department of Planning and Zoning

Geographically, the County is constrained by the presence of the Everglades to the west, Biscayne National Park to the southeast, Big Cypress National Preserve to the north and the Atlantic Ocean to the east. While approximately 62 percent of the County land area is park land or conservation uses, today's population is confined to less than 25 percent of the County's 2,000 square mile land area. Considering projected population growth of 30,000 people per year, the County clearly needs to grow in a more sustainable and compact form as opposed to sprawl.

This goal area seeks to create and connect communities where residents live, work and play. The land-use initiatives focus on the best uses of land within the UDB with the aim of making our communities more walkable and connected by a variety of public transportation options. Smarter development will help us prepare for the projected depletion of single-family residential land by 2015. Given that 68 percent of our residents have never used mass transit according to our 2008 resident satisfaction survey, we have hard work ahead.

Strategies

- Better integrate planning and prioritize investments
- Support existing communities and value neighborhoods
- Increase bicycling & walking
- Increase transit ridership
- Improve connectivity and mobility on the existing system

Our land outside of the UDB also requires careful planning considering the importance of environmental and agriculture lands. We acknowledge that much, if not all, can be achieved through the CDMP; the challenge is to correct the disconnects in the overall process from planning to implementation.

There are several initiatives below that tackle the hurdles in the County's internal development process in order to make the process consistent with the CDMP and the Board's intent. Our challenge is to simplify the process, not to complicate it; to shift the practices to the urban model called for in the CDMP and not the traditional suburban model that has been the practice.

Responsible Land Use and Smart Transportation Initiatives:

1. Better integrate planning and prioritize investments

- Coordinate among the County departments and other agencies in implementing the CDMP and the County code
- Increase transit-oriented development
- Develop Corridor Master Plans modeled after the community based area planning process and designed to address the Federal Livability Principles
- Establish a uniform set of criteria for departments to follow in developing budget priorities as part of the County's capital budget planning process - These criteria should include sustainability benefits and compliance with the CDMP
- Develop a map illustrating the location of capital improvement projects in comparison to areas designated in the CDMP for re-development, i.e. urban infill areas and urban centers for use by departments in planning and prioritizing infrastructure investments
- Better integrate land use and transportation planning modeling for the long-range transportation planning process
- Evaluate shifting current revenue streams to include funding of transit operations and maintenance and other sustainable modes
- Study innovative funding sources and mechanisms to support Miami-Dade Transit operations and maintenance costs and for capital improvements

2. Support existing communities and value neighborhoods

- Continue to promote infill development by exploring incentives and addressing costs of infrastructure
- Examine innovative options for infrastructure cost sharing mechanisms (consider public private partnerships, re-examine impact fees)
- Prioritize infrastructure and service delivery to infill and redevelopment areas consistent with the CDMP (water & sewer, parks, roadways, schools, etc.)
- Examine the potential barriers to living in urban centers and infill areas including public safety perceptions and access to schools and food, among others
- Provide for neighborhoods where residents can walk or bicycle to carry on their daily needs
- Update existing County and municipal regulatory criteria to provide for housing diversity
- Coordinate school locations with Miami-Dade County Public Schools and provide the regulatory criteria for all other schools to assure that these facilities are within reasonable walking or biking distance from the residential communities they serve
- Establish additional meaningful open space and recreation areas through cooperative land use and joint-development programs with schools, libraries, cultural areas, and other civic/institutional places
- Develop regulations and programs that promote connectivity, pedestrian movement and lower vehicular speeds
- Explore redfields to greenfields options (Red Fields to Green Fields seeks to convert vacant and financially distressed commercial property into urban parks.)

"The Kendall Cruiser offers commuters a convenient and greener alternative to driving on Kendall Drive. By taking the Kendall Cruiser, residents can enjoy a stress-free ride to work while reducing their carbon footprint."

- Harpal S. Kapoor, Miami-Dade Transit Director

3. Increase bicycling & walking

- Implement Complete Streets initiative – "Complete Streets" allow for safe, comfortable travel by all users, including pedestrians, bicyclists, public transportation riders and drivers, and people of all ages and abilities, including children, youth, families, older adults, and individuals with disabilities.
- Implement the Bicycle & Pedestrian Facilities Plan, prioritizing projects and securing funding
- Conduct non-motorized planning studies for corridors and urban centers
- Increase the number of safe walking and bicycling facilities as components of road improvement projects
- Fund and construct priority non-motorized multi-use trails
- Implement signage plans for multi-use trail and bike routes
- Establish criteria for the delivery of parks and recreational open spaces that are intended to encourage equitable access to neighborhood parks and open space as well as area-wide recreational activities for all County residents
- Provide or require bicycle parking and other end-of-trip facilities at public and private destinations
- Encourage municipalities to adopt the County's bicycle parking ordinance
- Expand bicycle parking legislation to include showers and lockers for employees
- Increase integration of transit with pedestrian and bicycle trips
- Include designated bicycle space within Metrorail cars
- Improve bicycle parking at transit hubs
- Reduce the automobile parking requirements in the zoning code

4. Increase transit ridership

- Increase the number of enhanced bus corridors
- Increase the number of park and ride facilities
- Complete the Airport Link – connection of the Metrorail to Miami International Airport
- Improve the image of transit including social marketing campaigns to target different groups and make riding the bus and train 'cool'- in particular, marketing efforts to non-transit dependent population
- Improve real or perceived problems with safety and cleanliness
- Increase technology features, including real time bus signage and Wi-Fi
- Establish and implement minimum standards to enhance routes within a quarter mile of public transit stops to create safe, convenient, comfortable, and aesthetically pleasing access for bicyclists and pedestrians including the elderly and disabled

5. Improve connectivity and mobility on the existing system

- Continue to implement projects that improve connectivity and mobility between major economic drivers and major activity hubs such as the Port of Miami, airports, sports venues, and convention centers
- Continue implementing traffic system management solutions including improved signal timing
- Continue to pursue traffic demand management solutions such as ridesharing, congestion pricing, and high occupancy toll lanes providing express transit service
- Work in partnership with the Metropolitan Planning Organization and South Florida Commuter Services to expand carpooling and vanpooling programs
- Expand the express bus service between Miami-Dade and Broward counties through extending the I-95 managed/ express lanes from Golden Glades Interchange to I-595
- Explore feasibility of "pay for miles travelled" insurance

Land use and transportation form the foundation of our communities. They are directly linked to our quality of life and have the potential to create and connect vibrant sustainable neighborhoods. While Miami-Dade County is large and complex, we must continue to evolve our development patterns to better serve our existing residents and generations to come.

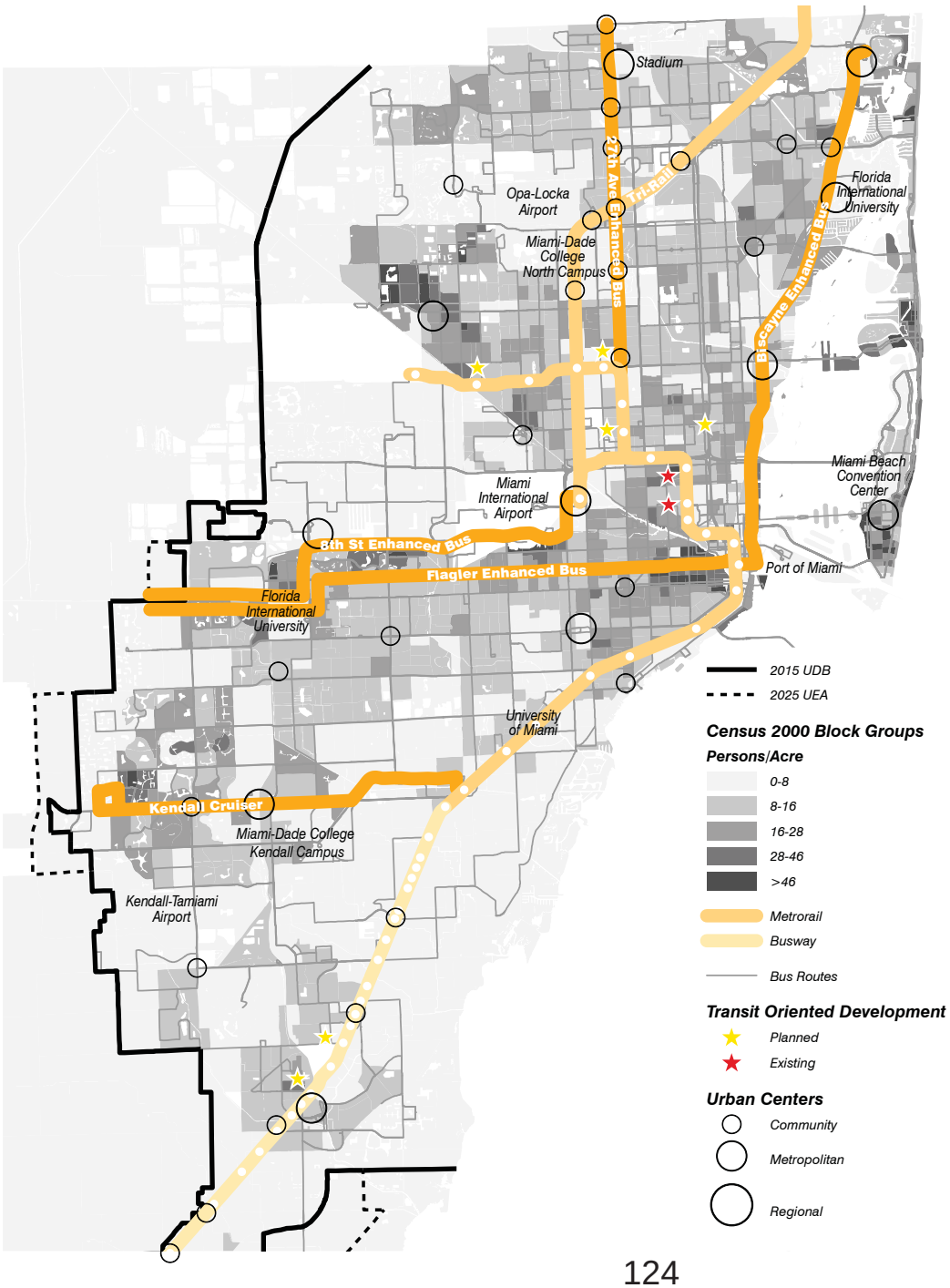
In June 2009, the Partnership for Sustainable Communities was formed by the U.S. Department of Housing and Urban Development, the U.S. Department of Transportation and the U.S. Environmental Protection Agency. These three agencies have pledged to ensure that housing and transportation goals are met while simultaneously protecting the environment, promoting equitable development, and helping to address the challenges of climate change. The following livability principles are guiding their work:

Southeast Florida Regional Partnership

- Provide more transportation choices
- Promote equitable, affordable housing
- Enhance economic competitiveness
- Support existing communities
- Value communities and neighborhoods
- Coordinate policies and leverage investments

The Southeast Florida Regional Partnership was formed to work towards these livability principles on a local level and has added a principle to enhance community resiliency to the impacts of climate change. It is a growing partnership of more than 200 private and public stakeholders across a seven-county region led by the South Florida and Treasure Coast Regional Planning Councils.

The Partnership was awarded $4.25 million on October 14, 2010, one of the highest amounts nationally. There is a clear and strong link between this regional effort and ***GreenPrint*** initiatives.



This map illustrates the County's population density distribution and the Comprehensive Development Master Plan's (CDMP) designated premium transit corridors and Urban Centers. The shaded areas of the map illustrate the current population density distribution, with the darker shades depicting the most dense areas of the County. The map serves as a tool to visualize where increased population could help to develop ridership to support investment in premium transit service such as bus rapid transit or a rail transit system. It also illustrates the CDMP's Urban Centers strategy which seeks to establish self-sufficient and sustainable transit-oriented neighborhoods located along the premium transit corridors or transit hubs and that are connected to other parts of the county by effective public transportation options. In addition, the stars on the map represent the existing and planned transit-oriented development projects.

Vibrant Economy

Sustainability is all about balance. Sustainability is the sweet spot in the center of three equally important pillars: the environmental, society and the economy. A vibrant economy is key to sustainability, and we increasingly understand that sustainability is key to a vibrant economy. A sustainable economic strategy is vital to address the environmental and social challenges while creating new opportunities for local businesses and creating the economic conditions to attract new and emerging clean industries. The green economy agenda builds on our sustainability strategy and provides the framework for improving resource use efficiency, reducing waste and pollution, and seeking alternative solutions for goods and services.

Goals

- ***Create green jobs***

  Cultivate an innovative and sustainable economic infrastructure that creates 20,000 green jobs by 2020 while building on our economic strengths and adding to our competitiveness in the global economy

- ***Build on our international reputation to become a green enterprise destination***

  Increase the percentage of green hotels, eco-tourism, and hospitality related businesses

VIBRANT ECONOMY

"A recent study of chief executives worldwide highlighted the importance of sustainability in the economy. 80 percent of CEOs believe that the economic downturn has raised the importance of sustainability as an issue for top management. Ninety three percent of these same CEOs see sustainability as important to their company's future success."

- UN Global Compact- Accenture CEO Study 2010

Defining a green economy

The local businesses and industries that drive Miami-Dade's economy can contribute to a more sustainable community through material selection, supply–chain management, businesses practices, and production of goods and services. Global, national and local demand for green products and services, green buildings and infrastructure, green economic growth and green jobs are already impacting the business models and practices of Miami-Dade's businesses and industries. The direction of government has a direct impact on industry as well. Our Comprehensive Development Master Plan directs land development towards a more compact and urban form, and we must effectively work with industry to implement that vision. As water and energy efficiency improvement requirements continue to advance, new approaches and standards must be reflected in the businesses that provide new construction and retrofit existing structures. These emerging trends will likely have a permanent impact on how businesses perceive their role in contributing to the welfare of the larger society beyond their own bottom line.

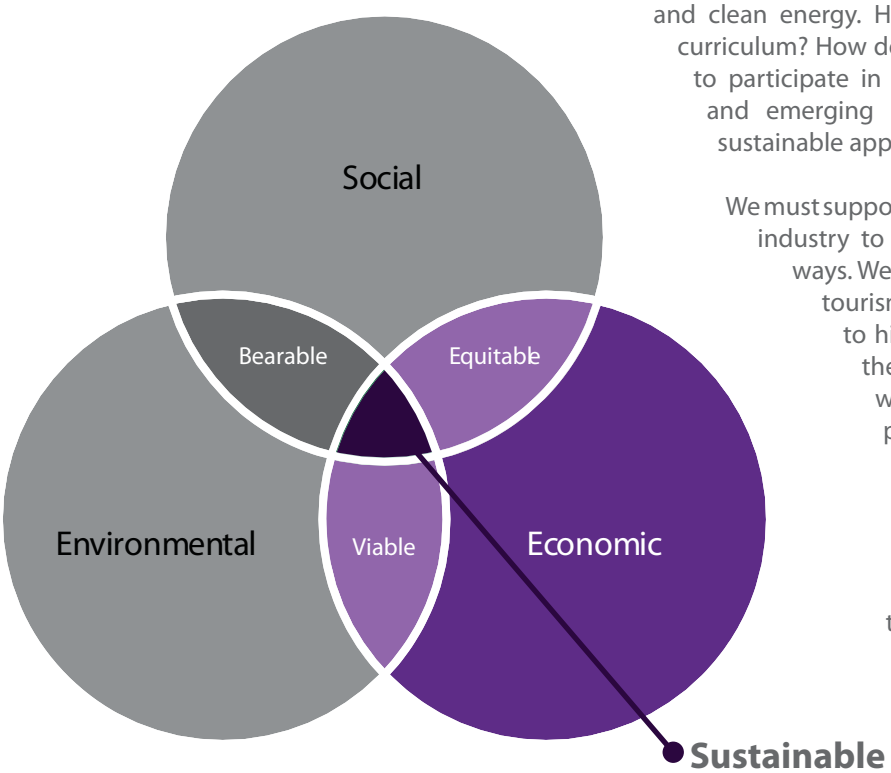
Roughly 20 years ago, the green movement in business and industry began to emerge with companies around the world implementing green practices, corporate social responsibility programs and sustainability initiatives. Today, green is one of the biggest trends to hit the modern market place.

Strategies

- Build a sustainable economy and promote green business
- Expand our successful tourism and trade industries
- Support educational institutions in their initiatives to develop a workforce for a sustainable economy
- Increase the sustainability of agricultural practices

Simply stated, our goal is to create green jobs. This cycle begins with supporting the education systems that feed our community's economy and cultivate and harness the creativity needed to move into a new era of technology and clean energy. How do we integrate sustainability into school curriculum? How do we position our institutions of higher learning to participate in and benefit from research and trends in new and emerging alternative energy, design, construction, and sustainable approaches in general?

We must support the current trend of our construction and trades industry to build, re-build and renovate in more efficient ways. We must build upon our successes and broaden the tourism industry to eco-tourism and "voluntourism" to highlight and support our natural wonders, from the beaches to South Dade to the environmental wonders of Biscayne and Everglades national parks. In a community and economy that thrive on the small-business model, we must recognize, retain and market that small and local businesses are green businesses. We must provide tools and incentives to facilitate the process. This sustainability pillar needs to be strengthened by the development of a green economy plan.



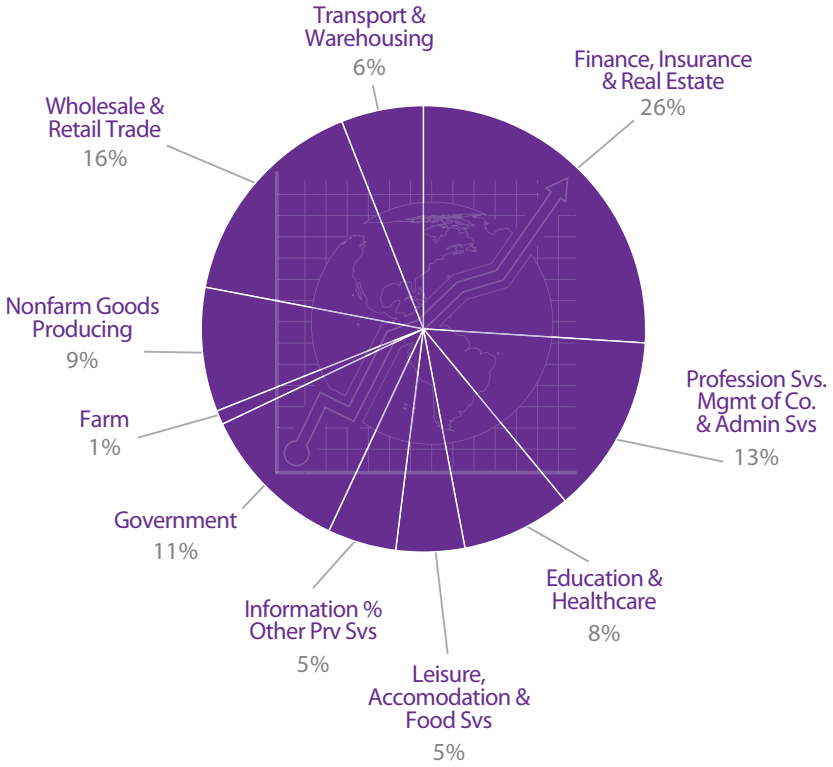
Vibrant Economy Initiatives:

1. **Build a sustainable economy and promote green business**
   - Establish a local action plan for green industries and green jobs and examine economic challenges related to climate change
   - Develop a Green Business Certification Program
   - Leverage state and federal funding to develop green small business loan program for sustainable improvements, i.e. revolving loan
   - Integrate sustainability criteria with existing and new County economic development programs

2. **Expand our successful tourism and trade industries**
   - Enhance and market the sustainability of major facilities and events
   - Explore a voluntary carbon offset purchasing program for conventions, conferences, large events, and individual tourists
   - Integrate and promote a sustainable tourism experience through linking hotels, restaurants, and our unique environment through the Florida Green Lodging Program
   - Make our Airport and Seaport sustainability leaders through certifications specific to the enterprise

3. **Support educational institutions in their initiatives to develop a workforce for a sustainable economy**
   - Promote technical/vocational training for sustainable fields through business and educational institution partnerships
   - Incorporate sustainability principles into public and private school and university initiatives

4. **Increase the sustainability of agricultural practices**
   - Develop a sustainability certification for agriculture
   - Explore new sustainable agriculture opportunities, expanding Best Management Practices



Agriculture provides an economic impact of more than $2.57 billion to the local and state economy (Dade County Farm Bureau).

Green economy concepts need to be integrated into current Miami-Dade economic development strategies. This is necessary to stay competitive as a business destination while helping existing local businesses incorporate the new demands of environmentally conscious consumers. Building a green economy in Miami-Dade is not just about attracting a few new industries that may need to find a local market. The focus needs to be on our existing businesses and industries, on examining new technologies and emerging clean industry and new technologies coupled with innovative public policy to align these components.

The conversation is no longer about the emergence of new industry, but rather about transforming our notion of economic activity. The goals are towards developing an economy that takes into consideration the more efficient and sustainable use of limited resources.

A new Florida Marlins Baseball Ballpark is under construction with a sustainability approach. The ballpark will be accessible via public transportation, will have solar panels on its parking garages, will have accessible seating, and will be applying for Leadership in Energy and Environmental Design (LEED) Silver certification. Five thousand constructions jobs are projected by the end of the project and once the Ballpark is open, 2,550 full and part-time jobs are anticipated.

***GreenPrint* is charting the course for a Green Economy Action Plan, where there are opportunities for:**

- Demonstration initiatives and stimulating private sector investment and innovation
- Providing state-of-the-art environmentally friendly buildings and infrastructures in a green business park environment
- Encouraging the development of a critical mass of private sector support services to support the clustering of local and international green companies
- Showcasing pilot projects for innovation through supporting easier access to environmental research and development, information on technological developments, and creative solutions
- Supporting entrepreneurship through the provision of incubation space for start-up companies
- Assisting in technological convergence across sectors, reducing information gaps and transaction costs and associated risks for green companies through the development of industry-led networks
- Promoting investment in knowledge and people, and wider public interest in environmental goods and services; and
- Demonstrating the benefits to companies of best practice in resource efficiency

Clearly, the possibilities are endless.

Healthy Communities

Being green is healthy, and this plan includes a focus on our daily quality of life. We focus on personal health through being more active and eating in such a way that is better for us, better for our local environment, and better for our local economy. We also focus on neighborhood health through an abundance of trees and gardens. Community design that incorporates parks and open spaces, paths for biking and walking, and access to healthy foods contributes to overall community health. The growing cost of health care, especially preventable conditions associated with obesity and lifestyle disease, is an expensive national problem. Diet and exercise have a clear link to reducing greenhouse gas emissions, as well, by promoting walking and biking over driving and increasing consumption of locally grown food that requires little transportation.

Goals

- ***Raise awareness that sustainable living is healthy***

  Decrease our community's lifestyle disease rates, such as diabetes and heart disease through healthy eating and exercise. Provide access to fresh, local and/or organic food in all neighborhoods through grocery stores, farmers markets and community gardens supported by local agriculture. Increase the number of short walking and biking trips through safety and other programs. Reduce barriers for disabled and elderly residents

- ***Plant more Florida-friendly and native trees and landscapes***

  Plant half a million trees by 2015 to achieve a 30 percent tree canopy by 2020 and encourage native, drought tolerant landscaping to cool our communities, capture greenhouse gas emissions, beautify our neighborhoods, and provide wildlife habitat

Amy McInerny of Studio Serendipity

HEALTHY COMMUNITIES

"Healthy people depend on a healthy environment. At Baptist Health, it is our mission to improve the health and well-being of the individuals and communities we serve. Therefore, we strive to promote environmental sustainability practices and reduce our ecological footprint, in order to ensure optimal health both within our community today and for future generations."

- Brian E. Keeley, President and CEO of Baptist Health South Florida

The connection between Responsible Land Use and Smart Transportation to Healthy Communities

We are a unique community made up of many geographically distributed smaller communities. In a sustainable future each of these distinct areas will be connected by smart transportation options, and each individual area will have features that allow residents to live, work and play nearby. Ultimately, this provides the framework for healthier living within our own neighborhoods and across Miami-Dade County.

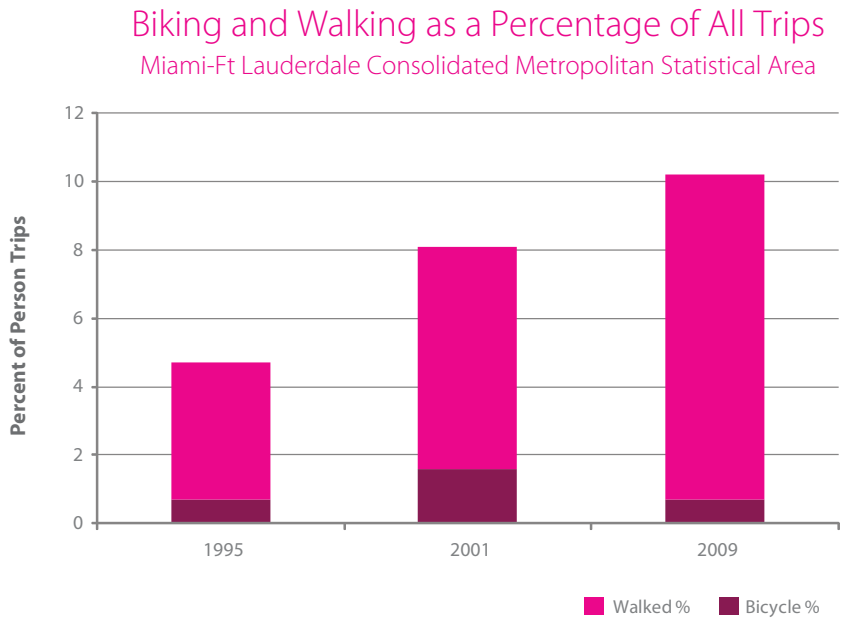
The benefits of healthy, sustainable lifestyles

The impacts of physical activity and nutrition on our health are massive. Data indicates that many Miami-Dade County residents face health risks from inactivity, obesity, being overweight, and low consumption of healthy foods such as vegetables. More than a third of adults reported no leisure time physical activity, and nearly two thirds were overweight or obese, according to a 2007 study (Florida Department of Health). The consequences on our health are disturbing: our ***GreenPrint*** Assessment Report details that diabetes and hypertension have been increasing.

We can help reverse these trends and improve our overall health by making it easier for individuals to make healthy, sustainable lifestyle decisions. This includes encouraging walking and biking by improving safety and through promotional efforts, in addition to the infrastructure improvements discussed in the Land Use and Transportation area. These efforts can have a big payoff: every hour of walking may increase life expectancy by two hours (American Heart Association). Of course, when residents get out of their cars and choose to walk and bike, carbon emissions are avoided as well.

Another strategy to promote outdoor activity is to increase the tree canopy. While we have the advantage of year-round warm weather, we also have periods of extreme heat. Shadier bike paths and sidewalks will cool our communities and get residents moving outside.

It should also be noted that a community's green infrastructure provides many environmental, social and economic benefits. The shade from a healthy urban forest, in particular, reduces the need for indoor air conditioning, slows stormwater runoff, improves air and water quality, protects soil from erosion, and stores atmospheric carbon. Urban forests are important because a lush tree canopy offsets the negative effects of carbon in the atmosphere.



Source: Federal Highway Administration, National Household Travel Survey (http://nhts.oml.gov)

South Floridians walked more frequently in 2009 than in 1995. However, the portion of trips taken by bike fluctuated over the same time period. All trips include biking, walking, transit, and vehicles.

The Value of Trees

- Suburban areas with mature trees are four to six degrees cooler than new suburbs without trees.
- One modeling study estimated that the direct energy savings from shading alone by trees and vegetation could reduce carbon emissions in various U.S. metropolitan areas by roughly one point five to five percent.
- One five-city study found that, on a per tree basis, cities accrued benefits ranging from roughly $1.50 to $3 for every dollar invested. These cities spent about $15 to $65 annually per tree, with net benefits ranging from approximately $30 to $90 per tree (U.S. Environmental Protection Agency).

A healthy tree canopy increases real-estate values, protects property from hurricanes by serving as a wind break, increases and improves wildlife habitat, reduces noise levels, contributes to economic sustainability and enhances community aesthetics and appeal. Research also shows that consumers are willing to shop longer and spend more in retail areas that have trees because trees provide a human habitat (Wolf, n. pag.). Simply stated, healthy communities are green and shady.

Additionally, we can encourage residents to make healthy nutritional choices by improving access to locally produced and/or organic fresh foods. In fact, there is a growing demand among our community for these products through farmer's markets, merchants and gardens; strategies in the Healthy Communities area focus on supporting this burgeoning local food movement.

A diet rich in fresh, unprocessed foods such as fruits and vegetables lowers the risk of obesity and potentially devastating diseases such as heart disease, diabetes, cancer and depression. Adults and children who eat organic foods reduce their exposure to toxins, hormones and antibiotics used in conventional agriculture; additionally, studies have shown that some organically grown produce contains higher levels of nutrients. Studies have shown that community gardeners and their children eat healthier, more nutrient rich diets than do non-gardening families. Importantly, community gardens provide access to nutritionally rich foods that may otherwise be unavailable to low-income families and individuals. Additionally, there is evidence that eating locally produced food reduces asthma rates, because children consume local pollen and develop immunities (Gardening Matters).

Healthy food is also sustainable food. Miami-Dade is the second largest agricultural producer in the state, but 90 to 95 percent of our produce is sold outside of Miami-Dade County. We may be able to reduce the carbon footprint of our food system by purchasing more from local producers. Organic agriculture has additional sustainability benefits by reducing emissions associated with the production and distribution of chemical fertilizers and pesticides and by improving the ability of farmland to sequester carbon from the atmosphere (Fernandez Rysavy 14-16).

Community gardens can serve as an outdoor classroom where youth can learn valuable skills, including practical math, communication, responsibility and cooperation. They also provide the opportunity to learn about the importance of community stewardship and environmental responsibility (Gardening Matters).

Local agricultural production benefits the local economy, and commercial community gardens may contribute to economic development as well. Local food production helps preserve green space. Other benefits of community gardens may include increased property values, reduced crime, neighborhood beautification, and increased community engagement (Gardening Matters).

Healthy Communities Initiatives:

Strategies

- Facilitate active and safe lifestyles for residents through the Open Space Master Plan and other community initiatives
- Plant more trees
- Promote fresh, local, organic food in all neighborhoods through grocers, farmer markets, and community gardens

1. Facilitate active and safe lifestyles for residents through the Open Space Master Plan and other community initiatives

- Implement the Open Space Master Plan
- Promote and develop biking activities such as the City of Miami Bike Days
- Explore tax incentives for bicycle commuting
- Improve safety for pedestrians and bicyclists through legislation and enforcement of traffic laws (i.e. anti-distracted driving laws, red light cameras, etc.)
- Increase safe walking, bicycling and driving behaviors through educational, public awareness and social marketing programs (for example, 'Share the Road,' WalkSafe, BikeSafe programs, Walk to School Day, Bicycle month)
- Increase participation in the "Safe Routes to School" program and provide school crossing guards at elementary schools
- Identify barriers to mobility for disabled and elderly residents and create an action plan

2. Plant more trees

- Promote community partnerships such as Million Trees Miami
- Promote proper tree maintenance (for example use the Community Image Advisory Board's Tree Care Guide in development)
- Promote landscaping and gardening suitable for the South Florida environment

3. Promote fresh, local, organic food in all neighborhoods through grocers, farmers' markets, and community gardens

- Create a working group to coordinate sustainable food initiatives
- Continue Redland Raised to promote local/organic agriculture and economy by connecting farmers with local users such as restaurants, grocers, and farmers markets
- Develop an analysis of potential sites and develop approach for turning 'un-buildable lots' close to schools and churches into community gardens
- Amend the Comprehensive Development Master Plan and County Code to provide for sustainable, urban agricultural practices inside the Urban Development Boundary

Physical Activity & Nutrition (2007)	County	State
Adults who are inactive at work	67.3 percent	34.5 percent
Adults who are sedentary	35.4 percent	25.4 percent
Adults who consume at least five servings of fruit and vegetables a day	23.1 percent	26.2 percent
Adults who consume three or more servings of vegetables per day	24.3 percent	29.1 percent
Adults who consume two or more servings of fruit per day	37.9 percent	36.2 percent
Adults who meet moderate physical activity recommendations	29.2 percent	34.6 percent
Adults who meet vigorous physical activity recommendations	23.7 percent	26.0 percent

Source: http://www.floridacharts.com/charts/mapp_report.aspx
http://www.cdc.gov/obesity/causes/index.html

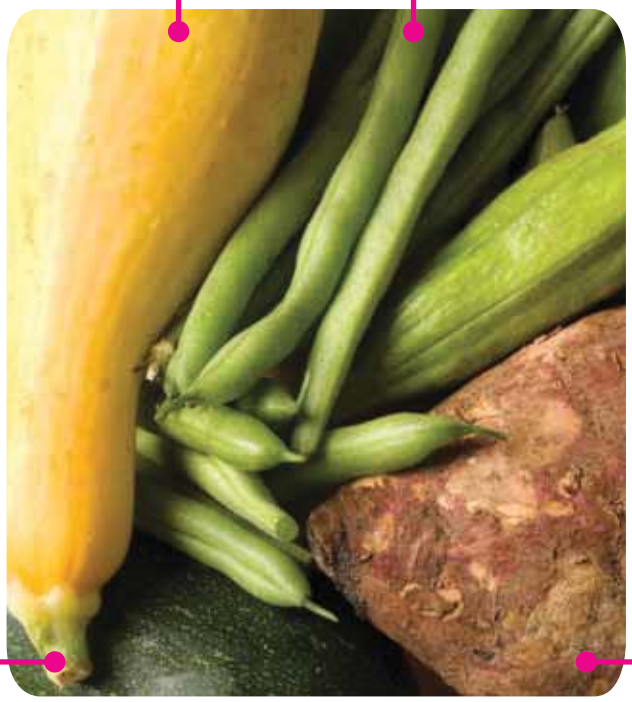
We must continue to build upon our success. Miami-Dade County has adopted a progressive Open Space Master Plan; ***GreenPrint*** is in line with this plan, and the actions and initiatives in both support each other. We must continue to promote community exercise in parks and community centers and continue to make facilities better, more available and more accessible.

Through the University of Florida and the Miami-Dade County Consumer Services Department Cooperative Extension, we have a strong and popular Florida Friendly Yards Program with a wide range of programs covering commercial crop agriculture education, commercial landscape maintenance, pesticide applicator training, home lawn and gardens and master gardener training. Cooperative Extension should continue such efforts to plant the right tree in the right place and should further encourage and work with big-box retail stores to stock and sell Florida-friendly plants. These are the foundation of a healthy Miami-Dade.

Benefits of Trees

- Contribute to the processes of air purification, oxygen regeneration and ground water recharge.
- Aid in the abatement of noise, glare, heat, air pollution and dust generated by major roadways and intense use areas.
- Act as a wind break to protect and buffer the effects of high winds on structures.
- Reduce local air temperatures and the urban heat island effect, where temperatures in cities are higher than surrounding suburban and rural areas due to paved and dark surfaces that absorb and store energy.
- Improve the aesthetic appearance of commercial, industrial and residential development, and complement urban redevelopment by protecting and increasing property values within the community.
- Promote public health and well-being and improve the pedestrian environment by providing shade and creating a setting conducive to walking and non-motorized transportation.
- Establish community identity, character and linkages.
- Trees save money on our electric bills by shading homes, offices, and streets, resulting in a reduced need for air conditioning.
- Trees reduce storm water runoff by intercepting rainfall through their leaves and branches, slowing the flow of rainwater and actively removing water from the soil.
- National studies indicate that trees increase property values by five to 15 percent and make communities more visually and environmentally appealing (Anderson and Cordell 153-164).
- Trees improve air quality by absorbing pollutants and particulate matter from the air. Trees shade pavement and reduce air temperatures.
- Recent studies have shown a positive correlation between trees and social benefits and quality of life indicators, including the reduction of reports of physical violence in public housing that had trees outside the buildings and significantly better relations and stronger ties between neighbors (Sullivan and Kuo, n. pag.).
- Research also shows that consumers are willing to shop longer and spend more in retail areas that have trees because trees provide a "human habitat" (Wolf n. pag.).

POLICE



Climate Change Action Plan

Florida is considered one of the most vulnerable areas to climate change, with Southeast Florida especially susceptible to impacts such as rising sea levels. Miami-Dade County has been on the forefront of these issues for many years. Our Board of County Commissioners and administrative departments have been implementing policies and initiatives to address climate change, environmental protection and other important sustainability issues including energy efficiency and water conservation. By tracking greenhouse gas (GHG) emissions early and analyzing climate change data, we have taken steps to reduce GHG emissions and avoid or reduce the severity of climate change impacts.

Now is the time to accelerate and build upon those efforts. Miami-Dade County is creating this climate action plan as an integral component of ***GreenPrint***. This initial plan will focus on what steps will be necessary in the next five years to further reduce GHG, as well as better determine the potential impacts and resulting vulnerabilities of climate change in the region and the community. These steps will make Miami-Dade County a more resilient community in the face of a changing climate. It is time to turn the science into action.

Goals

- ***Understand and respond to current and future climate change impacts***

  Integrate local climate change indicators with existing emergency management, storm water planning and infrastructure planning

- ***Reduce greenhouse gas emissions***

  Reduce greenhouse gas emissions by 10 percent by 2015, working towards 80 percent reduction by 2050 to advance the Cool Counties Program commitment

CLIMATE CHANGE ACTION PLAN

"I like to think of mitigation as avoiding the unmanageable, whereas adaptation is managing the unavoidable. We must do both in order to solve the problem of climate change."

- Dr. Jane Lubchenco, U.S. Department of Commerce Under Secretary for Oceans and Atmosphere, White House Listening Session, June 23, 2010 Miami-Dade County, Florida

I. What is climate change and what does it mean to Miami-Dade?

One of the most significant challenges facing the southeast Florida region and the world is the threat of climate change. Although the planet has experienced natural cycles in atmospheric concentrations of carbon dioxide and temperature for more than 600,000 years, there is now an unprecedented rate of greenhouse gas (GHG) build up in the earth's atmosphere due to human activities. As a result, more and more of the sun's heat energy is trapped. Worldwide, changes are occurring to many interconnected forces that determine precipitation, temperature, severe weather patterns, sea level, ocean currents and acidification. These related systems form complicated feedback loops that are affected by climate change and, in turn, can diminish or intensify climate change impacts. These complex relationships make the extent and timing of climate change impacts difficult to predict, especially at regional and local levels. In the absence of accurate and specific local-impact predictions, we are challenged with identifying and using credible climate scenarios, along with local impact and vulnerability assessments, as a basis for planning our sustainable future. The development of scenarios and planning regimes is challenging.

According to NOAA's July 2010 Global State of the Climate Report, the combined global land and ocean average surface temperature for July 2010 was the second warmest on record, and the global combined land and ocean surface temperature was the warmest January-July period on record.

(United States. Dept. of Commerce. NOAA, "Second Warmest July", n. pag.)

Climate Change versus Global Warming

The term "global warming" has evolved over the past decade to the term "climate change" because we have realized that the greenhouse effect does not merely lead to warmer temperatures. The term "global warming" represents the long-term rise in the average global temperature and can be misleading because the actual weather effects associated with "global warming" can be highly variable, depending on the region. As a result, we now use the term "climate change," which more accurately reflects that our concerns are much broader than global temperature increases. Climate change is defined as a function of increased average temperature over time while the actual weather-related effects of a changing climate can impact variability and extremes – including potential for warmer and cooler temperatures, wetter and dryer conditions, and changes in the intensity, frequency and patterns of storms.

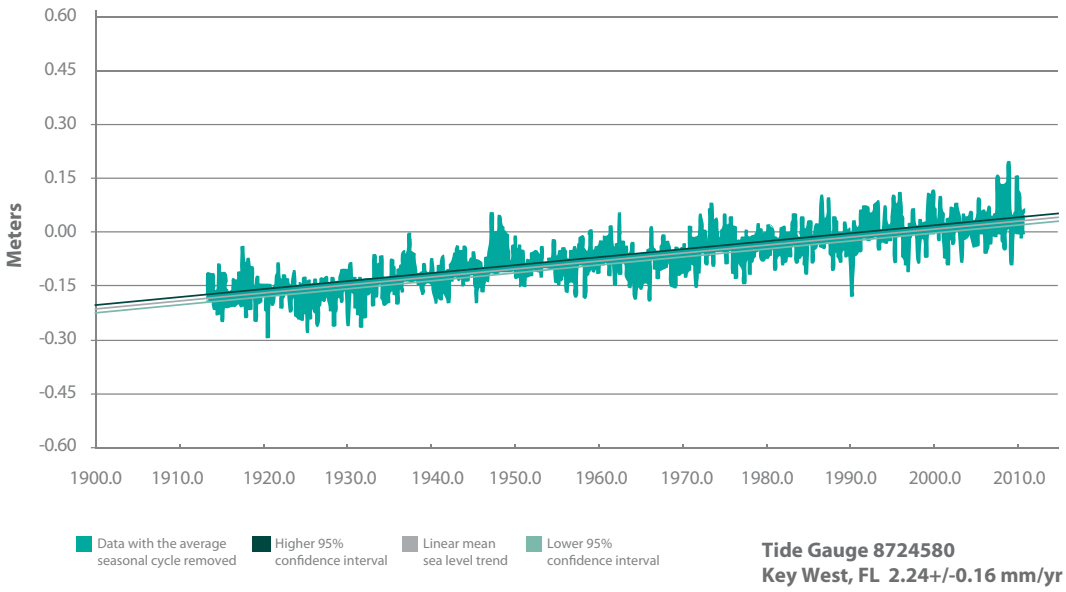
Global temperature increases affect many forces, including global weather patterns, ocean conditions and sea levels. Warming will not be the same for every region; long-term changes in average temperatures will have different impacts in different locations. Current science is projecting that the southeastern United States could experience a general increase in average temperatures anywhere from 4.5°F to 9°F in the coming century (Karl et al, 111), depending on the Intergovernmental Panel on Climate Change greenhouse gas emissions scenario utilized for the projections (Intergovernmental Panel on Climate Change (IPCC), "Special Report" Appendix 1). This temperature change will likely manifest itself as an increase in the number of days over 90°F, with the greatest temperature increases expected during the summer months (Karl et al., 111).

