greenPrint

Our Design for a Sustainable Future

Milestone 1:
Sustainability Assessment Report
January 2010

MIAMI-DADE COUNTY

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Milestone One: Sustainability Assessment

EXECUTIVE SUMMARY

GreenPrint -- Our Design for a Sustainable Future is being developed to serve as an overarching sustainability plan to reaffirm, establish and synchronize our government and community goals, initiatives and measures. GreenPrint will integrate with existing County efforts and additional community plans. It will not only make County government operations greener, but also improve the community's overall sustainability and quality of life. It is not the County's plan; it is the ***entire community's*** plan. An overview of the planning process and background is provided immediately after this Executive Summary.

The first milestone of the sustainability planning process is the development of this Assessment Report, which assesses environmental, economic, and social equity challenges within Miami-Dade, and the programs in place to address these issues. While this published assessment is used to gather baseline data and to identify the challenges to be addressed in the plan, it is ***not final***.

The Core Planning Team acknowledged that the assessment includes gaps, unanswered questions and open issues; from County operations to municipal input. It was available for public comment and input in December 2009 and January 2010. Comments are important for the plan's development, from the assessment milestone and as we move forward with the other milestones of the sustainability plan.

The Interdepartmental Team is responsible for developing the plan, including completing a sustainability assessment, under the direction of the Sustainability Plan Leader and with the assistance of the Core Team. Throughout the process, the Mayor's Sustainability Advisory Board provides expertise on the sustainability challenges facing the community and offers strategic direction and advice for GreenPrint's development. Since August 2009, the Core Planning Team has met with Mayor's Sustainability Advisory Board and the Interdepartmental Team over 20 times to gather information for the assessment (see *Acknowledgments*).

This assessment is organized in the following manner. First, it provides a general overview of the Miami-Dade's demographics and economy. It also frames the overarching theme of Climate Change as an assessment area which is affected and influenced by the 12 other areas identified and reviewed for the assessment. These areas are:

Energy (Electricity & Fuel)	Local Business & Industry
Environment	Public Safety
Government Operations	Schools
Health	Solid Waste & Recycling
Housing	Transportation
Land Use	Water

Under Government Operations, several specific areas are examined including the consumption of fuel, electricity and water for all county operations, and the scope of county purchasing. It also examines airport and seaport operations and their importance as an economic engine for the local economy.

Information may be presented in more than one section of this assessment report due to the cross-cutting nature of the issues.

Appendices to the assessment include a comprehensive list of sustainability related County legislation and acknowledgements.

The assessment areas will include the following sections:

- *Summary of Key Sustainability Challenges* - Presents main challenges identified through collaborative stakeholder analysis of assessment data and indicators.

  Assessment Data and Indicators - Provides data and analysis to identify key challenges establish a sustainability baseline.
- *Existing Efforts* - Consolidates current plans, goals, and initiatives related to the specific assessment area. The information serves as a reference tool to guide and educate participants through the planning process.
- *Community Feedback* **-** Shares feedback and results gathered though the planning process or surveys related to the assessment area.

Next steps include completing milestone one by finalizing the assessment and beginning milestone two where we set sustainability goals that will define the overarching objectives and scope of GreenPrint. Following are milestone three which includes the development of the plan, milestone four which is the plan's implementation and milestone five which is monitoring and evaluating the plan's progress.

PLANNING PROCESS & BACKGROUND

Miami-Dade County is one of America's most vulnerable communities to climate change. While the County has made great strides in moving toward a resilient and sustainable future, now it's time to focus on how to effectively achieve our aggressive energy and greenhouse gas reduction goals, and how to address climate change and sea level rise.

Sustainability is a relatively new term for many, and agreement as to what it means or how to achieve it remains an issue for debate. The Urban Land Institute (ULI) District Council in San Francisco is currently developing a succinct statement of what sustainability is and how to accomplish it in an effort to help focus the efforts of developers, public officials, environmentalists, citizens and businesses on how to build better places to live.

In summary, the ULI believes that sustainability responds to global conditions with local action. Therefore, the most important principle of sustainability is that ***it starts with community commitment.*** That means developing a common language and involving citizens, developers, businesses, environmentalists—all stakeholders, in other words—in a dialogue about why change must happen and what needs to change. It means educating the 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 change based on whim. And it means recognizing that sustainability is not about one piece of how to build our communities. It is about all the pieces of the puzzle.

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). The pilot toolkit is based on New York City's PlaNYC, an ambitious yet achievable plan that Mayor's Office of Long-Term Planning and Sustainability put together to address the major challenges facing New York City. Miami-Dade's plan will be used as a model to replicate throughout 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. For example, Miami-Dade was one of the first local governments to voluntarily participate in Cap & Trade through its membership in the Chicago Climate Exchange (CCX) for fuel reduction. In addition, Miami-Dade was the first in the region to create a Climate Change Advisory Task Force to study climate change and sea level rise and make recommendations to the Board.

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. Our plan will be the framework to evaluate and integrate environmental, social and economic benefits in the policy decisions we make, programs and initiatives we implement and services Miami-Dade County delivers.

Our Plan

GreenPrint -- Our Design for a Sustainable Future is being developed to serve as an overarching sustainability plan to reaffirm, establish and synchronize our government and community goals, initiatives and measures. GreenPrint will integrate with existing County efforts and additional community plans. It will leverage present sustainability goals and initiatives and develop new ones where needed. A central component of GreenPrint is the measures and targets associated with each initiative.

Milestones

The planning process is comprised of ICLEI's five key milestones. By following these milestones we will be able to evaluate and integrate the environmental, social and economic benefits in the policy decisions we make, the programs and initiatives we implement, and the services we deliver.

- *Milestone One: Conduct a sustainability assessment*
  To begin the planning process, a local government needs to first research and assess environmental, economic, and social equity baselines and challenges within the jurisdiction, and the programs in place to address these issues. ***This is milestone one.***
- *Milestone Two: Set sustainability goals*
  The sustainability goals define the overarching objectives and scope of the sustainability plan. The goals should address the challenges identified in Milestone One.
- *Milestone Three: Develop a sustainability plan*
  The local government then develops a sustainability plan, ideally with robust public input from all stakeholders. The plan details the policies and measures that the local government will take to improve local sustainability and achieve the goals defined in Milestone Two.
- *Milestone Four: Implement the sustainability plan*
  The local government implements the policies and measures in the sustainability plan.
- *Milestone Five: Monitor and evaluate progress*
  Monitoring and verifying implementation progress is an ongoing process. Achieving Milestone Five involves annually reporting on implementation progress and monitoring the overall sustainability of the jurisdiction using the sustainability indicators identified in Milestone One.