Is sea level rising?

The region's climate, unique natural resources and other distinct characteristics make the community extremely susceptible to some of the effects of changing climate conditions. In particular, our low elevation and porous substrate make the region vulnerable to the many potential effects of sea level rise. Even slight changes in sea levels have the potential to significantly affect our infrastructure, drinking water supply, and risks associated with storm surge, flooding, and coastal erosion. Given the potential consequences, it is imperative that we track changes and projections, closely monitor local conditions, and adopt adaptation strategies.

Key West Sea Level Rise Trend

This figure illustrates a clear trend of sea level rise from 1913 to 2006 at a NOAA tide gauge located in Key West, Florida



Source: U.S. Department of Commerce, NOAA, "Tides & Currents," n. pag.

It is important to note that relative sea level trends vary throughout the world. We will use the local sea level or local mean sea level trend for various planning needs associated with climate change adaptation planning. The National Oceanographic and Atmospheric Administration (NOAA) has three gauges located in the Southeast Florida region that measure mean sea level trend; Miami Beach, Vaca Key, and Key West.

According to NOAA, the mean increase in sea level trend at the Key West tide gauge is approximately 2.24 millimeters per year from 1913 to 2006, which is roughly equivalent to a change of 0.73 feet in 100 years (United States. Dept. of Commerce. NOAA, "Tides & Currents", n. pag.). A recent study by NOAA indicates that additional tide gauges in the southeast Florida area would allow for more accurate regional integration of sea level rise and tidal fluctuations. This additional data may be helpful as Miami-Dade County develops inundation maps to assess vulnerable areas and infrastructure. The bottom line, however, is simple: sea level is rising.

Current and Future Regional Threats

Today South Florida is experiencing the extreme conditions detailed below. Although their occurrence may not be directly attributed to climate change at this time, they are key hazard threats that are likely to be impacted by climate change.

Temperature Extremes

During the first seven months of 2010, southeast Florida experienced first-hand the types of temperature extremes that may occur as a result of climate change. According to the National Weather Service, the time period of December 2009 through February 2010 was "the coldest three months in nearly four decades," with average daily temperatures two to three degrees below normal across the region. Miami Beach experienced its second-coldest winter ever, with average temperatures 5.6 degrees below normal, and broke an all-time coldest January-February mark set in 1958 (United States. Dept. of Commerce. NOAA, "Hottest Summer" n. pag.). In stark contrast, the 2010 summer experienced hotter than normal temperatures. These unusually high temperatures began in May and continued through the summer. In fact, the period of June through August was the hottest summer on record for all four main climate sites in South Florida (Primary Airports in Miami, Ft. Lauderdale, Palm Beach, and Naples) (United States. Dept. of Commerce. NOAA, "Hottest Summer" n. pag.).

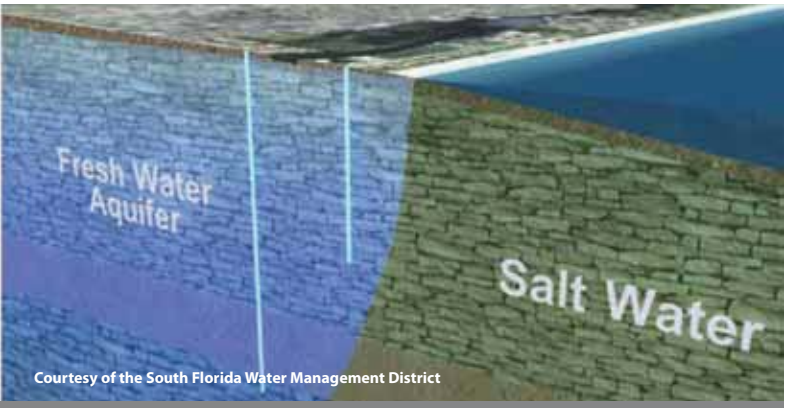
Rainfall Extremes

Changes in precipitation patterns are also projected to affect Miami-Dade County's climate. These changes can increase the likelihood of flooding and drought, both of which would have distinct but detrimental impacts on the County's water quality and supply. Since the early 1900's, South Florida's spring, summer and fall precipitation has dropped nearly 10 percent. (United States. Dept. of Commerce. NOAA, "2009 S. FL" 8). Local data indicates there has been an increase in heavy

Photo courtesy of Eric Blake, National Hurricane Center

Severe flooding from heavy downpour on Miami Beach, June 5, 2009.

downpours in the region, and a 2009 report by the Florida Oceans and Coastal Council indicates this trend may increase and combine with longer droughts in between. An example of these extremes was seen within a nine month period, between November 2008 and July 2009. The six-month period from November 2008 through April 2009 ranked as the second driest period on record over most of South Florida (United States. Dept. of Commerce. NOAA, "2009 S. FL" 8), which resulted in severe to extreme drought conditions over South Florida from late February through April. In May, this extremely dry season quickly reversed to a very wet rainy season with above-normal rainfall persisting into mid-July. In fact, a summer storm on June 5, 2009 dumped a total of 9.3 inches of rain on South Beach, most of it in less than three hours, overwhelming the gravity-driven stormwater drainage system. This caused severe flooding in areas of South Beach, Miami Beach and downtown Miami, leaving some areas with as much as three feet of standing water. (United States. Dept. of Commerce. NOAA, "2009 S. FL" 8)



Courtesy of the South Florida Water Management District

As sea level rises, the saltwater front may move further inland, threatening drinking water wells.

Salt Water Intrusion and Our Water Supply

Southeast Florida was historically a wetland habitat and therefore still has many low-lying areas, particularly to the west and south (the Everglades). Much of Florida has been under water in the past, during periods of higher sea levels. As sea levels rose and fell, the calcium carbonate from ocean organisms and algae were deposited, forming the sedimentary limestone bedrock (Allen 2). This substrate is extremely porous, allowing water to flow freely throughout the underground bedrock. This porosity hydrologically connects the region's sole source of fresh drinking water, the Biscayne Aquifer, to the salty water of the ocean. Because of this hydrologic connection, increases in sea level may push this salt-front line further inland and closer to drinking water wells, threatening the region's fresh water supply. The porosity of the ground is an additional challenge when it comes to protecting the community from inundation due to rising seas, since traditional walls and other barriers will not likely be effective for southeast Florida.

Coastal Erosion and Shallow Coastal Flooding

Beaches and sand dunes are an important component of the region's coastline and are very dynamic, constantly changing due to natural erosion and movement of sand from wind, currents, and wave action. They can provide a first line of defense from storm surge, and are significant assets that make the region an attractive tourist destination. Various weather events that lead to higher winds, tides, and surf cause additional erosion, which can be severe. Miami-Dade County has been addressing this issue since 1975 with its acclaimed Miami-Dade Beach Erosion Control Project. This program is recognized as a national model and has won numerous national and statewide awards. Although the specific amount varies from year to year and from project to project, Miami-Dade County invests approximately $6 million annually in beach restoration. Communities adjacent to the ocean and intracoastal waterways periodically

Flooding on Miami Beach on October 7, 2010 due to natural high tide exacerbated by on-shore winds, driving tidal waters up in to the streets through the stormwater drainage system.

experience flooding from extreme high tides. These occasional high tides inundate the coastal communities through gravity-driven stormwater drainage systems and over low-lying sea-walls, leading to infrastructure and property damage. Tide levels during June 2009 were six inches to two feet above normal. The cycle of the moon contributed to this event, which is not necessarily unusual. However, the geographic extent of this event along the entire East Coast made this high tide event anomalous. Even a tide .75 to one foot higher than normal can cause similar flooding in low-lying coastal areas if there is a strong on-shore wind, as was the case on October 7, 2010, driving saltwater into the streets of Miami Beach (Molleda, Robert. Personal email communication. October 12, 2010)

Low-lying coastal and inland wetland habitats also play an important role in the region's unique and valuable environmental attributes and are important to both local ecosystems and the economy. Coastal mangrove habitats help stabilize shoreline sediments, play a critical role as spawning grounds and nursery for many marine species, and form a protective line of defense from storm surge. Similarly, Biscayne National Park and Everglades National Park are home to a number of endangered species. In addition to the critical role of protecting and replenishing our region's drinking water supply, the Everglades also provides critical habitat that can serve as a corridor for species migration that may occur due to climate change. However, much of these natural areas have an elevation of less than three feet (United States. Dept. of the Interior 1), and therefore will also be extremely vulnerable to inundation impacts from sea level rise.

Inland Flooding and Stormwater Management

While coastal flooding as a result of climate change is an obvious threat, inland flooding is a threat of equal importance, especially when considering the development density and ground elevation of some urbanized areas in the western portions of the county. While our porous substrate provides some advantages - mitigating flooding and naturally recharging the freshwater aquifer by allowing some rain water to percolate into the ground - it also presents challenges. As sea level rises, the water table will also rise, coming closer to the ground surface and causing surface flooding in areas of lowest elevation. This threat of flooding will be further increased during periods of heavy precipitation since the capacity of the gravity-driven stormwater system and ground to absorb the run-off may be greatly reduced. Additionally, the probability of salt intrusion in the Biscayne Aquifer, which is currently the only source of water supply to the County, could potentially change the characteristics of the ground water.

Extreme Storms & Damage

There is much scientific research on the causes, trends and complex factors affecting tropical storm and hurricane development. A hint of this complexity was presented in a recent South Florida Water Management District (District) Report, which stated, "As the atmosphere warms, sea surface temperatures and wind shear will also increase. These two factors can have opposing effects on tropical storms. The role of sea temperatures is complicated. As the temperatures rise, overall storm frequency may decrease, but intensity of stronger storms may increase" (Ammon et al, 21). Add to this complexity the uncertainty of climate change and its effects on these storms, and the future trends and impacts become extremely unclear. What is clear is that our community will continue to experience these events, and they can

Impacts Now: Severe Weather
Florida is ranked number one in total damage costs from hurricanes (1900 – 2007), fourth in total damage costs from floods (1955 – 2007), and number one in total damage costs from hurricanes, floods, and tornadoes combined (1955 – 2007). (National Center for Atmospheric Research n. pag.).

have devastating impacts. The region is no stranger to hurricanes, as evidenced by Hurricane Andrew in 1992 and the busy hurricane season of 2005 (Hurricanes Katrina and Wilma).

Our community will continue to experience these events, and their impacts may be exacerbated through climate change. In addition to greater coastal erosion, for instance, increasing sea levels will likely amplify the height and distance of storm surge that may travel inland, increasing its damage. Furthermore, a higher water table associated with increased sea level may also lead to longer periods of flooding following storm events, delaying or perhaps even preventing the recovery of those communities hardest hit. Buildings, water and sewer networks, solid waste facilities and power utilities could all be at risk. Steps taken to better anticipate, prepare and adapt our community for tropical storms and hurricanes will improve the overall sustainability and resilience of our community.

What is known:
Hurricane frequency and strength have increased dramatically since 1995. Much of the change is attributed to natural cycles.

What is probable:
Warmer temperatures create the potential for stronger hurricanes. Hurricane frequency may remain the same or decrease as part of climate change. A lower number of tropical storms and hurricanes each year could reduce the region's water supply. Likewise, an increase in tropical activity could increase flooding. In either case, hydroperiod changes will be stressful to managed and natural systems.

What is possible:
While the number and strength of tropical storms change naturally, the exact degree to which climate change may alter the natural cycles is uncertain.

Information gaps:
While the number and strength of tropical storms change naturally, the exact degree to which climate change may alter the natural cycles is uncertain.

(Source: Ammon et al, 21)

II. Climate Change Adaptation Plan – Creating a Resilient and Sustainable Future for our Community

Miami-Dade already has knowledge and skill preparing for extreme events due to its experience preparing for and recovering from hurricanes. This experience provides us with an advantage that most other communities do not have. Within County government, our Stormwater Master Plan and Local Mitigation Strategy are two leading initiatives that serve as critical building blocks for community resilience. Further, Miami-Dade County has fostered effective working relationships with state and federal agencies to build local resilience, including the partnership among Federal Emergency Management Agency (FEMA), the State of Florida and Miami-Dade County to increase secondary canal drainage capacity between 2002 and 2006. Further, Miami-Dade County is actively engaged with the South Florida Water Management District, the National Park Service, and the U.S. Army Corps of Engineers on the Comprehensive Everglades Restoration Plan (CERP). Everglades restoration is now more important than ever, "since a restored Everglades will be healthier and more resilient to climate change," (United States. Dept. of the Interior 4).

Miami-Dade County is also working with the U.S. Geological Survey (USGS) to develop a water flow model that integrates surface and groundwater flow, in order to assess existing and future impacts on water resources in South Florida. The model will be capable of assessing the impacts of increasing water demand, changing water management practices, and climate change on the Biscayne Aquifer and the regional canal system in South Florida. It will also be able to assess salt water intrusion as a result of climate change and sea level rise, and will be an important tool in our adaptation planning efforts.

Other agencies are building resilience in Miami-Dade County as well. The District has numerous coastal gravity structures in canals throughout the region. These are designed to discharge excess water during heavy rain and storm events, and to help keep salt water from migrating into the freshwater upstream of the structure. The District has conducted a vulnerability analysis in the South Florida region, identifying several of these structures that have increasing tailwater levels, which is the water on the ocean-side of the structure. As sea level rises, this tailwater level will also rise, which will further reduce the discharge capacity of the structure. The District has specifically identified three structures as a priority for construction of new forward pumps once funding becomes available. These facilities will be designed to maintain a specific level of discharge capacity even with a certain amount of sea level rise.

GreenPrint Adaptation Strategies & Initiatives

A great deal of vital research is now underway that will increase our understanding of regional climate change impacts. Not only are temperatures and sea levels affected, but rainfall, storms, and ecological conditions are all impacted. The exact local impacts are extremely difficult to predict, given the complex drivers and dependencies, but general trends can be modeled. For example, El Niño and La Niña effects are common in the southeast, resulting in dramatic seasonal and year-to-year variations in temperature, precipitation and tropical storm development. In spite of the complexity and uncertainty associated with predicting local climate change impacts, we are able to build cost-effective adaptation strategies from our existing hazards planning efforts. During this first five-year phase of our Climate Change Action Plan (CAP), the majority of adaptation planning efforts outlined below will revolve around gaining a better understanding of the potential future climate changes our region may experience. This better understanding will arm us with critical knowledge necessary to develop planning tools that will help us evaluate potential resulting impacts, which in turn will allow us to better plan and prepare our community.

Strategies

- Track local and regional climate change indicators and trends
- Develop local and regional climate change scenarios depicting various impacts and time frames
- Integrate future climate change impacts into community and government decision-making for capital, operational, and land-use issues

The following initiatives are a step-by-step approach to build upon our current programs and successes, and turn science into action.

1. Track local and regional climate change indicators and trends

- Track local and regional indicators and trends such as sea level rise, temperature, precipitation and tropical storms
- Conduct a pilot project to assess the feasibility of using existing monitoring efforts and determine if the information can be used as vital signs of climate change
- Develop consensus-based graphic communication tools from the pilot project, reporting the monitoring data such as maps, bar graphs, and "stoplights"
- Develop a working group to analyze potential climate change related to public health impacts (for example infectious disease changes and heat related illness)
- Report periodically on the status of climate change indicators and trends

2. Develop local and regional climate change scenarios depicting various impacts and time frames

- Develop local and regional sea level rise scenario maps
- Develop planning maps and tools for Miami-Dade County based on consensus of Southeast Florida Climate Change Compact (Compact) planning scenarios

- Continue existing local surface water, ground water and salt water intrusion modeling projects, incorporating expected climate change impacts (i.e. changes in temperature, precipitation, sea level rise, etc.) and integrating with regional water modeling projects from the District and other South Florida Climate Change Compact partners

3. Integrate future climate change impacts into community and government decision-making for capital, operational, and land-use issues

- Analyze sea level rise scenario maps to model buildable/livable footprints and correlate economic scenarios
- Examine the implications of sea level rise on vulnerable facilities (i.e. solid waste facilities, and water and wastewater utilities)
- Develop mechanisms for organizations to integrate potential climate change impacts into capital and operational decision-making
- Continue to implement the Stormwater Master Plan

Southeast Florida is experiencing events that we can and should use to help us move forward in our understanding and planning for potential climate change impacts. While global climate change cannot be attributed to any one of these events, the longer-term threat to the region is clear. We must take advantage of the experience and knowledge gleaned from each extreme weather event to make our community more resilient to climate change. By informing ongoing planning and management efforts with the best available climate projections, programs such as hazard mitigation, floodplain management, and water resources management can pursue win-win strategies that accomplish multiple goals through coordinated cost-effective actions. We can also pursue a practical approach to climate adaptation by prioritizing actions that can reduce current exposure to hazard losses as well as addressing future vulnerabilities. These actions reap significant current and near-term benefits regardless of how the long-term scenarios unfold. By taking science, knowledge and experience to action, we ensure a more resilient future for our community.

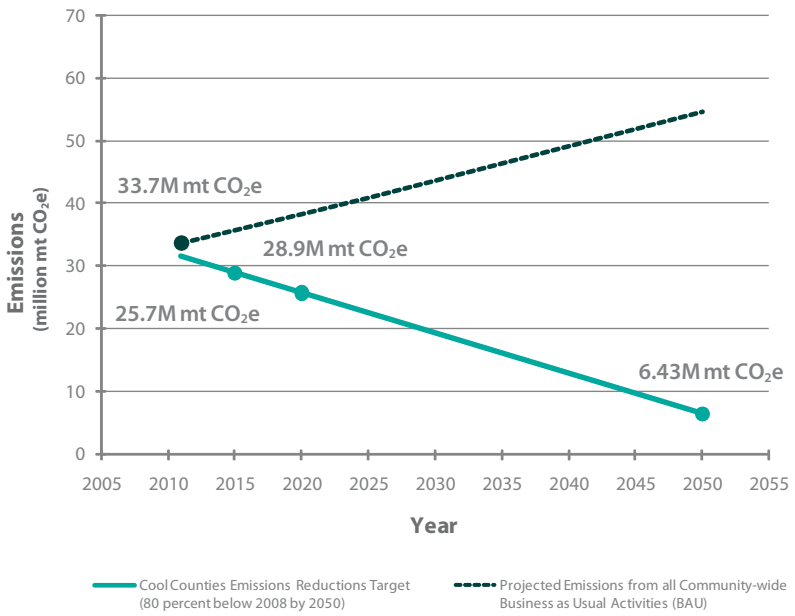
III. Climate Change Mitigation Plan – Reducing Greenhouse Gas Emissions

Our Baseline and Reduction Targets

This portion of the Climate Change Action Plan (CAP) rolls up all the goal area initiatives that reduce or avoid GHGs. Any responsible community must realize that it is equally important to maintain and even increase efforts to mitigate, or reduce GHGs while moving forward with adaptation planning. Miami-Dade County has long been a recognized leader in its commitment to reduce GHGs and has implemented numerous programs and policies over the years. This includes implementation of programs such as the Long-term CO_2 Reduction Plan, creation of the Climate Change Advisory Task Force (CCATF), membership in the Chicago Climate Exchange (CCX) pilot program, participation in the U.S. Cool Counties Program, and the joint establishment of the Southeast Florida Regional Climate Change Compact. ***GreenPrint*** will build upon this foundation by expanding upon the success of existing programs, identifying new opportunities, and leveraging these new opportunities with additional resources.

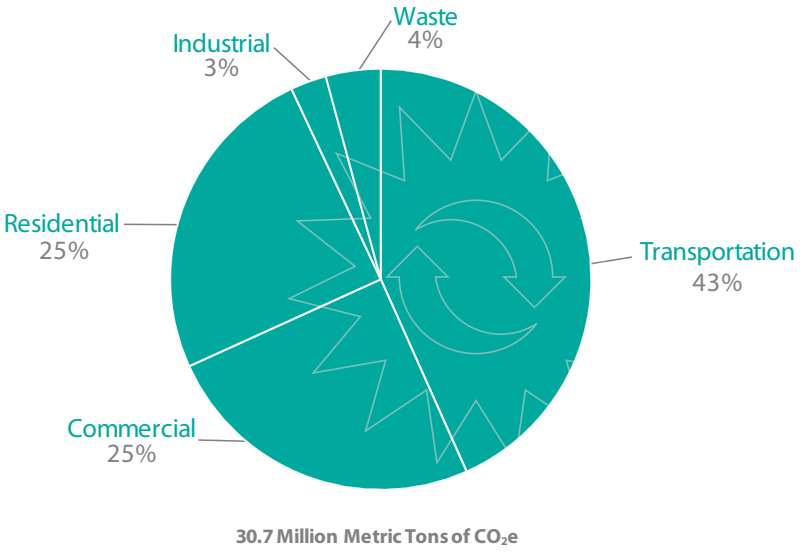
As one of the first participants in ICLEI's Cities for Climate Protection, Miami-Dade County has completed all five milestones and therefore has extensive experience in developing and implementing a formal climate mitigation program. By signing onto the Cool Counties Climate Stabilization Declaration in 2008, the County renewed its commitment and agreed to the terms of, "creating an inventory of county government (operational) GHG emissions and implementing policies, programs and operations to achieve significant, measurable and sustainable reduction of operational GHG emissions" in order to "help contribute to the regional reduction targets of 80 percent below current [2008] levels by 2050."

Miami-Dade County Greenhouse Gas Emissions Business as Usual Versus Reduction Targets



This graph illustrates the gap between doing nothing (business as usual) versus making aggressive changes to the way we operate. The ***GreenPrint*** initiatives begin to address the gap.

Miami-Dade County 2005 Community-wide Emissions Inventory by Community Sector



This chart illustrates total community-wide GHG. Clearly transportation, commercial and residential sectors are major contributors with significant potential for reductions.

This will be achieved by developing a GHG emissions inventory and regional plan that establishes short, mid, and long-term GHG reduction targets, with recommended goals to stop increasing emissions by 2010, and to achieve a 10 percent reduction every five years thereafter through 2050. The CCATF evaluated the Cool Counties commitment and recommended a countywide reduction goal of 20 percent below 2008 emission levels by the year 2020. In order to meet the estimated 2015 emissions target of 28.9 million metric tons of carbon dioxide equivalents (mt CO_2e), we would need to reduce emissions by approximately 6.8 million mt CO_2e at the end of this first five-year phase of ***GreenPrint***. Although the County has been taking steps to reduce GHG since the early 1990's, these new commitments will require us to significantly enhance our efforts, both community-wide and internally.

As one of the first steps in this renewed commitment, Miami-Dade County established a community-wide GHG baseline for calendar year 2005; an estimated 30.7 million mt CO_2e. County staff also calculated an emissions baseline for our internal operations, which totaled approximately 983,000 mt CO_2e, or about three percent of community-wide emissions. Emissions are converted to CO_2e based on their 100-year global warming potential using ICLEI's Clean Air and Climate Protection (CACP) software. The adjacent chart shows the overall community GHG emissions from energy use, broken down by community sectors, as in the CACP software. The emissions under this umbrella include all emission sources, both mobile and stationary. Emissions from the waste sector are primarily due to methane (CH_4) released from the landfills, which is approximately 21 times more potent as a GHG than carbon dioxide (CO_2). The County will measure progress in its emission reduction efforts from both the overall community-wide baseline and the internal government operations baseline. Before proceeding with the discussion of emission reduction efforts, it is helpful to define how a few terms will be used.

Direct versus Indirect Emissions

Direct emissions are emissions produced from sources within the boundary of an organization and as a result of the organization's activities; in other words, direct emissions are from sources that are under a particular organization's ownership and control. For example, the power company that generates electricity in a coal-fired power plant is a direct emitter.

The businesses that purchase the electricity, however, are indirect emitters. Indirect emissions are emissions generated in the wider economy as a consequence of an organization's activities, but occur at sources that are owned or controlled by another organization. Indirect emissions should not be confused with indirect impacts, which are impacts that may not immediately result in emission reductions, but rather impact them indirectly such as, codifying the sustainability planning process and creating a formal leadership structure for ***GreenPrint*** implementation.

In any case, all direct (on-site, internal) and indirect emissions (off-site, external, embodied, upstream and downstream) need to be taken into account when looking at the big picture.

Emission Impacts Defined

There are three types of emission impacts referenced in *GreenPrint*:

1. Emissions Reductions - Decreases in emissions resulting from cutting emissions that are measured in Miami-Dade County's community-wide baseline (think decreasing electricity purchases);
2. Emissions Offsets - Project-based emission reductions made outside the scope of the baseline used to counterbalance or compensate for emissions from other activities (think forest carbon sequestration);
3. Emissions Avoided - Emissions that are prevented from ever occurring through the implementation of a project or program (think carpooling, which takes cars off the road, "avoiding" emissions from those cars).

While "direct" emission reductions directly decrease the GHG footprint of Miami-Dade County, "offsets" and "avoided" emissions also help the cause. The explanations below help explain how.

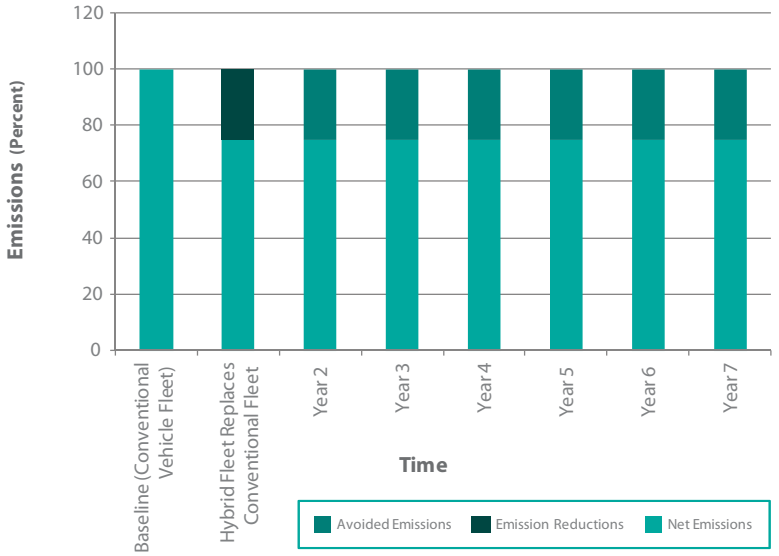
Miami-Dade County Emissions Reductions

Reductions are direct cuts in emissions that reflect decreases in energy or fuel consumption relative to a baseline year. Emission reductions come primarily from reduced and more efficient use of fuel as well as increased energy efficiency and conservation in residential, commercial and industrial buildings. An example of this is the initiative to reduce electricity use in internal County operations by 20 percent of 2007 levels by the year 2014. To achieve this goal, we might retrofit buildings to improve their energy performance and thus reduce their resultant emissions. It is important to note, however, that efficiency does not always result in emission reductions. For example, if we replace a fleet of conventional vehicles with their hybrid counterparts that are 25 percent more fuel efficient, we will achieve emission reductions. However, if we supplement our existing vehicle fleet with hybrid vehicles, despite the increased efficiency, the net impact will be increased emissions. In order to achieve real emission reductions, we must reduce below emission levels in our baseline year. This requires accounting for growth by increasing efficiency in baseline operations. This is a difficult task, since the County has experienced tremendous population growth over the past several decades, and projections show this trend will continue. A way of reconciling this is to also track emission reductions per capita, a useful metric by which to measure progress toward our emission reduction goals. This frames emission reductions in terms relative to growth rather than in absolute terms.

Miami-Dade County Emissions Offsets

Emissions offsets are produced by mitigation projects that sequester, destroy or reduce GHGs. Every active or proposed GHG cap-and-trade program worldwide includes a role for project-based emission reduction credits or offsets. Mitigation projects must meet eligibility standards and undergo independent verification before they can be issued tradable offsets in recognized trading systems. While each project type has its own set of criteria, the defining requirement for offset projects is that they are practice-changing, or go beyond business as usual. Miami-Dade County is currently exploring quantification of offsets from carbon sequestration in trees in our Environmentally Endangered Lands program.

Graphical Representation of Emission Reductions and Avoideances Over Useful Life of a Vehicle



When replacing a fleet of conventional vehicles with their hybrid counterparts that are 25 percent more fuel efficient, after the first year, emissions will be reduced for the fleet by 25 percent. In future years until the end of product's useful life, no further reductions will be accomplished. Instead, emissions will be avoided annually.

Miami-Dade County Emissions Avoided

In the context of ***GreenPrint***, we are using the term "emissions avoided" to capture the emissions not produced over the life of a project's implementation, and in instances where it may be complex to predict emission reductions.

When emission reducing activities are initially put in place, we will see emission reductions, which will count toward our reduction target. By calculating avoided emissions for the life of a project, we can track the emissions that would have otherwise occurred had the project not been implemented. To use the example cited above, if we replace a fleet of conventional vehicles with their hybrid counterparts that are 25 percent more fuel efficient, after the first year, we will have reduced emissions for that fleet by 25 percent. In future years, we will continue realizing those reductions but they will not reduce our net emissions any further. By replacing the conventional vehicles, however, we are avoiding emissions that would have otherwise taken place. A reasonable time to track avoidable emissions is over a product's useful life. For example, the useful life of a vehicle might be seven years.

We can also use avoided emissions to calculate the positive benefits of increasing public transit. While deploying more trains and buses increases overall fuel use, its net impact can be expected to reduce personal vehicle miles traveled, and thus have a positive impact on emissions management overall. While we may not be able to predict or estimate emissions reduced from this type of project, we can develop a measurement for emissions avoided by increasing ridership.

Our Electricity Source

Florida Power and Light (FPL) is the principal provider of electricity for Miami-Dade County. Two FPL power plants lie within Miami-Dade County boundary. Turkey Point, located on Biscayne Bay, holds two nuclear power units and is also an oil and gas facility. The 2,337.5 megawatt (MW) plant has the capacity to meet the annual electricity needs of more than 450,000 homes. Cutler Ridge, an oil and gas plant, has a considerably smaller capacity of 236.5 MW (FPL). Homestead Electric, a municipal-owned utility, also serves Miami-Dade County, but supplies less than one percent of its electricity. In 2008, 219.6 million megawatt hours (MWh) were consumed in the State of Florida, approximately 27.3 million of which were used by Miami-Dade County homes, businesses and government operations (United States. Dept. of Energy. EIA, Florida Electricity Profile n.pag.). Thus, Miami-Dade's electricity consumption represented roughly 12.5 percent of Florida's total consumption, while its residents accounted for about 13.5 percent of the state population.

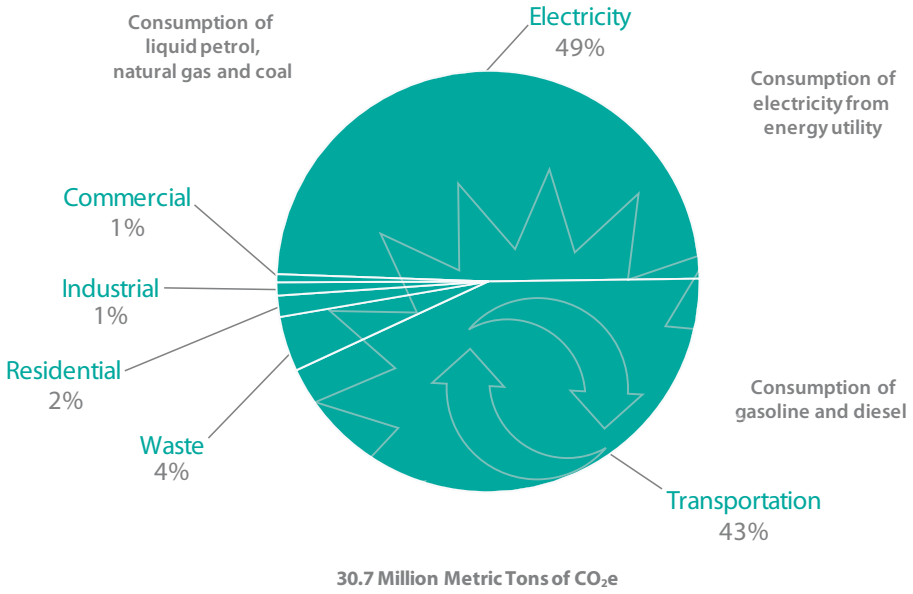
According to FPL, in 2005, 19 percent of its energy came from nuclear power, 42 percent from natural gas, 17 percent from oil and five percent from coal. The remaining 17 percent is purchased power. Because it is difficult to know the emissions associated with the purchased power, which is a significant portion of FPL's energy mix, Miami-Dade County uses verified default emission values from the Southeastern Electric Reliability Council that are integrated into ICLEI's CACP software, as opposed to the factors published by FPL that have not yet been verified by a third party.

Where should we focus?

In order to determine the best strategies to employ to reduce emissions, it is important to look at the emissions data from a different perspective. When the 2005 emissions baseline is viewed by end-use, as in the adjacent figure, it is apparent that electricity and transportation are by far the greatest contributors to community-wide emissions, at 49 percent and 43 percent respectively. The small remaining components shown for residential, industrial and commercial sectors in this chart are from other fossil fuels such as coal and natural gas.

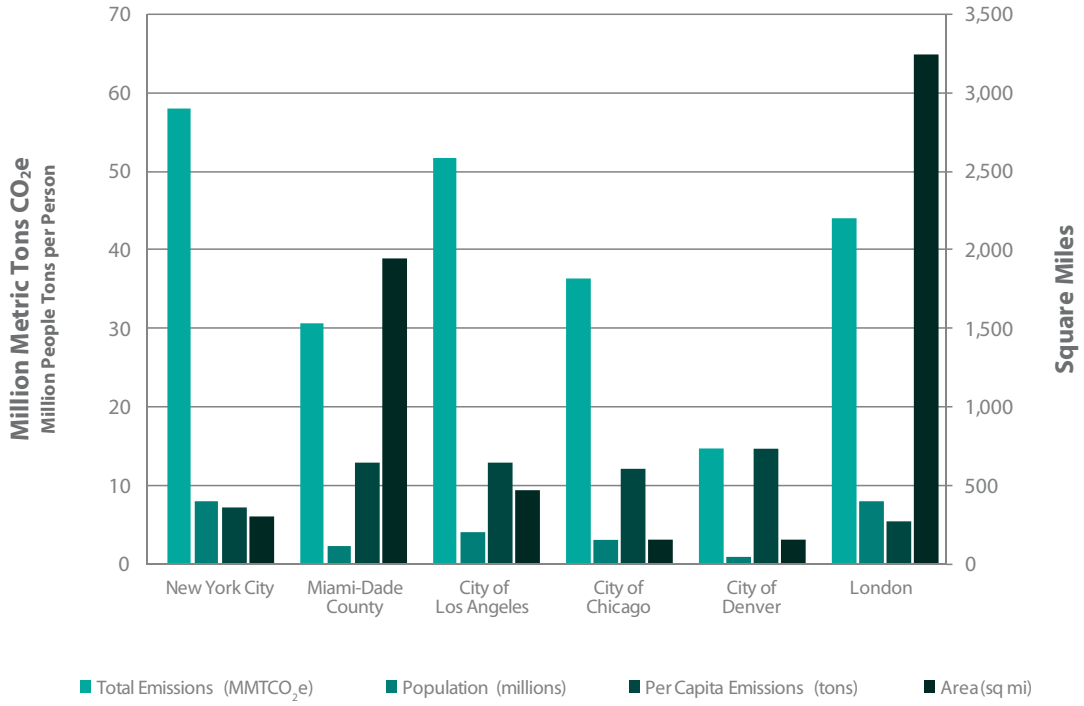
From yet another perspective, we see our overall emissions are not as high as some of our peer communities, but our per capita emissions are higher than several of those communities. Our opportunity and our challenge is to achieve significant emissions reductions through changes in electricity and personal vehicle use.

Miami-Dade County CY 2005 Community-wide Emissions Inventory by Consumption Source and Sector



This chart illustrates that electricity use and transportation are the largest sources of GHG and provide the greatest opportunities for reductions.

Greenhouse Gas Emissions Comparison by City



The graph depicts emissions totals for five major cities and Miami-Dade County. While our GHG are lower than several cities depicted, our non-compact development pattern contributes to a relatively high per capita GHG.

A New Normal

Although the recent downturn in the economy has caused much hardship nationwide, it does present a clear opportunity to begin to move the needle towards efficiency and sustainability. A tougher economy has forced behavior changes to decrease spending, increase savings and shift from gross consumerism to a more frugal lifestyle. Our community has seen obvious indications of this as reflected in a downward trend in the amount of waste in our solid waste management system, lower fuel emissions in our fleet, and increased ridership in our public transportation system during periods of higher fuel prices. The challenge and opportunity is to take advantage of an otherwise negative situation and allow it to become the new normal. How do we as a society and as a government avoid the temptation to grow, build, and pollute to the levels of just a few years ago? How do we manage growth, consume only what we need, conserve water and energy and recycle more? ***GreenPrint*** is our action plan to do so.

GreenPrint Goal Area Initiatives with Emission Reduction Impacts

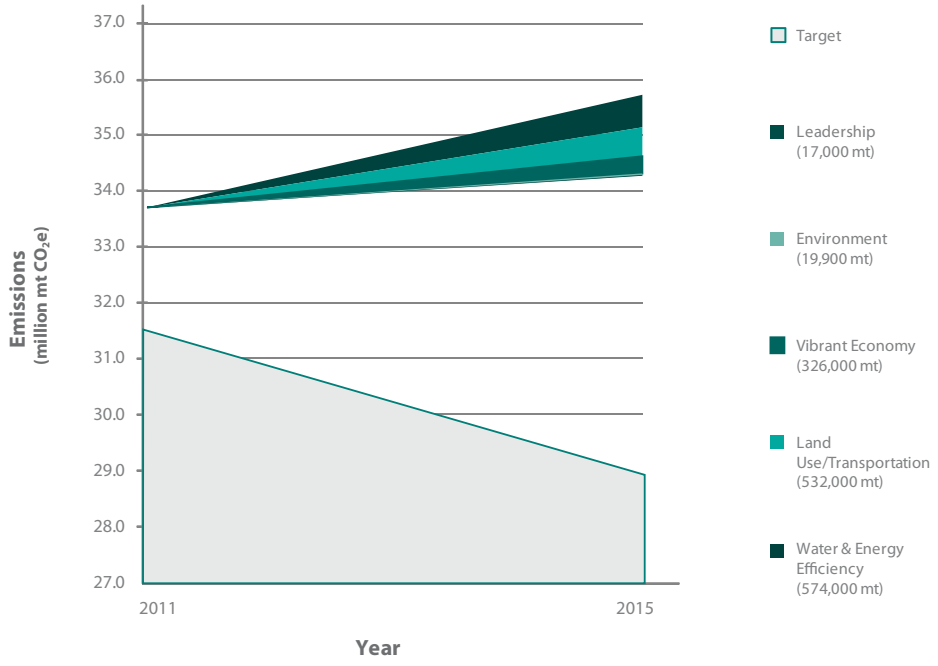
The following is a discussion of the ***GreenPrint*** goal area initiatives that specifically contribute towards our climate mitigation goals and efforts, either directly or indirectly. As can be seen here, Water and Energy Efficiency and Responsible Land Use and Smart Transportation are the two goal areas that contribute the greatest estimated emissions reductions towards the reduction target, followed by Vibrant Economy and Strong Leadership, Connections and Commitment. It is important to note that some of these initiatives will not be underway until the second or third year of this first five-year plan, while others may take several years to begin realizing emission-reduction benefits. As a result, we expect emissions benefits from some initiatives will increase significantly during subsequent phases of the long-term ***GreenPrint*** Plan, particularly if additional resources are invested to leverage these initial gains.

GreenPrint Goal Area Emission Reductions & Avoidance Summary

Goal Area	Emission Reductions (mt CO_2e)	Emission Avoidances (mt CO_2e)
Leadership, Connections & Commitment	17,000	26,000
Water & Energy Efficiency	574,000	2,030,000
Our Environment	19,900	66,200
Responsible Land Use & Smart Transportation	532,000	608,000
Vibrant Economy	326,000	326,000
TOTAL	1,470,000	3,050,000

Greenhouse Gas Emission Reductions by GreenPrint Goal Area

This chart shows how quantifiable ***GreenPrint*** initiatives contribute to the 2015 ten percent reduction target established through the Cool Counties commitment. These are the initial steps on a 40-year path to the 2050 target. It is anticipated that the impact will be accelerated in later years.



The Role of Strong Leadership, Connections and Commitment

Strong Leadership, Connections, and Commitment are invaluable elements of the economic, environmental, and social pillars that comprise sustainability. Decision-making by leaders in public and private organizations plays a critical role in ensuring a lasting high quality of life for our residents and visitors. While most of the strategies and initiatives grouped within this goal area have considerable benefits and are connected to other goal areas, many of the emission-reduction benefits are indirect. However, leadership and commitment are the driving forces that will result in the initiatives that produce measureable benefits in the future.

Strong Leadership, Connections and Commitment Strategies Contributing to Climate Action Plan Mitigation Efforts

- Be green government role models

The initiatives in the Strong Leadership, Connections and Commitment Goal Area reduce emissions by 17,000 mt CO_2e and avoid 26,000 mt CO_2e.

Strategy: Be green government role models

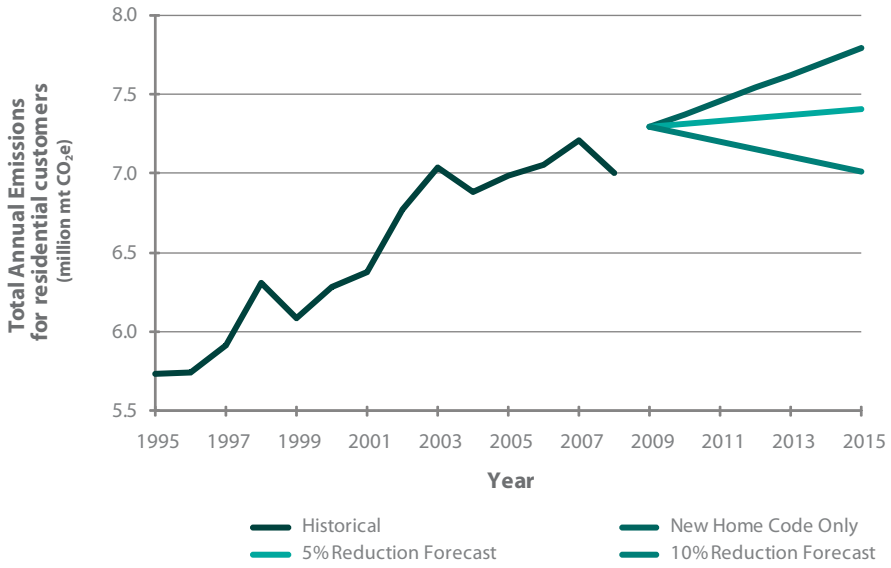
This strategy focuses on leadership initiatives that leverage a broad jurisdictional influence to promote sustainability and reduce GHGs. Miami-Dade County is large in geographic size and population and has expertise in natural resources management, emergency management, public health, transportation, construction, and sustainability. As a result, Miami-Dade County elected officials and administrators can work with partners of public policy at local, regional, state and federal levels. Since many of the County's regulations and policies have countywide jurisdiction, the County is uniquely positioned to work with municipalities to impact local on-the-ground activities that could lead the entire community toward sustainability.

The Climate Change Connection

At this time, we can calculate emissions benefits for the last initiative in this strategy, which is to adopt an existing draft County Ordinance (per Resolution R468-06) requiring water efficiency retrofits at point of home resale (prior to changing ownership) and later update the ordinance to require additional retrofits focusing on energy efficiency. The purpose of this initiative would be to accelerate community-wide water and energy efficiency. Energy conservation retrofits would include home energy uses that are not currently covered by Florida's Energy Code, such as pool pumps, since these uses now account for more than 55 percent of home energy use.

In assessing the GHG emissions impact of point-of-sale home efficiency retrofits, staff used methodology and assumptions that are further detailed in Appendix A. For illustrative purposes, two years of reductions are estimated within the five year time frame of our first ***GreenPrint*** plan. During this time, energy efficiency per household may increase by 17 percent, potentially resulting in 17,000 metric tons of GHG emissions reductions and 25,000 metric tons of GHG emissions avoided. Implementing this ordinance will affect almost one percent of all home energy consumption in just this short time period. The impact of this initiative should continue to grow over the years.

Residential Emissions Projections



This graph illustrates potential impacts from requiring energy retrofits at the time of home sales. Clearly, increasing sales would result in higher energy savings and lead to greater emission reductions. As home sales and retrofits remain consistent, our emissions are reduced to a new normal.

The Role of Water and Energy Efficiency

The relationship between the water sector and the energy sector is complex and highly interdependent. Water treatment and delivery, as well as wastewater treatment, are primarily dependent on electricity, along with other energy sources. These energy sources in Miami-Dade are all significantly fossil-fuel based and therefore, as highlighted earlier, energy and water use contribute heavily to GHG emissions. As water demand grows, so grows energy demand. Since population growth drives demand for both resources, water and energy demand follow similar growth rates. Saving a unit of water reduces the amount of energy used and the GHG generated to collect, treat, deliver, consume, treat, and dispose of it as wastewater. Therefore, every gallon of water saved translates to a GHG emission reduction.

Water and Energy Strategies Contributing to Climate Change Action Plan Mitigation Efforts

- Reduce energy and water consumption through increasing efficiency
- Improve energy planning through public-private partnerships
- Continue Water and Energy efficiency and conservation campaigns
- Expand alternative fuel (biodiesel/waste-based biodiesel) and renewable energy industries
- Be government leaders in energy, fuel, and water efficiency

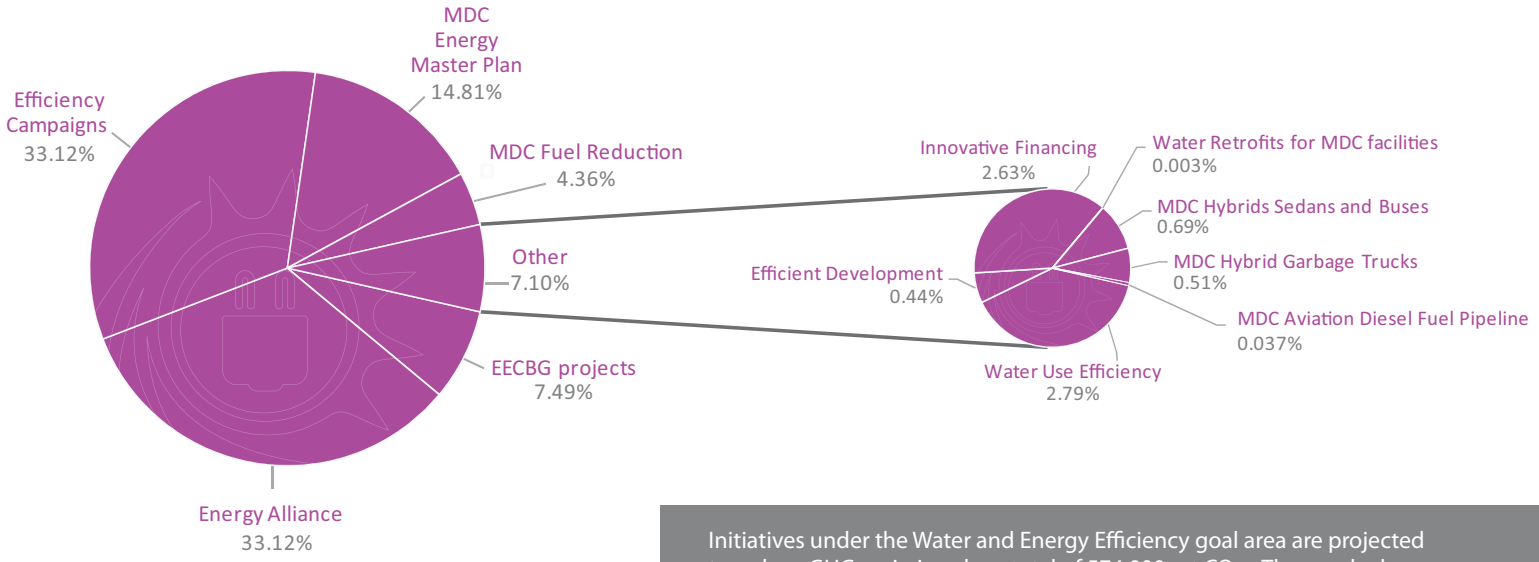
The Climate Change Connection

In Miami-Dade County it is estimated that producing one million gallons of potable water uses approximately 1,203 kWh, 46.4 therms of natural gas and 10.7 gallons of diesel, which translates into 1.03 mt CO_2e.

In addition, energy demand in the water sector will likely increase over time due to a number of factors, including population and urban load growth; increased water and wastewater treatment due to more stringent water quality regulations; and market, economic, regulatory, and legislative changes. By continuing to implement ***GreenPrint***, Miami-Dade County will be on the way to stabilizing GHG emissions from potable water production.

The initiatives in the Water and Energy Efficiency Goal Area reduce emissions by 574,000 mt CO_2e and avoid 2,030,000 mt CO_2e

Percentage Breakdown of Greenhouse Gas Emissions Reductions for Initiatives within the Water and Energy Efficiency Goal Area



Initiatives under the Water and Energy Efficiency goal area are projected to reduce GHG emissions by a total of 574,000 mt CO_2e. The graph above represents the contribution of each initiative towards the total on a percentage basis.

Strategy: Reduce water and energy consumption through increasing efficiency

This strategy is a collection of four initiatives that address community efficiency and conservation of electricity and water: water use efficiency, efficient development, federal Energy Efficiency and Conservation Block Grant (EECBG) projects, and innovative financing. These initiatives include measures intended to achieve high levels of energy efficiency in new homes and buildings, as well as existing buildings undergoing substantial renovation. Our biggest challenges and opportunities to achieve energy efficiency lie within the existing building stock. Enforcing the Florida Energy Code and implementing recommended alterations to the existing code and permitting process in Miami-Dade County, will help ensure that all new construction and substantial rehabilitation projects will achieve energy and water savings that extend over the life of the building. In addition, this strategy extends and builds upon existing successful water conservation initiatives that reduce GHG emissions related to water use by 16,000 mt CO_2e. In summary, when implemented, the initiatives under this strategy will result in projected emissions reductions of 76,630 mt CO_2e over the five-year ***GreenPrint*** period and avoidances of 1.45 million mt CO_2e.

Strategy: Improve energy planning through public-private partnerships

The opportunities for using energy more sustainably in our County are great, but collaboration among sectors is essential to seizing them. The adage "the whole is greater than the sum of its parts" is relevant to the approach our community takes in regard to energy management. Responsible management of energy is as much a societal challenge as it is economic and political. Florida's per capita residential electricity demand is among the highest in the country, due in great part to high air-conditioning use, particularly during hot summer months. Much of this energy is used wastefully; buildings are often shockingly cold. Retailers invite tourists to peruse their shops and restaurants with open doors that exude a frigid draft. Practices will have to change if residents are to change the patterns of our energy use.

An alliance made up of a diverse group of stakeholders can address these complex challenges across sectors and can identify market-based solutions. Whether it launches awareness campaigns, finances building retrofits, or coordinates rebate programs, an alliance can create community-wide programs that reduce and conserve energy and natural resources, achieving important emissions reductions. In addition, an alliance can create linkages with other existing organizations that focus on efficiency and GHG reduction, such as the Building Owners and Managers Association (BOMA). The alliance will seek to broaden the uptake of energy efficiency retrofit projects, and therefore it is estimated to reduce 190,000 mt CO_2e and avoid 305,000 mt CO_2e.

Strategy: Continue energy and water efficiency and conservation campaigns

While great emphasis is placed on new fuels and technologies, it is critical to realize that efficiency and conservation are proven to be the simplest and most cost-effective ways to achieve reductions today. If our community wants to save energy and water, it is important that our residents become aware of the resources they consume, and ways to reduce their consumption. Simple changes in behavior can quickly lead to significant energy and water savings. While it is well known that saving energy and water is a good thing, people are also often motivated by opportunities to save money. Through water and energy efficiency and conservation campaigns, County residents and business owners are challenged and empowered with the tools to reduce their consumption and their utility bills, through a series workshops, saving challenges, rebates, retrofits and exchanges. Participating residents can see the costs associated with energy and water go down while protecting energy and water resources. Overall this strategy has the potential to reduce 190,000 mt CO_2e and avoid 305,000 mt CO_2e.

Strategy: Expand alternative fuel (biodiesel/waste-based biodiesel) and renewable energy industries

As stated earlier, the most accessible and cost-effective way to reduce water and energy consumption is through efficiency and conservation initiatives. Keeping this in mind, initiatives within this strategy take the next step by encouraging the use of renewable energy sources that can provide overall sustainability benefits to our community: sustainably-sourced biodiesel (including waste-based biodiesel) and renewable energy. The use of these non-traditional energy sources can be accelerated through the deployment of technology and building local infrastructure. Since the State of Florida does not have a renewable portfolio standard, and our community is not aggressively pursuing distributed solar installations (decentralized solar electricity generation) or energy-efficiency (except for peak-demand management), initiatives under this strategy address the need to incentivize the market for renewable energy. Because the first step to renewable energy deployment is to perform energy efficiency retrofits (to avoid oversizing systems which worsens performance and increases costs), this should stimulate the energy efficiency market as well.

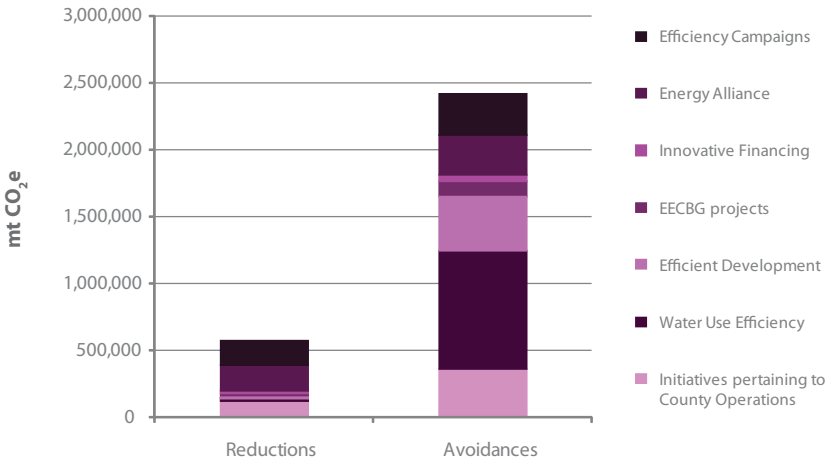
Because all renewable and alternative fuels are not the same, new fuels should be analyzed to ensure that they are sustainably sourced and have net environmental benefits. To estimate the impacts of renewable and alternative fuels on GHG emissions, the entire fuel lifecycle including fossil fuel extraction or feedstock growth, fuel production, distribution, and combustion should be evaluated.

No emissions reductions were calculated for this strategy; however, it is clear that by displacing the use of fossil fuels, vast GHG emissions reductions can potentially be achieved.

Strategy: Be government leaders in energy, fuel, and water efficiency

This strategy is a collection of 10 initiatives that address conservation of electricity, fuel and water in Miami-Dade County government operations. This strategy contains initiatives that build on current successes such as collecting energy-related data and reporting emissions. For example, when the CCX pilot program for direct emissions ends, the County will continue to collect data and report these emissions related to government operations. This will ensure continued leadership in the area of energy, fuel and water efficiency. This strategy area also contains new initiatives such as developing and implementing a government energy efficiency master plan. In many cases these initiatives involve developing new procedures and intensive data gathering that enable the County to identify operations that use the most resources; this information will then be used to prioritize future actions to reduce energy and water consumption even more and in a cost-effective manner. Initiatives that facilitate new procedures or expanded use of technological solutions will be assessed to ensure net sustainability benefits. Overall these initiatives will reduce GHG emissions by 117,128 mt CO_2e and avoid 355,000 mt CO_2e.

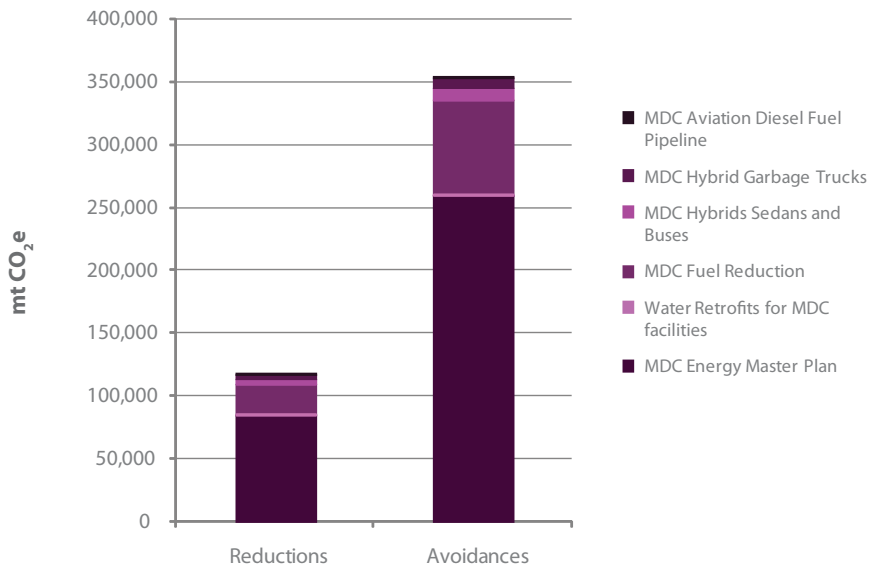
Emissions Impact Benefits of Community-wide Initiatives from the Water and Energy Efficiency Goal Area



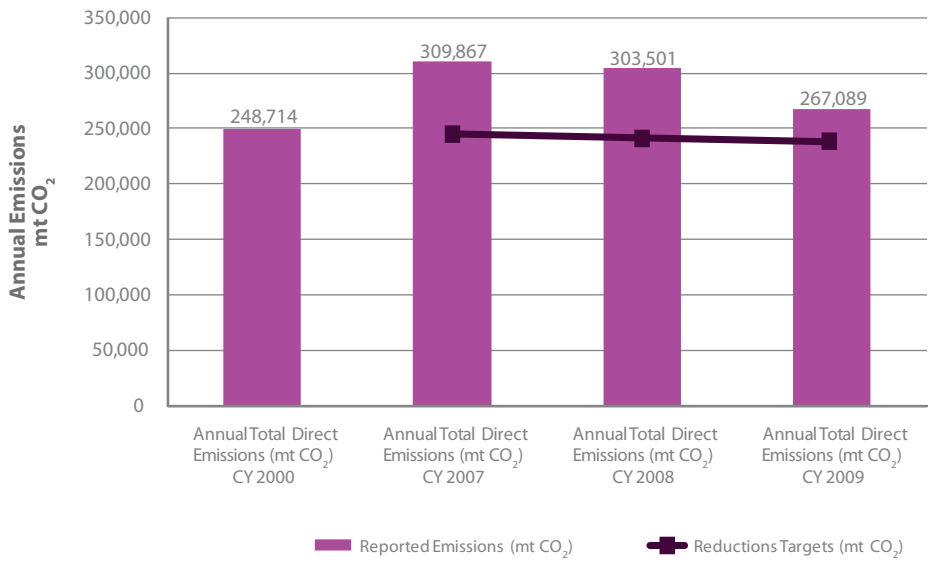
This is a graphical depiction of the emissions reductions and avoidances associated with Water and Energy initiatives. The bulk of initiatives will provide greater impact beyond the ***GreenPrint*** 2015 timeline.

Emissions Impact Benefits of Miami-Dade County Operations Initiatives from the Water and Energy Efficiency Goal Area

This is a graphical depiction of the emissions reductions and avoidances associated with County-specific Water and Energy initiatives. These are new initiatives that will build upon existing and recurring efforts.



Fuel Emissions of County Government Operations Chicago Climate Exchange



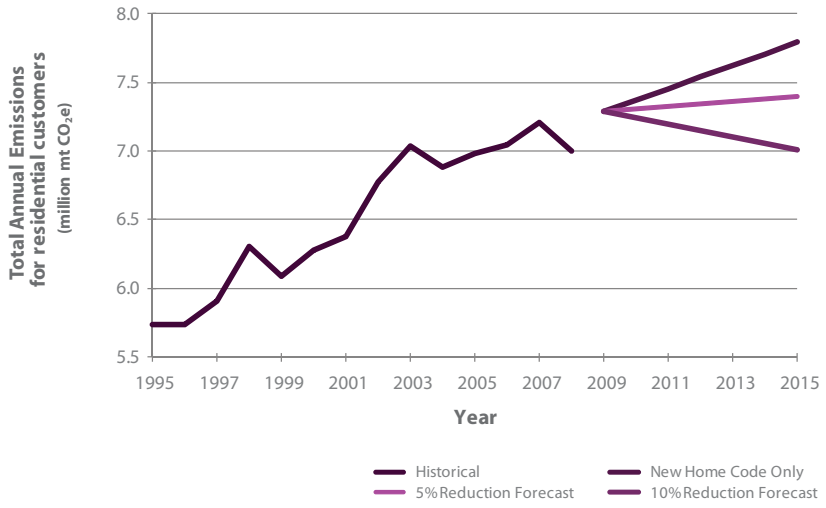
The adjacent chart shows data from the Chicago Climate Exchange (CCX) Program, one of Miami-Dade County's ongoing initiatives for tracking and reducing direct fuel emissions resulting from government operations. In this case, data was collected and emissions calculated according to CCX protocol. While CCX targets have not been met, the trend is in the right direction.

Miami-Dade reduced its fuel-related direct emissions by 42,778 metric tons of CO_2 from 2007 to 2009.

Furthering Emissions Reductions

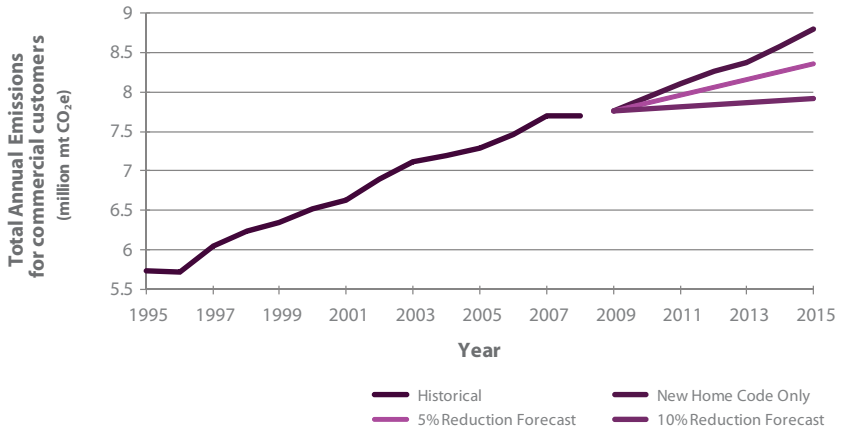
The strategies and initiatives to reduce energy and water use are, in almost every case, supportive of the ***GreenPrint*** Climate Action Plan's mission. By using energy and water more efficiently and more conservatively, we realize GHG emission reduction benefits. It is important to keep in mind that the projected GHG emission reductions are estimates based on realistic goals achievable within a foreseeable timeframe. In almost all cases, the potential for GHG emission reductions are greater than the plan reflects; some of them may increase exponentially after the first five years. Further reductions can be achieved by increasing financial investments in the initiatives, developing broader marketing plans, and adopting policies that enable greater participation in programs.

Forecast Scenario for Miami-Dade County Residential Sector Emissions Projections due to Electricity Consumption



These figures show additional emissions reductions based on electricity forecast for the residential and commercial sector if customers opt to improve existing buildings five percent or ten percent beyond what is required by the Florida Energy Code, thus resulting in more efficient buildings. As depicted in the graphs, more aggressive reductions in energy consumption result in greater emission reductions.

Forecast Scenario for Miami-Dade County Commercial Sector Emissions Projections due to Electricity Consumption



This can be illustrated by examining the strategy to incentivize energy efficient development. This initiative involves increasing energy efficiency in existing buildings and reaching total compliance with the Florida Energy Code for new construction. As a result of increasing the energy efficiency of buildings, their associated emissions are also reduced. The initiative milestones include: implementing recommendations from the Sustainable Code and Permitting Project (underway) pertaining to sustainable development; developing an incentive package such as reduced impact fees, intensity bonuses, and expedited permitting for green projects; developing a training program for building inspectors in order to attain total compliance with the Florida Energy Code; and marketing the program to property owners through websites and educational workshops. The projected emission reductions are based on a participation of 350 residential projects and 150 commercial renovation or expansion projects. These figures show projections in the emissions output of the average residential and commercial electric utility customer at different levels of energy performance. The more customers that opt to participate, the more emissions will be reduced; likewise, to the degree that the buildings are more efficient than required by code, the more emissions they reduce as a result.

Every initiative in the Water and Energy Efficiency goal area is designed to be scalable and achieve greater GHG emissions reductions than can be realized over the intial five-year period. In meeting its ***GreenPrint*** energy aspirational goal, emissions are projected to be reduced by 7.1 million mt CO_2e. However, emissions reductions for the Water and Energy Efficiency goal area are estimated at 574,000 mt CO_2e. While this is a first step toward meeting our reduction targets, it is important to note that further investments must be made in order to achieve County-adopted mandates.

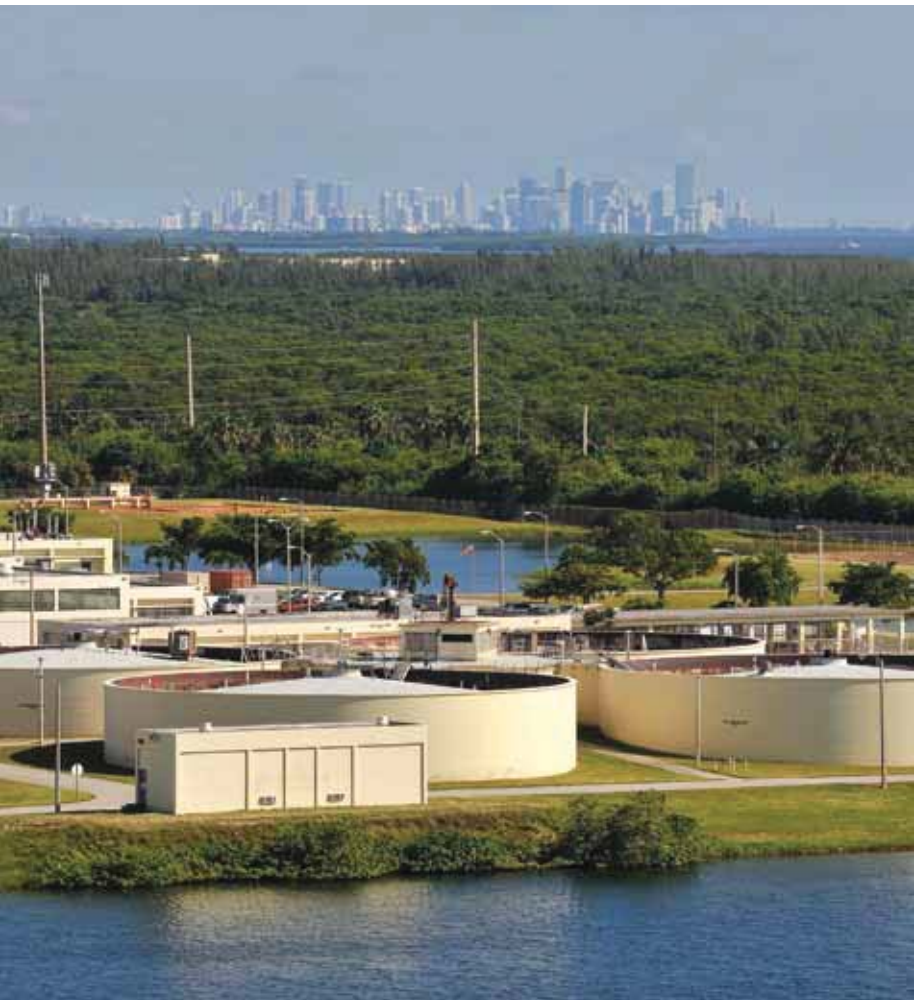
The Role of Our Environment

Our Environment is critical for the well-being of our residents, our ecosystems, and our economy. Quality air, water, marine resources, coastal habitats and wetlands are invaluable, and we work aggressively to improve and protect them. For purposes of the ***GreenPrint*** Climate Change Action Plan, the strategies and initiatives generally do not result in significant carbon emission decreases. Other sustainability benefits are numerous and tangible through storing and sequestering carbon emissions and providing healthy and livable environments. Strategies that have a beneficial impact on carbon storage, sequestration or emissions are included below.

Our Environment Strategies Contributing to Climate Action Plan Mitigation Efforts

- Implement wastewater reuse to provide future water supply and benefit the environment
- Protect environmental and other lands important for ecosystem and community resilience
- Protect, enhance, and restore our natural resources
- Develop a sustainable Solid Waste System and Master Plan, using waste to benefit our economy and environment

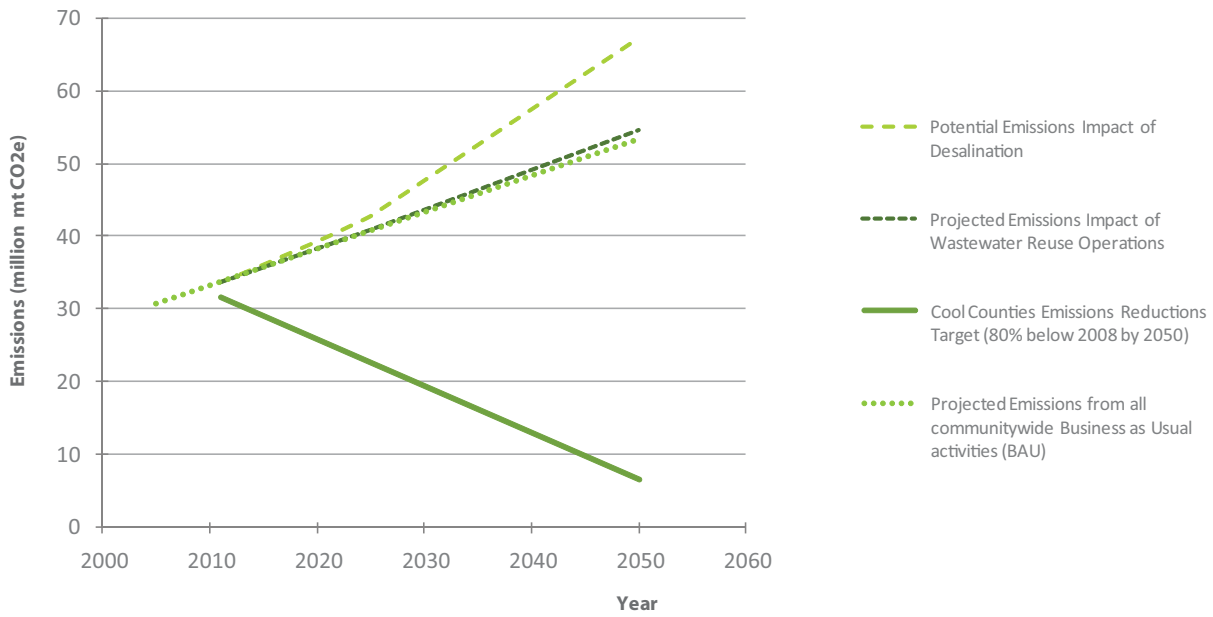
The initiatives in Our Environment Goal Area reduce emissions by 19,900 mt CO_2e and avoid 66,200 mt CO_2e.



Strategy: Implement wastewater reuse to provide future water supply and benefit the environment

This strategy includes initiatives to implement water reuse projects to recharge the Biscayne Aquifer and a pilot study to rehydrate wetlands and Biscayne Bay. As highlighted in the Water and Energy Efficiency goal area, water conservation and efficiency efforts have been successful and may even result in the postponement of planned wastewater reuse projects. Wastewater reuse projects have a clear long-term sustainability focus: preserving our drinking water supply in light of projected population increases and for ecosystem needs. On the other hand, wastewater reuse operations require more energy than current treatment. As illustrated in the next figure, these increased energy needs are significantly less than the alternative option of desalination. In fact, it is estimated that seawater desalination could use over 10 times the energy as reclaimed waste water (Cooley, Gleik, and Wolf).

Emissions Impact Comparison of Wastewater Reuse to Desalination



The above figure illustrates that increased emissions associated with wastewater reuse operations are significantly less than the alternative option of desalination.

Strategy: Protect environmental and other lands that may be important for ecosystem and community resilience

This strategy contains initiatives to acquire environmentally valuable lands and explore alternative funding sources through a carbon offset program. The Environmentally Endangered Lands (EEL) Program was established in 1990 through a countywide referendum that approved a two-year tax increase to acquire, restore and maintain environmentally endangered lands. Acquisition ensures that these lands are shielded from development and will continue to thrive as natural habitats. Current acquisitions exceed 20,000 acres and include rockridge pinelands, tropical hardwood hammocks, freshwater wetlands, coastal wetlands and scrub habitat.

The Climate Change Connection

By adopting a precautionary approach that maximizes the amount of open land retained over time, opportunities to adapt to the effects of climate change are preserved over the long term. Preservation of these lands also provides considerable carbon storage and sequestration value. The following table illustrates this value for current and future acquisitions. Raising additional revenue through a carbon offset program would extend the sustainability of the current trust fund which covers both purchases and management. Determining the potential revenue stream associated with such a program will be explored within year one of the ***GreenPrint*** Implementation Plan.

The retention of natural and open land provides many critical public services such as replenishing drinking water supplies, greater flexibility in protecting against saltwater intrusion, contributing to the implementation of regional restoration efforts, conserving native wildlife and habitats, and providing recreational space. Open and undeveloped lands, whether currently under some mechanism of protection or not, offer the greatest opportunities to provide for adaptation to the effects of climate change.

Benefits of Environmentally Endangered Lands for Carbon Storage and Sequestration

Environmentally Endangered Lands (acres)	Acres	Total Carbon Stored (Metric Tons)	Total Yearly Accumulation Carbon (Metric Tons)
EEL-owned lands	20,000	4,756,287.9	9,226.05
EEL-managed lands	2,800	268,501.2	2,108.6
Total	22,800	5,024,789.1	11,334.65
Remaining acres to be acquired	17,538.1	4,004,351.7	8,216.8

Sources: (Florida Fish and Wildlife Conservation Commission, National Council for Air and Stream Improvement and the United States Department of Agriculture Forest Service, South Florida Water Management District)

The table above demonstrates the existing carbon storage and annual sequestration value we gain from preserving environmentally endangered lands. It shows currently held lands as well as those that remain on the program acquisition list. More than five million metric tons of carbon is currently stored due to the EEL program.

Strategy: Protect, enhance, and restore our natural resources

This strategy contains multiple natural resource sustainability initiatives contributing to each sustainability pillar. Natural systems provide vital habitats for fish, wildlife, and tropical plant communities, including globally imperiled species. These settings contribute to recreational and economic opportunities for residents and visitors. The beach dunes, reefs and mangrove shoreline provide a buffer against costly storm erosion. Wetlands and other open lands are natural water reserves, storing and filtering fresh water and recharging the aquifer. Air quality is generally reflective of vehicle emissions and progressive pollution controls and has direct human health impacts. Air quality is frequently used when assessing clean cities and countries.

The Climate Change Connection

Wetlands, forests, and submerged plant communities also sequester carbon, contributing to reduction in GHGs. Reducing vehicle use directly reduces air pollution as well as carbon emissions. There is significant carbon sequestration value in the initiatives to minimize the impact of development on natural resources and continue to enhance and restore coastal habitats important to the health of Biscayne Bay. Wetlands and mangroves are protected in Miami-Dade County, and many restoration projects include their creation or enhancement as well. Layers of soil and peat that make up the mangrove substrate have a high carbon content of 10 percent or more. When disturbed, carbon is released back into the atmosphere, further contributing to increased carbon emissions (Ong).

Simply stated, undisturbed wetlands and mangroves are essential in capturing carbon. The existing acreage of wetlands is estimated at more than 800,000 acres, storing more than 212 million metric tons of carbon. 451 acres of coastal habitat have been enhanced by Miami-Dade County, and this number will grow to 535 acres within the ***GreenPrint*** timeframe. Determining the existing acreage of coastal mangroves within these habitats will be determined during year one of the ***GreenPrint*** Implementation Plan.

The Benefits of Wetlands Preservation and Restoration for Carbon Storage and Sequestration

Approximate Existing Wetlands within Miami-Dade County	Acres	Total Carbon Stored (Metric Tons)	Total Yearly Accumulation Carbon (Metric Tons)
Existing wetlands (excluding EEL acres reported in Table 1)	129,617	31,945,266	54,553
Existing wetlands acres within Everglades National Park wetlands	712,670	175,643,881	299,950
Total	860,870	212,169,093	362,325

The table above demonstrates the existing carbon storage and annual sequestration value we gain from preserving estimated existing wetlands. It is estimated that more than 212 million metric tons of carbon is currently stored.

Strategy: Develop a sustainable Solid Waste System and Master Plan, using waste to benefit our economy and environment

An essential component of Our Environment is the management of the resources we use. The amount and type of waste generated by a community - and the strategies employed to manage or treat that waste - contribute to human health, the environment, land use and economic development. The initiatives within this strategy include developing a sustainable Solid Waste Master Plan, using waste and landfill gas as energy, composting and recycling.

The Climate Change Connection

Currently, the County converts waste to energy (WTE). In FY 2008-09, this equaled 304,098,000 kWh, enough electricity to power approximately 21,000 homes. This amount offsets CO_2 emissions that would have been generated by the electric utility. Since this is an existing operation, it will not count directly towards any emission reductions within the ***GreenPrint*** planning timeframe. However, the Solid Waste Master Plan may result in WTE increases or decreases that would impact the quantity of emissions as compared to alternative options.

Community-wide and Residential Recycling

As a community, we recycled approximately 21 percent of the waste stream in 2009, according to the State of Florida recycling rate methodology. This includes the County's residential curbside recycling program, the conversion of yard trash into biomass fuel, the extraction of metals from garbage at the WTE plant, and the collection of white goods. It also includes municipal recycling programs and private sector recycling efforts. Miami-Dade County has conducted residential recycling since 1994. In 2008, we transitioned from a dual to a single-stream program, increasing annual collection tonnage by 88 percent.

In assessing the GHG emissions impact of recycling, the ICLEI Clean Air and Climate Protection (CACP) software and methodology demonstrates that the overall community recycling tonnage generates 1.5 million tons of CO_2e emissions offsets in comparison to landfilling. The County residential recycling program offset 155,000 CO_2e emissions. However, impacts specific to Miami-Dade County are more complex, and a life-cycle analysis approach is necessary. This would illustrate a comparative analysis of recycling material types and disposal methods. It would incorporate energy use and associated GHG emissions for recyclable goods that are land filled in comparison to being incinerated or recycled. This effort is incorporated in the Solid Waste Master Plan, with results expected in 2011.

The Role of Responsible Land Use and Smart Transportation

Each strategy and initiative in the Responsible Land Use and Smart Transportation area contributes to the goals of the Climate Change Action Plan. These are a collection of existing and new strategies that address land use patterns, community and transit design, services provided on the system, as well as strategies to improve system efficiencies associated with growth and mobility. The actions in this goal area are expected to achieve cross-cutting benefits from reducing emissions by facilitating a shift in trips made in the personal automobile to walking, biking and public transportation, to facilitating healthier communities through actions targeting street design, parks, and bicycle and walking facilities. It recognizes the need to prioritize sustainable modes of transportation in the long term while continuing to provide increased connectivity and improved traffic flow on the existing transportation network.

Responsible Land Use and Smart Transportation Strategies Contributing to Climate Action Plan Mitigation Efforts

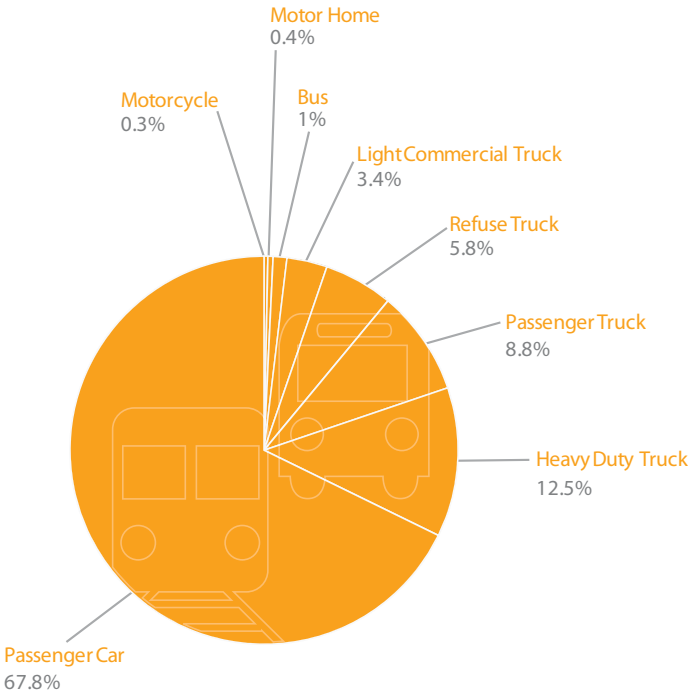
- Better integrate planning and prioritize investments
- Support existing communities and value neighborhoods
- Increase bicycling & walking
- Increase transit ridership
- Improve connectivity and mobility on the existing system

The initiatives in the Responsible Land Use and Smart Transportation Goal Area reduce emissions by 532,000 mt CO_2 e and avoid 608,000 mt CO_2e

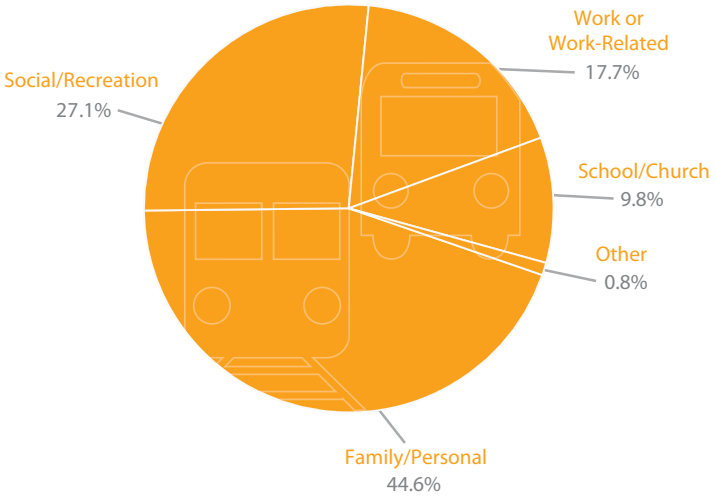
Decreasing the distances between where people live, work, play, and shop will reduce driving distances and perhaps avoid some automobile trips altogether. The figure below illustrates that the personal automobile will continue to be the greatest contributor to CO_2e emissions (10 metric tons/year), following the completion of transportation projects planned and funded through 2015 (MPO, "Emissions Scenarios"). The breakdown of trips by purpose from the U.S. Department of Transportation estimates that most trips are not work-related, but are trips that are shorter and personal, such as errands and shopping. Therefore, achieving more compact development in urban and suburban settings would make a great impact on reducing vehicle miles traveled (VMT) on the system (Urban Land Institute 5).

2015 Estimated Daily Greenhouse Gas Emissions by Vehicle Type

The personal automobile is expected to continue to be the largest source of GHG emissions within the transportation sector in 2015, contributing 68 percent of the GHG emissions . This estimate is based on transportation modeling, which includes transportation projects planned through 2015. (MPO, "Emissions Scenarios" Figure 12)



Breakdown of Trips by Purpose



Most trips are not work-related. Compact development can help people reduce car use for errands, shopping , and other personal trips. (Urban Land Institute 5)

Compact development strategies are not typically highlighted in climate change mitigation because they are considered indirect measures. They may reduce driving, but it is difficult to quantify the reductions caused by land use and zoning policies that encourage infill development. Several recent studies have analyzed and documented the effect of compact development on driving. A study published by the Urban Land Institute, "Growing Cooler: The Evidence on Urban Development and Climate Change," estimates that the five "Ds" of compact development— density, diversity, design, destination, and distance to transit—can lead to 12 to 18 percent reductions in VMT by 2050 (Urban Land Institute 20). The studies reported a wide range of reductions in VMT, five to 60 percent, which is an indication of how much there is to be learned about the effect of compact development on driving. An additional economic benefit of VMT reductions is reducing the vulnerability of residents and businesses to sudden increases in gasoline prices. For purposes of estimating the benefits through implementing this plan, a five percent decrease in VMT from compact development strategies and initiatives has been established. The target was chosen in light of the wide ranges established in the studies and is likely very conservative based on the Transit Oriented Development and rezoning efforts over the past 11 years in areas designated as urban centers. Applying a five percent reduction target to projected GHG emissions from the system in 2015, reveals a potential reduction of 500,000 metric tons of CO_2e.