Core Sustainability Team

Prior to launching into the five milestone process, a Sustainability Plan Leader and Coordinator were appointed by the County Manager to coordinate the development of the plan, and a Core Sustainability Team from the Department of the Environmental Resource Management (DERM), Department of Planning and Zoning, Government Information Center (GIC), Office of Strategic Business Management (OSBM), and Office of Sustainability (OOS), was established to assist with the plan's coordination.

The planning process and GreenPrint will adhere to the following guiding principles:

- The County will lead by example
- The concept of sustainability will guide County policy and decision-making
- Metrics and targets will be used to define goals and measure progress
- The County will collaborate with local municipalities to create a sustainability movement among all jurisdictions in the County
- Partnerships between jurisdictions and between the public and private sector are necessary to achieve sustainability goals
- Transparency and accountability will guide the County's sustainability actions
- Initiatives in the plan will be designed to be aggressive but achievable
- The County will ensure the benefits of sustainability policies are equitably distributed to county residents.

- The plan will reflect community demographics and the economy and include the following key sustainability components addressing both County operations and the community as a whole:

Air quality	Land use
Biscayne Aquifer and Bay water quality	Local food sources
Climate change mitigation/adaptation	Parks and open space
Civic engagement	Public safety
Ecosystems and habitat	Public health
Energy supply and demand	Schools and education
Government operations	Transportation fleets and transit
Green businesses and jobs	Water and sewer capacity
Green procurement	Water-use efficiency
Housing affordability	Waste capacity and recycling

Sustainability Interdepartmental Team

While every County department is charged with defining initiatives to make their operations more sustainable or "green,"; under the direction of the Sustainability Leader, the Sustainability Interdepartmental Team is responsible for developing the plan, as well as coordinating the County's efforts to ensure that the collective objective for all County activities is smart and sustainable investments are a normal part of doing business. Specific roles of the Interdepartmental Team include:

- Completing a sustainability assessment to obtain a baseline understanding of the major sustainability goals, initiatives and challenges,
- Identifying new goals and initiatives, and
- Providing feedback throughout the process.

Throughout the four month assessment process, every County department participated on the Interdepartmental Team in varying degrees.

Mayor's Sustainability Advisory Board

The Mayor's Sustainability Advisory Board serves as a key stakeholder group for the development and implementation of GreenPrint. It represents diverse constituents, which include: elected officials, business and real estate leaders, community designers, environmental and advocacy groups, academia, and regional planners. The role of the Board is to provide expertise on the sustainability challenges facing the County and offer strategic direction and advice for GreenPrint's development. Additionally, experts in the field of sustainability and staff from the Miami Dade County Public Schools provided valuable insight.

City Sustainability Liaisons

GreenPrint, will not only make our government operations greener, but also improve the community's overall sustainability and quality of life. This collaborative plan will not be accomplished without the partnership of all municipalities in Miami-Dade. While cities are being represented on the Mayor's Sustainability Advisory Board by the Miami-Dade County League of Cities, the County created a City Sustainability Liaisons group to provide feedback on the plan's assessment and development and share with us any city green or sustainability plans. Currently, cities are in different stages of climate change awareness and planning. Links to municipal websites are available at www.miamidade.gov/greenprint .

GOVERNMENT STRUCTURE

This section is provided as background, to establish a common understanding of our local history and to set the backdrop for the data we are reviewing and the plan we are developing. 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 (2,466,827), approximately 1.081 million or 43.8 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.

A recent 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.
(Source: FY 2009-10 Proposed Resource Allocation and Multi-Year Capital Plan)

COMMUNITY DEMOGRAPHICS & OUR ECONOMY

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, 2008). Miami-Dade County is often referred to as the "Gateway to Latin America and the Caribbean." The County's population is estimated to be 2,466,827. Population figures used are from the Florida Estimates of Population (April 1, 2008) 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 $23,125 and the median family income is $49,894. Of the County's total population, 11.8 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 27 foreign chartered banks and over $12 billion on deposit as of September 30, 2008, according to the Florida Department of Financial Services, Office of Financial Regulations. According to the Federal Reserve Bank of Atlanta, as of September 30, 2008, there were 13 Edge Act Banks throughout the United States; five of those institutions were located in the County with over $12.5 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 2008, 78 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 1970s to one dominated by services in the late 1990s 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.
(Source: FY 2009-10 Proposed Resource Allocation and Multi-Year Capital Plan)

KEY CHALLENGES & INDICATORS

The following overarching indicators were considered in determining the key challenges of the assessment areas.

- Expected population growth by 30,000 people per year, a million every three decades.
- 68 percent hispanic by 2020
- There are more persons lacking a high school degree in Miami-Dade County relative to the state and nation. In fact, 12.7 percent, the share of the population in the County with less than a 9th grade education is almost twice compared to the nation's 6.5 percent.
- The percentage of those with less than a high school degree for hispanics and blacks is more than three times than that for non-hispanic whites.
- Foreign born persons have the lowest level of educational attainment, while those from other states are mostly highly educated.
- Per capita income steadily becoming less than national average.
- Increasing unemployment rate – from 6.8 percent in January to 11.8 percent in October 2009. However, November figures are at 10.5 percent.
  (Source: Florida Agency for Workforce Innovation)

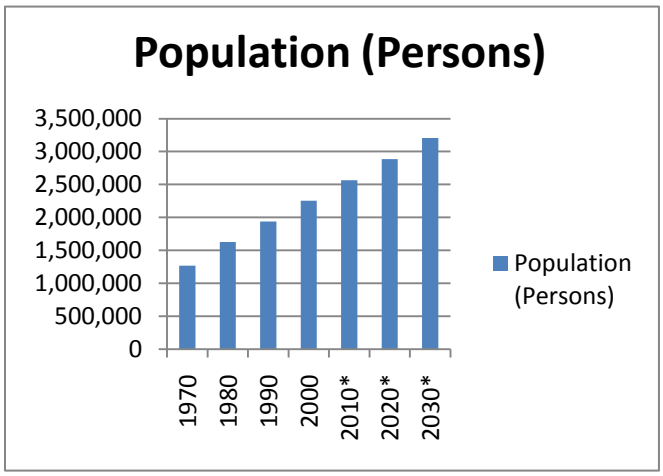
Population Growth

The County's population has grown significantly in the past three decades. As shown in Table 1, between 1970 and 2000, the population increased by nearly one million. And while the numbers indicate that the state population is not growing, county population it is expected to increase another million by 2030. With population growth averaging around 30,000 persons per year, the population for 2030 is projected to be 3,206,287.