What is Compact Development?

Successful compact development is a land use settlement pattern that features most or all of the following:

- Concentrations of population and/or employment;
- Medium to high densities appropriate to context;
- A mix of uses;
- Interconnected streets;
- Innovative and flexible approaches to parking;
- Pedestrian, bicycle and transit-friendly design; and
- Access and proximity to transit.

Compact development can be built anywhere. It encompasses residential and commercial development and can be adapted to urban, suburban, and rural settings. Single-family houses, townhomes, and apartments all have a place in compact development. Employment centers are also important candidates for compact development.

(Urban Land Institute 3)

To focus on how ***GreenPrint*** strategies will reduce emissions and aid in future planning and decision-making, calculations are provided below for those initiatives for which assumptions were feasible to develop. Initiatives are organized in the following strategy groupings:

Strategies: Better Integrate Planning and Prioritize Investments & Support Existing Communities and Value Neighborhoods

These strategies include a collection of initiatives addressing planning, land use, and community design, which are expected to cumulatively and indirectly achieve significant GHG emissions reductions. The overarching strategy to "Better Integrate Planning and Prioritize Investments" is designed to make future investments in an efficient transportation system that provides more choices, reduces household transportation costs, supports our unique economic engines and create close-knit, self-sufficient neighborhoods connected by sustainable transportation services. It also includes initiatives to explore opportunities to shift current funding revenue streams and to identify new and innovative funding sources and mechanisms to support transit and other sustainable modes. The second strategy to "Support Existing Communities and Value Neighborhoods" includes initiatives aimed at driving development to infill areas and redevelopment areas through such initiatives as lowering barriers to increasing densities in infill and redevelopment areas and providing incentives. Some barriers identified through the planning process include water and sewer infrastructure, poor design, and minimal connectivity. Other initiatives include providing for meaningful open spaces and recreation areas, designing pedestrian and bicycle friendly neighborhoods and providing for housing diversity.

The Climate Change Connection

The initiatives in these strategies are expected to lead to significant emissions reductions through VMT reductions prompted by more compact development. GHG emissions reduction estimates were made for the initiative "Increase Transit-Oriented Development" as indicated below. One such approach is to establish housing and mixed-use facilities near Metrorail stations. Actual ridership percentage gains realized through the affordable housing development at the Santa Clara Metrorail Station were applied to two projects scheduled for completion by 2015.

Quantified Emission Reductions Associated with Strategies

Initiative	Total Projected VMT Reduced (miles/yr)	Total Projected Reduced Emissions (mt CO_2e)
Implementation of policies and initiatives leading to compact development	5 percent decrease	500,000
Initiatives contributing to the overall 5 percent decrease, for which VMT estimates were made:		
Transit-Oriented Development-Brownsville a 467-unit affordable housing building (expected completion by 2014)	7,633,397	4,206
Transit-Oriented Development-Northside a 350-unit affordable housing building (expected completion by 2014)	14,138,547	7,791

Strategy: Increase Bicycling & Walking

This strategy is a collection of initiatives expected to shift from trips in the personal automobile to bicycling or walking trips. Actions include providing more bicycle and pedestrian facilities and amenities such as parking and end-of-trip facilities. Two innovative and potentially game-changing initiatives are to adopt a complete streets policy that will drive the prioritization of alternative and more sustainable modes of transportation in street design and construction, and the initiative to reduce the automobile parking requirements in the zoning code.

The Climate Change Connection

The goal is to increase the percentage of trips taken by walking or bicycling from 10 to 16 percent, consistent with the Federal Highway Administration's goal of 15.8 percent. Also listed are the emissions reductions expected from two specific projects where assumptions and methodologies could be established:

Quantified Emission Reductions Associated with Strategy

Initiative	Total Projected Reduced Emissions (mt CO_2e)
Increase the percentage of total trips taken by walking or bicycling from 10 percent to 16 percent of all travel trips *(over plan period of 5 years)*	128,622
Fund & Construct Priority non-motorized multi-use trails 8.4 miles of Black Creek Trail *(expected completion by July 2012)*	643
Include designated bicycle space within Metrorail cars *(1,750 bikes on trains/year beginning in 2014)*	984
Total	130,249*

***Note: - These emissions are a component of the emissions reductions estimated from compact development strategies (500,000 mtons CO_2e) and initiatives and will be discounted from those estimates in emissions summary tables. CO_2e and initiatives and will be discounted from those estimates in emissions summary tables.**

The estimated emissions reductions for the aspirational goal were established using data from the National Household Travel Survey (U.S. DOT n. pag.), which includes the Miami-Ft. Lauderdale Consolidated Metropolitan Statistical Area (CMSA) and was prorated by population as follows:

Emission Reductions to Achieve a Six Percent Increase in Walking and Biking Trips

Trip Mode	Total add. Trips 2010-2015	Miles per trip	Vehicle miles reduced	Emissions reduced (mt C02e)
Biking	85,288,323	2	170,576,647	94,007
Walking	465,430,565	0.5	232,715,282	128,252
			Total	222,259
			At 58 percent (Miami-Dade vs. Broward population)	130,249

Strategy: Increase Transit Ridership

This strategy is a collection of initiatives that include implementable transportation improvements along priority corridors, linking the Metrorail to Miami International Airport (MIA), establishing strategically located Park & Ride facilities, and other service and efficiency improvements. With limited funding for new capital projects and increasing operation and maintenance costs, a series of low-cost efficiency actions are being prioritized. These initiatives are not listed below as they do not provide direct emissions reductions but are expected to increase ridership, particularly boosting "choice ridership," attracting those individuals who could drive their cars but who choose to ride transit instead because of the conveniences and other benefits. Non-quantified initiatives include developing social marketing campaigns to make riding transit "cool," continuing to improve safety, increasing technology features including real time bus signage announcing arrival times and Wi-Fi availability, and improving access and amenities at transit stops and stations for all users.

The Climate Change Connection

All initiatives in this strategy contribute to achieving the overarching aspirational goal to add 10 million boardings to our public transportation system through increased services, enhancing convenience, comfort, and timely service. True to the interlinked nature of land use and transportation, initiatives grouped under the first strategy in this area, such as increasing transit-oriented development, also contribute to an increase in ridership. Other contributions to reductions are expected from initiatives that target transit service improvements and other low-cost efficiency improvement-type actions.

The table below illustrates the aspirational goal of increasing transit ridership by 10 percent, or 10 million boardings, along with estimated gains from additional percentage increases:

Emission Reductions from Increasing Transit Ridership

Miami-Dade County	Metro Bus	Metrorail	Metro Mover	Total
If we increase transit ridership by	Reduced emissions from ridership increase in mt CO_2e			mt CO_2e
10 percent	18,747	7,238	463	26,448
20 percent	37,495	14,476	926	52,897
30 percent	56,242	21,714	1389	79,345
40 percent	74,990	28,952	1852	105,794
50 percent	93,737	36,191	2315	132,242

Specific reductions calculations were possible for a few initiatives within this strategy, one of which is to improve transit services and to develop transit ridership within priority corridors so premium transit service, such as bus rapid transit or a rail transit system, can be implemented successfully when deemed feasible. Corridor improvements include articulated hybrid buses, improved transit stops, Wi-Fi, traffic signal priority, improved headways, and Park and Ride facilities. (MPO, "Draft Near Term" 15). Ridership projections were made for these planned improvements and are the basis for the emissions reduction estimates. Estimates were also calculated for Park and Ride facilities planned for specific locations based on parking capacities of several planned facilities. Opportunities for public-private partnerships to establish Park-and-Ride facilities, as a part of transportation concurrency requirements for new developments, are being pursued. Finally, ridership increases were projected for the AirportLink system expansion connecting the Metrorail to the Miami Intermodal Center and, eventually, MIA.

airportlink

An additional two million Metrorail boardings expected each year with the completion of the Airport Link, which connects the Metrorail to Miami International Airport.

Quantified Emission Reductions Associated with Strategy

Initiative	Total Projected Reduced Emissions (mt CO_2e)
Add 10 million boardings to our public transportation system through increased services, enhancing convenience, comfort, and timely service - over plan period of five years	13,901
Increase the number of enhanced bus corridors – Service improvements on four priority corridors over the plan period of five years	3,258
Increase the number of Park and Ride facilities. Establishing six facilities by 2015	892
Complete the Airport Link – connection of the Metrorail to Miami International Airport – completion by April 2012	8,397
Total	26,448*

***Note: - The initiatives in this strategy contribute to the estimated emissions reductions from the aspirational goal of increasing transit ridership by 10 percent, or 10 million boardings (26,448 mtons CO2e) as established in the previous table.**

Strategy: Improve Connectivity and Mobility on the Existing System

This strategy is a collection of existing and new initiatives that address the need to increase connectivity and improve traffic flow on the existing transportation network. Initiatives include providing critical connections throughout the network, improving freight movement and access to our economic engines, expanding proven strategies to smooth traffic flows, and promoting ridesharing programs within our region. Initiatives in this area also include prioritizing projects that improve connectivity and mobility between major economic drivers and major activity hubs such as the Port of Miami, MIA, sports and arts venues, and convention centers. This effort recognizes the need to focus on those projects that provide for the greatest number of jobs as well as those that improve the economic competiveness of our communtity.

The Climate Change Connection

In terms of emissions reductions, the improved movement or flow of people and freight accomodated through these projects is expected to reduce travel times and, in the case of freight projects, ease the conflict between commercial trucks and personal passenger vehicles on urban streets and major roadways. Another significant opportunity for communities to reduce idling time of vehicles on the network is through the implementation of traffic system management solutions including improved signal timing, or Advanced Traffic Management System (ATMS). As of August 31, 2010, the County completed installation of 94.8 percent of ATMS on designated intersections. The emissions reduction benefits from this program are not included in this plan because they were put in place prior to plan development. The emissions reductions associated are expected to be significant from a decrease in overall fuel consumption as a result of increased traffic flow, reduction of traffic stops, and an overall reduction in traveling time.

The following are initiatives for which assumptions and methodologies were developed to estimate emissions reductions:

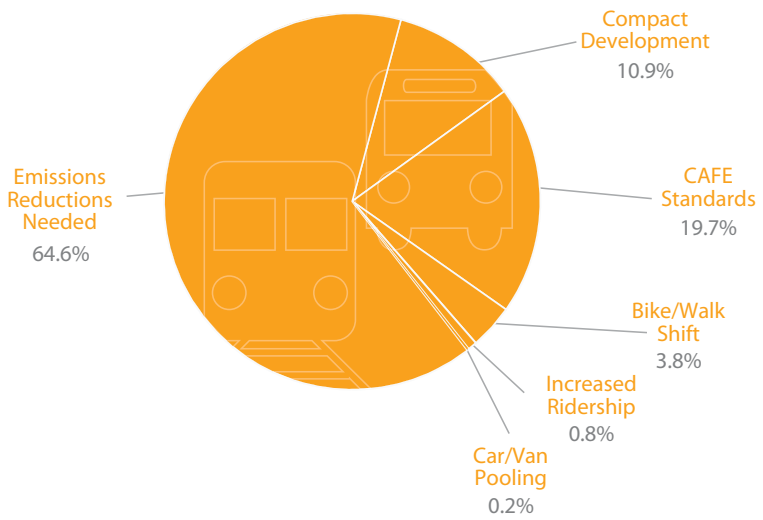
Quantified Emission Reductions Associated with Strategy

Initiative	Total Projected Reduced Emissions (mt CO_2e)
Work in partnership with the Metropolitan Planning Organization (MPO) and South Florida Commuter Services to expand carpooling and vanpooling programs Increase carpool participation by five percent/year Increase Vanpool fleet by 12 vans/year	Carpooling 3,892
	Vanpooling 1,613
Expand the express bus service between Miami-Dade and Broward counties through extending the I-95 managed/express lanes from Golden Glades Interchange to I-595 (expected completion of construction by December 2013)	337
Total	5,842

Is it enough?

Overall emissions would need to be decreased by 6.78 million metric tons of CO_2 by 2015 to reach adopted targets. Recognizing the transportation sector accounts for approximately half of all GHG emissions, adopting a proportional target reduction would require a reduction of 3.39 million metric tons of CO_2 emissions by 2015 from the transportation sector. The culmination of emissions reductions estimates from the strategies and initiatives in this area, as well as the expected emissions reduction gains from the phasing in of cars with higher fuel efficiency as a result of the current Corporate Average Fuel Economy (CAFE) Standards, is depicted in the below figure.

Percent Contribution to Greenhouse Gas Emissions Reduction Target from the Land Use and Transportation Goal Area



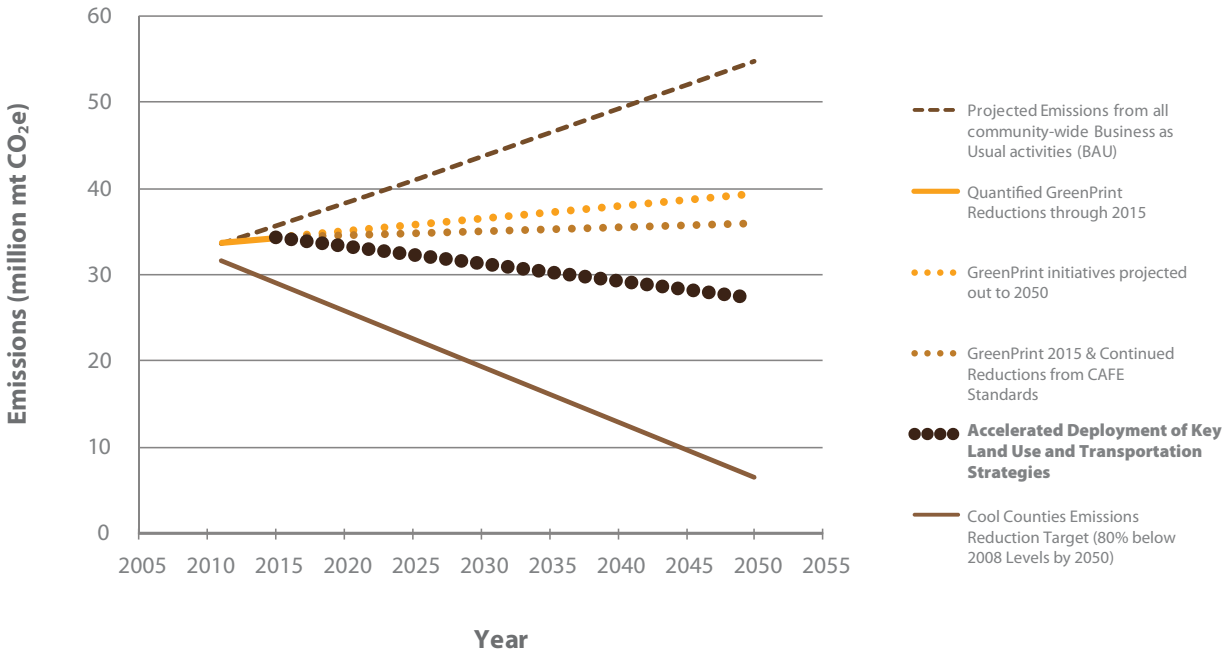
This figure illustrates the need for reductions necessary to reach our aggressive long-term target. It is important to understand that this plan includes actionable initiatives implementable within the five-year time frame. It is an important beginning that informs the next critical steps. While the transportation sector provides one of the greatest opportunities for emissions reductions, it also provides the greatest challenges given the high cost of multimodal investments and our existing development pattern. This includes changes in land uses, compact and mixed-use developments that are dependent on market and overall economic conditions, and investments needed to establish a true multimodal transportation system. This plan endeavors to establish a framework by which priorities and investments are made.

Based on emissions produced, the transportation sector must play a significant role in reduction: roughly 50 percent. This chart represents the quantifiable percent contribution from the initiatives and highlights the remaining opportunities for reduction. Reductions in this goal area will need to be accelerated to reach the 80 percent reduction goal by 2050.

Closing the Gap

There is no silver bullet solution, especially in light of economic constraints. Perhaps the first step is to agree on our destination, to agree that we will take deliberate and concerted steps to shape our community, to make decisions in policies, investments, processes, that are driven by the expected benefits to our community and our future. The strategies within the Leadership, Connections, and Commitment Goal Area and strategies outlined here set that path. Accelerated benefits could be realized by pushing key ***GreenPrint*** strategies further and faster. The figure below illustrates deployment scenarios for some key strategies to close the gap: moderate to aggressive implementation of compact development strategies, increasing the rate at which vehicles are replaced with higher fuel efficient vehicles, and increasing the percentage of trips made by alternative modes, particularly by mass transit.

Greenhouse Gas Emissions Scenarios for the Land Use and Transportation Goal Area



This graph depicts the emissions reductions of varying implementation scenarios of key land use and transportation strategies and their potential acceleration. Acceleration includes intensifying compact development efforts, expediting vehicle replacements that meet CAFE standards, and shifting 10 percent of overall trips on the system from the personal automobile to walking, biking, and transit trips.

Growing Smarter

Intensifying the deployment of a compact and efficient urban form through more density, diversity, design, destination, and distance to transit could realize a 12 to 18 percent reduction in VMT by 2050 (Urban Land Institute 20). According to recent studies, this could contribute a 6.4 million to 9.6 million metric tons CO_2e reduction to long-term emissions.

Shifting to More Fuel Efficient Vehicles

Fuel economy standards currently are, as they have been since its creation in 1975, set through the CAFE standards, administered by the National Highway Traffic Safety Administration (NHSTA). On April 1, 2010, EPA and NHTSA announced a joint final rule requiring passenger cars, light-duty trucks, and medium-duty passenger vehicles meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 34.1 miles per gallon (MPG) (U.S. EPA n. pag.). The standards apply to model years 2012 through 2016. The EPA and NHTSA are now working on rulemaking to establish national standards for model years 2017 and beyond.

It is important to note that the average rate of increase in fuel efficiency for vehicles entering the fleet over the last 10 years was used to project emissions for the years beyond 2017. This is likely a conservative estimate considering the EPA recently released proposed standards ranging from 47 to 62 MPG for model years 2017 to 2025 (U.S. EPA n. pag.). An increase in MPG for model years beyond 2017 would increase the rate of introduction of more fuel efficient vehicles into the community fleet. For example, assuming a 2.1 percent increase per year rather than a 1.7 percent increase would accelerate the amount of emissions reductions that could be realized by 2050, illustrated in the chart to the left. Miami-Dade County could be at the forefront of the efforts to advocate for rapid implementation of the new CAFE standards and for federal, state and local incentive programs. This is an area where the County is leading by example with its fleet purchases, which include 329 active gasoline-electric hybrid sedans, three of which are plug-in hybrid electric vehicles (PHEVs).

Current standards could cut greenhouse gas emissions by an estimated 670,000 metric tons CO2e over the first period of this plan, based on an estimated 1.7 percent MPG increase per year across the fleet.

Making Mass Transit a Viable Option

The personal automobile contributes 68 percent of the emissions from the transportation sector. Our current public transportation system supports four percent, or 326,000 (MPO, "Draft Near Term" 9) out of approximately eight million daily trips on the network (MPO "Long Range" 55). Considering this, adopting a scenario of doubling current ridership would not make a significant impact on reducing emissions relative to the target. Shifting 10 percent of the eight million daily trips to walking, biking, and mass transit would result in emissions reductions of 650,000 mt CO_2e by 2050, and is a component of the emissions reductions represented by the accelerated deployment scenario. The County's current direction for transit is improving services and developing transit ridership within priority corridors so that when a rail transit system is deemed feasible it can be implemented successfully (MPO, "Draft Near Term" 15). The acceleration of this phased-in approach is critical not only to realizing sustainability benefits for residents but also to achieving emissions reductions needed to mitigate climate change.

Initiatives addressing the barriers to increasing densities in infill and redevelopment areas and incentivizing effective development are essential for acceleration, as is significant support from leadership, both in terms of policy and funding.

Absent the resources to move the needle on emissions reductions that quickly, it is still important to make the improvements outlined in the strategies and initiatives. It all adds up to a more sustainable community. "Combinations of strategies create synergies that enhance the potential reductions from individual measures. In particular, land use changes combined with expanded transit services achieve stronger GHG reductions than when only one option is implemented" (Cambridge 1).

The Role of Vibrant Economy

The strategies and initiatives in this portion of the plan have indirect emissions reductions as well as direct impacts that will be determined though the ***GreenPrint*** implementation process.

Vibrant Economy Strategies Contributing to Climate Action Plan Mitigation Efforts

- Build a sustainable economy and promote green business

The initiatives in the Vibrant Economy Goal Area reduce emissions by 326,000 mt CO_2e and avoid 326,000 mt CO_2e.

Strategy: Build a sustainable economy and promote green business

The focus of Vibrant Economy is building upon our successful economic engines and transforming operations into more sustainable practices. From the airport and seaport to trade, tourism and agriculture, we can build a sustainable economy and promote green business. Miami-Dade County benefits from a diverse economy, not solely relying on one or two industries. While tourism, trade and agriculture are key economic drivers, Miami-Dade County also enjoys a thriving small business sector.

A recent article in "Environment 360" posed this intriguing question, "how significant would it be if America's 29 million small businesses increased their energy efficiency and reduced their emissions?" (Bowman n.pag.) Running a more energy-efficient business and sustainable operation is easier than reaching consensus on sea level rise maps. Given the number of small businesses that make up the diverse Miami-Dade economy, there is great potential to reduce emissions.

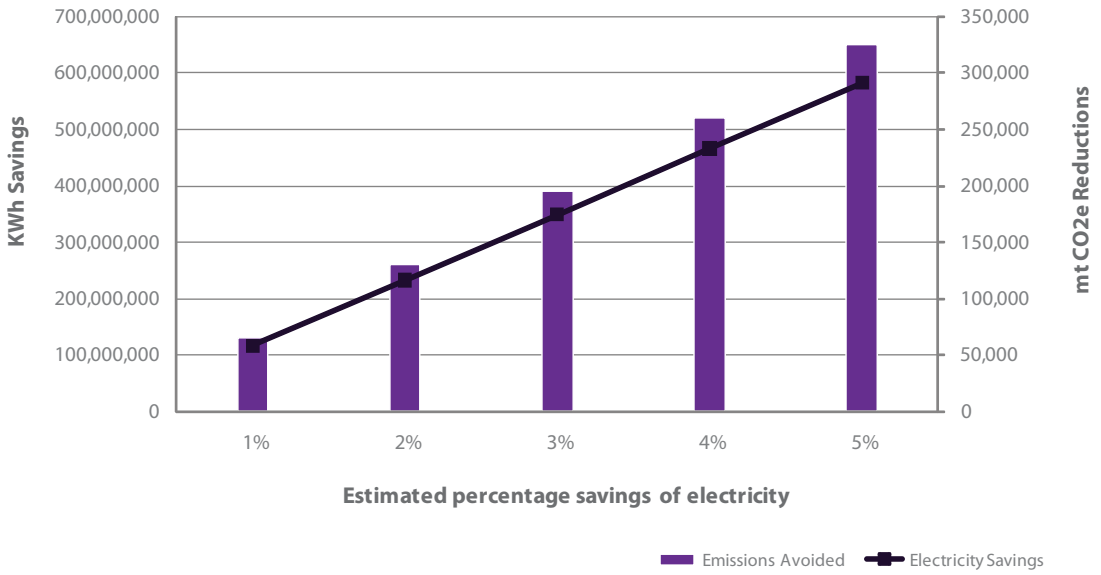
The Climate Change Connection

The cornerstone of this strategy is the Miami-Dade Green Business Certification Program, which is being developed to help local enterprises maximize their social, ecological and financial performance. Local small businesses are by definition sustainable business: they tend to hire locally, buy locally and sell locally. The program will document savings and help market the benefits to educated and eco-conscious consumers. The new program aims to help businesses become more resource-efficient with energy, water, raw materials and waste production. The program is in the development phase; therefore, businesses are encouraged to perform self audits now, based on a checklist of program standards. Green businesses conserve energy by using energy-efficient lighting and Energy Star-rated equipment; conserve water through the use of low-flow toilets and water flow restrictors; and reduce waste by recycling, composting and using materials with recycled content. These practices also create a safe and healthy workplace for employees and customers.

This figure illustrates the relationships between savings in electricity and reductions in CO_2 emissions. As the business becomes more efficient, it saves money and the community as a whole benefits from the CO_2 reductions.

If all businesses registered through the Miami-Dade County Tax Collector reduce electrical consumption by the percentages shown they will also reduce greenhouse gas emissions as illustrated.

Potential Energy and Emissions Savings as Commercial Businesses Become More Energy Efficient



The Role of Healthy Communities

The Healthy Communities goal is important to the well-being of our residents. By encouraging outdoor activities and promoting local, organic fresh food, we are helping to combat obesity and lifestyle diseases such as diabetes and cardiovascular disease. Although the strategies and initiatives in this area do not all result in obvious or easily measurable carbon emission decreases, their sustainability benefits are significant. Strategies that have a beneficial impact on carbon storage, sequestration, or emissions are included below.

Healthy Communities Strategies Contributing to Climate Action Plan Mitigation Efforts

- Facilitate active and safe lifestyles for residents through the Open Space Master Plan and other community initiatives
- Plant more trees
- Promote fresh, local, organic foods in all neighborhoods through grocers, farmers' markets, and community gardens

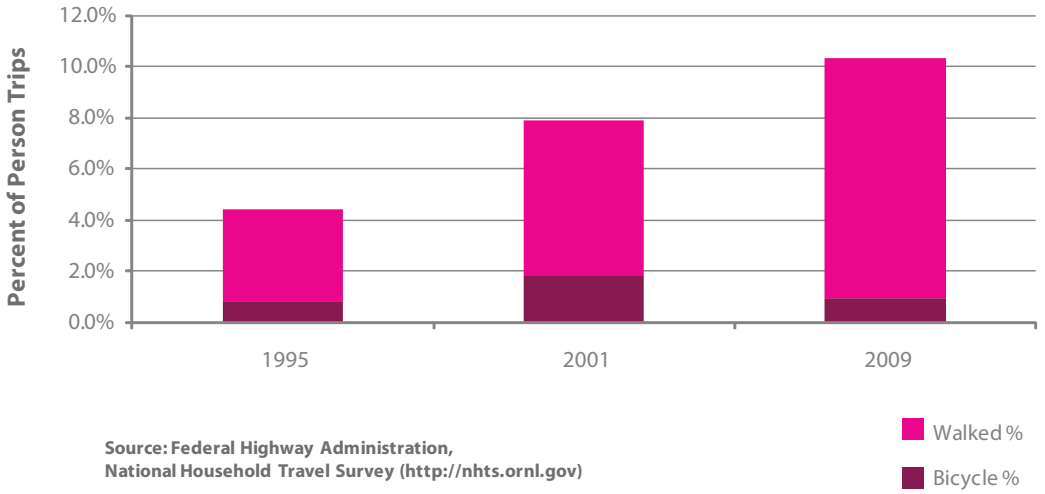
Strategy: Facilitate active and safe lifestyles for residents through the Open Space Master Plan and other community initiatives

This strategy includes various initiatives to promote walking and biking. Half of the trips in the United States could be completed within a 20-minute bike ride, and a quarter of trips are within a 20-minute walk (Rails to Trails Conservancy). Nonetheless, most of these trips are taken by car. This is certainly the case in South Florida, with its hot, humid climate and car-centric culture. Some progress has been made, as shown in the figure below. Between 1995 and 2009 the percentage of person trips taken by walking or biking in South Florida increased from approximately four percent to 10 percent. The 2009 figure is slightly below the national average of 12 percent (National Household Transportation Survey).

The Climate Change Connection

The County estimates that increasing biking and walking to 16 percent of total trips by 2015 could result in emissions reductions of 130,249 metric tons.

Biking and Walking as a Percentage of All Trips Miami-Ft Lauderdale Consolidated Metropilitan Statistical Area (CMSA)



Source: Federal Highway Administration, National Household Travel Survey (http://nhts.ornl.gov)

South Floridians walked more frequently in 2009 than in 1995. However, the portion of trips taken by bike fluctuated over the same time period. All trips include biking, walking, transit, and vehicles.

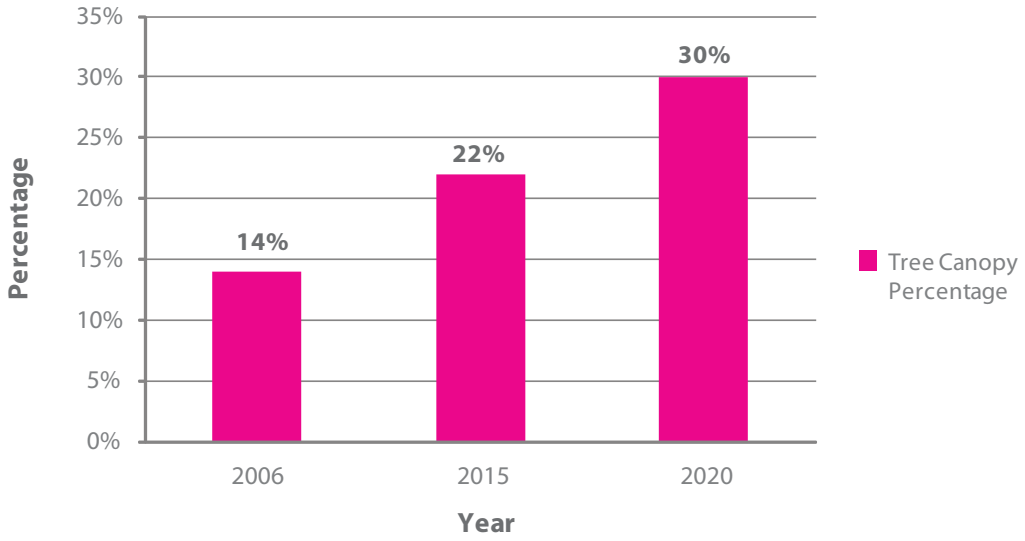
Strategy: Plant more trees

This strategy includes initiatives to plant more trees and promote proper tree selection and maintenance, thus increasing our tree canopy from 14 percent in 2006 to 30 percent by 2020. Trees reduce air pollution by absorbing or intercepting pollutants such as carbon monoxide, sulfur dioxide, nitrogen dioxide, ozone and particulates. A single mature tree can absorb carbon dioxide at a rate of 48 pounds per year, and release enough oxygen into the atmosphere to support two human beings. Three hundred trees can counterbalance the amount of pollution one person produces in a lifetime (Alexander n.pag.). Additionally, tree leaves and branches intercept rainfall, hold it and then release it slowly, thereby reducing runoff, increasing infiltration into the soil, and helping to maintain water quality. One study from the U.S. Forest Service estimated that over a 50 year lifetime a tree generates $31,250 worth of oxygen, provides $62,000 worth of air pollution control, recycles $37,500 worth of water, and controls $31,250 worth of soil erosion (Alexander n.pag.).

The Climate Change Connection

Trees can sequester and store small amounts of carbon from the atmosphere, helping to reduce GHG levels. More significantly, trees can be a natural air conditioner, reducing the need for electrical cooling and, as such, reducing GHG. The evaporation from a single large tree can produce the cooling effect of 10 room-size air conditioners operating 24 hours per day (McPherson and Simpson n.pag.). A recent study by American Forests found that the maximum potential annual savings from energy-conserving landscapes around a typical home ranged from a low of 13 percent in Madison, Wisconsin to a high of 38 percent in Miami (Alexander n.pag.). Another modeling study estimated that the direct energy savings from shading alone by trees and vegetation could reduce carbon emissions in various U.S. metropolitan areas by roughly 1.5 to five percent (U.S. Environmental Protection Agency). In addition to the previously mentioned sustainability benefits, trees play an important role in encouraging outdoor health-promoting activity like walking and biking, especially in South Florida's climate, which can reduce the use of personal vehicles for short trips. Shade trees can also keep parked cars—particularly their gas tanks—cooler, which lowers evaporative emissions.

Percentage of Tree Canopy in Miami-Dade County



Source (2006): Presentation by Francisco Escovedo, Assistant Professor, University of Florida, at the Fourth Annual Tree Summit held June 25, 2010 at Florida International University

Our goal is to increase tree plantings to achieve a total tree canopy from the 2006 level of 14 percent to 22 percent in 2015, and ultimately to 30 percent in 2020. The 30 percent tree canopy target was established by the Board of County Commissioners through the 2007 Street Tree Master Plan and the Comprehensive Development Master Plan.

Strategy: Promote fresh, local, organic food in all neighborhoods through grocers, farmers' markets, and community gardens

This strategy focuses on promoting local and organic farming, as well as increasing the availability of this produce to the general public and urban communities. It is difficult to calculate the environmental impact of fresh, local food initiatives since the carbon footprint of food depends on many factors, including food type and methods of production and distribution. However, there is broad general consensus that local, organically produced and unprocessed foods promote sustainability.

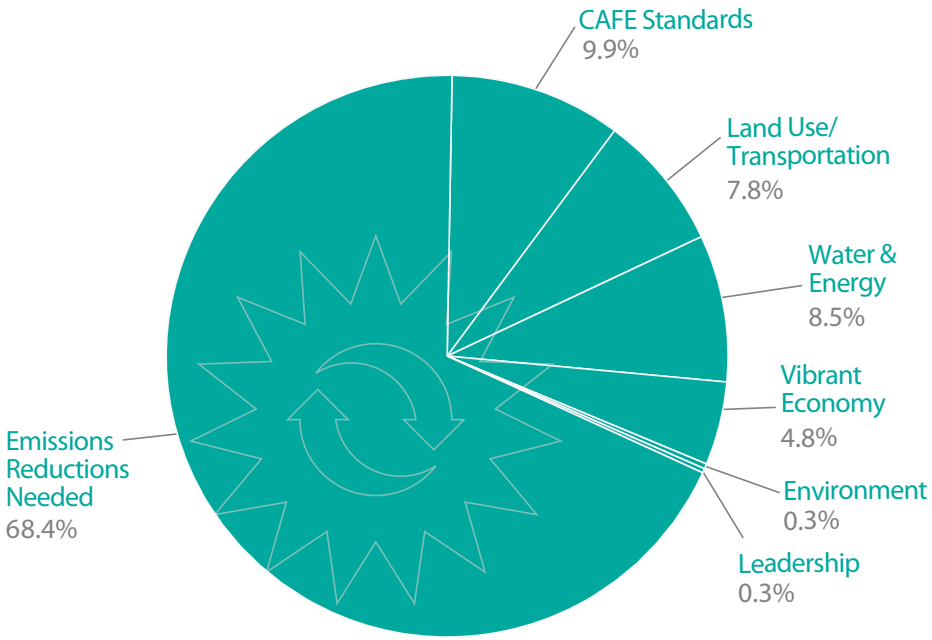
The Climate Change Connection

Producing food locally may reduce the GHG related to transportation and marketing of food, and reducing pesticide and chemical fertilizer use can reduce emissions associated with the manufacturing, distribution and application of these products, reduce erosion and improve soil quality. Some studies have shown that organically farmed soil sequesters significantly more carbon than conventionally farmed soil (Fernandez Rysavy n.pag.). Community gardens that produce local food have additional sustainability benefits, including the reduction of heat island effects in urban areas, which decreases the need for air conditioning, water filtration, and reduction of soil erosion and run-off.

Moving Forward

From this first five-year phase of our Miami-Dade Climate Change Action Plan, two things are clear: one, our community is a true leader in tackling climate change issues, and we have tremendous success and experience to build upon; and two, we have a lot of work to do to reach our mitigation goals and make our community more resilient to current hazards and future impacts. The figure below illustrates the ***GreenPrint*** contributions towards emission reductions, as well as the gap expected despite implementation of these initiatives. This action plan has clearly laid out potential opportunities to close that gap and leverage resources, and it is up to us as a community to work together to make this happen.

GreenPrint Contribution Toward the Cool Counties Greenhouse Gas Reduction Target



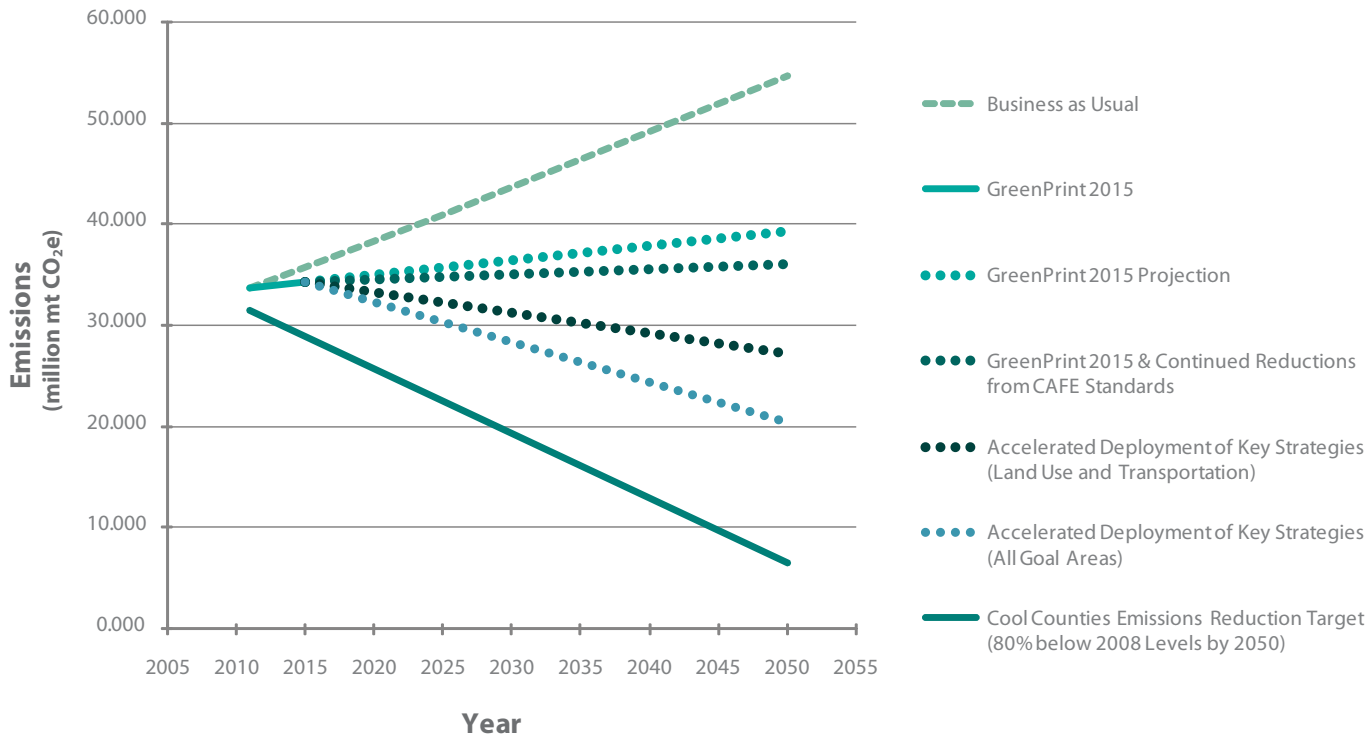
6.8 million metric tons CO_2e

This chart shows how quantifiable ***GreenPrint*** initiatives contribute to the 2015 ten percent reduction target established through the Cool Counties commitment. Again, these are the initial steps on a 40-year path to the 2050 target. It is anticipated that the impact will be accelerated in later years.

Looking further ahead, the figure on the next page illustrates the tremendous potential to make significant strides towards the Cool Counties GHG goal of 80 percent reduction by 2050. Through full, and in some cases accelerated, deployment of key strategies across all goal areas, we can close that projected gap considerably. This would include fully implementing compact development strategies, shifting the mode for the percentage of the population utilizing public transit from four percent to 10 percent, increasing the penetration rate of vehicles with newer CAFE standards to accomplish a complete fleet turnover in 20 years rather than 25 years, decreasing residential and commercial average electricity consumption by 20 percent, and achieving a 25 percent electricity consumption reduction for targeted local businesses. Even if these accelerated deployment endeavors are realized, a remaining 14 million metric tons of CO_2e would still need to be reduced

to reach our target. While this may seem daunting, it emphasizes the need for the continuous development of initiatives that will further contribute to GHG emissions reductions in future ***GreenPrint*** updates. Better economic conditions and improved technology and innovation, as expected in the future, will serve to make this goal even more attainable.
As a coastal community identified as one of the most vulnerable to climate change, it is incumbent upon us to harden

Greenhouse Gas Emission Reduction Scenarios

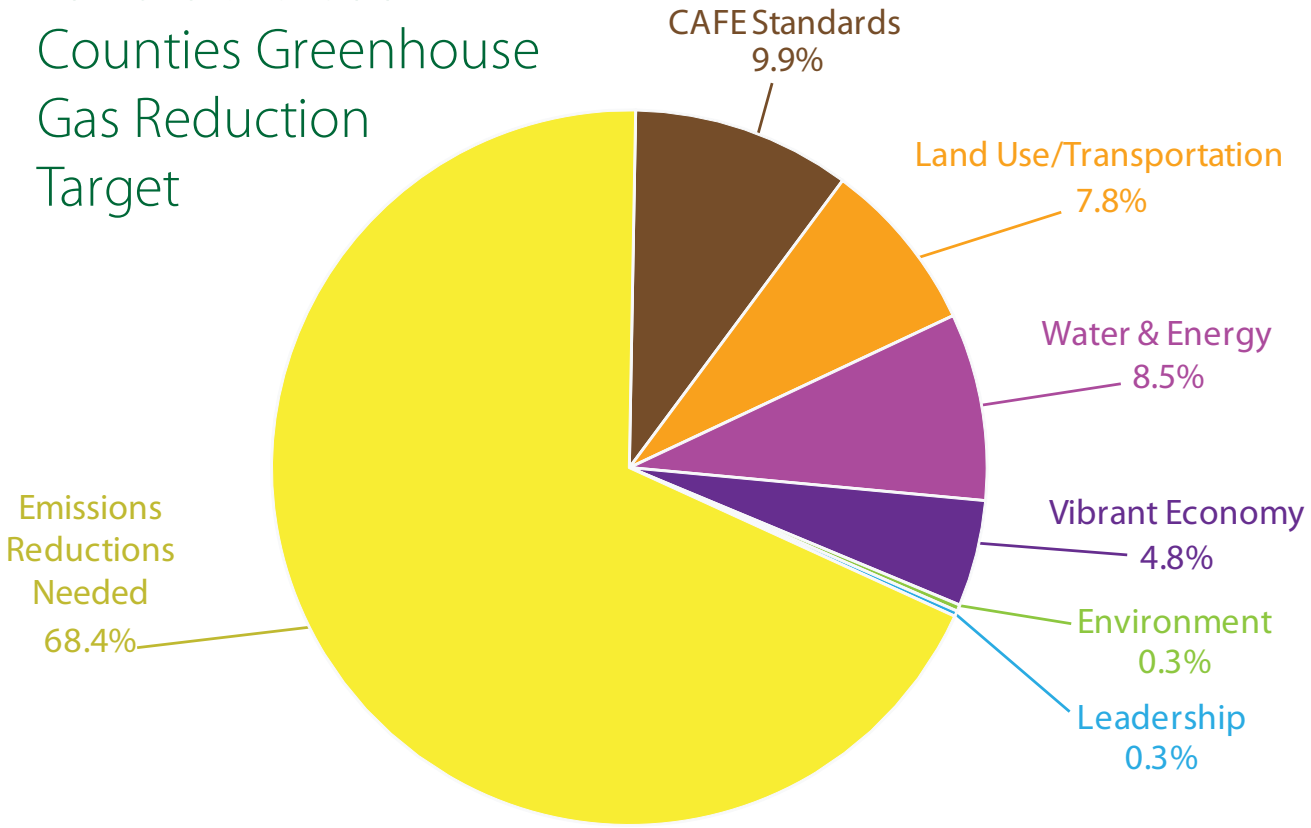


This chart compares a business-as-usual scenario with our aggressive Cool Counties commitment target. ***GreenPrint's*** contribution is shown, as well as hypothetical accelerated emission reduction strategies.

ourselves against current hazards and improve the resiliency to prepare for, respond to, and recover from, future climate change. Recent occurrences of temperature and rainfall extremes provide a glimpse of potential future impacts. These events, as well as tropical storms that periodically impact our region, can cause significant infrastructure and socio-economic damage, but they can also present important learning opportunities that provide valuable experience and knowledge for current and future progress.