Table 1
Miami-Dade County
Population
(Historic and Projected)
1970 - 2009

Year	Population (Persons)
1970	1,267,792
1980	1,625,781
1990	1,937,094
2000	2,253,362
2010*	2,563,885
2020*	2,885,439
2030*	3,206,287

*Projected
(Source: Department of Planning and Zoning, Research Section, 2009)



Race
In 1970, approximately 62 percent of the County's population was white, 15 percent black and 23 percent hispanic. In 2000 approximately 23 percent were white, 20 percent black and 57 percent hispanic. In three decades, the demographic profile of the County shifted from predominantly white to predominantly hispanic. This trend is expected to continue; it is projected that by 2020 the County will be approximately 12 percent white, 20 percent black and 68 percent hispanic.

Age
As shown in Table 2, the County's median age has remained steady in the past three decades.

Table 2
Miami-Dade County
Median Age
1970 – 2000

YEAR	Median Age
1970	34.2
1980	34.7
1990	34.2
2000	35.6

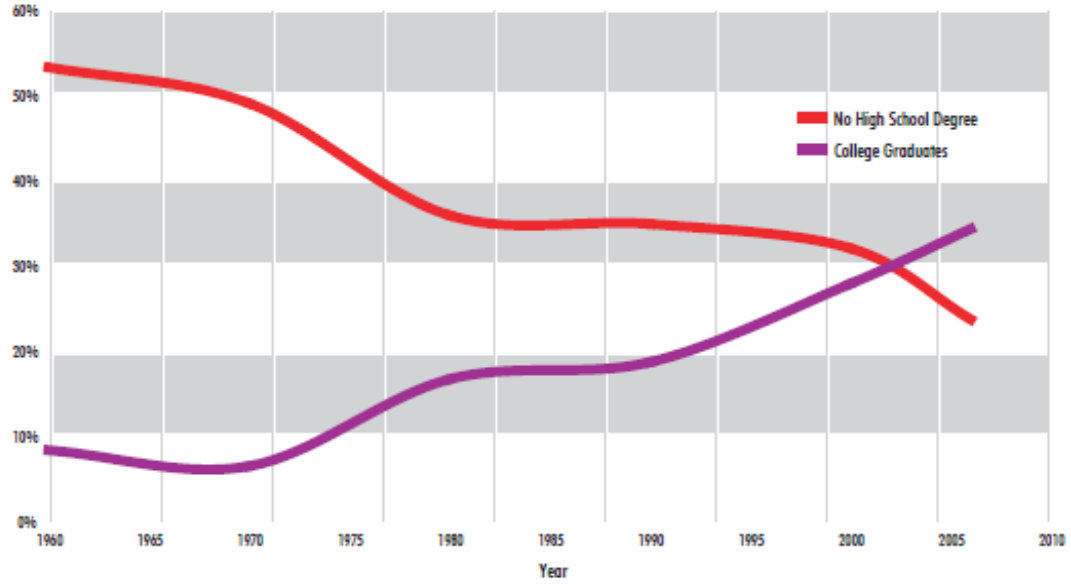
Educational Attainment
Over the past four decades, improvements in the educational attainment level in the County were achieved, most significantly during the 1970's and since 2000. The percent of the population 25 years and above not completing high school decreased from 53.4 percent in 1960 to 23.8 percent in 2006, while college graduates increased from 8.4 percent to 34.4 percent in the same period. Please note that for this report, the data on educational attainment includes only persons 25 years and above.

When comparing Miami-Dade, the proportion of the population with higher education degrees is similar to that of the state and nation. However, when compared to persons lacking a high school degree, the County ranks higher, with 12.7 percent of the population having less than a 9th grade education. This is almost twice the share for the nation at 6.5 percent (see Charts 1 and 2).

Marked differences are present when comparing different ethnic groups within the County. In 2006, 54.7 percent of non-hispanic whites had a college degree or higher, compared to 32 percent hispanics and 20 percent non-hispanic blacks. The difference in the share of college graduation rates between the above groups has grown since the 1970s (see Charts 3 and 4). The percentage of those with less than a high school degree for hispanics and blacks is more than three times than that of non-hispanic whites. For blacks the figure is 29.8 percent, hispanics 27.1 percent and white non-hispanics 7.8 percent.

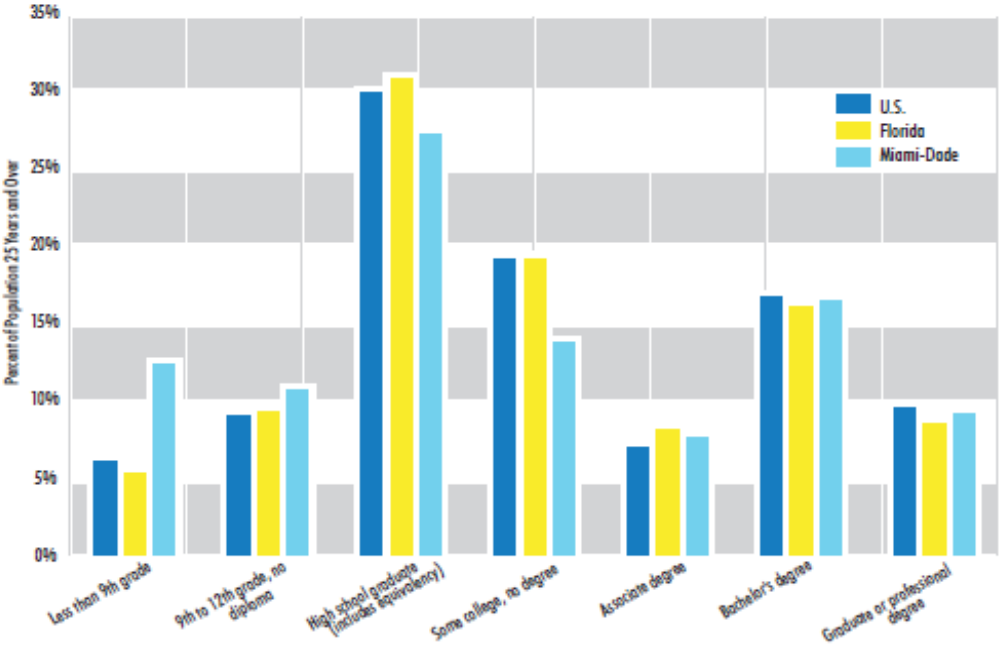
In terms of gender, the differences are not significant. Although, in the future we expect to see higher levels of education for females given the trends observed in the school enrolment data. Those persons that are foreign born have the lowest level of educational attainment, while those from other states are the mostly highly educated.
(Source: "Miami-Dade County at a Glance, Educational Attainment" - Department of Planning and Zoning, Research Section)

Chart 1:
Educational Attainment Levels for Persons 25 and Above
Miami-Dade County, 1960 - 2006



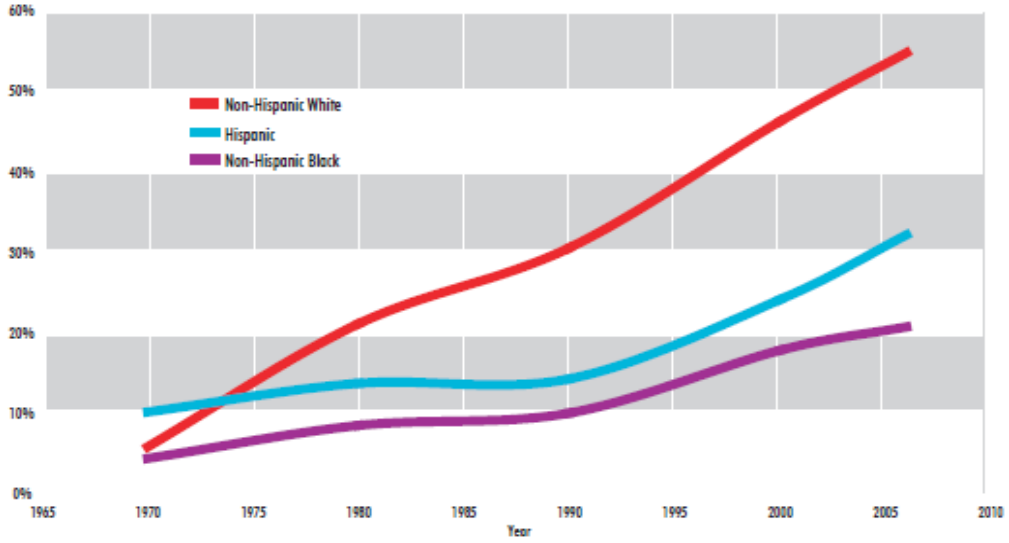
Source: U.S. Census Bureau, Decennial Census 1960 - 2000, American Community Survey 2006 . Prepared by Miami-Dade County, Department of Planning and Zoning 2008.

Chart 2:
Comparative Educational Attainment
Miami-Dade County and United States, 2006



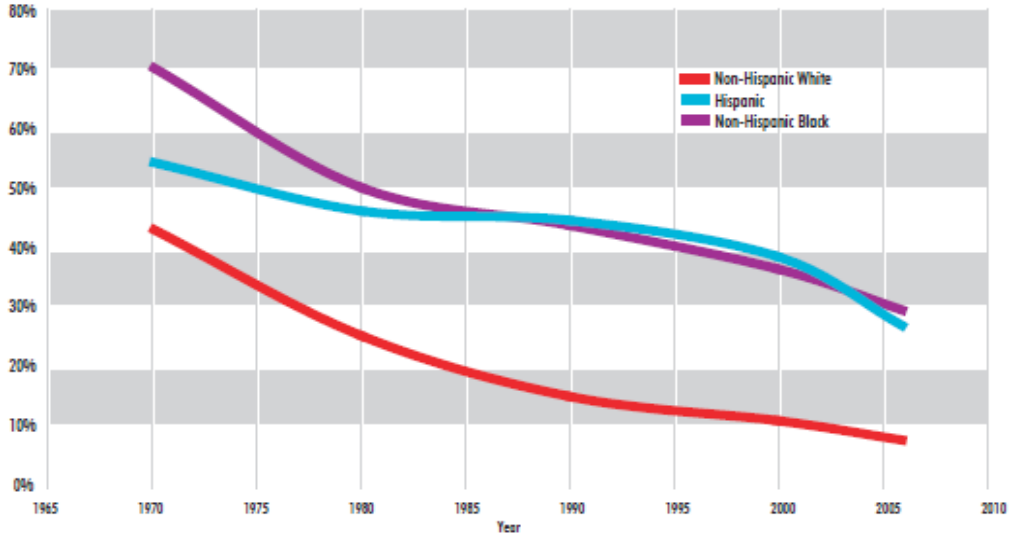
Source: U.S. Census Bureau, American Community Survey 2006. Miami-Dade County, Department of Planning and Zoning 2008.
Note: Data are estimates based on a sample and are subject to sampling variability

Chart 3: Persons 25 Years and Above, with College Degree or Higher by Ethnicity, Miami-Dade County, 1970 - 2006



Source: U.S. Census Bureau, Decennial Census 1970 - 2000, American Community Survey 2006 . Prepared by Miami-Dade County, Department of Planning and Zoning 2008.