GreenPrint is a 40-year journey. We are embarking upon this initial phase and will build upon our existing knowledge and experience. It is our challenge and opportunity to use this initial five-year phase to build upon successes and create a foundation to move forward. This will help provide the tools and information so critical to educating the community and decision-makers. By combining our opportunities and knowledge with the resources provided through our regional, state, and federal partnerships, we have the tools that will allow us to chip away at that gap and help our community remain strong and adapt to a new normal of a changing climate. Let us now take that knowledge and experience and turn science into action.

GreenPrint Contribution Toward the Cool Counties Greenhouse Gas Reduction Target



The scope of ***GreenPrint*** can hardly be overstated; its development encompassed the soaring ambition of our aspirational goals, the grueling challenges of a battered economy and the relentless synthesis of seemingly limitless input. Countless hours were spent researching best practices and gathering stakeholder input. During the course of the year, nearly 100 public meetings were held, and approximately 360 new and existing initiatives were evaluated. The success of this plan hinges on our ability to harness this community's proud history of environmental stewardship and elevate ourselves to a new generation of sustainability missions.

GreenPrint 2010 gave us the opportunity to unify many of the good steps we are taking and chart a single path to a sustainable future. Never before has one County document detailed the impact of so many projects and processes. ***GreenPrint*** connects the dots, weaving regulations and plans into a clear vision with measurable goals. It is consistent with the Comprehensive Development Master Plan, so our actions will not be in conflict. These are the tools to guide attentive decision making. As a community we have reached a whole new level of awareness that will influence and impact future planning and decision making.

GreenPrint details 137 specific sustainability initiatives. Twenty-seven of those directly impact carbon dioxide emissions, estimated to result in approximately 1.5 million metric tons of CO_2 equivalent reductions and 2.9 million metric tons of CO_2 equivalents (mt CO_2e) avoidances, as detailed in the Climate Action Plan.

Our Cool Counties target is aggressive and long term: achieve an 80 percent reduction in emissions from our 2008 emissions by 2050. Keeping this in mind, ***GreenPrint*** 2010 represents the first five years of a 40-year journey. Without ***GreenPrint***, our "business as usual" scenario projections assume that our Countywide emissions would increase to approximately 36 million metric tons of CO_2 equivalents by 2015. Our Cool Counties reduction commitment, when translated into a short-term 2015 target, is a 10 percent, or 6.8 million metric tons of CO_2 equivalents reduction below our 2008 value of about 32 million metric tons of CO_2 equivalents.

Is the glass half empty or half full?

Although the ***GreenPrint*** strategies amounting to a reduction of 1.5 million mt CO_2e may not reach the 6.8 million mt CO_2e target, they are the initial steps on that 40-year path. We are making progress despite the worst economic conditions in modern history. This is our beginning.

We also know that important benefits of our sustainability plan were not able to be quantified in this first ***GreenPrint*** plan, since they are new and developing. For example a county-specific energy master plan, solid waste master plan, local green economy action plan and specific sea-level-rise planning scenarios must be developed. We are laying the foundation for thoughtful and data-driven decision making to reach our goals. In light of our economic conditions, our sprawling development patterns and projected population growth of 30,000 annually, we believe our glass is half-full. Our initiatives today will have impacts far beyond the short-term assumptions and calculations.

Every time we revisit ***GreenPrint***, new tools will have emerged, such as CAFE standards and clean energy technologies that will accelerate GHG reductions and propel us to that sustainable future. These will impact ***GreenPrint*** 2015, ***GreenPrint*** 2020, and beyond. With better economic conditions and those better tools and technologies, we can sprint from these first steps. We are doing this for us, and for the next generation of green leaders.

We see tomorrow's leaders committed to a sustainable agenda in a healthy, well-planned Miami-Dade County, where we balance the needs of a diverse community, a vibrant economy, in a beautiful environment. Do you see it too?

Implementation Table

The Implementation Table contains actionable and measureable initiatives designed to achieve our 2015 sustainability goals. As ***GreenPrint*** is the umbrella for many existing plans, existing sustainability initiatives are included when deemed critical to accomplishing the goal area strategy. Other initiatives were developed through the planning process to address specific sustainability challenges or to expand on strengths. The Planning Process and Acknowledgements chapters highlight that our effort to identify and develop initiatives has been collaborative. It represents the culmination of work completed by the Mayor's Sustainability Advisory Board, the Interdepartmental Team, the Climate Change Advisory Task Force, community stakeholders, cities, the Southeast Florida Regional Climate Change Compact partners, and of course the core planning team. Miami-Dade County is the implementation lead on many initiatives and others are owned by community stakeholders.

The Implementation Table is organized by each *GreenPrint* Goal Area

The table presents information for each initiative such as the lead entity and partners (internal or external to Miami-Dade County government), funding scenarios, legislative action needed, key five-year milestones, impact on carbon emissions or the value of carbon storage, and performance indicators and targets. It is our action plan and will be used to monitor progress and determine success.

Mutually Beneficial and Inter-related Goals

The sustainability pillars are overlapping. Benefits in one goal area are often inter-related with benefits in another. Although there are seven different goal areas, the plan is holistic and the order of the goals is purposeful…starting with strong leadership, connections, and commitment to ultimately creating healthy communities. Each area contributes to a solid foundation for the Climate Change Action Plan to adapt and reduce our greenhouse gas emissions. Plans are important, but implementation is crucial for a sustainable Miami-Dade County.

Leadership, Connections and Commitment

Initiative	Lead & Partners	Funded and Unfunded Costs Capital / Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
STRATEGY: Strengthen regional and local community partnerships							
1. Implement the Southeast Florida Regional Climate Change Compact	**Lead** Office of Sustainability (OOS) and Department of Enivronmental Resources Management (DERM) for Miami Dade County Regional Climate Action Partners (Leads for Palm Beach, Broward, and Monroe Counties) **Partners** South Florida Water Management District (SFWMD), International Council for Local Environmental Initiatives (ICLEI) Climate Leadership Initiative (CLI) Municipalities	Operating Costs: Funded plus in-kind exisiting staff **Year 1:** $75,000 **Year 2:** $125,000 Seeking additional funding from federal and foundation sources to augment existing resources	Kresge Foundation through the Climate Leadership Initiative. In-kind contributions from ICLEI, participating Counties, National Oceanic and Atmospheric Administration (NOAA), U.S Geological Ssurvey (USGS), and the U.S. Army Corps. of Engineers (USACE)	No.	**Year 1:** Develop baseline and future projections of greenhouse gas missions within Southeast Florida. **Year 1-2:** Draft Regional Climate Action Plan, Develop mitigation strategies to obtain coordinated emission reductions, and develop sea level rise scenario maps to identify vulnerable areas in the SE Florida region. **Year 2-5:** Further develop climate change impact scenarios for regional adaptation planning.	Regional emissions baseline and targets TBD through implementation	Achievement of milestones
2. Codify the sustainability planning process and create a formal leadership structure for GreenPrint implementation	**Lead** Office of Sustainability (OOS) All initiative owners	Within existing resources	Within existing resources	Yes. Approval by Board of County Commissio ners	**Year 1:** Planning process legislation Create the internal and external reporting structure and mechanism Establish the implementation team **Year 2-5:** Report on progress	Indirect impact	Achievement of milestones
3. Encourage all municipalities to adopt GreenPrint	**Lead** Office of Sustainability (OOS) **Partners** Elected officials, City and County Managers Association (CCMA), Municipal liaisons	Within existing resources	Within existing resources	Yes. Approval by municipal governmen ts	**Year 1:** Continue the municipal liaison meetings. **Year 1-2:** Present at municipal commissions	Indirect impact	Achievement of milestones # of municipalities that adopt GreenPrint

Leadership, Connections and Commitment

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
4. Pursue more public-private partnerships to implement policies identified in County plans that improve County services	**Lead** County Executive Office (CEO) Individual departments and other entities depending on selected partnerships **Partners** Miami-Dade County School Miami-Dade County Public Schools TBD	TBD through implementation	TBD through implementation	TBD	TBD through implementation **Year 1**: Identify and prioritize opportunities including partnerships such as increasing green space though shared use agreements with schools and improving bus service following roadway shoulder use model **Year 2**: Implement selected partnerships.	TBD through implementation	TBD through implementati on, Number of PPPs
STRATEGY: Integrate sustainability into all leadership systems							
5. Continue to participate in and influence sustainability policy formulation and decision-making at the national and international level through partnerships, conferences, and legislation	**Lead** Local elected officials, Office of Sustainability (OOS) **Partners** Four County Regional Climate Compact, Seven-County Partnership, ICLEI, State and Federal Partners (SFWMD, NOAA, EPA)	Within existing resources	TBD through implementation	TBD	TBD through implementation	Indirect impact	TBD by specific climate change and energy legislation
6. Integrate sustainability knowledge into existing leadership programs and new elected official orientations countywide	**Lead** UM Initiative on Excellence in Public Service Partners Office of Sustainability (OOS), Dade Community Foundation Miami Fellows Initiative, Leadership Miami,	Within existing resources	Within existing resources	TBD	**Year 1:** Inventory and partner with existing leadership programs. Establish sustainability track. **Year 2-5:** Implement	Indirect impact	Number of participants in leadership programs Success of participants in their fields

Leadership, Connections and Commitment

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
	Chamber of Commerce Leadership programs, Beacon Council United States Department of Defense Southern Command						
STRATEGY: Be green government role models							
7. Integrate and prioritize climate change and sustainability in local government strategic planning, business planning and in fiscal decision making	**Lead** County Executive Office (CEO) Office of Sustainability (OOS) **Partners** Miami Dade Office of Strategic Business Management (OSBM), County and Municipal Executive Offices, All County Departments, Municipalities	Within existing resources	Within existing resources	Yes. Codify sustainability planning process.	**Year 1-3:** Establish sustainability organizational measures and targets for strategic and business plans and for agency heads' performance evaluations **Year 3-4:** Monitor and report GHG reductions and other sustainability measures **Year 5:** Recognize agencies that achieve and exceed sustainability targets	TBD through implementation	Achievement of milestones and targets
8. Develop an interagency working group to ensure implementation of the CDMP by tackling conflicts between different County plans and within the development process	**Lead** County Executive Office (CEO) Office of Strategic Business Management (OSBM) **Partners** All County Departments	Within existing resources	Within existing resources	TBD through implementation process	TBD through implementation	Indirect impact	Completion of charge memo objectives

Leadership, Connections and Commitment

Initiative	Lead & Partners	Funded and Unfunded Costs Capital	Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
9. Work with local Board of Rules and Appeals and other stakeholders to maintain the Florida Energy Code and to better define and set forth responsibilities of each trade in order to improve compliance with and enforcement of the Code (Within the Florida Energy Code and 2010 Florida Statutes, Chapter 468, Part XII)	**Lead** Building and Neighborhood Compliance (BNC)/ Building Code Compliance Office (BCCO) **Partners** Miami Dade Board of Rules and Appeal (and possibly Broward Board of Rules and Appeal), Office of Sustainability (OOS), Builders Association of South Florida (BASF) and other Builder/Trade Associations, Other stakeholder groups to be determined	Unfunded Approximately (2) energy Code specialist positions Cost would be $160,000 – 210,000 annually (2 Energy Code specialist positions at $80k-$105k each).		Unidentified Perhaps through permit fees.	New legislation is not required, but existing codes and regulations need to be better defined and updated.	**Year 1:** Request/ convene a BORA subcommittee to study the lack of compliance/enforcement program **Year 2:** Establish a check box on permit card that building being reviewed has been inspected for compliance with Florida Energy Code **Year 3:** Lobby for additional State certified energy raters and request more local representation on the Florida Building Commission.	TBD through implementation	Achievement of milestones and targets Compliance with the Florida Energy Code
10. Adopt existing draft County Ordinance (per Resolution R468-06) requiring water efficiency retrofits at point of home resale (prior to changing ownership) and later update the ordinance to require additional retrofits focusing on energy efficiency	**Lead** Office of Sustainability (OOS) Water and Sewer Department (WASD) **Partners** Building and Neighborhood Compliance (BNC)/ Building Code Compliance Office (BCCO), USGBC South Florida Chapter, Others TBD	Within existing resources		Within existing resources	Yes. Would require adoption of an ordinance that has already been developed, then modification of this ordinance and subsequent adoption of the modified version.	**Year 1:** Review, update, and finalize draft ordinance and submit through proper channels for adoption **Year 2:** Research and draft modified language for adopted ordinance to include energy efficiency component **Year 3:** Submit revised ordinance through proper channels for adoption **Year 4:** Educate stakeholders about the ordinance **Year 5:** Enforce Ordinance	Indirect impact	Achievement of milestones and targets

Leadership, Connections and Commitment

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
STRATEGY: Create ongoing outreach, education, and dialogue with the community about the implications of climate change and the benefits of sustainability							
11. Develop and implement ongoing community outreach about sustainability and climate change	**Lead** Office of Sustainability (OOS), Miami-Dade College (MDC), Florida International University (FIU), University of Miami (UM), Florida Atlantic University (FAU), Barry University, St. Thomas University, Other local universities, Miami Dade Public School System (M-DCPS) **Partners** Media, Museums, South Florida Climate Compact partners (Miami-Dade, Palm Beach, Broward, Monroe counties)	TBD through implementation	TBD through implementation	No.	**Year 1:** Establish partnerships and work plan framework and analysis of current communication mechanisms and competitions **Year 2:** Craft educational content that is aligned with work plan **Year 3:** Conduct outreach **Year 4:** Assess outreach and modify as necessary **Year 5:** Continue outreach and assessment	Indirect impact	Achievement of milestones and targets
12. Estimate the Costs of Action vs. Inaction and communicate implications to key decision-makers	**Lead** School of Business of St. Thomas University **Partners** Offices of Economic Development Coordination (OEDIT) and Sustainability (OOS), South Florida compact partners (Miami, Dade, Broward, Palm Beach and Monroe Counties), Representatives from academia, and key business leaders through the Beacon Council	Operating funding required (if panel recommends such a study)	TBD through implementation	**TBD**	**Year 1:** Convene a group of experts to evaluate study merits, options, scope of work, value, etc. **Year 2:** If decision is to initiate the study, identify funding sources and procure. **Year 3:** Conduct the study **Year 4:** Share study with decision makers.	Indirect impact	Achievement of milestones

Water and Energy Efficiency

Initiative	Lead & Partners	Funded and Unfunded Costs		Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
		Capital	Operating					
STRATEGY: Reduce energy and water consumption through increasing efficiency								
13. Continue to implement the Water Use Efficiency Plan and the Non-Revenue Water Loss Plan initiatives to meet established reduction targets	**Lead** Water and Sewer Department (WASD) **Partners** Office of Sustainability (OOS)	Funded: Water Conservation Approximately $1.5 million for water saving devices. Water efficiency audits Unfunded: Replacement and repair of piping for water loss Water audit retrofits	Funded: Water Conservation outreach and audit reduction	WASD revenue	No, however code changes may be needed to ensure increased water efficiencies such as rainwater harvesting and new construction that does not require 100% landscape irrigation	Water use efficiency plan **Year 1:** Implement plan to reach water efficiency reduction target (1.5 MGD for 5 years). Implement the water efficiency audit program: Restore program to 150 homes per year **Year 2:** Expand program to reach 200 homes per year, 50 commercial sites per year and 10 industrial sites (or a combination thereof **Year 3-5:** Develop monitoring mechanism to track water retrofits undertaken and associated reductions Non revenue water loss reduction program **Year 1-3**: Perform audits, meter testing and Pilot projects aimed at reducing annual real water and apparent water losses **Year 4-5**: Develop and implement leakage reduction plan and evaluate plan effectiveness **Future**: Expand plan and encourage wholesale customers to implement similar programs	16,000 mt CO_2 over five years	Audit performance indicators would be based on funding. Number of audits Estimated annual water savings: 3.2 billion gallons per year Estimated annual cost savings Estimated annual electricity savings in kwh: 3.6 million kWh per year retrofits performed post audit
14. Incentivize energy efficient development	**Lead** Building and Neighborhood Compliance (BNC) and	Existing resources and funding TBD based on incentive mechanisms		TBD based on recommendations from Sustainable Code and Permitting Project (EECBG	May require BCC action	Existing Buildings **Year 1:** Implement recommendations from Sustainable Code and	**Year 1-5**: Residential Sector: 583 mt CO_2e (over 5	Estimated annual electricity savings

Water and Energy Efficiency

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
prioritizing walkable, transit-oriented areas	Building Code Compliance (BCCO) **Partners** Office of Sustainability (OOS) Builders Association of South Florida (BASF) Latin Builders Association of South Florida (LBA)		Project)		Permitting Project (EECBG Project) pertaining to sustainable development. **Year 1-2:** Develop incentive package for property owners to incorporate high energy performance strategies in renovation/expansion projects. **Year 2-5:** Market program to property owners through website and/or educational workshops New Construction **Year 1:** Implement recommendations from Sustainable Code and Permitting Project (EECBG Project) pertaining to sustainable development **Year 1-2:** Develop inspectors training program in order to attain one hundred percent compliance with the Florida Energy Code. **Year 2-5:** Enforce compliance and market green building rating standards.	years) Commercial Sector: 1,950 mt CO_2e (over 5 years)	Residential Sector: 209,000 kWh per year; Commercial Sector: 699,000 kWh per year
15. Implement EECBG projects	**Lead** Office of Sustainability (OOS) **Partners** Department of Environmental Resource Management (DERM), General Services	Funded thru 2012 Unfunded beyond 2012	Department of Energy's Energy Efficiency and Conservation Block Grant (EECBG) program	Yes – adoption of federal legislation to appropriate EECBG continuatio n funding	**Years 1-3**: 12 projects must be completed by August 2012. Projects listed in the Water and Energy Efficiency Chapter. **Years 4-5:** No action	54,000 mt CO_2e over five years	Estimated annual electricity savings in kwh: 19 million kWh per year Estimated

Water and Energy Efficiency

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
	Administration (GSA), Libraries, Miami Dade Parks & Recreation (MDPR), Public Works Department (PWD), Water & Sewer Department (WASD), Enterprise Technology Service Department (ETSD), Office of Grants Coordination (OGC), Office of Capital Improvements (OCI), Department of Procurement Management (DPM), Office of Strategic Business Management (OSBM), Government Information Center (GIC), Finance Department						jobs created
16. Promote and create innovative financing for energy efficiency	**Lead** Office of Sustainability (OOS) **Partners** Finance Department, PWD (Special Taxing District), BNC, Property Appraiser	Self sustaining depending on mechanism		Federal, local	**Year 1:** Continue to monitor progress of PACE legislation on a federal level to determine by end of 2011 how program will take shape (specifically, whether it will be PACE or have another structure) Enact Energy Program ordinance (leaving room for flexibility in ordinance) **Year 2:** Form financing mechanism for voluntary energy efficiency and renewable energy program **Year 2-5:** Develop program out; MDC's role will be a facilitator as opposed to a program administrator	Residential Sector savings: 3,100 mt CO_2e over 5 years Commercial Sector savings: 12,000 mt CO_2e over 5 years	Estimated annual electricity savings in kwh: 1 million kWh per year Estimated jobs created

Water and Energy Efficiency

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
STRATEGY: Improve energy planning through public-private partnerships							
17. Create a Miami-Dade Energy Alliance with a diverse group of stakeholders to implement sustainable energy and building management system retrofits and practices that conserve energy, natural resources, and provide reinvestment savings	**Lead** Initiated by the County with a diverse group of internal and external stakeholders. Leadership of the group could be rotated year to year to the different external stakeholders **Partners** Miami-Dade County Municipalities, Florida Power and Light (FPL), Gas companies, Clean Cities, Building Owners & Managers Association (BOMA), General Services Administration (GSA), Florida Green Building Coalition (FGBC), US Green Building Council (USGBC), Miami Dade County Schools, Other County Departments, Local Universities	To be determined though implementation			**Year 1:** Form the Alliance. Identify and recruit a group of community stakeholders **Year 2:** Hold meeting and develop agenda and strategies Collaborate with utilities to for smart grid initiatives **Year 3:** Identify feasible retrofit/energy performance improvement projects and how to fund them **Year 4-5:** Implement projects and track their energy and financial benefits	This will be estimated using the multiplier factor of 2 and emissions reductions from the campaigns initiative. 190,00 mt CO_2e over 5 years	
STRATEGY: Continue water and energy efficiency and conservation campaigns							
18. Continue to implement current campaigns and pursue additional funding	**Lead** Water and Sewer Department (WASD), Office of Sustainability (OOS) **Partners** Government Information Center(GIC), Department of Environmental Resources Management	Water Campaign: Total Budget: $223,000 Web SLA: $96,000 Marketing: $127,000 Water conservation programs are funded through end of FY2010 and will continue to be funded by WASD at a lesser level. For the energy conservation	The water conservation program is funded through ratepayer's fees and grants from the SFWMD. The energy conservation projects are funded by the federal government through the Department of Energy's Energy Efficiency and Conservation Block Grant	Yes . Adoption of federal legislation to ensure EECBG continuatio n funding is required past the initial three	**Year 1**: Allocate funding across existing energy efficiency (OOS EECBG) and water efficiency (DERM) outreach programs and Implement workshops and campaigns **Year 2-5:** If possible, expand these programs	190,000 mt CO_2e over 5 years	Estimated water savings: 230,000 gal per year Estimated annual fuel savings in gallons: 240,000 gal UNL per year

Water and Energy Efficiency

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
	(DERM) Consumer Services (Ag Extension Center), Solid Waste Management (SWM), Public Library System, Dream in Green, Florida Power and Light (FPL)	programs, funding needs met for the next two fiscal years or until September 30, 2012. Additional funding for both programs need to be identified.	(EECBG) program.	years	to include greater cross-sections of the economy (ie, residential, commercial and industrial sectors) and continue to Implement workshops and campaigns		Estimated annual electricity savings in kwh: 58 million kWh per year
STRATEGY: Expand alternative fuel (bio-diesel/waste-based bio-diesel) and renewable energy industries							
19. Explore partnerships with large public and private landowners/entities to implement alternative fuel/energy parks and incentivize public and private use	**Lead** County Executive Office(CEO), Office of Sustainability (OOS) **Partners** Office of Economic Development & International Trade (OEDIT), DERM, Beacon Council, Potential private sector partners TBD	Within existing resources	TBD through implementation	TBD through implement ation	**Year 1:** Work with OEDIT/Beacon Council to determine what partnerships can be explored **Year 2-3:** Identify and foster opportunities for partnership with renewable fuel/energy companies **Year 4-5:** Explore how MDC can facilitate development of local renewable fuel/energy production		TBD through implementati on
20. Incentivize local and sustainable alternative energy/fuel industries, and enact legislation to remove obstacles and stimulate the industry	**Lead** County Executive Office (CEO) Department of Environmental Resources Management (DERM), Solid Waste Department (SWD), Water and Sewer Department (WASD) **Partners** Office of Sustainability (OOS), Office of Economic Development & International Trade (OEDIT), Florida Power and Light (FPL),Beacon Council	Unfunded		Pursue Black and yellow grease legislation; if not possible, develop voluntary program for separation	**Year 1-2:** Work with OEDIT/Beacon Council to explore tax incentives Create incentives Develop tax incentives for renewable energy/fuel companies Develop marketing/recruitment program for renewable energy/fuel companies and assist process to ensure that business plans are sustainable and to help stimulate market **Year 3-5:** Implement	TBD based on incentives created	TBD based on incentives created

Water and Energy Efficiency

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
STRATEGY: Be government leaders in energy, fuel and water efficiency							
21. Develop and implement a government energy efficiency master plan	**Lead** Office of Sustainability (OOS) **Partners** All (through energy liaisons)	Plan development within existing staff resources Funding may be needed for implementation		No	**Year 1-2:** Develop framework for plan (QA/QC on baseline and electricity data collection process) and form Energy Conservation Liaisons from all departments Write and distribute plan that empowers departments to monitor and manage their electricity use **Year 3-5:** Implement reduction strategies identified in plan	85,000 mt CO_2e over 5 years	Estimated annual electricity savings in kwh: 30 million kWh per year Percentage of buildings benchmarked annually = 20%
22. Continue to implement Energy Star Portfolio Manager Benchmarking of County facilities	**Lead** All Miami-Dade County Departments **Partners** Office of Sustainability (OOS)	Staff time and training of Energy Conservation Liaisons. Additional funding required to implement retrofits		No	**Year 1:** Reactivate Energy Liaisons committee and train them on the Energy Star process **Year 1-5:** Benchmark a minimum 20% of MDC building per year (100% by 5th year)	TBD through implementation	Percentage of buildings included in Miami Dade County Energy Star portfolio
23. Develop incentives for County employees to save energy through the Idea Machine	**Lead** Human Resources (HR), Office of Sustainability (OOS) **Partners** All County Departments	None	County Idea Machine	No	**Year 1:** Create a process through the Idea Machine. **Year 1-5:** Implement	TBD through implementation (based on ideas)	Number of pursuable ideas submitted
24. Create a countywide energy reinvestment fund to capture savings from energy efficiency projects and reinvest in new energy efficiency projects, making the	**Lead** Office of Sustainability (OOS), Office of Strategic Budget and Management (OSBM) **Partners** All County Departments	Unfunded Capital Cost: $1 million in loan capital	To be determined	No	**Year 1:** Set up reinvestment fund including repayment mechanism; develop application package and selection process **Year 1-5:** Award first tranche of loans and perform retrofits Collect payments to recharge	TBD through implementation	Number of projects Energy efficiency

Water and Energy Efficiency

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
EECBG program financially sustainable					fund; begin new application cycle, reissue loans, repeat		
25. Retrofit government facilities according to water efficiency audit recommendations	**Lead** Office of Sustainability (OOS), Water and Sewer Department (WASD) **Partners** All County Departments	$180,000 for 39 audits $758,730 for implementation of the recommendations	Funding required to continue auditing County facilities and to implement recommendations	No	**Year 1:** Secure funding for audits and implementation or recommendations **Year 1-2:** Prioritize buildings to be audited **Year 2:** Perform audits **Year 3-5:** Complete retrofits and track savings	18 mt CO_2e over 5 years	TBD based on retrofits implemented Number of audits completed Estimated annual electricity savings in kwh: 4,000 kWh per year Estimated annual fuel savings in gallons: 150 gal of diesel equivalent per year Estimated water savings: 3.5 million gal per year
26. Continue fuel reduction and monitoring programs such as Chicago Climate Exchange	**Lead** Office of Strategic Business Management (OSBM) **Partners** Department of Environmental Resources Management (DERM), County departments using fuel for operations	Operating/Funded; costs fluctuate over length of 6 year membership with expected annual average cost of $71,000	Fleet Operations Fund General Fund	Yes, for membership continuance	**Years 1-5:** Reduce emissions 1.5% annually relative to baseline year 2000	25,000 mt CO_2e over 5 yrs assuming renewal	Yearly emissions report
27. Continue to transition	**Lead** General Services	Within existing budgets	Department budgets	No	**Year 1:** Prioritize deployment of existing	TBD in implementation	# of active hybrid

Water and Energy Efficiency

Initiative	Lead & Partners	Funded and Unfunded Costs Capital / Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
fleet to hybrid electric vehicles	Administration (GSA) Miami Dade Transit (MDT) **Partners** Additional County departments with fleet				hybrid vehicles **Year 2-5:** Continue to transition transit fleet to hybrid and expand transit to increase ridership		vehicles: 329 # of inactive hybrids made active: 103 # of hybrid buses purchased: 254 Fuel reduction: 76,000 gallons of DSL/yr; 33,000 gallons of UNL/yr
28. Continue to purchase hybrid-hydraulic diesel garbage trucks	**Lead** Solid Waste Management (SWM) **Partners** General Services Administration (GSA)	Capital: $380,000 per truck Operating: $13,918 per truck	SWM budget	No	October 2011 for purchase of 10 additional trucks. 126 trucks by 2015	2,700 mt CO_2e over 5 years	Estimated annual fuel savings in gallons of diesel: 57,000 gallons per year Trucks Purchased: 126 over five years (10 in Year 1, then 26 each additional year for Years 2 - 5
29. Create a process to purchase biodiesel that complies with Environmental Protection Agency's biodiesel protocol which requires a minimum 50% GHG lifecycle reduction	**Lead** Department of Procurement Management (DPM) **Partners** County Executive Office (CEO) General Services Administration (GSA) Miami Dade Transit (MDT) Office of Sustainability (OOS)	Within existing resources	Within existing resources	No	**Year 1 and 2:** Develop a procurement process that requires vendor of biodiesel to disclose country of origin and feedstock of biodiesel being purchased.	TBD based on biodiesel purchased	Achievement of milestones

Water and Energy Efficiency

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
30. Develop a process that facilitates delivery of diesel fuel to Miami International Airport from Port Everglades through existing aviation fuel pipeline	**Lead** Miami-Dade Aviation Department (MDAD) **Partners** General Services Administration (GSA) Private suppliers	Capital cost is $2 million to upgrade existing tank farm. This cost would be paid for up front by private vendor but could be offset through incentivized lease with the County. Operational costs TBD.	By private vendor through procurement agreement	Yes. Board of County Commission (BCC) action.	**Year 1:** Hold an "expression of interest meeting" with potentially interested parties **Year 1-2:** Release the Request for Proposal **Year 2-3:** Award contract	210 mt CO_2e over 5 years	Estimated annual fuel savings in gallons of diesel fuel: 22,000 gallons per year

Our Environment

Initiative	Lead & Partners	Funded and Unfunded Costs		Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
		Capital	Operating					
Strategy: Implement wastewater reuse to provide future water supply and benefit the environment								
31. Implement Wastewater Reuse Projects consistent with the 20-Year Water Use Permit and the Miami-Dade Water and Sewer Department Master Plans to recharge the Biscayne Aquifer	**Lead** Water and Sewer Department (WASD) **Partners** Department of Environmental Resources Management (DERM), Office of Capital Improvements(OCI), Office of Strategic Business Management (OSBM) , Public Works Department, & General Services Administration (GSA)	Total cost of all 3 projects is $1.61billion **Phase 1:** funded **Phases 2 and 3:** unfunded	**Phase 1:** $17.74 million **Phase 2:** $24.79 million **Phase 3:** $18.83 million	State of Florida Alternative Water Supply Grants State Revolving Fund (SRF) Loans Revenue Bonds Operating Revenues	New legislative action will be needed to approve construction projects and to raise rates	**Dec 31, 2014:** South District Water Reclamation Plant (Phase 1) **Dec 31, 2021:** West District Water Reclamation Plant (Phase 2) **Dec 31, 2025:** North and Central District Water Reclamation Plants **Dec 31, 2026:** West District Water Reclamation Plant (Phase 3)	26,000 mt CO_2e increase within 5-years After all phases are on-line, increase of 93,000 annually in comparison to current energy use Although emissions will increase in comparison to current operations, they are less than the emissions associated with desalination	Achievement of milestones Gallons of potable/desalinized water displaced by reclaimed water
32. Develop a water and wastewater utility and municipal working group to identify and implement wastewater reuse opportunities at both the utility and municipal levels	**Lead** Water and Sewer Department (WASD) **Partners** Municipalities	TBD through implementation	TBD through implementation	Working group within existing staff resources	Unidentified	**Year 1**: Establish topic within current wholesale customer meetings. **Year 2-5:**Evaluate and implement opportunities	TBD through implement-ation	Gallons of potable/desalinized water displaced by reclaimed water
33. Assess the feasibility of using highly treated wastewater to rehydrate wetlands and Biscayne Bay	**Lead** Water and Sewer Department (WASD) **Partners** Department of Environmental Resources	Pilot study: $20 million. This includes all costs associated with the pilot, including constructing and operating the pilot plant, water quality testing and toxicity and ecological testing.		Pilot study: WASD If the pilot is successful and there is agreement and regulatory approval to do a full-scale treatment plant to generate volumes	Yes. If the pilot study is successful, funding and approval is	**Year 1:** Complete the water quality data Phase 1 **Year 2-5**: Complete the toxicity test Phase 2 and the ecological test Phase 3.	Energy and GHG emissions will increase from the intense water treatment approaches and will be	Achievement of milestones Pilot Study indicators will be related to water quality,

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Initiative	Lead & Partners	Funded and Unfunded Costs		Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
		Capital	Operating					
	Management (DERM)			of water needed for restoration in the Comprehensive Everglades Restoration Plan (CERP), then the County may seek partnership with the USACE.	required from USACE and U.S. Congress	**Year 4:** Complete pilot project (2015) At completion of each phase feasibility of project will be evaluated (could be cancelled at any phase). **Year 5** and beyond: Will based on Years 1-4 results	monitored through the pilot project.	and are likely to include nutrient concentration s, removal of micro contaminants, and some laboratory toxicity tests.
STRATEGY: Address salt intrusion that threatens drinking water wellfields and sensitive natural areas								
34. Formalize an interagency working group to evaluate and address issues associated with salt water intrusion	**Lead** South Florida Water Management District (SFWMD) **Partners** Water and Sewer Department (WASD), Department of Environmental Resources Management (DERM) Department of Planning & Zoning (DPZ)	Within existing resources Costs would be based on project(s) identified by the working group	Within existing resources Future periodic revision of the isochlor line will require funding	Within existing resources	No.	**Year 1:** Convene working group within 3-months of GreenPrint adoption	Not applicable	Projects identified and completed
35. Monitor the isochlor line and address spatial gaps in salt intrusion data gathering	**Lead** Water and Sewer Department (WASD) Partners WASD contract with United States Geological Survey(USGS), Department of Environmental Resources Management (DERM)	Funded: $263,000 (Monitoring well installation)	Funded: $1,825,724 (contract coves FY 08/11) Additional monitoring funding will be needed.	WASD	No	Completion of well installation by August 2010. **Year 1:** Publication of revised isochlor line March 2011	Not applicable	Completion of milestones Movement of the isochlor line
36. Construct a water control structure on/near the Florida City Canal to isolate this canal from South Florida	**Lead** Department of Environmental Resources Management (DERM) **Partners** South Florida Water	<$900,000	Not applicable	Grant from the SFWMD and the County Stormwater Utility	Yes. Board of County Commissio ners approval of cost sharing	**Year 1:** Project design **Year 2-5:** Permitting, bidding, award and construction	Not applicable	Completion of milestones Impact on the isochlor line

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Initiative	Lead & Partners	Funded and Unfunded Costs		Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
		Capital	Operating					
Water Management District's dry season agricultural drawdown	Management District (SFWMD)				agreement.			
37. Construct a earthen plug at the Card Sound Road Canal	**Lead** Department of Environmental Resources Management (DERM) **Partners** None	$3,000	Not applicable	Wetland Restoration Trust Fund	Yes. Board of County Commissioners approval of Class I Permit.	**Year 1:** Project design **Year 2-5:** Permitting, bidding, award and construction	Not applicable	Completion of milestones Impact on the isochlor line Wetlands function: Improvement of mangroves Native species planting
STRATEGY: Protect, enhance, and restore our natural resources								
38. Continue to minimize the impact of development on natural resources such as air, wetlands, Biscayne Bay and coastal habitats, natural forest communities, and trees through regulatory programs	**Lead** Department of Environmental Resources Management (DERM) **Partners** Florida Department of Environmental Protection (DEP), South Florida Water Management District (SFWMD), U.S. Environmental Protection Agency (EPA)	Not applicable	Funded within existing resources	DERM, FDEP, SFWMD, EPA	Yes. Board of County Commissioners approval of funded delegated contracts.	Continue operating programs **Year 1:** Determine appropriateness of programs to evaluate for CO_2 impact. **Year 2-5:** Select programs, establish criteria and baselines. Explore determining the economic value of environmental resources.	Existing wetlands store an estimated >212 million metric tons of carbon, with and annual accumulation of >362,000 metric tons.	Air quality results Water Quality results # of Coastal habitats restored Estimated wetlands acreage Trees planted
39. Identify dedicated funding sources for beach renourishment projects to maintain quality beaches and minimize the negative	**Lead** Department of Environmental Resources Management (DERM) **Partners** County Executive Office(CEO), Office of Strategic Business Management (OSBM),	Current Government Obligation Bond funding available is estimated to be used completely in the next	Within existing resources. DERM staff manage capital projects. MDPR	Federal and State grants, Bond issues	Yes. Board of County Commissioners approval of construction.	**Year 1-2:** Identify funding source. Promote Miami-Dade best practice approach.	Not applicable	Completion of projects Impact on sea turtle nesting Beach renourishment activities are on-going,

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Initiative	Lead & Partners	Funded and Unfunded Costs: Capital	Funded and Unfunded Costs: Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
impacts of storm events	Park and Recreation (MDPR)	one- to two-year period. Funding will be needed for work beyond FY 2010-2011 FY 10-11 funded: $7.4 million FY 11-15 unfunded: =$ 7.8 million	maintains beaches.					correcting erosional areas caused by the dynamic system of coastal currents and the effects of frequent storm events
40. Continue to enhance and restore coastal habitats important for the health of Biscayne Bay	**Lead** Department of Environmental Resources Management (DERM) **Partners** County Executive Office (CEO) Office of Strategic Business Management (OSBM) Park and Recreation (MDPR)	Funded: $4,940,000 Unfunded: $5,400,000	Within existing staff resources	Florida Inland Navigation District (State Grants) Biscayne Bay Trust Fund	Yes. Board of County Commissioners approval of construction contracts and potential future funding agreements.	**Year 1:** Highland Oaks Wetlands Restoration Oleta River State Park Hammock Restoration **Year 2:** FIU/Oleta River State Park Wetlands Restoration **Year 3:** Matheson Hammock Wetlands Restoration **Year 4-5:** Oleta River Hammock Restoration	Mangrove value impact TBD within Year 1	Completion of milestones Cumulative acres of coastal habitats restored: 525 acres
41. Develop appropriate indicators of the status and health of the resources of Biscayne Bay, through a collaborative approach with academic, governmental, nongovernmental organizations, and stakeholder entities	**Lead** Marine and Estuarine Goal Setting for South Florida (MARES): University of Miami Algal bloom indicator update: Florida International University **Partners** National Oceanic and Atmospheric Administration (NOAA), National Park Service (NPS), South Florida Water Management District	$493,000 as part of an anticipated three year, $1.47 million grant. Project will assist in coordinating data collection and analysis among agencies to optimize cost-effectiveness and avoid duplication.		MARES funding is from by a grant to the University of Miami and some of its collaborators from the NOAA Center for Sponsored Coastal Ocean Research. Additional funding will be required to continue collection of underlying data upon which the indicators are based and to analyze the data.	No.	Chl a (algal bloom) indicator presently being updated through 2008. **Year 1:** MARES project will begin development of indicators for the southeast Florida Shelf **Year 2:** Integrate these indicators for a more comprehensive assessment of all coastal waters	Not applicable	Achievement of milestones Chl a: spatial indicator trends: Improvement Remaining indicators to be developed through the MARES initiative.