Chart 4: Persons 25 Years and Above with Less Than High School Degree, by Ethnicity, Miami-Dade County, 1970 - 2006



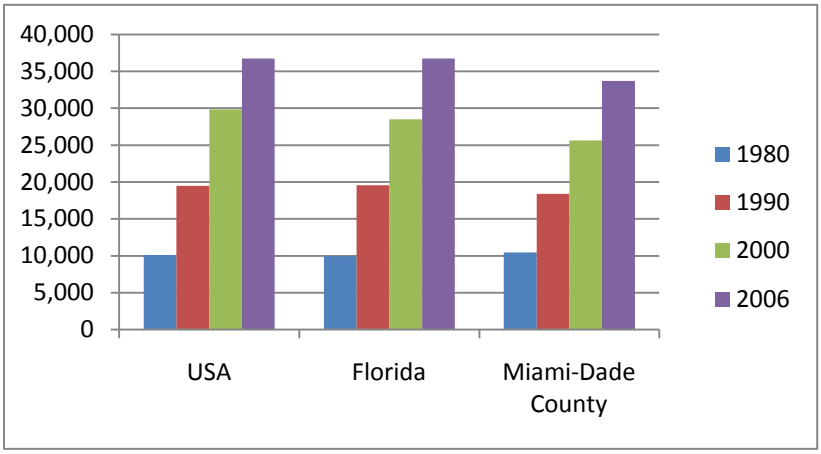
* All People excluding Blacks and Hispanics.

Source: U.S. Census Bureau, Decennial Census 1970 - 2000, American Community Survey 2006. Prepared by Miami-Dade County, Department of Planning and Zoning 2008.

Income

Chart 5 shows the per capital personal income in the Unites States, Florida and the County in 1980, 1990, 2000 and 2006. In 1980, the County's per capital personal income was higher than that of the state and nation. Since then, though, the County's per capita personal income has been lower than that of the state and nation. In 1990, the County's figure was $1,103 less than that of the nation, $4,214 in 2000, and $3,002 in 2006.

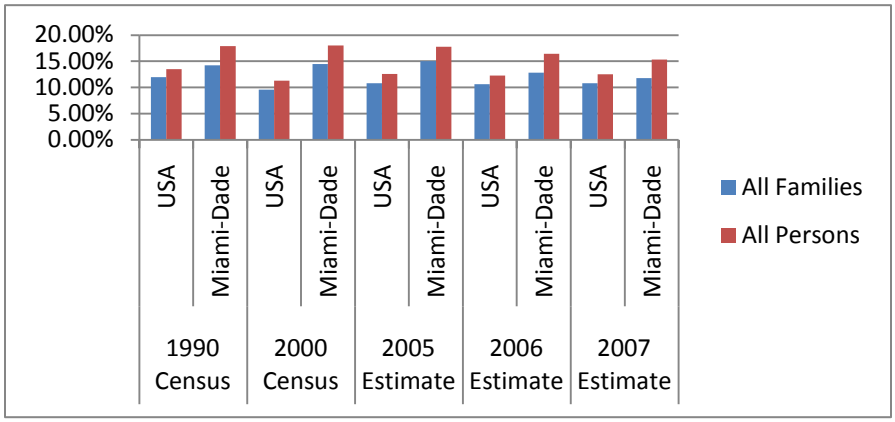
CHART 5: MIAMI-DADE COUNTY PER CAPITA PERSONAL INCOME ($) 1980 - 2006



Poverty

As illustrated in Chart 6, the County's poverty level figures have steadily lagged behind those of the nation. The 2000 census showed a slight increase in poverty over 1990 census figures. The 2006 and 2007 estimated numbers, showed an overall decrease in the number of poor families and individuals over the 2000 census figures. Given the current economic conditions, these figures are expected to worsen during the 2010 census reporting period.

CHART 6: PERCENTAGE OF FAMILIES AND PEOPLE WHOSE INCOME IN THE PAST 12 MONTHS IS BELOW THE POVERTY LEVEL



Employment

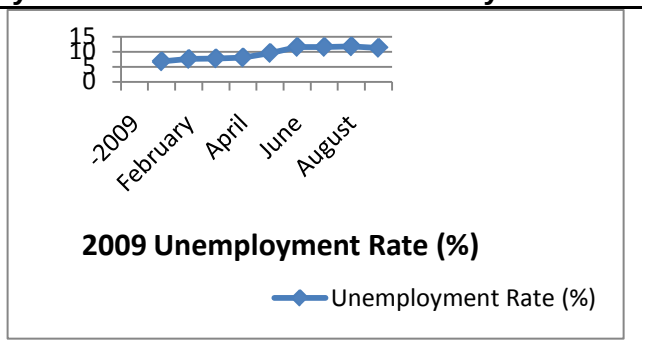
As illustrated in Table 3, unemployment rates have fluctuated historically from an approximate rate of 8 percent during the 1990s to a rate of 4.6 percent during 2005. With the current economic downturn, the County's unemployment figures have changed drastically. As shown in Table 4 and Chart 7, the County's 2009 monthly unemployment rate has increased considerably from 6.8 percent in January 2009 to 11.8 percent in October 2009. However, November 2009 figures are at 10.5 percent.

Table 3
Employment Statistics for Miami-Dade County
1990 to 2008

Year	Labor Force	Employment	Unemployment	Unemployment Rate percent
1990	987,269	909,877	77,392	7.8
1995	1,048,926	964,401	84,525	8.1
2000	1,103,485	1,046,900	56,585	5.1
2005	1,133,274	1,081,204	52,070	4.6
2008	1,212,446	1,142,665	69,781	5.8

Table 4 & Chart 7
2009 Monthly Unemployment Rate for Miami-Dade County

Month (2009)	Unemployment Rate (percent)
January	6.8
February	7.6
March	7.8
April	8.1
May	9.6
June	11.6
July	11.6
August	11.8
September	11.3



(Source: Department of Planning and Zoning, Research Section, 2009)

Voter Population

Miami-Dade County serves 1,258,727 registered voters across 836 precincts at 574 polling places on Election Day. Miami-Dade has the most complex elections operation in the State of Florida, only county that does not have a consolidated elections calendar for municipalities. Over 20 countywide and/or municipal elections are conducted a year, offering three ways to vote: absentee voting, early voting and in-precinct voting on Election Day. Not only does Miami-Dade have the largest number of voters in the state, but it is also the largest county in terms of population and geography, demographics, and demand for multi-lingual services.

The number of registered voters has steadily increased with population growth and currently stands at 49 percent (Chart 8). We have experienced changes in voting patterns due to new accessibility to voting. In fact, since 2000 we have seen a steady increase in absentee or early voting, as well as voter turnout (Chart 9).