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Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
	(SFWMD), Department of Environmental Resource Management (DERM), Florida Fish and Wildlife Conservation Commission (FWC) , Florida Department of Environmental Protection (FDEP), Audubon Society						
42. Continue to support the Comprehensive Everglades Restoration Plan (CERP)	**Lead** US Army Corps of Engineers; South Florida Water Management District (SFWMD) **Partners** Federal, state, tribal, and local government agencies may participate in planning teams.	The entire program has a 50-year time frame and is now expected to cost well in excess of $10 billion.	For the portion that is funded: 50:50 Federal: Non-Federal match required. Federal appropriations authorized by U.S. Congress and State appropriations from Florida legislature/SFWMD. If match is not available from both partners for a particular activity, the project cannot proceed. For the portion that is unfunded: Budget bills and authorizations, such as federal Water Resources Development Act at the federal level		Approval of individual project implementation plans; authorization of plans by Congress; federal and state funding approvals; federal or state award of construction contracts; initiation of construction	Not applicable	Progress with projects will be monitored.
43. Report the air quality benefits of mass transit use and reduced vehicle miles traveled	**Lead** Department of Environmental Resources Management (DERM) **Partners** Miami-Dade Transit Department (MDT)	Within existing resources	DERM MDT	No	**Year 1:** Develop mechanism to calculate air quality impacts. Report. **Year 2-5:** Continue	TBD through transit ridership	Reductions in CO, NOx, PM and CO_2
44. Continue to pursue funding for government and private diesel retrofit projects in partnership with the EPA Southeast Diesel Collaborative	**Lead** Department of Environmental Resources Management (DERM) **Partners** U.S. Environmental Protection Agency (EPA), Southeast Diesel Collaborative (US SEDC)	Funding with be determined by future EPA grant allocation	EPA	Yes. Board of County Commissioners approval based on grant	Determined by grant(s)	TBD through grant allocation	TBD through grant allocation

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Initiative	Lead & Partners	Funded and Unfunded Costs		Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
		Capital	Operating					
STRATEGY: Protect environmental and other lands that may be important for ecosystem and community resilience								
45. Continue to acquire important lands through the Environmentally Endangered Lands (EEL) program	**Lead** Department of Environmental Resources Management (DERM) **Partners** Environmentally Endangered Lands Program (EEL)	Funded: FY 10/11 – FY 14/15: $28.173 million	Within existing staff resources funded by EEL Trust Fund	EEL Trust Fund	Yes. BCC approval of acquisitions .	Continue acquisition program	Existing lands: Estimated Carbon Stored : 5,024,789 Estimated Yearly Accumulation of Carbon on (metric tons): *11,335* Lands remaining to be acquired have the potential to store an additional 4,004,352 metric tons of carbon and accumulate 8,216 tons of carbon annually.	**Year 1-5:** Cumulative acquisition target: 24,000 acres
46. Explore alternative funding sources for the EEL program such as a carbon offset sequestration program	**Lead** Department of Environmental Resources Management's (DERM) Environmentally Endangered Lands Program (EEL) **Partners** Office of Sustainability (OOS) Chicago Climate Exchange (CCX)	Year 1 milestone within existing staff resources		Supplemental funding is being sought to support the EEL Program.	Year 1 milestone will evaluate whether legislative action is required.	**Year 1:** Develop a Project Document with the CCX to determine value of existing EEL lands and revenue opportunities **Year 2-5:** Evaluate and implement	CO_2 sequestrat-ion TBD through implementation	Achievement of milestones
STRATEGY: Develop a sustainable Solid Waste System and Master Plan, using waste to benefit our economy and environment								
47. Continue to develop a sustainable Solid Waste Master plan	**Lead** Department of Solid Waste Management (DSWM)	$1.5 million for Phases 1 and 2		DSWM Disposal and Collection Fees	TBD through Master Plan recommen	**Year 1:** Completion of Phase 1 (assessment of current system) **Year 2:** Completion of Phase 2: Development of	TBD through Master Plan alternatives	Achievement of milestones

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Initiative	Lead & Partners	Funded and Unfunded Costs		Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
		Capital	Operating					
	Partners Customers Community stakeholders				dations	alternatives and road map for implementation. Alternatives include a "Pay as You Throw" system, Rate structure changes, diversion through recycling, composting, mulching, increased waste to energy usage, and new technologies		
48. Use waste as energy at the WASD South District Wastewater Treatment facility	**Lead** Water and Sewer Department (WASD) **Partners** Department of Solid Waste Management (DSWM)	Funded: $17.04 million	Costs are not yet in annual budget	Capitol: $1.8M funded by federal EECBG grant, remaining through WASD Plan Expansion Funds and WASD Series 2010 Bond Funds Operations and Maintenance: WASD annual budget	Yes. BCC Approval of contracts.	**Year 1:** Award co-generation units contract **Year 1-5:** Co-generation construction schedule to be based on contract	440 mt CO_2e per year	Achievement of milestones Amount of CO_2e impact avoided
49. Explore a residential composting program	**Lead** UF IAFS Miami-Dade County Cooperative Extension Service (UF IFAS) **Partners** Department of Solid Waste Management (DSWM)	**Funded:** Workshops will be offered by UFAS existing staff resources resources **Unfunded:** Bulk purchase of compost units. Residents would purchase compost units, approximately $50 each		UF IFAS	No	**Year 1**: Conduct educational workshops **Year 2**: Conduct surveys to determine program effectiveness **Year 2-5:** Continue/refine program based on Year 1-2 results	Not applicable	Number of workshop attendees: 450 annually Number of attendees composting (follow-up survey results)
50. Explore a private sector development of a local soil/compost industry	**Lead** MDC Agriculture Manager **Partners** Department of Solid Waste Management (DSWM)	Explored within existing staff resources in conjunction with the Solid Waste Master Plan		Within existing staff resources and Solid Waste Master Plan contract	TBD through Master Plan recommen dations	**Year 1:** Evaluate the quantity of waste needed for SWM operations in comparison to agriculture/ landscaping industry demand. Evaluate potential distribution and operational models. **Year 2-5**: Based on Year 1 results	TBD through implementation	Achievement of milestones
51. Continue to increase	**Lead** Department of Solid		Funded: New single	DSWM residential collection fees	No	**Year 1-5:** Continue increase current	County residential	County residential

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Initiative	Lead & Partners	Funded and Unfunded Costs		Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
		Capital	Operating					
participation in the residential recycling program	Waste Management (DSWM) **Partners** Waste services Inc., Waste Management of Florida Inc., World Waste Recycling Inc.		stream program: Approximately $8 million annually Savings of $4.5 million in comparison to former dual stream program Unfunded: Year 1-5: Outreach			participation with existing customers and encourage municipalities to join.	collection program: Total emissions avoided = 839,449 mt CO_2e Community recycling: 1,645,000 mt CO_2e avoided	collection program: 4% tonnage increase in FY 2010-11 2% increase each year thereafter
52. Partner with community leaders, and private entities to elevate commercial and multi-family recycling	**Lead** Department of Solid Waste Management (DSWM) **Partners** Building Owners and Management Association (BOMA), Greater Miami Chamber of Commerce, Municipality Chambers Private Waste Hauling Companies League of Cities Municipalities	Not applicable	Unfunded: Outreach Staffing needs to be determined through development of work plan.	TBD	Possibly. Chapter 15 of Miami-Dade County Code may need to be updated based on development of the work plan.	**Year 1:** Identify and prioritize key industries. Establish partnerships and work plan, develop outreach program. Host recycling forum link with current enforcement program **Year 2-5:** Implement	TBD through implementation	Number of known establishment conducting recycling. Recycling tons collected by private haulers (Approach TBD)
53. Mandate recycling in all local government buildings	**Lead** County Executive Office (CEO), Office of Sustainability (OOS) **Partners** Miami-Dade County's Department of Solid Waste Management(DSWM), Department of	TBD		Already funded by current costs of waste disposal. Waste disposal costs will go down with a resulting increase in recycling costs/revenues.	No	**Year 1:** Advertise contract **Year 2-5:** Implement and encourage municipalities to join		Tons recycled

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Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impacts	Performance Indicators and Targets
	Environmental Resource Management(DERM), Resource Conservation Committee						
54. Explore a pilot composting and mulching program for County operations such as Public Works and Park and Recreation departments	**Lead** Public Works Department (PWD), Parks and Recreation (MDPR) **Partners** Department of Solid Waste Management(DSWM), Public School System, S. Dade South and Water Conservation District	Within existing staff resources (PWD) Unfunded Capital (MDPR): $250,000 No new operating costs due to potential revenue for compost (MDPR)	Within existing staff resources (PWD) Attempting to obtain Pepsi Refresh Grant, otherwise TBD (MDPR)	No	**Year 1:** Evaluate current mulching operations and ability to use in gardens and within own operations or to generate revenue. (PWD) **Year 2-5:** Implement and expand (PWD) TBD based on funding (MDPR)	Indirect impacts	Achievement of milestones, % reduction to landfill (PWD), Lbs. of compost created (MDPR)

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Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
STRATEGY: Better integrate planning and prioritize investments							
55. Coordinate among the County departments and other agencies in implementing the CDMP and the County code	**Lead** County Executive Office (CEO) Department of Planning and Zoning (DPZ) **Partners** Departments in the Neighborhood and Transportation Strategic Area Teams, Metropolitan Planning Organization (MPO), Miami-Dade Expressway Authority (MDX), Florida Department of Transportation (FDOT)	Within existing resources	Within existing resources	No.	**Year 1:** Quarterly meetings coordinated by DPZ to achieve integrated planning by bringing together individual departments and stakeholders to evaluate their planning and activities and how they comply and/or further the Comprehensive Development Master Plan and County code. Develop work plan **Year 1-5:** Implement identified improvements	Indirect measures	TBD through implementation
56. Increase transit-oriented development (TOD)	**Lead** Miami-Dade Transit (MDT) Department of Planning and Zoning (DPZ) **Partners** General Services Administration (GSA), Parks & Recreation (MDPR), Public Works Department (PWD), Metropolitan Planning Organization (MPO)	Joint Development Agreements: Funded: Brownsville: Estimated cost at $175 million Unfunded: Northside: TBD Additional Urban Centers through County legislation: Additional TOD projects TBD	Funded by private developers through the Florida Housing Finance Corporation (FHFC)	No.	**Year 1:** Continue to plan and legislate urban centers. Complete joint development agreements: Brownsville – 467 units of affordable housing **Year 1-4:** Construction Northside – 350 units of affordable housing **Year 1:** Complete Lease Agreement with Development. Continue to **Year 2:** Planning and permitting process **Year 3-4:** Construction	13,000 mt CO_2e reduced (4,200 Brownsville, 7,800 Northside)	Ridership at stations or along corridors where TOD occurs Three urban center plans per year
57. Develop Corridor Master Plans modeled after the community based area planning process and	**Lead** Department of Planning and Zoning (DPZ) **Partners** Metropolitan Planning	Within existing resources	Within existing resources Seek grant funding	County Zoning Ordinances	3 years to develop plans if grant funded. **Year 1:** Phase 1 milestones (3-6 months): Powerpoint of stakeholder goals; and	Indirect measures	Corridor Transit Ridership, Bicyclists and Pedestrians, Site plans for commercial uses,

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Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
designed to address the Federal Livability Principles	Organization (MPO), Transit Department (MDT), Public Works Department (PWD), Water and Sewer Department (WASD), Parks & Recreation (MDPR), various business and community partners				Assessment Reports **Phase 2 milestones** : Charrette Workshop; Charrette Work-in-Progress Presentation **Year 2-3:** **Phase 3 milestones** (10-14 months): Final Corridor Plan Report; Implementation Strategies and Recommendations; 3D Massing Model **Phase 4 milestones** (12-18 months): Zoning Ordinances; Zoning Map Amendments		New Jobs, Site plans for affordable housing, tree canopy, flooding, Park space, funding shift of water and sewer transmission lines to corridors, site plans for affordable housing, site plans for workforce housing, number of public participants
58. Establish a uniform set of criteria for departments to follow in developing budget priorities as part of the County's capital budget planning process - These criteria should include sustainability benefits and compliance with the CDMP	**Lead** County Executive Office (CEO) Office of Strategic Business Management (OSBM) **Partners** Office of Capital Improvements (OCI), Office of Sustainability (OOS), Department of Planning and Zoning (DPZ) and all other departments	Within existing resources	Within existing resources	No.	**Year 1:** Gather and review current department prioritization processes. Establish sustainability criteria and links to the CDMP Establish a mechanism and prioritization process to ensure that departments use the criteria and that capital projects are tied into the Business Planning process Prioritize investment and seek funding for projects facilitating the movement of people and goods through the county's economic engines. **Year 2-5:** Implement	Indirect measure	Number of projects contributing to CDMP policies and sustainability goals VHTs or VMTs reduced per project and associated emissions reduction; Jobs created

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Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
59. Develop a map illustrating the location of capital improvement projects in comparison to areas designated in the CDMP for re-development, i.e. urban infill areas and urban centers for use by departments in planning and prioritizing infrastructure investments	**Lead** Office of Strategic Business Management (OSBM) Office of Capital Improvements (OCI) **Partners** Department of Planning and Zoning (DPZ), Metropolitan Planning Organization (MPO), Transit Department (MDT), Public Works Department (PWD), Water and Sewer Department (WASD), Solid Waste Department (SWD), Enterprise Technology Services (ETSD), Government Information System (GIS), (all capital departments)	Within existing resources	Within existing resources	No.	**Year 1:** Develop map **Year 2:** Develop and implement prioritization process **Year 2-5:** Continue to implement and annually update map	Indirect measure	# of new infrastructure projects in designated areas
60. Better integrate land use and transportation planning modeling for the long-range transportation planning process	**Lead** Metropolitan Planning Organization (MPO) Department of Planning and Zoning (DPZ) **Partners** Office of Sustainability (OOS) Transit Department (MDT)	Within existing resources	Within existing resources	No.	**Year 1:** Make it a legislative priority to improve localized modeling that includes density scenarios based on the implementation of the County's land use policies. Establish a uniform set of criteria to be used to prioritize projects in the county's long range transportation planning (LRTP) process. This criteria should address the LRTP Goals, sustainability benefits and the furtherance of CDMP policies. **Year 2-5:** Implement	Indirect measure	Completion of the milestones
61. Evaluate shifting current	**Lead** County Executive Office	Within existing resources	Within existing resources	Possibly	**Year 1:** Study, evaluate and prioritize options	Indirect measure	Increase in funding

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Initiative	Lead & Partners	Funded and Unfunded Costs Capital / Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
revenue streams to include funding of transit operations and maintenance and other sustainable modes	(CEO) Office of Strategic Business Management (OSBM) **Partners** Metropolitan Planning Organization (MPO), Transit Department (MDT), Citizens Independent Transportation Trust (CITT), Department of Planning and Zoning (DPZ)				**Year 2-5:** Implement		
62. Study innovative funding sources and mechanisms to support Miami-Dade Transit operations and maintenance costs and for capital improvements	**Lead** County Executive Office (CEO) Office of Strategic Business Management (OSBM) **Partners** Citizens Independent Transportation Trust (CITT), Transit Department (MDT), Metropolitan Planning Organization (MPO), Department of Planning and Zoning (DPZ)	Currently funded $82,009 Scope: Review literature interview industry leaders, and meet with County officials and staff. Prepare a full range "menu" of potential revenue techniques with description of use, components, and characteristics such as complexity and revenue potential completion scheduled for September 2010	People's Transportation Plan, CITT	Possibly	**Year 1:** Evaluate and select recommendations of the study **Year 2-5:** Pursue implementation	Indirect measure	Amount of actual funding secured
STRATEGY: Support existing communities and value neighborhoods							
63. Continue to promote infill development by exploring incentives and addressing costs of infrastructure	**Lead** County Executive Office (CEO) Department of Planning and Zoning (DPZ) **Partners** Office of Capital Improvements (OCI), Office of the Property Appraiser (PA), Transit Department (MDT), Office of Strategic Business Management (OSBM)	Requires staff assignments for research and analysis; there may be consulting work necessary. Cost of infrastructure TBD.	Within existing resources	Possibly	**Year 1:** Evaluate EECBG consultant work and develop work plan Assess staffing or consulting needs Evaluate tax incentives their costs and benefits (including carbon footprint) **Year 2-5:** Implement	Indirect measure	TBD through implementation Potentially: # of projects # of units

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Initiative	Lead & Partners	Funded and Unfunded Costs Capital / Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
64. Examine innovative options for infrastructure cost sharing mechanisms (consider public private partnerships, re-examine impact fees)	**Lead** Office of Strategic Business Management (OSBM) Office of Capital Improvements (OCI) Builders Association of South Florida (BASF) **Partners** Department of Planning and Zoning (DPZ), Public Works Department (PWD), Water & Sewer Department (WASD)	Within existing resources	Within existing resources	County (potential)	**Year 1**: Identify and evaluate options **Year 2-5:** Implement	Indirect measure	TBD through implementation # of mechanisms/ improvements
65. Prioritize infrastructure and service delivery to infill and redevelopment areas consistent with the CDMP (water & sewer, parks, roadways, schools, etc.)	**Lead** Office of Strategic Business Management (OSBM) Office of Capital Improvements (OCI) **Partners** Department of Planning and Zoning (DPZ), Public Works Department (PWD), Water & Sewer Department (WASD), Parks & Recreation (MDPR), Transit Department (MDT)	Initially within existing resources. May require additional resources.	Initially within existing resources.	County (potential)	**Year 1-2:** Develop list of infrastructure needs per urban center and re-development area Integrate with quarterly Comprehensive Development Master Plan implementation meetings **Year 3-5:** Integrate needs into resource allocation planning.	Indirect measure	Completion of the milestones
66. Examine the potential barriers to living in urban centers and infill areas including public safety perceptions and access to schools and food, among others	**Lead** Department of Planning and Zoning (DPZ) **Partners** Economic Development Coordination (a division of DPZ), Public Works Department (PWD), Water & Sewer Department (WASD)	Initially within existing resources. May require additional resources.	Initially within existing resources.	No	**Year 1**: Develop a list of barriers and Action Plans to address barriers. Assess staffing or consulting needs **Year 2-5**: Implement Action Plans	Indirect measure	Completion of the milestones
67. Provide for neighborhoods where residents can walk or	**Lead** Department of Planning and Zoning (DPZ)	The Comprehensive Development Master Plan (CDMP) portion can be accomplished with existing	Within existing resources	County through the CDMP and	**Year 1:** Prepare update to the CDMP to provide for revised guidelines of urban form as part of the	Indirect measure	Completion of the milestones

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Initiative	Lead & Partners	Funded and Unfunded Costs Capital / Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
bicycle to carry on their daily needs	**Partners** Public Works Department (PWD), Parks & Recreation (MDPR)	staff. Subdivision regulation update may require additional staff assignment		Subdivision Code	Evaluation & Appraisal Review (EAR) based amendments Assess the resources needed to begin the subdivision regulations update.		
68. Update existing County and municipal regulatory criteria to provide for housing diversity	**Lead** Department of Planning and Zoning (DPZ) **Partners** All municipalities, Housing and Community Development(HCD)	The County portion can be accomplished with existing staff or staff assignment. The municipal portion needs to be coordinated	Within existing resources	County	**Year 1:** Develop draft Ordinance updating the County Code	Indirect measure	Completion of the milestones
69. Coordinate school locations with Miami-Dade County Public Schools and provide the regulatory criteria for all other schools to assure that these facilities are within reasonable walking or biking distance from the residential communities they serve	**Lead** Department of Planning and Zoning (DPZ) **Partners** Miami Dade County Public Schools (M-DCPS), Parks & Recreation Department (MDPR)	The County portion requires staff assignment. Use process similar to the development of the Interlocal Agreement on School Concurrency	Within existing resources	County and M-DCPS	**Year 1:** Establish a working group with the M-DCPS Prepare ordinance establishing criteria	Indirect measure	Completion of the milestones
70. Establish additional meaningful open space and recreation areas through cooperative land use and joint-development programs	**Lead** Parks & Recreation Department (MDPR) **Partners** Department of Planning and Zoning (DPZ), Miami-Dade Public Library System (LIB), Cultural Affairs	Funding for implementation of Policy ROS-8G of the RISE is through the Communities Putting Prevention to Work (CPPW) Grant	Communities Putting Prevention to Work grant	No.	**Year 1-2:** Development of a new urban design manual for meaningful public spaces that incorporate elements which encourage incidental physical activity.	Indirect measure	Number of partnerships resulting in coordinated public spaces constructed as part of civic projects.

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Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
with schools, libraries, cultural areas, and other civic/institutional places	(CUA), General Services Administration (GSA); Miami-Dade School District				**Year 3-5:** Changes to department operating procedures in the incorporation of meaningful public spaces in the planning and development of libraries, museums, schools, government buildings, transit stations within Transit-Oriented Development (TOD) and stand-alone transit stations, and other civic/institutional places These milestones are based on the CDMP Recreation Open Space Element policies ROS-8G, ROS-3A and ROS-3B;		
71. Develop regulations and programs that promote connectivity, pedestrian movement and lower vehicular speeds	**Lead** Department of Planning and Zoning (DPZ) **Partners** Public Works Department (PWD), Parks & Recreation Department (MDPR), Metropolitan Planning Organization (MPO), Florida Department of Transportation (FDOT)	Portion can be accomplished with existing staff, the balance may require staff assignments		County	**Year 1:** Inventory current needs and strategies. Develop programs needed such as roundabouts. Develop action plans **Year 2:** Develop regulatory framework	Indirect measure	Completion of the milestones
72. Explore redfields to greenfields options (Red Fields to Green Fields seeks to convert vacant and financially distressed commercial property into urban parks.)	**Lead** Parks & Recreation Department (MDPR) **Partners** Department of Planning and Zoning (DPZ), Transit Department (MDT);	TBD through implementation	Potential sources include FDIC, federal funds, private investors	Local and federal	Dependent on funding	Indirect measure	Number of Redfield to Greenfield Projects

Responsible Land Use and Smart Transportation

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
	Housing & Community Development (HCD); University of Miami; Health and Built Environment Committee of the M-D County Health Department.; Speedwell Foundation; Knight Foundation and Trust for Public Land						
STRATEGY: Increase bicycling & walking							
73. Implement Complete Streets initiative – **"Complete Streets"** allow for safe, comfortable travel by all users, including pedestrians, bicyclists, public transportation riders and drivers, and people of all ages and abilities, including children, youth, families, older adults, and individuals with disabilities.	**Lead** Department of Planning and Zoning (DPZ) **Partners** Office of Sustainability, Public Works Department (PWD), Parks & Recreation Department (MDPR), Metropolitan Planning Organization (MPO), Florida Department of Transportation (FDOT), Miami-Dade Expressway Authority (MDX), Transit Department (MDT)	Portion can be accomplished with existing staff, the balance may require staff assignments		County	**Year 1:** Submit Resolution to the BCC on the Complete Street Initiative. Submit ordinance Update the Zoned right-of-way via ordinance concurrently. **Year 2-5:** Incorporate concept into planning, design, approval, and implementation processes for construction, reconstruction, retrofit, maintenance, alteration, or repair of streets, bridges, or other portions of the transportation network, including pavement resurfacing, restriping, and signalization operations if the safety and convenience of users can be improved. Departments make "Complete Streets" practice a routine part of everyday operations, in every projects and in coordination with other	Indirect measure	Completion of the milestones

Responsible Land Use and Smart Transportation

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
					departments, agencies, and jurisdictions.		
74. Implement the Bicycle & Pedestrian Facilities Plan, prioritizing projects and securing funding	**Lead** County Executive Office (CEO), Metropolitan Planning Organization (MPO) **Partners** Department of Planning and Zoning (DPZ), Office of Sustainability (OOS), Public Works Department (PWD), Parks & Recreation Department (MDPR), Florida Department of Transportation (FDOT), Miami-Dade Expressway Authority (MDX)	The 2011 Transportation Improvement Program includes $158.9M of funded roadway projects that will include 22.7 miles of bike lanes. The bike lanes are a component of the larger project and costs can not be isolated from the overall project costs.	Various Federal, State, and Local Transportation Funds	No	**Year 1 – 5**: Construct projects in Bicycle and Pedestrian Facility Plan - 22.7 miles of bike lanes planned in the projects specified in the Transportation Improvement Program.	Indirect measure	Number of miles of bicycle and pedestrian facilities built/year
75. Conduct non-motorized planning studies for corridors and urban centers	**Lead** Metropolitan Planning Organization (MPO) **Partners** Florida Department of Transportation (FDOT), Public Works Department (PWD), Department of Planning and Zoning (DPZ), Parks & Recreation Department (MDPR), Municipalities and bicycling community groups	TBD	Potential federal funds in Transportation Reauthorization Bill, MPO Unified Planning Work Program (UPWP)	No	**Year 1:** Develop scope of work for studies and submit for funding through the Unified Planning Work Program **Year 2 – 5:** Develop plans for each of the corridors and urban centers Seek capital funding for implementation	Indirect measure	Develop 1 plan/year
76. Increase the number of safe walking and bicycling facilities as components of road improvement projects	**Lead** Florida Department of Transportation (FDOT), Public Works Department (PWD) **Partners** Metropolitan Planning	The review of projects is within existing resources Cost is variable if facility is incorporated into other roadway construction as the cost of sidewalks and bike lanes is nominal where right-	People's Transportation Plan, Road Impact Fees, State and federal funds (depends on roadway jurisdiction)	County – update Zoned Right of Way	**Year 1-5:** Ongoing identification of bike and pedestrian project needs and opportunities in scoping phase of projects	Indirect measure	Increase the number of bike and walking facilitates in road improvement projects Decrease in the

Responsible Land Use and Smart Transportation

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
	Organization (MPO), Department of Planning and Zoning (DPZ)	of-way is available.					number of bicycle injuries/fatalities
77. Fund and construct priority non-motorized multi-use trails	**Lead** Parks & Recreation Department (MDPR) **Partners** Metropolitan Planning Organization (MPO), Public Works Department (PWD), Transit Department (MDT), Florida Department of Transportation (FDOT)	Biscayne Trail and Black Creek Trail Bridge: 2,599,789 Averages: Capital approximately $875,000 per mile for paved trail Maintenance: approximately $15,493 per mile	Surface Transportation Enhancement (SE) program, Federal High Priority Projects (FHPP), Surface Transportation Program (STP), Legislative Earmarks, General Obligation Bonds (GOB), American Recovery and Reinvestment Act (ARRA) stimulus funding. Potential funding from the passing of the Active Community Transportation (ACT) act of 2010	Need BCC pass waiver on GOB 17% soft cost cap (planning services, design services and project administration) to permit expenditures of up to 25% (see form for details).	**Year 1 -2:** Biscayne Trail Segments A & B 3/15/10 to 1/17/12; Black Creek Trail segment A 10/1/10 to to 9/18/12; Black Creek Trail Bridge A construction 7/31/11 to 7/3/12; Snake Creek Trail Phase 1 construction 12/04/1 to 12/5/12; Old cutler Trail Phase 1 7/10 to 1/11; Commodore Trail construction 11/10 to 10/11	Black Creek Trail: 640 mt CO_2e reduced over 5 years 2,400 mt CO_2e avoided over 5 years	# of trail projects completed, including # of miles of trail
78. Implement signage plans for multi-use trail and bike routes	**Lead** Park & Recreation Department (MDPR) & Public Works Department (PWD) **Partners** Metropolitan Planning Organization (MPO)	$5,000/mile for regulatory signage $1,835/ trail way finding sign (within right-of-way)	Building Better Communities Bond, competitive grants, Fernandez Pave the-Way Foundation, Rails-to Trails Conservancy and Coca-Cola, Surface Transportation Enhancements Program, municipal donations	No	**Year 1:** PWD to complete assessment of needs for pavement markings. **Years 2-5:** Complete pavement markings as funding allows. Seek additional funding for remaining needs.	Indirect measure	Miles of marked trails and routes
79. Establish criteria for the delivery of parks and recreational open spaces that are intended to encourage equitable access to neighborhood parks and open space as well as area-wide	**Lead** Parks & Recreation Department (MDPR) **Partners** None identified	Communities Putting Prevention to Work (CPPW) Grant	This effort is being funded through the Center for Disease Control's Communities Putting Prevention to Work Grant	No	Completion by December 2011 with implementation through adoption by the Park and Recreation Department of standards	Indirect measures	The development of department operating procedures and standards

Responsible Land Use and Smart Transportation

Initiative	Lead & Partners	Funded and Unfunded Costs Capital / Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
recreational activities for all County residents							
80. Provide or require bicycle parking and other end-of-trip facilities at public and private destinations	**Lead** Metropolitan Planning Organization (MPO), Department of Planning and Zoning (DPZ) **Partners** Business community, Large employers	Unfunded: Bike Rack: $225/rack Bike Locker: $2,500/locker	Unfunded	No	**Year 1:** Develop the necessary code and program changes to implement initiative. Adoption of the changes.	Indirect measure	Number of bike parking facilities, showers, and/or lockers established each year
81. Encourage municipalities to adopt the County's bicycle parking ordinance	**Lead** Metropolitan Planning Organization (MPO), Department of Planning and Zoning (DPZ) **Partners** Municipalities	Within existing resources Parking retrofits to be funded In accordance with new development.	Within existing resources	Yes. County and City.	**Year 1**: County to adopt updated regulations. **Year 2-5:** Adoption by municipalities	Indirect measure	Number and/or percent of municipalities who have adopted ordinance each year
82. Expand bicycle parking legislation to include showers and lockers for employees	**Lead** Department of Planning and Zoning (DPZ) **Partners** Metropolitan Planning Organization (MPO), County Attorney Office (CAO)		Within existing resources	County	**Year 1:** Adoption by Board of County Commissioners	Indirect measure	Number of employment sites with showers and/or lockers
83. Increase integration of transit with pedestrian and bicycle trips	**Lead** Transit Department (MDT) **Partners** Metropolitan Planning Organization (MPO)	TBD through implementation	Federal and local	No	**Year 1:** Establish baseline of number of bicycle and pedestrian trips to transit Inventory and explore expanding programs to increase bicycling and pedestrian trips Identify barriers and disincentives to bicyclists and pedestrians	3,800 mt CO_2e reduced over 5 years, 19,000 mt CO_2e avoided over 5 years	1,750 Bike on Train Permits/Year
84. Include designated	**Lead** Transit Department (MDT)	Funded $2.3 million/ Metrorail car	Peoples Transportation Plan	No	**Year 1** - Notice to proceed to metrorail car	Indirect Measure	Number of permits for bikes

Responsible Land Use and Smart Transportation

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
bicycle space within Metrorail cars	**Partners** N/A				builder **Year 3** – Prototypes received 2013 **Years 4 and 5** – Staggered replacement of 136 rail cars in fleet with 4 cars per month – 4 bike racks per car		on trains
85. Improve bicycle parking at transit hubs	**Lead** Transit Department (MDT) **Partners** Metropolitan Planning Organization (MPO)	Unfunded Unit Costs: Bike Rack: $225/rack Bike Locker: $2,500/locker	No dedicated funding source	No	**Year 1** - Review and update the list of Bicycle Parking Needs and Recommendations in the *Bicycle Parking Plan for Miami-Dade Transit (2002)* Evaluate results of bike lid demonstration project underway at University Station Seek funding for bike parking racks or lockers	Indirect measure	Number of bicycle parking spaces (racks, lockers, lids, etc.) established at hubs
86. Reduce the automobile parking requirements in the zoning code	**Lead** Department of Planning and Zoning (DPZ) **Partners** Transit Department (MDT), Metropolitan Planning Organization (MPO), Public Works Department (PWD)	Within existing resources	Within existing resources	County Ordinances	**Year 1** – Identify zoning districts and type of uses that will benefit from parking requirement reduction. Urban center parking requirements could be used as a model for this process. Identify additional transit needs resulting from parking reductions. **Year 2**- Establish series of parking reductions through ordinances	Indirect measure	Number of ordinances and number of spaces eliminated
STRATEGY: Increase transit ridership							
87. Increase the number of enhanced bus corridors	**Lead** Transit Department (MDT) **Partners** Federal Transportation	Partially funded North Corridor – 35.8M East – West Corridor – 22.6M Flagler Street Corridor – 8.8M Bisc. Blvd Corridor – 6.7M	County General Fund, People's Transportation Plan, Federal or state program grants (block grants) and competitive	Federal, state and local	**Year 2:** North Corridor: Phase 2 2012, Phase 2 – 2016 **Year 4:** Flagler Street Corridor: 2014	3,300 mt CO_2e reduced over 5 years 13,000 mt avoided CO_2e over 5	Increase in ridership along corridors

Responsible Land Use and Smart Transportation

Initiative	Lead & Partners	Funded and Unfunded Costs Capital / Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
	Authority (FTA), Florida Department of Transportation (FDOT), Federal Highway Administration (FHWA), Metropolitan Planning Organization (MPO), Miami-Dade Expressway Authority (MDX), Public Works Department (PWD), Department of Planning and Zoning (DPZ)		grant opportunities		Biscayne Blvd Corridor: 2014 East-West Corridor : 2016	years	
88. Increase the number of park and ride facilities	**Lead** Transit Department (MDT) **Partners** Federal Transportation Authority (FTA), Florida Department of Transportation (FDOT), Metropolitan Planning Organization (MPO), Miami-Dade Expressway Authority (MDX), Public Works Department (PWD), Department of Planning and Zoning (DPZ), private developers and private property owners	Funded 1. Kendall Dr/SW 150 Ave - $190K annual lease payments 2. Kendall Town Center - $0 capital costs 3. Miami Gardens Dr/73 Ave - $1.8M capital costs 4. Busway/SW 344 St – $10.7M capital costs 5. NW 107 Ave/12 St - $0 capital costs 6. Kendall Dr/SW 127 Ave - $2.8M capital costs	County General Fund, People's Transportation Plan, Federal or state program grants (block grants) and developer driven	Possibly for joint participation agreements	**Year 1:** Establish a standard practice to encourage or require these facilities as Traffic Concurrency Measures	900 mt CO_2e reduced over 5 years 4,000 mt CO_2e avoided over 5yrs	Number of Park & ride facilities constructed Number of Park & Ride facilities constructed as part of development projects
89. Complete the Airport Link – connection of the Metrorail to Miami International Airport	**Lead** Transit Department (MDT) **Partners** Florida Department of Transportation (FDOT), Metropolitan Planning Organization (MPO), Public Works Department (PWD), Department of Planning and Zoning (DPZ)	Funded $526 Million	FDOT - $100 Million People's Transportation Plan - $426 Million	No	**Year 1:** Miami River Crossing estimated to begin by Summer 2011. Tie into existing Earlington Heights Station estimated to begin by Summer 2011. **Year 2:** Project estimated to be complete by April 2012.		Number of boardings originating and ending at Miami Intermodal Center (MIC)
90. Improve the image of	**Lead** Transit Department (MDT)	Unfunded – scope and costs TBD	County General Fund, People's Transportation	No	**Year 1:** Review existing marketing and public	Indirect measure	Completion of the milestones

Responsible Land Use and Smart Transportation

Initiative	Lead & Partners	Funded and Unfunded Costs Capital / Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
transit including social marketing campaigns to target different groups and make riding the bus and train 'cool' - in particular, marketing efforts to non-transit dependent population	**Partners** Government Information Center (GIC), Metropolitan Planning Organization (MPO), Florida Department of Transportation (FDOT), South Florida Commuter Services, South Florida Regional Transportation Authority (SFRTA), Federal Transportation Authority (FTA), possibly universities		Plan, Federal or state program grants (block grants) and competitive grant opportunities		involvement plans to evaluate new initiatives. Conduct best practice research to develop an education program to show non-bus riders how to ride the bus. Components could include providing community workshops, trial rides or develop on-line video that would walk people through the process step by step		
91. Improve real or perceived problems with safety and cleanliness	**Lead** Transit Department (MDT) **Partners** MDPD, Contracted Security, Civic organizations, employers and other community stakeholders	MDT Operational support expenses	County General Fund, People's Transportation Plan, Federal or state program grants (block grants) and competitive grant opportunities	No	**Years 1-5:** Continue to conduct regularly scheduled safety and inspection audits to maintain passenger facilities and vehicles while monitoring complaints, accidents, and incidents/continue marketing and outreach efforts/maintain visible level of system wide security presence	Indirect measure	Level of investment in safety projects/accident ratios/compliance with system safety program plan
92. Increase technology features, including real time bus signage and Wi-Fi	**Lead** Transit Department (MDT) **Partners** Enterprise Technology Services (ETSD), Public Works Department (PWD)	Funded Real Time Signage for all Metrorail Stations: 5.4 Million Real Time Signage for Bus Stops: $15,000/ stop Onboard Wi-Fi on rail vehicles and premium bus routes: $1,500/vehicle (bus or train)	Real Time Signage for all Metrorail stations: FDOT funds, local gas taxes, ARRA, and MDT operating budget Real Time Signage for Bus Stops: CAD/AVL funding Onboard Wi-Fi on rail vehicles and premium bus routes: MDT operating budget	No	**Year 1-5:** Install signage and Onboard Wi-Fi	Indirect measure	# of people signing up for mobile alerts, # of train stations and bus corridors with real time information/Wi-Fi accessibility
93. Establish and implement minimum standards to	**Lead** Transit Department (MDT) Public Works Department	Improvements made as part of private development projects will be part of	Development driven, People's Transportation Plan, and competitive	Possible	**Year 1:** Promote inclusion of transit amenities in new projects	Indirect measure	-number of development projects that

Responsible Land Use and Smart Transportation

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
enhance routes within a quarter mile of public transit stops to create safe, convenient, comfortable, and aesthetically pleasing access for bicyclists and pedestrians including the elderly and disabled	(PWD) **Partners** Department of Planning and Zoning (DPZ), Metropolitan Planning Organization (MPO), Community Image Advisory Board (CIAB), Florida Department of Transportation (FDOT), Municipalities and private developers	development costs. Costs vary according to amenities. TBD through implementation	grant funding		adjacent to transit facilities through incentive mechanisms such as density increases Assess and identify needs including shading; retiming signalization for crossing; medians, crossings, and sidewalk improvements including ADA, bike, and pedestrian accessibility; accommodations for rain and weather protection; **Year 2-5:** Develop plan, identify and seek funding for implementing improvements		include accessibility improvements or amenities -reduce the number of transit stops identified by MDT as having limited accessibility
STRATEGY: Improve connectivity and mobility on the existing system							
94. Continue to implement projects that improve connectivity and mobility between major economic drivers and major activity hubs such as the Port of Miami, airports, sports venues, and convention centers	**Lead** County Executive Office (CEO) **Partners** Metropolitan Planning Organization (MPO), Miami-Dade Transit (MDT), Port of Miami (POM), Aviation Department (MDAD), Department of Planning and Zoning (DPZ), Federal Highway Administration (FHWA), Federal Transportation Authority (FTA), Florida Department of Transportation (FDOT),City of Miami, South Florida Regional Transportation Authority (SFRTA), Miami-Dade Expressway Authority (MDX), Amtrak, Greater	Miami Intermodal Center - $2.25 Billion, funded Port of Miami Tunnel – $610 Million, funded Viaduct – Phase 1: $117 Million, funded; Phase 2: $85 Million, partially funded	Federal, State, and Local funds	No	**Year 1-4**: Continue construction of projects. MIC –expected completion in 2012 Port of Miami Tunnel – expected completion in 2014 Viaduct – Phase 1 expected completion in 2011, Phase 2 2020	Viaduct – 19,000 tons CO_2/year Emission Reductions estimates not available for other projects	Completion of Milestones Level of Service ratings on connecting roadways

Responsible Land Use and Smart Transportation

Initiative	Lead & Partners	Funded and Unfunded Costs Capital / Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
	Miami Chamber of Commerce and the Greater Miami Visitors & Convention Bureau.						
95. Continue implementing traffic system management solutions including improved signal timing	**Lead** Public Works Department (PWD) **Partners** Florida Department of Transportation (FDOT) Metropolitan Planning Organization (MPO) Enterprise Technology Services Department (ETSD) Office of Intergovernmental Affairs (OIA)	Funded $23 million	People's Transportation Plan and State Grant	No	**Year 1:** Scope and select consultant services. Perform additional software enhancements, along with the study and/or implementation of related projects (e.g. new Traffic Management Center, evaluation and implementation of software that is adaptable to real-time traffic volume fluctuations, expansion of the video surveillance system, enhanced communication network, etc.) **Year 2-5:** Explore additional TSM approaches.	Indirect measure	Completion of the milestones
96. Continue to pursue traffic demand management solutions such as ridesharing, congestion pricing, and high occupancy toll lanes providing express transit service	**Lead** Metropolitan Planning Organization (MPO) **Partners** Florida Department of Transportation (FDOT), Miami-Dade Expressway Authority (MDX), South Florida Commuter Services (SFCS)	Unfunded until 2015	Varies	No	For congestion pricing: **Year 1:** Explore the adoption of a Mobility Fee (i.e. Road User Fee, Modified Impact Fee, Transportation Utility Fee) through conducting research on types and the feasibility of implementation	n/a	Completion of the milestones
97. Work in partnership with the Metropolitan Planning Organization	**Lead** Metropolitan Planning Organization (MPO) Department of Planning and Zoning (DPZ)	Carpool $3.1 million per year Vanpool $1,279,953 for tri-county	Federal and state funding	No	Carpool 5% increase in participation each year Vanpool net growth of 12 vans	Carpool 4,000 mt CO_2e reduced over 5 years, 11,000 mt	Carpool # Commuters switched to Carpool from SOVs, # Vehicle

Responsible Land Use and Smart Transportation

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
(MPO) and South Florida Commuter Services to expand carpooling and vanpooling programs	**Partners** Florida Department of Transportation (FDOT), South Florida Commuter Services (SFCS)	program. Capital costs make up approximately 55% of the costs.			per year	CO_2e avoided over 5 years Vanpool 2,000 mt CO_2e reduced over 5 years, 10,000 mt CO_2e avoided over 5 years	trips and miles eliminated Vanpool # of vanpools, average monthly mileage, passenger trips and passenger miles saved, fuel and emissions savings
98. Expand the express bus service between Miami-Dade and Broward counties through extending the I-95 managed/express lanes from Golden Glades Interchange to I-595	**Lead** Florida Department of Transportation (FDOT) **Partners** Miami-Dade Transit (MDT), Broward County Transit (BCT), Metropolitan Planning Organization (MPO)	Capital: $3.2 million Operation & Maintenance – $3.8 million/year	Capital – Federal Transit Administration Operation & Maintenance– FDOT (Tolls and State Funds)	No	**Year 1:** Plan route and service expansions Begin construction March 2011 **Year 3:** Complete construction December 2013	1,350 mt CO_2 reduced and 1,350 mt CO_2 avoided	Ridership on express buses
99. Explore feasibility of "pay for miles travelled" insurance	**Lead** Office of Sustainability (OOS) **Partners** Metropolitan Planning Organization (MPO)	n/a	n/a	State	**Year 1:** Locally conduct and evaluate best practice research Identify statewide organization partners.	Indirect Measure	Completion of the milestones