Chart 8 - Miami-Dade County Elections Department
Registered Voters, 1920 to 2010

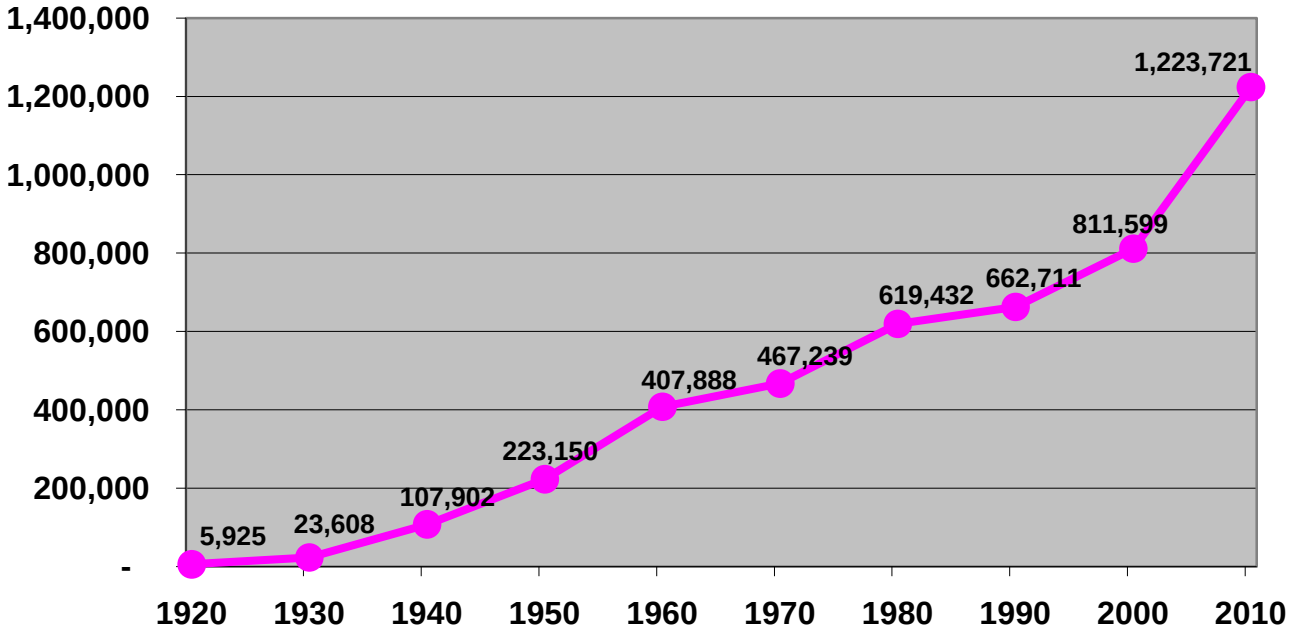
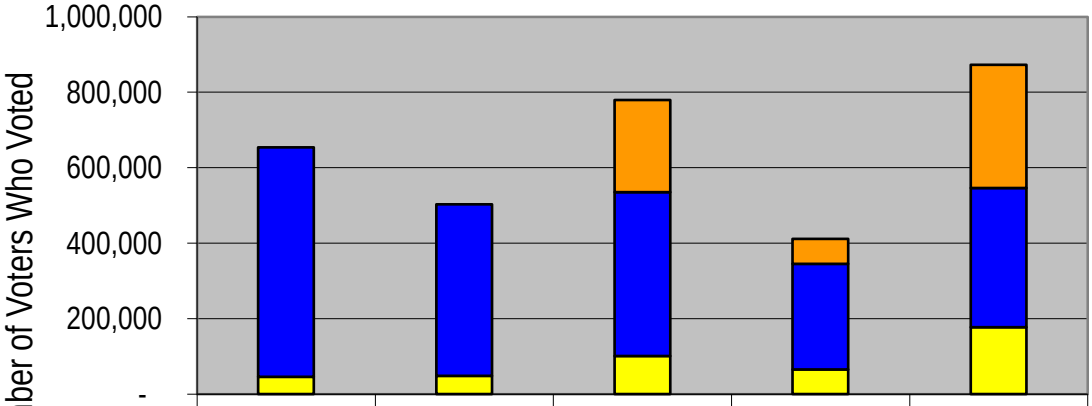


Chart 9 - Miami-Dade County Elections Department
Voter Turnout by Voting Method, 2000 to 2008 General Elections



	2000 General Election	2002 General Election	2004 General Election	2006 General Election	2008 General Election
Early Voting	-	-	244,067	66,190	326,170
Election Day	608,167	454,510	433,824	279,910	368,540
Absentee	45,692	48,083	101,062	64,918	177,550

Note: Early Voting was introduced in November 2002, therefore, it was not offered in the 2000 and 2002 General Election.

Climate Change

There is consensus among the world's leading scientists that global climate change is among the most significant problems facing the world today. Florida is considered one of the most vulnerable areas to climate change, with Southeast Florida on the frontline to experience its impacts, especially rising sea levels.

Miami-Dade County has been in the forefront of these issues for many years. The Miami-Dade Board of County Commissioners and County 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 on, reviewing and analyzing climate change data and information, we have taken steps to reduce GHG emissions and avoid or reduce the severity of anticipated climate change impacts. This work, and efforts to date, will be developed into an overall climate action strategy, which will become an integral component of GreenPrint.

Climate Change

Assessment Area

One of the most significant challenges facing Miami-Dade County is the threat of climate change impacts. Ice cores show that the earth has experienced natural cycles in atmospheric concentrations of CO_2 and temperature for over 600,000 years. However, as a result of human activities, there is now an unprecedented build-up of greenhouse gases (GHGs) in the earth's atmosphere, causing the atmosphere to progressively trap more of the sun's heat energy. As a result, changes are occurring worldwide that are impacting the many interconnected systems and feedback loops that determine precipitation, temperature, severe weather patterns, ocean currents and acidification, and sea level throughout the world.

Recognizing very early on that climate change was an issue of great importance, Miami-Dade County established a Long-Term Urban CO_2 Emissions Reduction Program in 1993 and has continued implementing GHG emission reduction initiatives since that time. Despite reducing or avoiding approximately 34 million equivalent tons of CO_2, through the implementation of this program, the County did not reach its reduction goal. In fact, total equivalent carbon dioxide gas emissions increased by 8.5 million tons from 1988 to 2005. Several factors contributed to this increase including: an increase in the County's population by approximately 27 percent; an increase in electrical usage per household resulting from larger homes and personal electronics; the advent and proliferation of sport utility vehicles (SUVs); and an absence of stricter national Corporate Average Fuel Economy (CAFE) standards. Important lessons were learned during the implementation of this Program which are being carried forward as the County continues to implement successful emission reduction projects and looks for opportunities to further reduce emissions. In fact, Miami-Dade continues to be a leader in aggressively tackling emissions reductions by being the first local government in the Southeast to become a member of the Chicago Climate Exchange (CCX), thereby committing to reduce its fuel-related carbon emissions by 6% from the year 2000 levels by 2010.

As a low-lying coastal community, Miami-Dade is more susceptible to many of the potential impacts which may occur as a result of climate change, particularly those associated with sea level rise and severe storm events. Once again recognizing the local importance of this issue early on, the County formally began its climate change adaptation planning in 2006 with the creation of the Climate Change Advisory Task Force (CCATF). This diverse group of knowledgeable and engaged individuals from various sectors of the community is charged with reviewing and analyzing climate change data and information, and subsequently providing recommendations to the Board of County Commissioners for actions that would further reduce greenhouse gas emissions, avoid or reduce the severity of anticipated climate change impacts. These recommendations and efforts will be developed, along with additional GHG emissions reduction initiatives, into an overall climate action strategy, which will become an integral component of GreenPrint.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

Climate Change Mitigation

- Affecting and accomplishing significant and measureable GHG emissions reductions community-wide from the residential, commercial, and industrial sectors in order to meet regional GHG emission reduction goals.
- Reducing GHG emissions associated with county operations' (internal) energy and fuel use while continuing to provide, and even increase services, to the community such as mass transit (busses & commuter rail), solid waste disposal, adequate drinking water supply, sewer services, flood protection, etc.
- Effectively communicating the benefits and need for GHG emission reduction to all sectors of the community.
- Revising existing county policies and procedures for land use, transportation, and construction in light of climate change and sea level rise data.

Adapting to climate change will be a cornerstone of the County's overall resiliency to an ever changing climate, and will ultimately determine the community's sustainability. The key challenges associated with climate change adaptation are as follows:

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

Climate Change Adaptation

- Determining and/or predicting local and regional changes in climate trends (precipitation, temperature, severe storm events) and sea level rise, based on national and global information and models.
- Developing regional climate change impact scenarios depicting the extent and timing of sea level rise, weather trend changes, and severe storm events for adaptation planning purposes, despite the inherent uncertainties associated with numerous interconnected feedback loops and ever-changing data and models.
- Protecting the aquifer from salt water intrusion and preventing or minimizing flooding in low-lying areas as sea level rises.
- Effectively communicating the urgency and necessity of climate change adaptation planning in order to obtain necessary resources and support for implementation now.
- Enacting and implementing changes in policies, codes, programs, and capital investments.

ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

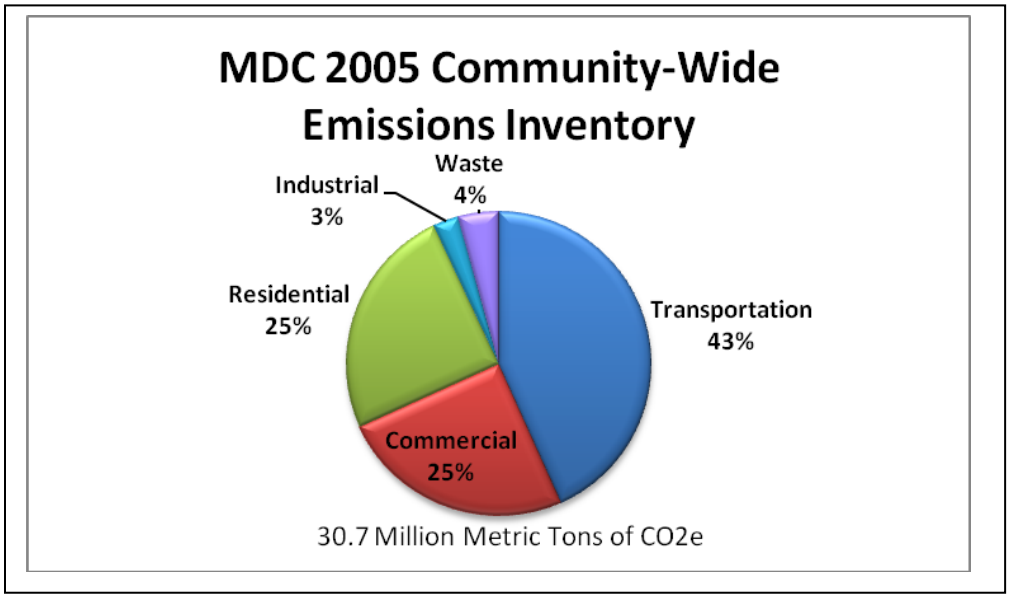
Climate Change Mitigation

Fossil fuel and electricity consumption are directly correlated to emissions of Greenhouse Gases (GHGs) and are the primary source of these emissions in Miami-Dade County, both

internally for county operations, and community-wide. As a result, efforts to reduce GHG emissions are focused on reducing fossil fuel and energy use and therefore, many indicators, initiatives, and programs identified in the Energy, Land Use, and Government Operations Areas of this report would result in fuel and/or energy use reduction. Since these topics are discussed at length in the above-mentioned report areas, the information provided in this section focuses on the relationship of these topics to emissions and emission reductions. A review of these above-mentioned report areas is suggested to better understand the specific indicators and initiatives mentioned below, and should be kept in mind while reading this section

As part of the forthcoming climate action strategy, the County has established a new GHG emissions baseline for calendar year 2005, with an estimated total of approximately 30.7 million metric tons of CO_2 Equivalents (CO_2e) county-wide (Chart 1). An emissions baseline was also calculated for the County's internal government operations, which totaled approximately 983,000 metric tons CO_2e (See Chart 4), or approximately three percent of the community-wide regional emissions. Emissions are calculated in CO_2 equivalents, using various emission coefficients for other GHG emissions, to account for their contribution to the overall baseline. Chart 1 shows the overall community GHG emissions from both fossil fuel and electricity use, broken down by the primary community sectors. It is from both the overall community-wide baseline and the internal government operations baseline that the County will measure progress in its emission reduction efforts.