Vibrant Economy

Initiative	Lead & Partners	Funding		Funding Sources	New Legislative Action	Milestones	Emissions Reduction	Performance Indicators and Targets
		Capital	Operating					
STRATEGY: Build a sustainable economy and promote green business								
100. Establish a local action plan for green industries and green jobs and examine economic challenges related to climate change	**Lead** Economic Development **Partners** Office of Sustainability (OOS), Department of Environmental Resources Management (DERM) Small Business Development (SBD), Finance Local Business Tax Socio-economic Development Council 7 County Regional Partnership	Within existing resources at this time		Within existing resources at this time	No.	**Year 1:** Appoint a Green Economy Task Force. Assess local green economy and develop an action plan. **Year 2-5**: Implement	Indirect impact	Achievement of milestones will determine indicators and targets # of jobs created
101. Develop a Green Business Certification Program	**Lead** Office of Sustainability (OOS) Economic Development **Partners** Department of Environmental Resources Management (DERM), Water and Sewer Department (WASD) Small Business Development	Pilot to be accomplished within existing resources. May require additional funding based on inspection time required.		Explore federal grant options	Yes. Will require Board of County Commissioner approval	**Year 1:** Pilot **Year 2-5:** Program roll-out	TBD Based on number of businesses participating in program	# of businesses certified Energy efficiency, water reductions, etc. # of businesses that adopt the Green Jobs Pledge through the certification
102. Leverage state and federal funding to develop green small business loan program for sustainable improvements, i.e. revolving loan	**Lead** Elected Official(s) Financial Institution Economic Development **Partners** Office of Sustainability (OOS) Office of Grants Coordination (OGC) Finance Dept. Municipalities	Funding is expected to be external and TBD through implementation		Seed money to be identified through grants, private investment etc.	Yes. Will require Board of County Commissioner approval	**Year 1:** Develop program and identify funding **Year 2-5:** Implement when funding is secured	TBD through implementation Based loans and retrofits	# of loans # and type of retrofits # of jobs created

Vibrant Economy

Initiative	Lead & Partners	Funding Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Reduction	Performance Indicators and Targets
103. Integrate sustainability criteria with existing and new County economic development programs	**Lead** County Executive Office (CEO) Economic Development **Partners** Planning and Zoning (CDMP) Office of Sustainability Beacon Council	Within existing resources	Within existing resources	Yes. Will require Board of County Commissioner approval	**Year 1:** Identify existing programs and integrate criteria **Year 2-5:** Identify new programs as needed	TBD through implementation	Achievement of milestones TBD through implementation: # of businesses # of jobs created
STRATEGY: Expand our successful tourism and trade industries							
104. Enhance and market the sustainability of major facilities and events	**Lead** Greater Miami Visitors and Convention Bureau (GMVCB) **Partners** Economic Development (Green Certification Program) Florida Department of Transportation	Within existing resources at this time TBD through implementation	Within existing resources at this time TBD through implementation	No	**Year 1:** Inventory existing sustainable venues Examine how to enhance additional venues **Year 2-5:** Market and grow number of facilities and events	TBD through implementation (based on number and types of facilities and events)	# of facilities # of events
105. Explore a voluntary carbon offset purchasing program for conventions, conferences, large events, and individual tourists	**Lead** Greater Miami Visitors and Convention Bureau **Partners** Office of Sustainability (OOS) Agriculture Manager Farm Bureau Community Image Advisory Board (CIAB) Department of Environmental Resources Management (DERM) Park and Recreation (MDPR)	Program development within existing resources	Intended to be a revenue source	May require BCC action	**Year 1:** Research and develop program **Year 2-5:** Market and implement	Emission offsets TBD through implementation	Funding generated
106. Integrate and promote a sustainable tourism	**Lead** Agriculture manager Greater Miami Visitors	TBD through implementation		May require BCC action	**Year 1**: Organize and add to the Green Lodging Program	TBD Based on number of	

Vibrant Economy

Initiative	Lead & Partners	Funding: Capital	Funding: Operating	Funding Sources	New Legislative Action	Milestones	Emissions Reduction	Performance Indicators and Targets
experience through linking hotels, restaurants, and our unique environment through the Florida Green Lodging Program	and Convention Bureau (GMVCB) **Partners** Office of Sustainability (OOS) Economic Development Florida Department of Environmental Protection (FDEP) Green Lodging Program National Park Service South Florida Water Management District Park and Recreation					**Year 2-5:** Implement program	events participating in project.	
107. Make our Airport and Seaport sustainability leaders through certifications specific to the enterprise	**Lead** Miami International Airport (MIA) Port of Miami (POM) **Partners** Office of Sustainability	TBD through implementation			No	**Year 1**: Identify the appropriate green certification programs through benchmarking **Year 2-5**: Obtain certification and promote	TBD through implementation	ISO 140001 Certification Status, etc.
STRATEGY: Support educational institutions in their initiatives to develop a workforce for a sustainable economy								
108. Promote technical/ vocational training for sustainable fields through business and educational institution partnerships	**Lead** Economic Development Small Business Development **Partners** Office of Sustainability Area colleges and universities	Initially within existing resources. New program funding TBD through implementation.		TBD	No	**Year 1:** Establish a team to coordinate efforts. Inventory existing technical/ vocational training and assess demand for additional programs. **Year 2-5:** Develop programs and implement	Indirect emissions	Achievement of milestones # of program participants
109. Incorporate sustainability principles into public and private school and university initiatives	**Lead** Planning & Zoning (DPZ) **Partners** Office of Sustainability MDC Public Schools Colleges/ Universities Environmental Education Providers	Requires staff assignments			May require BCC action. May require State legislative action	**Year 1:** Establish a team to coordinate efforts. Inventory existing academic program and identify needs.. **Year 2-5:** Develop programs and implement	Indirect impact	Achievement of milestones # of children receiving information

Vibrant Economy

Initiative	Lead & Partners	Funding		Funding Sources	New Legislative Action	Milestones	Emissions Reduction	Performance Indicators and Targets
		Capital	Operating					
STRATEGY: Increase the sustainability of agricultural practices								
110. Develop a sustainability certification for agriculture	**Lead** Economic Development, Agriculture Manager **Partners** Office of Sustainability Farm Bureau	Within existing resources at this time			May require BCC action	**Year 1:** Develop program Year 2: Roll into Green Certification Program **Year 2-5:** Implement	TBD through implementation	# of certification
111. Explore new sustainable agriculture opportunities, expanding Best Management Practices	**Lead** Economic Development, Agriculture Manager **Partners** Office of Sustainability Fairchild Tropical Gardens	Within existing resources at this time			May require BCC action	**Year 1:** Explore expanding on the Ag Incubator Partnership with Fairchild (currently under study) **Year 2-5:** Implement	TBD through implementation	TBD through implementation

Healthy Communities

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
STRATEGY: Facilitate active and safe lifestyles for residents through the Open Space Master Plan and other community initiatives							
112. Implement the Open Space Master Plan (OSMP)	**Lead** Miami-Dade Parks Department (MDPR) **Partners** Miami-Dade Public Works Department (MDPWD)	Year 1 milestones : $529,000 Year 2-5 milestones: TBD	Year 1 milestones: Communities Putting Prevention to Work (CPPW) Grant	No	**Year 1:** Begin implementation of Strategies of the CPPW Grant including: 1. Complete the Park and Open Space and Recreation Activities Access and Equity Evaluation and Measures 2. Improve Urban Design Manual Volume I (Private Development), Pattern Book, Safe Routes to Parks (SRTP) and Way-finding Signage. 3. Improve the Urban Design Manual Volume 2 (Public Development) **Years 2-5:** Continue implementation of the OSMP: 1. Identify new areas to be designated for greenways, trails, and bicycle lanes, and update the North Miami-Dade Greenway Master Plan and South Miami-Dade Greenway Network Master Plan and the CDMP to include such greenways. Including designation of Western Greenway. 2. Develop a plan for protecting and preserving designated Environmental Zones (Eco Zones) & Cultural Zones.	Indirect impact	Achievement of milestones (See OSMP)

Healthy Communities

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
113. Promote and develop biking activities such as the City of Miami Bike Days	**Lead** Metropolitan Planning Organization (MPO) **Partners** Parks, municipalities, OOS, GIC, Miami Bike Scene, Emerge Miami, South Florida Bike Coalition, Green Mobility Network, other private organizations	Funding agreements vary Costs vary by event; informal events may have no costs; large events like Bike Days cost approximately $30,000 for street closures, security, etc.	Funding agreements vary	No.	**Year 1:** Identify interested parties; develop information sharing / promotional approach. Explore developing additional programs. **Year 2 – 5:** Implement and follow-up	Indirect impact: May lead to residents shifting vehicle trips to walking and bike trips	Number of events Targets to be determined through implementation
114. Explore tax incentives for bicycle commuting	**Lead** Metropolitan Planning Organization (MPO) **Partners** GSA, HR, OOS, South Florida Commuter Service	Program development: Within existing staff and resources Implementation of tax incentives: dependent on number / extent of employees using incentives	Implementation of tax incentives: Tax benefit funded by federal govt. Additional benefits funded by employer	No.	**Year 1:** Evaluate feasibility for Miami-Dade County workforce **Year 2-5:** Implement and promote incentives to municipalities, private sector	Indirect impact: May lead to employees shifting vehicle trips to walking and bike trips	Number of County employees using benefit; Number of employers providing benefit Targets to be determined through implementation
115. Improve safety for pedestrians and bicyclists through legislation and enforcement of traffic laws (e.g. anti-distracted driving laws, red light cameras, etc.)	**Lead** Metropolitan Planning Organization (MPO) **Partners** Police, Intergovernmental Affairs	Planning and advocacy: within existing staff and resources Implementation of red light cameras: TBD depending on specific technology used	Traffic fines, ad valorem revenue	Yes – local red light camera laws, state legislation on distracted driving	**Year 1:** Research best practices and develop recommendations for new legislation **Year 2-5:** Put forth recommendations to BCC, State; implement and enforce if adopted	Indirect impact: May lead to residents shifting vehicle trips to walking and bike trips	Annual: Bike injuries: <365 Bike fatalities: <8 Pedestrian injuries: <1,200 Pedestrian fatalities: <64
116. Increase safe walking, bicycling and driving behaviors through educational, public awareness and social marketing programs (for example, 'Share the Road,'	**Lead** Metropolitan Planning Organization (MPO) Miami-Dade Police Department (MDPD) **Partners** Police, Government Information Center (GIC), University of Miami Miller School of Medicine	Miami Dade Police Department (MDPD) pedestrian safety program: Within existing staff and resources; no new funding needed	County Unincorporated Area General Fund; possible Florida Department of Transportation (FDOT) pedestrian safety grants; Federal Safe Routes to School funds; US Department of Health and Human Services Communities Putting	No.	**Year 1:** Explore program needs and best practices to increase safe behaviors. Continue to serve all public/private schools in unincorporated Miami Dade through the MDPD pedestrian safety program; continue to provide pedestrian safety	Indirect impact: May lead to residents shifting vehicle trips to walking and bike trips	Number of residents reached through MDPD pedestrian safety program: 219,000 October 2009 – August 2010 Number of schools served in

Healthy Communities

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
WalkSafe, BikeSafe programs, Walk to School Day, Bicycle month)			Prevention to Work (CPPW) initiative (Miami Dade Health Department is grantee; has subcontracted with UM)		outreach to senior centers and faith based organizations, at special events, etc. **Year 2-5:** Implement		MDPD pedestrian safety program: Target is 100% of schools in UMSA Bike injuries: <365 Bike fatalities: <8 Pedestrian injuries: <1,200 Pedestrian fatalities: <64
117. Increase participation in the "Safe Routes to School" program and provide school crossing guards at elementary schools	**Lead** Metropolitan Planning Organization (MPO) **Partners** Public Works, School Board, Florida Department of Transportation (FDOT), Police	Federal program: Average capital cost of $31,000 per school based on 13 initial project completed School crossing guard program: Within existing staff and resources; no new funding needed.	Federal grants (via FDOT) current Safe Routs program is authorized for projects scheduled for completion through 2015 County Unincorporated Area General Fund: Municipalities requesting crossing guards over the cost of the service	No	Completion of individual routes: **Year 1:** 13 schools **Year 2:** 6 schools **Year 3:** 8 schools **Year 4- 5:**11 schools Continue to provide/train school crossing guards for all public schools in UMSA and to municipalities by request	Indirect impact: May lead to residents reducing vehicle trips	Number of children age 0-14 years hit by cars Target: <166 (2007 total – Source WalkSafe) Number of Safe Routes programs completed: Total target is 38 school (excludes 13 projects previously implemented)
118. Identify barriers to mobility for disabled and elderly residents and create an action plan	**Lead** Americans with Disabilities Act (ADA) Coordination/ Senior Advocate **Partners** Public Works, Parks	Within existing staff and resources	Within existing staff and resources	No	**Year 1**: Establishment of working groups; identification of barriers; development of action plan **Year 2-5:** Implement	Indirect impact: May lead to residents reducing vehicle trips	Installation of accessibility improvement, removal of existing barriers will be established based on action plan

Healthy Communities

Initiative	Lead & Partners	Funded and Unfunded Costs Capital	Funded and Unfunded Costs Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
STRATEGY: Plant more trees								
119. Promote community partnerships such as Million Trees Miami	**Lead** Community Image Advisory Board (CIAB) **Partners** Public Works Department (PWD), Parks Department, Department of Environmental Resources Management (DERM)	Tree purchase is currently unfunded: Costs vary depending on the kind of tree, its size, and where it will be planted. For planning purposes, unit costs for a small street tree (average size, 40 gallon tree) are provided. Average Unit cost _$175 per tree Average Unit cost (including installation and warrantee)=$ 350 per tree.	Maintenance costs are currently unfunded: Establishment costs: Average Unit cost =$150 per year for first 3 years (Note that installation contracts include 90 days of watering and establishment costs and a 1 year warrantee on each tree.) Establishment period is 3-5 years. Maintenance costs: Average Unit cost = $50 per year after 3 years for pruning, etc.	Partial funding for administering program exists through FY 2010. Potential County, municipality and private partnerships.	Some local legislation to support community tree plantings and inter-local agreements between governments will be needed.	**Year 1:** Create a steering committee and work plan and secure funding; establish partnerships with interested municipalities organizations, companies, and tree-planting groups, to include public institutions that have resources to maintain trees; develop participation requirements to ensure ongoing tree maintenance; identify main target planting sites; develop a system to track countywide tree planting efforts; develop a website and clearing house for information; streamline county policies to facilitate public plantings; develop and promote sponsorship program. Year 2-5: Plant trees Coordinate tree planting projects and tie in existing independent efforts for planting trees through the community to account for efforts outside the county projects (target 125,000 per year, planted or counted)	Impact TBD through implementation. **Year 1:** Utilize the localized carbon storage and sequestration and CO_2e avoidances approaches defined in "Miami-Dade County's Urban Forests and their Ecosystem Services," led by the University of Florida and currently under peer review to determine emission targets.	Target is 500,000 trees by 2015. Tree canopy target is 30% (50% tree canopy in suburban residential, 25% tree canopy in urban residential, 10% tree canopy in the urban core)

Healthy Communities

Initiative	Lead & Partners	Funded and Unfunded Costs Capital	Funded and Unfunded Costs Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
						Five year plan is 50% of goal to reach 30% by 2020.		
120. Promote proper tree maintenance (for example use the CIAB Tree Care Guide in development)	**Lead** Community Image Advisory Board **Partners** Government Information Center (GIC) Department of Environmental Resources Management (DERM), Office of Sustainability (OOS), local media, University of Florida Institute of Food and Agricultural Sciences (IFAS)	Leverage existing promotional programs			None	**Year 1:** Identify partners, existing marketing/publication mechanisms, work plans, event schedule Incorporate tree care into the "Million Trees" website; promote through social networking sites **Year 2:** Continue to promote programs and direct traffic to website so it can be updated as new information becomes available	Indirect impact	Number of County planting events (5 per year); Number of County tree give-a-ways (4 per year) Number of website hits
121. Promote landscaping and gardening suitable for the South Florida environment	**Lead** University of Florida Institute of Food and Agricultural Sciences Miami-Dade County Cooperative Extension Service (IFAS)	Within existing staff and resources (program could be expanded with additional funding)		Miami Dade County University of Florida, Miami Dade Water and Sewer Department (WASD) Department of Environmental Resources Management (DERM) Solid Waste Department (SWD)	None	n/a – continue current program	n/a	317 + classes on Florida friendly landscaping per year 11,000 + class participants per year 30,000 education contacts per year including phone, office, email and on-site consultation
STRATEGY: Promote fresh, local, organic food in all neighborhoods through grocers, farmers' markets, and community gardens								
122. Create a working group to coordinate sustainable	**Lead** Earth learning	A full-time staff person and some interns) with lead agency to coordinate the		Grant funding (e.g. USDA)	Legislation to enable urban	Establishment of a Food Policy Council, development of a local	Indirect impact	Examples include: Number of

Healthy Communities

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
food initiatives	**Partners** Office of Sustainability (OOS), Municipalities, Miami-Dade County Public Schools, Miami-Dade College, Breaking Ground Collaborative (Greenworks, Youth LEAD, Belafonte Tacolcy Center, and urban oasis project), other community groups	work of the council with the many groups and other municipalities and county; funds to bring in consultants on assessment; web development for a portal and interactive tracking system for initiatives; local food guides		agriculture, community composting (even curbside composting) Additional helpful legislation would include requirements/incentives for institutional procurement of local foods, local government targets for edible landscaping, state property tax incentives for small food farms	food web portal (pre-web portal already exists) (sub-group of the GreenPrint Implementation Partners); other specific milestones to be developed through implementation		community gardens Number of farmer's markets Percent of local that stays local Percent of local food production that is organic Specific indicators and targets to be developed through implementation
123. Continue Redland Raised to promote local/organic agriculture and economy by connecting farmers with local users such as restaurants, grocers, and farmers markets	**Lead** Agricultural Manager **Partners** Government Information Center (GIC), Parks Department, local government, agricultural industry and other community organizations, restaurants, grocers	Funding for promotional material (approx. $330,000 for five years; $142,000 in grant funding has already been received); capital funding for construction of community commercial kitchen (approximately $1-3 million; a more detailed study of the costs is currently underway); capital funding for construction of "mega" market (possibly in the range	County budget, grants, possible private sector investment	Possibly land use	Promotional material placement in retail outlets (ongoing), publish cookbook (mid 2011); development of community commercial kitchen (timeline of 2-3 years once funding is obtained); establishment of new markets (ongoing); establishment of "mega" farmers' market in central location	Possible reduced from transportation, chemical use, processing, etc.	# of retail outlets carrying Redland Raised promotional material (target is to maintain total of 180); # of farmers' markets – targets to be developed through implementation

Healthy Communities

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
		of $3 million; could be less if an existing public facility can be identified); ongoing operating funding support			(timeline of 3-5 years once funding is obtained)		
124. Develop an analysis of potential sites and develop approach for turning 'un-buildable lots' close to schools and churches into community gardens	**Lead** Community Image Advisory Board (CIAB) **Partners** Office of Sustainability (OOS), General Service Administration (GSA), Parks; will require nonprofit partners to manage urban agriculture initiatives; other municipalities may also participate		No existing funding. Possible revenue from the sale or lease of County property and/or a portion of successful community garden revenue, should gardens be commercially viable	Yes-land use policy may have to change, agreements or leases of County land to organizations may need to be approved, etc.	Development of list of available lots, development of policy, identify gardening non-profits	Possible reduced from transportation, chemical use, processing, etc.	# / acreage of parcels donated or leased for gardens; targets to be developed through
125. Amend the Comprehensive Development Master Plan (CDMP) and County Code to provide for sustainable, urban agricultural practices inside the Urban Development Boundary (UDB)	**Lead** Planning & Zoning **Partners** Agricultural Manager	Within existing staff and resources	n/a	Yes; amend CDMP and zoning code	CDMP amendment – April 2012	Possibly reduced from transportation, chemical use, processing, etc.	Target is achievement of milestone

Climate Change Action Plan

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
STRATEGY: Track local and regional climate change indicators and trends							
126. Track local and regional indicators and trends such as sea level rise, temperature, precipitation and tropical storms	**Lead** SE FL Climate Change Compact **Partners** Department of Environmental Resources Management (DERM) Water and Sewer Department (WASD), NPS, US Geological Survey (USGS), South Florida Water Management District (SFWMD), National Oceanic Atmospheric Administration (NOAA), Office of Emergency Management (OEM) Universities	Within existing resources	Within existing resources	No.	**Year 1**: Assemble indicators and trends	Indirect impact	TBD through implementation
127. Conduct a pilot project to assess the feasibility of using existing monitoring efforts and determine if the information can be used as vital signs of climate change	**Lead** Department of Environmental Resources Management (DERM) **Partners** Water and Sewer Department (WASD), National Park Service (NPS), US Geological Services (USGS), South Florida Water Management District (SFWMD)	Within existing resources	Within existing resources	No.	**Year 1:** Assemble an interagency team to review ongoing environmental monitoring efforts in south Miami-Dade and conduct a pilot program to track climate change related patters or trends on a local scale using data identified and indicators chosen	Indirect impact	TBD through implementation
128. Develop consensus-based graphic communication tools from the pilot project reporting the monitoring data such as	**Lead** Department of Environmental Resources Management (DERM) **Partners** Water and Sewer Department (WASD),	TBD as a result of the pilot study	TBD	No.	**Year 2**: December 2012 complete graphics	Indirect impact	TBD through implementation

Climate Change Action Plan

Initiative	Lead & Partners	Funded and Unfunded Costs Capital Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
maps, bar graphs, "stoplights"	National Park Service (NPS), US Geological Services (USGS), South Florida Water Management District (SFWMD)						
129. Develop a working group to analyze potential climate change related to public health impacts (for example, infectious disease changes, heat related illness)	**Lead** Miami Dade County Health Department (MDCHD), Epidemiology, Disease Control, and Immunization Services Program **Partners** Division of Environmental Health and Engineering Academia partner	Within existing resources :The initiative requires a commitment of 4 work group members for 2 hours each week, starting August 9, 2010 to August 5, 2011. Pending supervisory approval, each work group member is expected to commit time to the initiative in addition to their normal work duties	No funding sources have been identified; however, potential funding requirements and opportunities will be explored	No	**Year 1:** Organize group and develop work plan	Indirect impact	TBD through implementation
130. Report periodically on the status of climate change indicators and trends	**Lead** National Oceanic Atmospheric Administration (NOAA) **Partners** Office of Sustainability (OOS), Department of Environmental Resources Management (DERM), SE Fl Regional Compact, South Florida Water Management District (SFWMD)	TBD through implementation		No	**Year 2:** Produce report	Indirect Impact	TBD through implementation
STRATEGY: Develop local and regional climate change scenarios depicting various impacts and time frames							
131. Develop local and regional sea level rise scenario maps	**Lead** Southeast Florida Regional Climate Compact Partners **Partners** Dept. of Environmental Resources Management (DERM) National Oceanic	TBD during the planning process			**Year 1:** Work with partners to analyze and reconcile data **Year 2**: Complete maps	Indirect impact	Achievement of milestones

Climate Change Action Plan

Initiative	Lead & Partners	Funded and Unfunded Costs Capital	Funded and Unfunded Costs Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
	Atmospheric Administration (NOAA), South Florida Water Management District (SFWMD), US Geological Survey (USGS)							
132. Develop planning maps and tools for Miami-Dade County based on consensus of SE FL Climate Change compact planning scenarios	**Lead** Department of Environmental Resources Management (DERM) **Partners** Dept. of Planning and Zoning (DPZ) Enterprise Technology Services Dept. (ETSD), Office of Emergency Management (OEM), South Florida Water Management District (SFWMD), National Oceanic Atmospheric Administration (NOAA), US Geological Survey (USGS), Compact partners	TBD during the planning process		TBD through implementation	No	**Year 1-2**: Use local and regional climate change data and models to develop planning scenarios **Year 3-5:** Develop planning maps and tools for local decision makers	Indirect impact	Achievement of milestones
133. Continue existing local surface water, ground water and salt water intrusion modeling projects, incorporating expected climate change impacts (i.e. changes in temperature, precipitation, sea level rise, etc.) and integrating with regional water	**Lead** Water and Sewer Department (WASD) **Partners** US Geological Survey (USGS)		$49,158.50/year (O&M) Total $2,769,513 (6 years)	WASD departmental revenues	No	**Year 1-2:** Complete (3) modeling scenarios with completed integrated model **Year 3:** Publish peer reviewed report and publically release model code	Indirect impact	Achievement of milestones

Climate Change Action Plan

Initiative	Lead & Partners	Funded and Unfunded Costs Capital	Funded and Unfunded Costs Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
modeling projects from the South Florida Water Management District and other SE FL Climate Change Compact partners								
STRATEGY: Integrate future climate change impacts into community and government decision-making for capital, operational, and land-use issues								
134. Analyze sea level rise scenario maps to model buildable/livable footprints and correlate economic scenarios	**Lead** County Executive Office (CEO) Department of Planning & Zoning (DPZ) Office of Economic Development (OED) **Partners** Department of Environmental Resources Management (DERM) Water and Sewer Department (WASD) Office of Sustainability (OOS) Enterprise Technology Services Department (ETSD) Community leaders	Initially within existing resources TBD during the planning process		TBD during the planning process	No	Pending development of maps	Indirect impact	Achievement of milestones
135. Examine the implications of sea level rise on vulnerable facilities (i.e. solid waste facilities, and water and wastewater utilities)	**Lead** County Executive Office (CEO) Office of Capital Improvements (OCI) Office of Sustainability (OOS) **Partners** Department of Environmental Resources Management (DERM),	Within existing resources		Within existing resources	No	**Year 1 - 2**: Appropriate County departments (determined by OOS) will evaluate/estimate impact of minimum 1 ft. sea level rise on responsibilities and operations (Incl. geographic, economic, & sociologic & maps) **Year 1 - 2**: Based on above, determine	n/a	Achievement of milestones

Climate Change Action Plan

Initiative	Lead & Partners	Funded and Unfunded Costs Capital	Funded and Unfunded Costs Operating	Funding Sources	New Legislative Action	Milestones	Emissions Impact	Performance Indicators and Targets
	Water and Sewer Department (WASD), Seaport, Dade County Airport Department (DCAD), Solid Waste Management (SWM), Office of Capital Improvements (OCI), Public Works Department (PWD) Private stakeholders					departments likely have the most impacts. **Year 2 – 3**: Priority departments identified above determine at what level of sea level rise they will need to modify economics, operations, and/or infrastructure		
136. Develop mechanisms for organizations to integrate potential climate change impacts into capital and operational decision-making	**Lead** County Executive Office (CEO) Office of Strategic Business Management (OSBM) Office of Sustainability (OOS) **Partners** All County departments	Within existing resources		Within existing resources	No	Pending evaluation of impacts to operations and infrastructure, and development of planning scenarios and maps	Indirect impact	Achievement of milestones
137. Continue to implement the Stormwater Master Plan	**Lead** Department of Environmental Resources Management (DERM) **Partners** SFWMD, OEM, USACE	$5,000,000	$25,000,000	Stormwater Utility fee	No	Basins updated on rotating basis every 3 years	n/a	Maintain a CRS score of 5 Square miles of terrain modeling (topographical mapping) updated

Sustainability Scorecard

Measuring progress is crucial to ***GreenPrint's*** success. The ***GreenPrint*** Scorecard is a clear and simple depiction of high-level key performance indicators for each goal and their 2015 targets. In some cases, the targets are numerical and defined. Other targets will be baselines, in essence, or comparisons to past results or trends. The development of some targets will depend on decisions made through implementation.

The ***GreenPrint*** Scorecard will be integrated into Miami-Dade County's Strategic Management framework, utilizing existing software to frequently update and display performance results. Many indicators are already actively examined and will simply be 'linked' to the electronic Scorecard, while others will be created to meet ***GreenPrint's*** needs. ***GreenPrint*** Annual Reports will be created to demonstrate to the community, in detail, the progress of each performance indicator as well as the progress of each initiative contained within the Implementation Table.

Strong Leadership, Connections, and Commitment

• Create the next generation of green leaders

Performance Measures	2015 Target
Number of ***GreenPrint*** implementation partners	100
Total County sustainability legislation passed	>100
Stakeholder meetings	Quarterly
Sustainability grant funding	Based on availability

Water and Energy Efficiency

• Use less water and energy

Performance Measures	2015 Target
Water conservation (per day)	1.5 million gallons
Community non-renewable energy use (per capita)	20 percent reduction
County government energy use	20 percent reduction
Renewable energy produced from County government operations	5 percent increase
Community Energy Star facilities	>132
Combined Greenhouse Gas Emissions Reduction (metric tons) for (EECBG) Program	54,000 mt CO_2e
Number of retrofit projects resulting from Innovative financing initiative	2,500 residential 1,250 commercial
Energy Efficiency Block Grant (EECBG) funding	$12,523,700

Our Environment

• Maintain exceptional quality of air, drinking water, and coastal waters used for recreation

Performance Measures	2015 Target
Air quality index best rating	90 percent
Drinking water quality	100 percent
Biscayne Bay water quality rating	95 percent to 100 percent
Outstanding Florida waters rating	Maintain
Beach renourishment areas completed	100 percent

• Protect and enhance Biscayne Bay, the Everglades, and vital ecosystems

Performance Measures	2015 Target
Restoration of coastal habitats and wetlands	525 acres
Environmentally endangered lands preserved	24,000 acres

• Reinvent our solid waste system

Performance Measures	2015 Target
Solid waste diversion rate	50 percent by 2020
Annual County curbside residential recycling rate (per household)	355 lbs
Annual solid waste produced (community per capita)	1,250 lbs

Responsible Land Use and Smart Transportation

• Use our land wisely, creating and connecting strong sustainable neighborhoods

Performance Measures	2015 Target
Urban center area plans	15
Multi-corridor master plans	6
Transit-oriented developments	4
Enhanced bus corridors	4
Park and ride lots	6
Park and open spaces accessibility metrics	Develop

• Provide more transportation options, reducing the time we spend in our cars

Performance Measures	2015 Target
Total transit ridership (boardings)	10 million
Walking or bicycling trips as a percent of all transportation modes	16 percent
Resident satisfaction with sidewalk availability	65 percent
New bicycle trails and lanes	40 miles

Vibrant Economy

• Create green jobs

Performance Measures	2015 Target
New green jobs	20,000 (by 2020)
Green Business Certifications	750
Unemployment rate*	<12.5 percent
Educational attainment*	Increase

*Note these are important trends to monitor, rather then reflective of GreenPrint performance

• Build on our international reputation to become a green enterprise destination

Performance Measures	2015 Target
Percentage of green hotels	20 percent
Eco-tourism	20 percent
Hospitality related businesses	20 percent

Healthy Communities

• Raise awareness that sustainable living is healthy

Performance Measures	2015 Target
Diabetes rate	Decrease
Heart disease rate	Decrease
Obesity rate	Decrease
Local food consumption	Increase
Farmers Markets	Increase
Community Gardens	Increase

• Plant more Florida-friendly and native trees and landscapes

Performance Measures	2015 Target
Tree plantings	500,000

Climate Change Action Plan

Understand and respond to current and future climate change impacts (Adaptation)

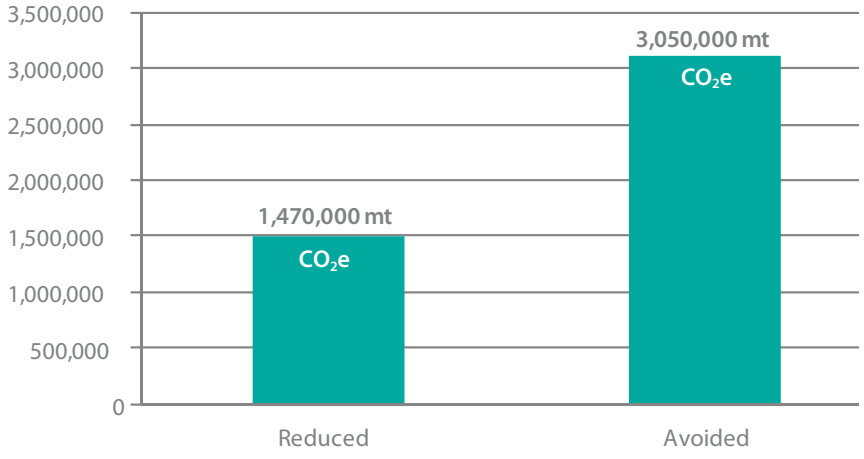
Performance Measures	Target
Maintain or improve FEMA flood rating	5
Develop local & regional Sea Level Rise Maps for planning	Complete by 2012
Perform initial sea level rise vulnerability assessment using agreed upon Climate Change Compact parameters	Complete by 2011
Complete 2 existing groundwater delineation projects	Complete by 2013
Complete existing groundwater modeling project	Complete by 2012
Regional Indicators	**2015 Trend**
Sea level rise*	
Precipitation*	
Temperature*	
Storm events*	
Groundwater modeling*	
Public health indicators*	

*To be develope through a NOAA partnership and Southeast Regional Climate Change Compact

• Reduce greenhouse gas emissions (Mitigation)

Performance Measures	2015 Target	
Greenhouse gas emissions	Reductions	Avoidances
Strong Leadership, Connections, and Commitment	17,000 mt CO_2e	26,000 mt CO_2e
Water and Energy Efficiency	574,000 mt CO_2e	2.0 million mt CO_2e
Our Environment	20,400 mt CO_2e	66,000 mt CO_2e
Responsible Land Use and Smart Transportation	532,000 mt CO_2e	608,000 mt CO_2e
Vibrant Economy	326,000 mt CO_2e	326,000 mt CO_2e
Total	1.5 million mt CO_2e	3.1 million mt CO_2e

Projected Greenhouse Gas Emissions to be Reduced and Avoided through GreenPrint 2015



The ***GreenPrint*** planning team calculated the impact of initiatives on Greenhouse Gas Emissions. Appendix A illustrates the assumptions used in identifying these impacts. The effort to calculate reductions was focused on ***GreenPrint's*** five-year timeframe and forecasts the results over an expected or hypothetical program lifetime when possible. Emissions avoidances, storage, and sequestration were also calculated as appropriate for each initiative. The results represent ***GreenPrint's*** contribution to pursing Miami-Dade County's Cool Counties commitment of reducing emissions by 80 percent by 2050.

Since the calculated emission reductions and avoidances are estimates based on available data and assumptions, the numbers presented in Appendix A have been rounded for simplicity. Each Goal Area total represents the sum of the individual initiatives rounded to three significant digits. The projected emission reductions and avoidances from the individual initiatives are displayed using two significant digits.

Strong Leadership, Connections and Commitment

Initiative	Calculation Assumptions	Projected Emission Reductions: 5 Years 2011 - 2015	Projected Emission Reductions: Program Lifetime	Emission Avoidances, Storage, or Sequestration
Adopt existing draft County Ordinance (per Resolution R468-06) requiring water efficiency retrofits at point of home resale (prior to changing ownership) and later update the ordinance to require additional retrofits focusing on energy efficiency	Ordinance requiring the retrofitting of homes to meet current energy code upon resale. Calculation assumes: 7,657 homes sold each year; annual residential electricity consumption of 14,605 kWh per home; 80% of total energy use will be affected by the retrofitting; and the retrofitting will increase efficiency by 17%.	17,000 mt CO_2e	Assuming a 2% increase in home sales each year from 2011 – 2050, emissions reductions are 49,000 mt CO_2e	Avoided: 26,000 mt CO_2e over five years
Strong Leadership, Connections, and Commitment Total Emission Reductions:		**17,000 mt CO_2e**	**Avoidances:**	**26,000 mt CO_2e**

Water and Energy Efficiency

Initiative	Calculation Assumptions	Projected Emission Reductions: 5 Years 2011 - 2015	Projected Emission Reductions: Program Lifetime	Emissions Avoidance, Storage, or Sequestration
Continue to implement the Water Use Efficiency Plan and the Non-Revenue Water Loss Plan initiatives to meet established reduction targets	Reduce total water consumption by 1.5 MGD through efficiency and conservation. Reduce total annual apparent water losses from 16.6 billion gallons per year to 10 billion gallons per year and non-revenue water loss by 50 percent from 10.2 billion gallons per year to 5 billion gallons per year by improving implementation of the IWA/AWAA four basic methods of managing real losses.	16,000 mt CO_2e	Total Program Reductions: 105,000 mt CO_2e over 20 years (19.8 MGD)	Avoided : 890,000 mt CO_2e over 20 years
Incentivize energy efficient development	Implement permitting process recommendations to increase green development. Aim to reduce energy use in residential sector for 350 retrofits and in commercial sector for 150 retrofits. Calculations assume 500 buildings per year, 70% Residential (350 bldgs) and 30% Commercial (150 bldgs); annual electricity consumption of 14,605 kWh/residential bldg and 114,247 kWh/commercial bldg; average area of 2,344 ft^2 per residential building and 3,266 ft^2 per commercial bldg;	Residential Sector: 580 mt CO_2e Commercial Sector: 2,000 mt CO_2e	Each additional 5 years: Residential Sector: 580 mt CO_2e Commercial Sector: 1,950 mt CO_2e	Avoided: Residential: 1,600 mt CO_2e over 5 years; Commercial: 6,800 mt CO_2e over 5 years Additionally, 100% compliance with Energy Code will avoid 390,000 mt CO_2e (assumes 5% reduction from

Water and Energy Efficiency

Initiative	Calculation Assumptions	Projected Emission Reductions: 5 Years 2011 - 2015	Projected Emission Reductions: Program Lifetime	Emissions Avoidance, Storage, or Sequestration
Incentivize energy efficient development	Implement permitting process recommendations to increase green development. Aim to reduce energy use in residential sector for 350 retrofits and in commercial sector for 150 retrofits. Calculations assume 500 buildings per year, 70% Residential (350 bldgs) and 30% Commercial (150 bldgs); annual electricity consumption of 14,605 kWh/residential bldg and 114,247 kWh/commercial bldg; average area of 2,344 ft^2 per residential building and 3,266 ft^2 per commercial bldg; 80% of total energy use will be affected by the retrofitting; and the retrofitting will increase efficiency by 17%.	Residential Sector: 580 mt CO_2e Commercial Sector: 1,950 mt CO_2e	Each additional 5 years: Residential Sector: 580 mt CO_2e Commercial Sector: 1,950 mt CO_2e	Avoided: Residential: 1,550 mt CO_2e over 5 years; Commercial: 6,760 mt CO_2e over 5 years Additionally, 100% compliance with Energy Code will avoid 390,000 mt CO_2e (assumes 5% reduction from overall residential consumption by 2015)
Implement EECBG projects	This value includes all EECBG Projects except the Energy Efficiency Campaigns. This initiative was evaluated using the criteria as described in the EECBG Activity Worksheets for each project.	43,000 mt CO_2e	Assumes a 20-year life on all projects: 193,000 mt CO_2e	Avoided: 118,000 mt CO_2e
Promote and create innovative financing for energy efficiency	Roll out a PACE program that enables 500 residential and 250 commercial property owners (per year) to finance energy and water efficiency performance improvements via their property taxes. Calculations assume: annual electricity consumption of 14,605 kWh/residential bldg and 114,247 kWh/commercial bldg; 15% energy reduction per retrofit.	Residential Sector savings: 3,100 mt CO_2e Commercial Sector savings: 12,000 mt CO_2e	Each additional 5 years: Residential Sector savings: 3,100 mt CO_2e Commercial Sector savings: 12,000 mt CO_2e	Avoided: Residential: 9,200 mt CO_2e Commercial: 36,000 mt CO_2e
Create a Miami-Dade Energy Alliance with a diverse group of stakeholders to implement sustainable energy and	Calculations assume a multiplier factor of 2 and emissions reductions from the campaigns initiative below.	190,000 mt CO_2e	Calculations beyond 2015 were not available in 2010.	Avoided: 305,000 mt CO_2e
Retrofit government facilities in line with water efficiency audits	Implement water efficiency retrofits in 39 buildings which were audited in the initial phase.	18 mt CO_2e	Calculations beyond 2015 were not available in 2010.	Avoided: 92 mt CO_2e
Continue fuel reduction and monitoring programs	Encourage fuel use reduction and maximum fuel efficiency whenever possible. Calculation assumes: 10% reduction in use for each fuel type (diesel, unleaded, B5, E10, natural gas, LPG, propane, and jet fuel) over five years.	25,000 mt CO_2e	Calculations beyond 2015 were not available in 2010.	Avoided: 76,000 mt CO_2e
Continue to transition fleet to hybrid gasoline-electric vehicles (sedans, buses)	Continue to purchase / replace light fleet sedans and heavy fleet buses with more fuel efficient vehicle options. Calculations assume: annual mileage for fleet vehicles of 9,200 miles; average fuel efficiency of 18.21 mpg for fleet gasoline-powered sedans; average fuel efficiency of 42 mpg for fleet hybrid vehicles; average fuel efficiency of 80 mpg for PHEVs; average mileage per charge of 100 miles for Nissan Leaf; average mileage per charge of 40 miles for Chevy Volt; average annual mileage of 44,000 miles for bus fleet; average fuel efficiency of 3.4 mpg for fleet non-hybrid buses; average fuel efficiency of 3.9 mpg for fleet hybrid buses; No. of active hybrid vehicles: 329; No. of inactive hybrids made active: 103; No. of hybrid buses purchased: 254	4,000 mt CO_2e	2,200 mt CO_2e over 7-year life of vehicle	Avoided: 10,000 mt CO_2e over 5 years
Continue pilot project for vehicular technologies and alternative fuels that reduce net GHGs, such as hybrid-hydraulic diesel garbage trucks.	Replace some traditional garbage trucks with hybrid hydraulic-diesel trucks. Plan is to purchase 126 of these trucks over the next 5 years with a 7 years for life of engine Calculations assume: 2,400 gallons of diesel fuel savings per year per truck	2,900 mt CO_2e	Each additional hybrid hydraulic diesel garbage truck can potentially reduce emissions 23 mt CO_2e	Avoided: 7,800 mt CO_2e
Develop a process that facillitates delivery of diesel fuel to MIA from Port Everglades through existing aviation fuel pipeline	Instead of using trucks to deliver fuel, use existing aviation fuel pipeline to pipe in diesel. Private entity would lease and upgrade existing tank farm facility at MIA to create this "tankering" operation. Calculations assume: 1,500 deliveries per month, 40-miles one-way by Heavy Truck	210 mt CO_2e over 5 years	Calculations beyond 2015 were not available in 2010.	Avoided: 1,100 mt CO_2e
Water and Energy Efficiency Total Emissions Reductions:		**574,000 mt CO_2e**	**Avoidances:**	**2.0 million mt CO_2e**

Our Environment				
Initiative	**Calculation Assumptions**	**Projected Emission Reductions: 5 Years 2011 - 2015**	**Projected Emission Reductions: Program Lifetime**	**Emissions Avoidance, Storage, or Sequestration**
Implement Wastewater Reuse Projects consistent with the 20-Year Water Use Permit and the Miami-Dade Water and Sewer Department Master Plans to recharge the Biscayne Aquifer	Wastewater reuse is a sustainable alternative to wastewater disposal. In the past wastewater reuse has been limited in southeast Florida due to the costs of treatment and distribution relative to the low cost of providing potable water to meet the needs of residents. Shallow ground water is no longer available to meet new water supply demands, and the County has identified projects to meet about 50% of new water supply needs over the next 20 years with reclaimed wastewater. Calculation assumes: 46,149,520 kWh increase in demand in 2014, and 170,448,014 kWh increase in demand after all phases are online in 2026.	26,000 mt CO_2e increase This increase is not included in the total reductions noted at the end of the table (19,900) since the purpose of the table is to total reductions only. However, the method of calculation is included here for documentation and replication purposes.	After all phases are on-line, the increase is estimated at 93,000 annually in comparison to current energy use. Completion of the final phase is estimated in year 2026.	The increased energy needs are *significantly less* than the alternative option of desalination. It is estimated that seawater desalination could use over 10x the energy as reclaimed waste water.
Continue to minimize the impact of development on natural resources such as air, wetlands, Biscayne Bay and coastal habitats, natural forest communities, and trees through regulatory programs	The County seeks to protect and manage the intrinsic value of the wetlands through the wetland regulatory program. Calculation assumes 860,870 freshwater wetland acres within the County and Everglades National Park, carbon storage value of 609 metric tons per hectare, and 1.02 for accumulation through the methodology cited in the Climate Change Our Environment section.	This initiative will not result in emission reductions	This initiative will not result in emission reductions	Carbon storage in estimated existing wetlands is approximately 212 million metric tons. Annual carbon accumulation is approximately 362,000 metric tons.
Continue to acquire important lands through the Environmentally Endangered Lands (EEL) program	Calculations assume 22,800 EEL acres within the County and 17,538 priority lands not yet acquired. Carbon storage and accumulation values vary based on the habitat type according to the methodology cited in the Climate Change Our Environment section. The values are based on the habitat community types, including freshwater marsh, mangrove swamp, pinelands, tropical hardwood hammocks, mixed pine-hardwoods, and low impact urban.	This initiative will not result in emission reductions	This initiative will not result in emission reductions	Carbon storage in existing EEL acres is estimated at over 5 million metric tons. Annual carbon accumulation is estimated at over 11,000 metric tons. Storage for remaining acres to be acquired is estimated at 4 million metric tons, with annual carbon accumulation estimated at over 8,000 metric tons.
Use waste as energy at the WASD South District Wastewater Treatment facility	Calculation assumes: Replacing flaring 900 ft^3/min with combustion at co-generation plant; combustion will produce 17.5 million kWh/yr.	440 mt CO_2e	Each additional 100 cfm of biogas combusted in the co-generators can potentially reduce emissions 49 mt CO_2e	Avoided: 2,200 mt CO_2e
Continue to increase participation in the residential recycling program	Calculation assumes: 2009 recycling statistics – 36,700 tons of Mixed General Paper, 1,300 tons of aluminum, 3,800 tons of HDPE plastics, & 12,900 tons of glass – recycled; a 4% increase in 2010, and then a 2% increase in subsequent years through 2015.	20,000 mt CO_2e	Continuing the program from 2016 -2050, with an assumed annual increase in tons recycled of 0.5% can potentially reduce emissions by 34,000 mt CO_2e	Avoided: 64,000 CO_2e
	Our Environment Total Emission Reductions:	**19,900 mt CO_2e**	**Avoidances:**	**66,200 mt CO_2e**

Responsible Land Use and Smart Transportation				
Initiative	**Calculation Assumptions**	**Projected Emission Reductions: 5 Years 2011 - 2015**	**Projected Emission Reductions: Program Lifetime**	**Emissions Avoidance, Storage, or Sequestration**
Land Use Strategies and Initiatives - Better Integrate Planning and Prioritize Investments & Support Existing Communities and Value Neighborhoods	A collection of indirect measures that facilitate compact development and are expected to achieve GHG emissions reductions. Calculation assumes: Baseline of 30,203 tons CO_2e emitted from personal vehicle (MPO, "*Emissions Scenarios*" Figure 12), 5% reduction. This results in an estimated 500,000 mt CO2e reduction by 2015. The emissions reductions estimates from the following two initiatives Transit-Oriented Development and Walking and Biking initiatives were subtracted from the 500,000 because specific emissions reductions estimates have been made for those compact development strategies.	360,000 mt CO_2e	Aggressive implementation of Compact Development strategies may result in emissions reductions of approximately 8 million mt CO_2e	Avoided: 360,000 mt CO_2e
Increase transit-oriented development (TOD) that integrates transportation and affordable housing	VMT reductions realized from the Santa Clara DOT were correlated to two TOD developments expected to go online by 2015 (Brownsville and Northside). Brownsville Station TOD, 467 units of affordable housing. Northside Station TOD, 350 units of affordable housing. Calculation assumes: After implementation, an 87%/99% increase in weekday/weekend ridership over current values, average trip length of 7.2 miles.	4,200 mt CO_2e for Brownsville 7,800 mt CO_2e for Northside.	This initiative is a subset of the Aggressive Implementation of Compact Development	Avoided: 4,200 mt CO_2e for Brownsville, 7,800 mt CO_2e for Northside
Increase Bicycle & Walking Strategy & Initiatives	These are a collection of initiatives expected to achieve a mode shift from the single occupancy vehicle to bicycle or walking. Calculations assume: Six percentage point increase to 16% walking/biking, data as provided by the FHWA, average trip length of 2 miles and 0.5 miles for biking and walking, respectively.	130,000 mt CO_2e	This initiative is a subset of the Aggressive Implementation of Compact Development	Avoided: 130,000 mt CO_2e
Fund & construct priority non-motorized multi-use trails	Calculations assume: 860,700 VMT eliminated by Ludlam Trail (*MDPR Draft Miami-Dade County Trail Benefits Study – Ludlam Trail Case Study)*. Length of trail is 6.2 miles for Luldam Trail, 8.4 miles for Black Creek Trail; reduction achievements per mile for Ludlam Trail were applied to Black Creek Trail.	640 mt CO_2e	This initiative is a subset of the Aggressive Implementation of Compact Development	Avoided: 2,600 mt CO_2e
Increase integration of transit and biking	Calculations assume: 1,750 Bike and Ride permits per year, 255 workdays per year, 1 mile ride to bus station (times 2) for each boarding.	1,000 mt CO_2e	Each additional 100 permits can potentially reduce emissions 57 mt CO_2e	Avoided: 5,000 mt CO_2e

Responsible Land Use and Smart Transportation				
Initiative	**Calculation Assumptions**	**Projected Emission Reductions: 5 Years 2011 - 2015**	**Projected Emission Reductions: Program Lifetime**	**Emissions Avoidance, Storage, or Sequestration**
Increase Transit Ridership	These are a collection of service improvement initiatives that are projected to increase transit ridership by 10%. Calculations assume: Average trip length on Metro Bus, Metro Rail and Metro Mover of 4.5, 7.2, and 1.0 miles, respectively, and 2009 boardings for Metro Bus, Metro Rail, and Metro Mover of 75,608,000, 18,244,476, and 8,100,144, respectively. 10% ridership increase would be 10 million more boardings per year, based on the above boarding numbers, equating to 26,448 mt CO2e. The emissions reductions estimates from the following initiatives were subtracted from this overall shift to avoid double-counting, resulting in a net decrease of approximately 13,000 mt CO2e: Increase the number of enhanced bus corridors; Increase the number of Park and Ride facilities; Complete the Airport Link, connection of the Metrorail to Miami International Airport; and Expand the express bus service between Miami-Dade and Broward Counties through extending the I-95 managed/express lanes.	14,000 mt CO_2e	Every 5% increase in transit ridership can potentially reduce emissions 13,000 mt CO_2e	Avoided: 26,000 mt CO_2e
Increase the number of enhanced bus corridors	Enhancements include traffic signal prioritization, areas along corridor with dedicated lane, shorter headways, larger capacity buses, technology improvements such as Wi-Fi, etc. Calculations assume: 3,600 additional daily boardings over the next five years, average trip length of 4.5 miles on Metro Bus.	3,300 mt CO_2e	Calculations beyond 2015 were not available in 2010.	Avoided: 13,000 mt CO_2e
Increase the number of Park and Ride facilities	Establish six new Park & Ride Facilities. Calculation assumes: 80% of the available parking spaces are occupied 6 days per week, 52 weeks per year. Average trip length of 4.5 miles, doubled for round trips.	900 mt CO_2e	Calculations beyond 2015 were not available in 2010.	Avoided: 4,000 mt CO_2e
Complete the Airport Link – connection of the Metrorail to Miami International Airport	Calculation assumes: 66,700 increased daily boardings, average trip length of 7.2 miles.	8,400 mt CO_2e	Calculations beyond 2015 were not available in 2010.	Avoided: 34,000 mt CO_2e
Expand the express bus service between Miami-Dade and Broward Counties through extending the I-95 managed/express lanes from Golden Glades Interchange to I-595	Calculation assumes: 800 increased daily boardings, average trip length of 3 miles.	340 mt CO_2e	Calculations beyond 2015 were not available in 2010.	Avoided: 670 mt CO_2e
Work in partnership with the Metropolitan Planning Organization (MPO) and South Florida Commuter Services to expand carpooling and vanpooling programs	Work in partnership the MPO and South Florida Commuter Services to expand carpooling and vanpooling programs Calculations assume: 10,090,688 total passenger miles eliminated for Vanpool Program; 7,063,423 total passenger miles eliminated and annual increase in participatation rate of 5% for Carpooling Program.	1,600 mt CO_2e for Vanpool Program 3,900 mt CO_2e for Carpool Program	Each additional 100 commuters switched may potentially reduce emissions 2.4 mt CO_2e	Avoided: 10,000 mt CO_2e for Vanpool Program 11,000 mt CO_2e for Carpool Program
Responsible Land Use and Smart Transportation Total Emissions Reductions:		**532,000 mt CO_2e**	**Avoidances:**	**608,000 mt CO_2e**

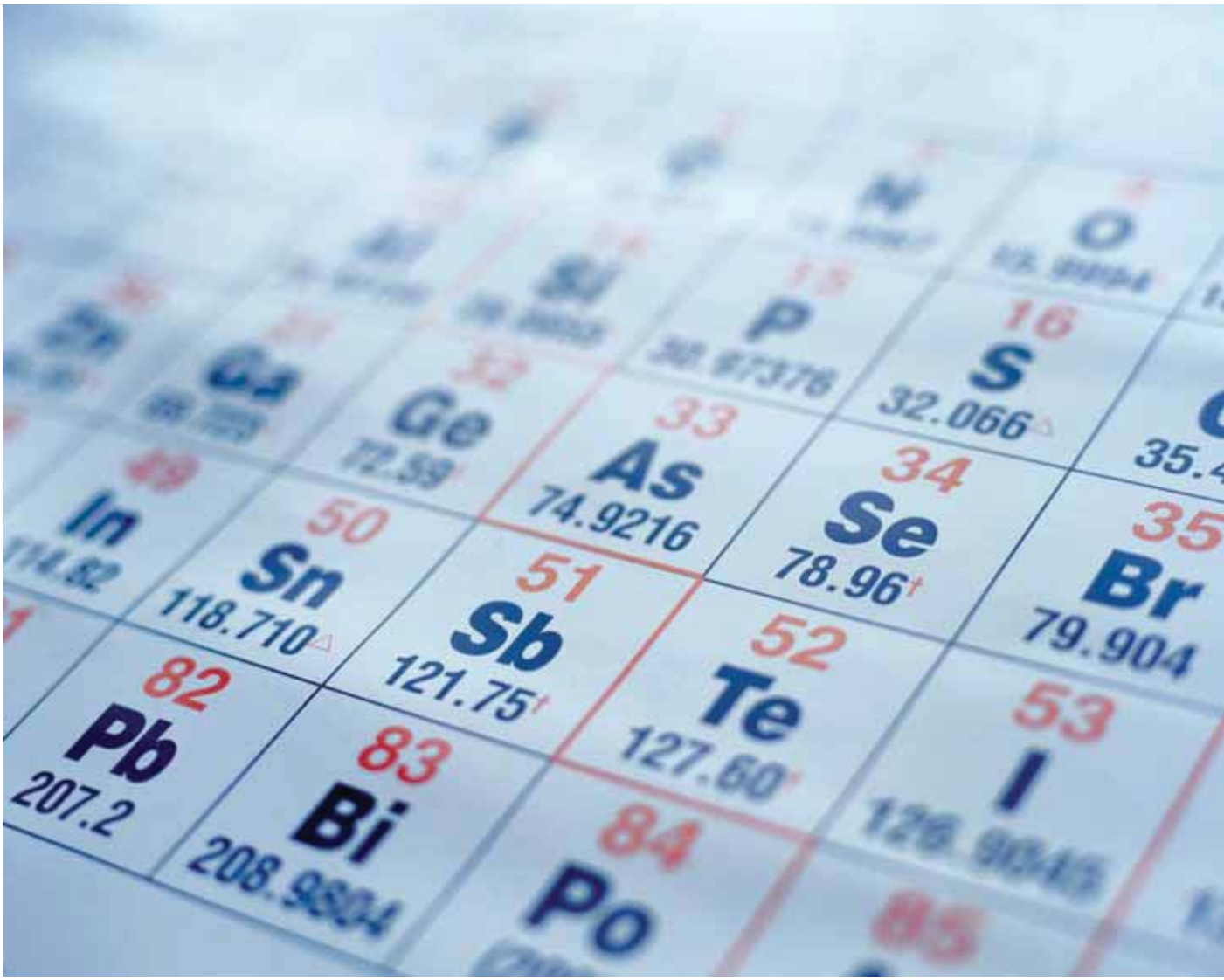
Vibrant Economy				
Initiative	**Calculation Assumptions**	**Projected Emission Reductions: 5 Years 2011 - 2015**	**Projected Emission Reductions: Program Lifetime**	**Emissions Avoidance, Storage, or Sequestration**
Establish a local action plan for green industries and green jobs and examine economic challenges related to climate change	Estimated percentage savings based on energy consumption reduction by businesses registered through the Miami-Dade County Tax Collector Office achieving County Green Business Certification Standards. Calculation assumes: 102,000 local businesses, average commercial consumption of 114,247 kWh/year, 5% energy savings	326,000 mt CO_2e	Calculations beyond 2015 were not available in 2010.	Avoided: 326,000 mt CO_2e
	Vibrant Economy Total Emissions Reductions:	**326,000 mt CO_2e**	**Avoidances:**	**326,000 mt CO_2e**
	GreenPrint 2015 Total Emissions Reductions:	**1.5 million mt CO_2e**	**Avoidances:**	**3.1 million mt CO_2e**

Additional Impact on Emissions (not a GreenPrint initiative)				
CAFE Standards Calculations	Calculations assume: Estimated 2010 VMT of 53,451,000 miles, an annual 0.08% reduction in VMT (based on historical data), current average fuel efficiency of 22.5 mpg, annual increase in average fuel efficiency of 1.7%	670,000 mt CO_2e		Avoided: 2 million mt CO_2e

Global Warming Potential (GWP) and Carbon Dioxide Equivalents (CO_2e)

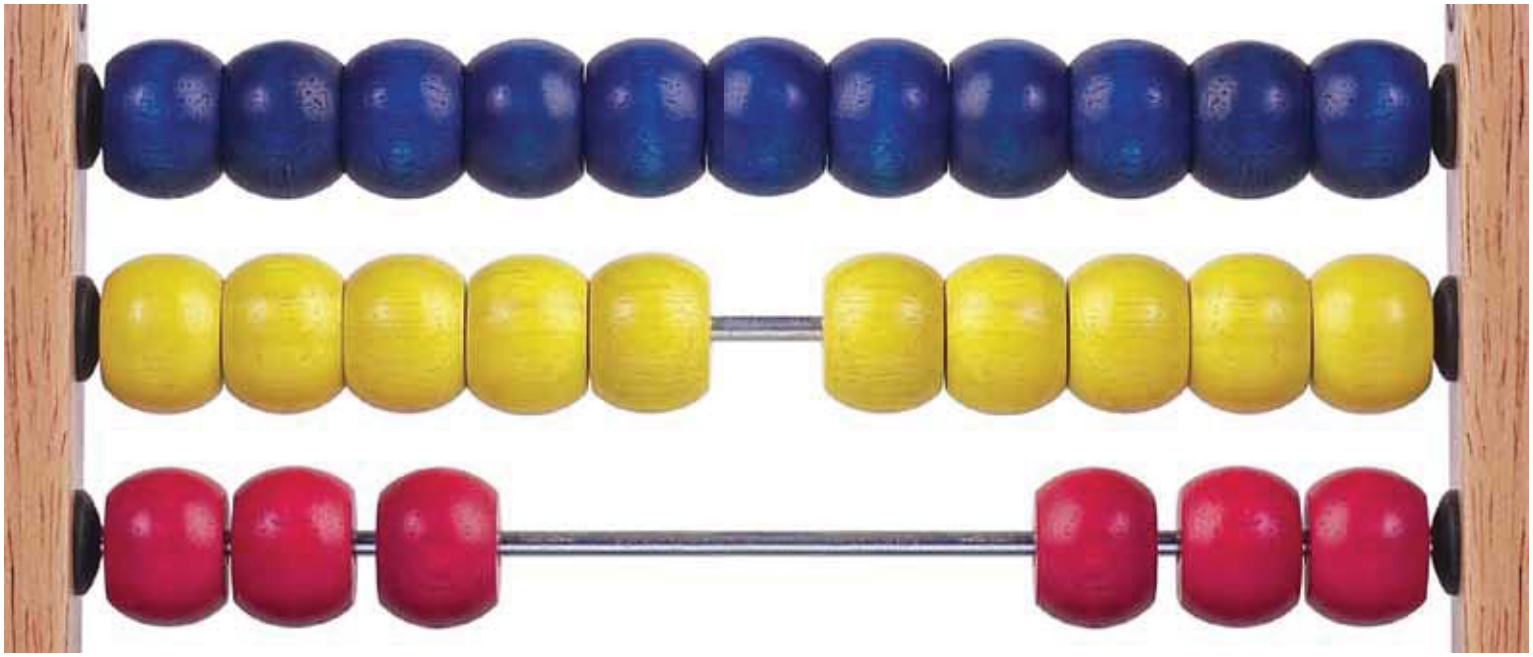
The concept of global warming potential (GWP) was invented to allow comparisons of the total cumulative warming effects of different GHGs over a specified time period. The warming effect of CO_2 is assigned a value of 1, and the warming effects of other gases are calculated as multiples of this value. Therefore, GWPs are used to convert emissions of non-CO_2 gases into their CO_2 warming equivalents (CO_2es). The CO_2e of a non-CO_2 gas is calculated by multiplying the mass of the emissions of the non-CO_2 gas by its GWP.

A 100-year GWP of 21 for CH_4 means that each gram of CH_4 emitted is considered to have cumulative warming effects over the next 100 years equivalent to emitting 21 grams of CO_2. Using the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (SAR) 100-year GWP of 21 for CH_4, the CO_2e of 310 tons of CH_4 is 310 tons x 21 = 6,510 tons CO_2e. Emitting 310 tons of CH_4 would thus be considered to result in the same cumulative warming over the next 100 years as emitting 6,510 tons of CO_2.



Emissions Factors

Fuel Type		CO_2e Emissions Factor		Source
UNL	mpg	21.5	lbs CO_2e/gal	Obtained by entering 1,000,000 gallons of UNL into STAPPA/ALAPCO and ICLEI's Clean Air and Climate Protection Software, Version 1.1, June 2005 under Passenger Vehicle
	VMT	1.21	lbs CO_2e/mi	Obtained by entering 1,000,000 vehicle miles traveled in STAPPA/ALAPCO AND ICLEI'S CLEAN AIR AND CLIMATE PROTECTION SOFTWARE, VERSION 1.1, JUNE 2005 under UNL and Passenger Vehicle
DSL	Stationary	21.2	lbs CO_2e/gal	Obtained by entering 1,000,000 gallons of Stationary DSL in STAPPA/ALAPCO AND ICLEI'S CLEAN AIR AND CLIMATE PROTECTION SOFTWARE, VERSION 1.1, JUNE 2005 under Buildings
	Mobile	21.3	lbs CO_2e/gal	Obtained by entering 1,000,000 gallons of DSL in STAPPA/ALAPCO AND ICLEI'S CLEAN AIR AND CLIMATE PROTECTION SOFTWARE, VERSION 1.1, JUNE 2005 under Passenger Vehicles
NG	Stationary	12.4	lbs CO_2e/therm	Obtained by entering 1,000,000 therms in STAPPA/ALAPCO AND ICLEI'S CLEAN AIR AND CLIMATE PROTECTION SOFTWARE, VERSION 1.1, JUNE 2005 under Residential Sector
Electricity	SERC	1.23	lbs CO_2e/kWh	Obtained by entering 1,000,000 kWh in STAPPA/ALAPCO AND ICLEI'S CLEAN AIR AND CLIMATE PROTECTION SOFTWARE, VERSION 1.1, JUNE 2005 under 08 - Southeastern Electric Reliability Council



Miami-Dade County is the largest County in the southeastern United States and the ninth largest in the nation by population (per US Census Bureau Annual Population Estimates – July 1, 2009). Miami-Dade County is often referred to as the "Gateway to Latin America and the Caribbean." The County's population is estimated to be 2,462,182. Population figures used are from the Florida Estimates of Population (April 1, 2009) prepared by the Bureau of Economic and Business Research, College of Business Administration at the University of Florida and are certified by the Governor of Florida. The population density is 5,830 people per square mile within the urban area.

The racial makeup of the County is 62 percent Hispanic, 18 percent white, 18 percent black, two percent other races. Approximately one half of the people living in Miami-Dade County in 2004 were foreign born. Among County residents, 29.3 percent speak English, 62.4 percent speak Spanish, 4.9 percent speak Creole, and 3.4 percent speak other languages. The per capita income in the County is $23,846 and the median family income is $51,730. Of the County's total population, 13.2 percent of the families live below the poverty line.

Approximately 418 square miles (excludes Bay and Coastal Water) of the County are within the urban development boundary while the total County land area currently covers a total of 2,431 square miles (1,946 square miles of land and 485 square miles of water) and is bound by Biscayne Bay and the Atlantic Ocean to the east, Everglades National Park to the west, the Florida Keys to the south, and Broward County to the north. Miami-Dade County is the only metropolitan area in the United States that borders two national parks: Biscayne National Park and Everglades National Park.

The Greater Miami area is the center for international commerce in the southeastern United States and its proximity to the Caribbean, Mexico, and Central and South America makes it a natural center of trade to and from North America. In addition, the international background of many of its residents is an essential labor force characteristic for multi-national companies which must operate across language and cultural differences.

The County had the highest concentration of international bank agencies on the east coast south of New York City, with a total of 28 foreign chartered banks and over $14 billion on deposit as of September 30, 2009, according to the Florida Department of Financial Services, Office of Financial Regulations. According to the Federal Reserve Bank of Atlanta, as of September 30, 2009, there were eight Edge Act Banks throughout the United States; five of those institutions were located in the County with over $11.015 billion on deposit. Edge Act Banks are federally chartered organizations offering a wide range of banking services, but limited to international transactions only. The favorable geographic location of the County, a well-trained labor force and the favorable transportation infrastructure have allowed the economic base of the County to expand by attracting many national and international firms doing business in Latin America.

The Greater Miami area is also the leading center for tourism in the state. Miami ranks second behind Orlando as a destination for non-residential air travelers according to the Florida Division of Tourism of the Department of Commerce. It is also the principal port of entry in the State for international air travelers. During 2009, 69.5 percent of international air travelers entering the State arrived through Miami International Airport, according to statistics compiled by the U.S. Department of Transportation.

The County's economy has been transitioning from mixed service and industrial in the 1970's to one dominated by services in the late 1990's primarily due to the expansion in international trade, the tourism industry, and health services. Wholesale trade and retail trade have and are projected to become stronger economic forces in the local economy. This reflects the County's position as a wholesale center in Southeast Florida, which is serving a large international market. The tourism industry remains one of the largest sectors in the local economy.

About Our Government

This section is provided as background, to establish a common understanding of our local history and to set the backdrop for the data we collected and the plan we developed. The County has operated since 1957 under a unique metropolitan system of government known as a "two-tier federation." This was made possible when Florida voters approved a constitutional amendment in 1956 that allowed the people of the County to enact a home rule charter. At that time, the electors of Miami-Dade County were granted the power to revise and amend the Charter from time to time by countywide vote. The most recent amendment was in January 2008. The County has home rule powers, subject only to the limitations of the Constitution and general laws of the State.

The County has, in effect, a County government with certain powers effective throughout the entire County, including 35 municipalities located within the County, and a municipal government for the unincorporated area of the County. Unlike a consolidated city-county, where the city and County governments merge into a single entity, these two entities remain separate. Instead there are two "tiers," or levels, of government: city and County. The County can take over particular activities of a city's operations if the services fall below minimum standards set by the Board of County Commissioners (Board) of Miami-Dade County or with the consent of the governing body of a particular city. Of the County's total population, approximately 1.074 million or 43.6 percent live in the unincorporated area, the majority of which is heavily urbanized. For residents living in the Unincorporated Municipal Service Area (UMSA), the County fills the role of both tiers of government. Residents within UMSA pay a property tax for municipal-type services provided by the County such as police, parks, public works, and zoning. Residents of municipalities do not pay UMSA tax. There are currently 35 municipalities in the County, the City of Miami being the largest and the Town of Cutler Bay being the most recently incorporated.

An amendment to the Miami-Dade County Charter, approved on January 23, 2007, created a Strong Mayor form of government, with further charter amendments approved on November 4, 2008. The Mayor is elected countywide to serve a four-year term. The Mayor, who is not a member of the Board, serves as the elected executive or administrative head of County government. In this role, the Mayor is responsible for the management of all administrative departments and for carrying out policies adopted by the Commission. The Mayor has, within ten days of final adoption by the Board, veto authority over any legislative, quasi-judicial, zoning, and master plan or land use decision of the Board, including the budget or any particular component, and the right to appoint the County Manager and all department directors unless disapproved by a two-thirds majority of those Commissioners then in office at the next regularly scheduled meeting. The Mayor is limited to two four-year terms in office.

The Board is the legislative body, consisting of 13 members elected from single-member districts. Members are elected to serve four-year terms (with no term limits) and elections of the membership are staggered. The full Board chooses a Chairperson, who presides over the Board, as well as appoints the members of its legislative committees. The Board has a wide array of powers to enact legislation, create departments, and regulate businesses operating within the County. It also has the power to override the Mayor's veto with a two-thirds vote.

Florida's Constitution provides for five elected officials to oversee executive and administrative functions for each County: Sheriff, Supervisor of Elections, Tax Collector, Property Appraiser, and Clerk. Through the Home Rule Charter, the first three of these offices were reorganized and became subordinate County Departments. The most visible distinction between Miami-Dade and other Florida counties is the title of its law enforcement agency. It is the only County in Florida that does not have an elected sheriff, or an agency titled "Sheriff's Office." Instead, the equivalent agency is known as the Miami-Dade Police Department and its chief executive is known as the Director of the Miami-Dade Police Department.

On January 29, 2008, a charter amendment was approved to make the Property Appraiser an elected position. November 4, 2008 was the first election for a Property Appraiser in Miami Dade County. The Clerk of the Board is a separate, duly elected constitutional officer as mandated by Article V, Section 16 of the Constitution of the State of Florida. The Clerk is elected to a four-year term by the electorate of Miami-Dade County. In this capacity, the Clerk serves as the Clerk of the Board of County Commissioners, County Recorder, County Auditor, custodian of all County funds, and custodian of all records filed with the Court.

Aesthetics Master Plan

The overall Goal of the Aesthetics Master Plan by the Community Image Advisory Board is to articulate the principles and standards for establishing a practical, sustainable beautification and greening process for County Corridors, Gateways and Facilities. The Vision that would guide the development of the Aesthetics Master Plan is of a community in which County Corridors, Gateways, and Facilities are well designed and visually pleasing in appearance that are developed and maintained in a manner that reflects a world class image of Miami -Dade County as a sub-tropical paradise. The maintenance of community aesthetics is essential to the continued health and growth of Miami-Dade County's vibrant economy as well as to the daily quality of life of its 2.4 million residents. It addresses the issues of:

- Litter
- Poor or low-quality landscaping
- The lack of adequate tree canopy
- Bleak roadways and parking lots with little space for trees or plants
- Poorly designed public facilities and spaces, and
- Insufficient public art.

www.miamidade.gov/image/library/miami-dade_county_aesthetics_master_plan_final_report.pdf

community image advisory board

Beautifying Our Community

Bicycle Facilities Plan 2025

Increasing numbers of Miami-Dade County residents and visitors are choosing to walk or bike for all or a portion of their trip. To meet the needs of these travelers, the Miami-Dade Metropolitan Planning Organization (MPO) has addressed walking and bicycling in its transportation plan. The creation of a Bicycle Plan is a step towards not only enhancing the County's bicycling facilities but also achieving a higher percentage of non-motorized trips by identifying areas in greatest need of bicycle improvements and focusing improvements to those areas. The 2025 Bicycle Plan builds on the 1997 Bicycle Plan utilizing a series of new quantitative tools to objectively evaluate the transportation network. Bicycle projects were ranked creating a priority listing of roadways for improvements and associated funding sources were identified.

The purpose of the 2025 Bicycle Plan is to:

- Update the 1997 Bicycle Plan which did not identify priority projects and funding
- Identify bicycle facility needs based on quantitative analysis
- Identify candidate project to address the bicycle facility needs
- Prioritize bicycle facility projects; and
- Develop a Minimum Revenue Plan based on projected funding.

www.miamidade.gov/mpo/m12-plans-bfp.htm

Comprehensive Development Master Plan (CDMP)

The CDMP expresses the County's general objectives and policies addressing where and how it intends development or conservation of land and natural resources will occur during the next ten to twenty years, and the delivery of County services to accomplish the Plan's objectives. It provides for "sustainable development" - allowing for land capacity to meet projected needs, preservation of wetlands and agricultural areas and protection of (drinkable) water well fields.

The CDMP establishes the broad parameters for government to do detailed land use planning and zoning activities, functional planning and programming of infrastructure and services. The Plan establishes a growth policy that encourages development:

1. At a rate commensurate with projected population and economic growth.
2. In a contiguous pattern centered on a network of high-intensity urban centers well-connected by multi-modal intra-urban transportation facilities.
3. In locations which optimize efficiency in public service delivery and conservation of valuable natural resources.

Miami-Dade County has more than 2,000 square mile of land, of which almost 500 square miles have been developed for urban uses. The Countywide land use plan broadly defines land use categories, with the smallest distinguishable area of the Land Use map set at 5 acres. The CDMP also establishes an Urban Development Boundary (UDB).

www.miamidade.gov/planzone/planning_metro_CDMP.asp

Freight Plan

The performance of the Miami-Dade freight network is critical to the County's mobility and economic competitiveness. Efficient and safe goods movement benefits business and the general public. There are few areas in the country that have the modal access that Miami-Dade shippers and receivers enjoy. This freight plan addresses the region's freight mobility needs and will become the basis for the freight component of the next MPO long-range transportation plan (LRTP). In this manner, the County can improve the movement of freight in ways that are consistent with its future vision.

Freight movement touches the lives of all businesses and residents. Without efficient goods movement, the economic engine of the country, state, and County would stall. The efficient movement of goods is a critical component of Miami-Dade County residents' daily lives and should be a planning focus for the ongoing growth and prosperity of the County. The Miami-Dade Freight Plan describes the County freight system and the needed infrastructure improvements and policies to enhance freight mobility and access to the year 2035.

Freight needs are addressed through projects and policies that respond to requirements of the freight industry and that benefit the region. These projects will be considered within the regional long-range transportation plan (LRTP) which is the MPO's financially constrained priority list of projects to the year 2035. These projects will be weighed among other priorities to provide the best infrastructure improvement and maintenance program for the County.

www.miamidade.gov/mpo/docs/MPO_miamidade_freight_plan_es_200903.pdf

Long Range Transportation Plan

The purpose of the Miami-Dade 2035 Long Range Transportation Plan (LRTP) is to develop a plan for a multimodal transportation system that complies with state and federal requirements, optimizes the movement of people and goods, and meets the goals and objectives adopted by the Miami-Dade Metropolitan Planning Organization Governing Board. The LRTP Steering Committee developed eight primary goals for the Miami-Dade County transportation system, including safety and security, sound investing, enhancing connectivity, energy conservation and supporting economic vitality. They are the basis for selecting and prioritizing projects to develop a transportation system that optimizes the movement of people and goods while reinforcing the fundamental guiding principles of sustainability, equability and environmental capability. The LRTP is a plan to prioritize and designate the funding of projects that address the goals, but is not an implementation plan for achieving these comprehensive goals and objectives.

www.miamidade2035transportationplan.com/

Open Space Master Plan

This Park and Open Space System Master Plan, released in December of 2007, envisions that great parks, public spaces, natural and cultural areas, streets, greenways, blueways, and trails will "create a seamless, sustainable system of parks, recreation and conservation open spaces for this and future generations." It will ensure that every resident in the County can safely and comfortably walk, bicycle, drive and/or ride transit from their home to work, school, parks, shopping and community facilities. Conservation areas and critical habitats will be protected from over-use and negative impacts. It will create an interconnected network of shaded and safe bikeways and trails connect to parks, neighborhoods, schools, employment centers, civic buildings, and other community destinations. Existing streets will be transformed into tree-lined boulevards and parkways that define the County's urban form. These public actions will generate multiple public benefits to maximize taxpayer dollars.

These projects along with enhancements of public spaces and streets will encourage the revitalization of neighborhoods; allow for the orderly redevelopment of existing land uses in response to changing markets and demographics; and ensure greater environmental protection. It will also improve the social fabric of the County.

www.miamidade.gov/greatparksummit/library/OSMP_FINAL_REPORT_entiredocument.pdf

Pedestrian Plan

Increasing numbers of Miami-Dade County residents and visitors are choosing to walk or bike for all or a portion of their trip. To meet the needs of these travelers, the Miami-Dade Metropolitan Planning Organization (MPO) has addressed walking and bicycling in its transportation plan. The creation of a Pedestrian Plan is a step towards not only enhancing the County's pedestrian facilities but also achieving a higher percentage of non-motorized trips by identifying areas in greatest need of pedestrian improvements and focusing improvements to those areas. The purpose of the 2025 Pedestrian Plan is to identify pedestrian facility needs based on quantitative analysis; identify Candidate Projects to address pedestrian facility needs; prioritize pedestrian projects; and develop a Minimum Revenue Plan based on projected funding.

www.miamidade.gov/mpo/m12-plans.htm#null

Social Services Master Plan 2005-2007

The Social Services Master Plan was developed for improving the quality of life for Miami-Dade County residents through Community Planning, Partnerships, Coordination of Resources, and Community Involvement. It presented that building a livable community for ALL recognizes that human services cannot operate in a vacuum; that there are other institutions and factors affecting the quality of life. The goals were for Miami-Dade County's residents to live and work in a culturally-sensitive, safe and stable environment, and to do this, be able to earn a wage that will support the basic needs of families. To earn that livable wage, residents must have sufficient work skills and training and to attain those skills, they must be educated. To be educated, residents must be healthy enough to go to school and learn and must have access to healthcare and medical information. To stay healthy, residents must have shelter that is safe, sanitary and affordable, and to be able to afford housing, you must have a livable wage. Livable Communities is the cross-system application of this plan.

Guiding principles:

- A shared vision of the needs of Miami-Dade County residents
- Improved coordination, collaboration and communication across systems
- Increased accountability for investments (outcomes versus workload measures)
- Promoting synergy through mutual support and networking
- Leveraging resources across systems
- Promoting partnerships between the public and private sectors
- Ensuring flexibility to respond to new or emerging community needs
- Improving outcomes for consumers and caregivers
- Improving the quality of life for all Miami-Dade County residents

www.co.miami-dade.fl.us/grants/library/08-Executive_Summary.pdf

Solid Waste Master Plan 2012

This two phased Solid Waste Master Plan will identify new activities, programs, facilities and technologies to provide sustainable solid waste services that will ensure public health and environmental protection for Miami-Dade County residents for the next 50 years. The Master Plan will look at new technology, resource conservation, recycling, waste diversion and responsible financing to meet current solid waste needs of our community, while conserving resources for the future. Phase I began in June 2009 with data collection, an assessment of the existing system and a projection of long-term solid waste management needs. It will include a program to encourage input from the public, an evaluation of regulatory and policy impacts, and a financial analysis. At the conclusion of Phase I, alternatives for improvements will be identified.

Phase II will turn the findings from Phase I into a comprehensive Master Plan for a long-term, sustainable solid waste management system. The Master Plan will include solutions such as potential new technologies, operations or facilities, as well as financial analysis and strategy for implementation. Completion of the Solid Waste Management Plan is scheduled for summer 2012.

www.miamidade.gov/dswm/master_plan.asp

Strategic Plan

Miami-Dade County's 2003-2007 Strategic Plan is the cornerstone of our results-oriented government. Budget decisions are based on the priorities identified through our strategic planning process. Each department develops a Business Plan that outlines how their key activities will support Strategic Plan priorities. The Strategic Plan provides a roadmap for the upcoming years as we allocate resources, improve overall performance and ensure we are delivering results. Currently the new strategic plan is under development and will incorporate lessons learned and recommendations received over the past five years. One key objective is to develop clearer and more succinct goals and outcomes, while reducing the number of "layers" in the plan.

The strategic areas of the plan's focus are:

- Economic Development
- Health and Human Services
- Neighborhood and Unincorporated Municipal Area Services
- Public Safety
- General Government Services
- Recreation and Culture
- Transportation

www.miamidade.gov/stratplan2003/home.asp

Street Tree Master Plan

The mission of the Community Image Advisory Board's Street Tree Master Plan is to provide the framework to design and implement street tree plantings that complement the purpose and intent of the Landscape and Tree Ordinances and to be used as minimum standards in order to enhance the County tree canopy to a minimum of 30 percent coverage, countywide by 2020.

Adequate tree canopy is vital to the environmental and economic well being of our community. The Street Tree Master Plan focuses on policies and practices that result in reduction to the tree canopy and then sets the course to reverse the trend. It establishes policy direction to begin management of Miami-Dade County's urban tree resources as a necessary priority and calls attention to the green infrastructure to address the concerns of trees along our streets and highways. It describes the procedures for planting and maintenance of street trees throughout Miami-Dade County and encourages partnerships with municipalities for the countywide implementation of the Plan for a greener, more livable community.

www.miamidade.gov/image/library/Street%20Tree%20Master%20Plan%20rev%20September%202007.pdf

Transit Development Plan FY2010 to 2020 (DRAFT)

Miami-Dade Transit operates the 14th largest transit system in the United States and is the largest transit system in the State of Florida. MDT is one of the largest departments in Miami- Dade County government. MDT operates four (4) transit modes of service: bus (Metrobus), heavy rail (Metrorail), automated guideway (Metromover), and demand-response service (Special Transportation Services or STS). Together these modes comprise an integrated multi-modal transit system for Miami-Dade County and record more than 326,000 daily (weekday) boardings on the MDT system while STS daily average is approximately 5,300.

The fiscal year 2010 – 2020 Draft Transit Development Plan (TDP) Major Update is a strategic development and operational guide for public transportation used by MDT for the next 10 year planning horizon. The Draft TDP includes an update of existing services, demographic and travel characteristics overview, a summary of local transit policies within the region, the development of proposed transit enhancements, and the preparation of a 10-year implementation plan that provides guidance for future MDT planning.

www.miamidade.gov/transit/library/pdfs/misc/tdp_may_2010.pdf

Miami-Dade County Water/Wastewater Facilities Master Plans

Rapid population growth and redevelopment in Miami-Dade County has required significant expansion of the wastewater/water systems. At the same time, regulatory pressure has required the upgrade/rehabilitation of the existing collection and transmission system and the implementation of reuse to obtain consumptive use permit increases. By 2020, it is expected that Miami-Dade County's population will have grown by approximately 20 percent to 2.9 million people, water and sewer services will be primary among the services that will need to expand to accommodate the burgeoning populace. The Department's Water and Wastewater Facilities Master Plans were developed to address these specific needs and were approved in fiscal year 2003 by the Miami-Dade Board of County Commissioners.

The plans outline the water and wastewater needs of the County as it seeks to sustain the projected growth in the area. On November 15, 2007, the Governing Board of the South Florida Water Management District (SFWMD) approved the Department's consolidated application for a 20-year Water Use Permit. The Permit allows the Department to draw an allocation of 347 million gallons per day (MGD) of drinking water from the Biscayne Aquifer, the County's primary source, through 2027. Prior to this approval, permits from SFWMD had been issued for five years. The new Permit allows the Department to plan for water needs over a longer horizon.

The Permit does come with several conditions; chief among them is the requirement that the Department develop alternative water supply sources in addition to the Biscayne Aquifer to cover the County's future water demands above the 347 MGD allocation. To that end, the Department has already begun updating its Water and Wastewater Master Plans to identify water treatment and distribution, sewage collection and disposal, as well as alternative water supply source needs.

www.miamidade.gov/wasd/library/2009_annual_report.pdf

Water Use Efficiency Plan

In order to be current with the evolving legislative climate and to commit to a more accountable approach to water conservation, Miami-Dade Water and Sewer Department (WASD) is updating its Water Conservation Plan as a Conserve Florida goal-based program to be implemented over a five-year period. The implementation of this Plan will improve the County's current level of water use efficiency. Historically, the County has implemented all required and four of the five optional (recommended) water conservation measures set forth by South Florida Water Management District. WASD will also implement quantifiable measures in addition to SFWMD required and recommended measures as provided in this goal-based plan. The Conserve Florida program includes a toolbox of non-quantifiable and quantifiable measures.

www.miamidade.gov/conservation/water_use_efficiency.asp

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