Chart 1

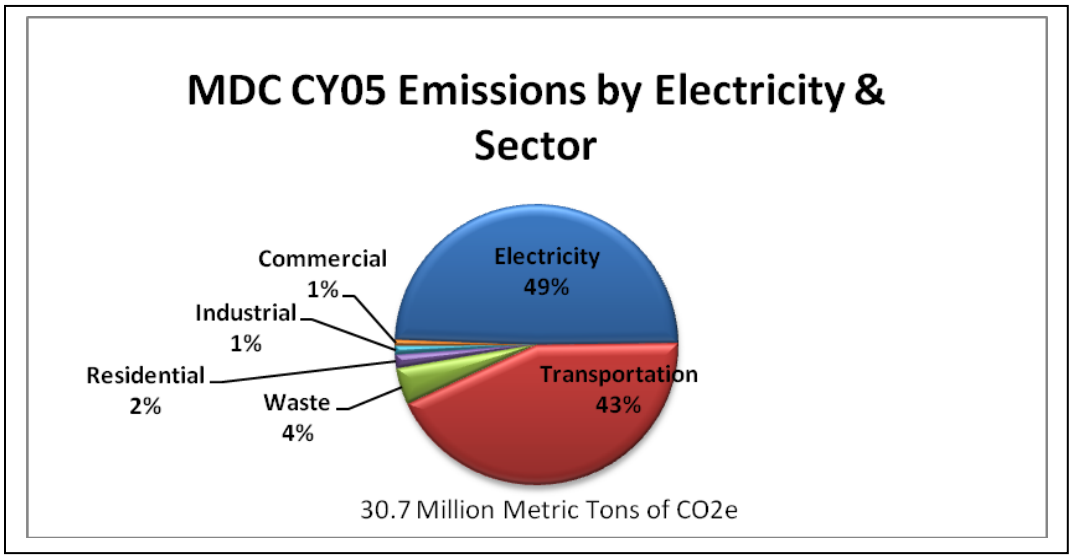


(Source: Miami-Dade Department of Environmental Resources Management)

When fuel and electricity emissions are combined together, as in Chart 1, the Residential and Commercial sectors' emissions are almost equivalent. Taking the same emissions information in Chart 1 above and separating the fuel emissions from the electricity emissions reveals that electricity and transportation are by far the greatest contributors to community-wide emissions and are roughly equivalent in their contribution (Chart 2 below). When comparing Chart 1 above with Chart 2 below, it becomes apparent that the primary source of emissions from the Residential and Commercial sectors is electricity use, since the other sectors' emissions remain relatively the same in both charts. The small remaining components shown for Residential, Industrial, and Commercial sectors in Chart 2 are from other fossil fuels such as coal and

natural gas. Emissions from the waste sector are primarily due to methane released from the landfills, which is approximately 21 times more potent as a GHG than CO_2.

Chart 2

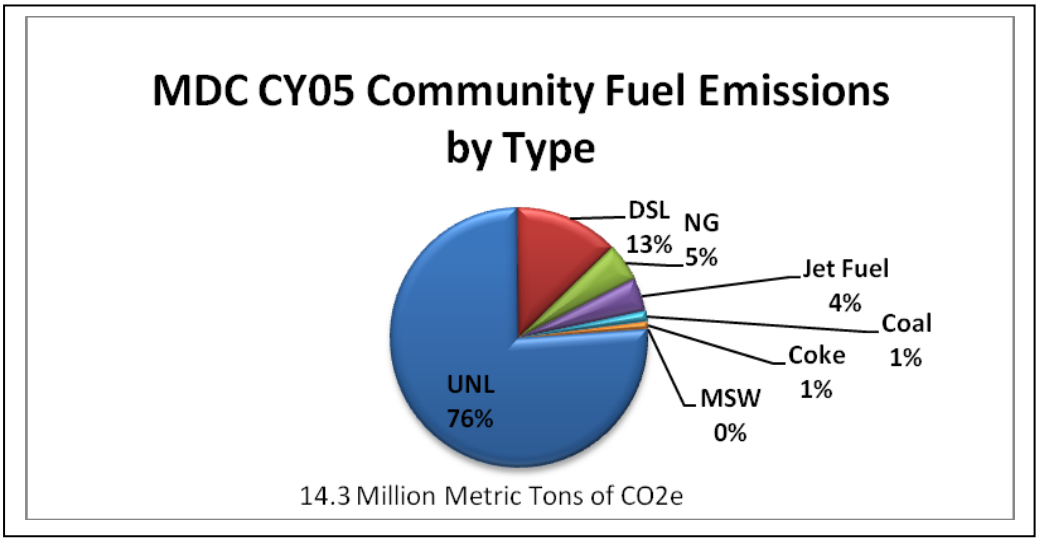


(Source: Miami-Dade Department of Environmental Resources Management)

Emissions from Fuel Use

Under the overall Transportation sector, unleaded fuel use by light duty (passenger) vehicles accounts for approximately 76 percent of the transportation emissions, and diesel fuel comprises approximately 13 percent the total (Chart 3). The substantial portion of emissions from unleaded fuel reveals that personal passenger cars are still the greatest overall contributor to the community-wide fuel emissions.

Chart 3



(Source: Miami-Dade Department of Environmental Resources Management)

The longer and farther individuals travel in their personal vehicles, the more GHG emissions are released. Therefore, vehicle miles travelled (VMTs) and vehicle hours travelled (VHTs) serve as descriptive indicators of community-wide and government operations' fuel-derived emissions and should be a prime target for reduction initiatives. Reduced use of personal vehicles and

associated VMT and VHT community-wide can be accomplished by improving public transportation function and accessibility, and increasing use of public transportation (See Transportation Area) and by promoting walk-ability, bike-ability, infill, mixed-use, and transit-oriented development (TOD) (See Transportation, Land-Use, and Government Operations Areas). Providing the service and accessibility to public transportation is only part of the challenge; the other critical element is changing individuals' perceptions and behaviors to reduce use of personal vehicles. This source of emissions has historically proven difficult to reduce, and is very challenging because it is not under direct control of County government. However, new federal legislation was proposed on September 15, 2009, by Environmental Protection Area (EPA) and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) that will improve fuel economy for all new cars and trucks sold in the United States and will result in reduced GHG emissions (See "*Existing Efforts*").

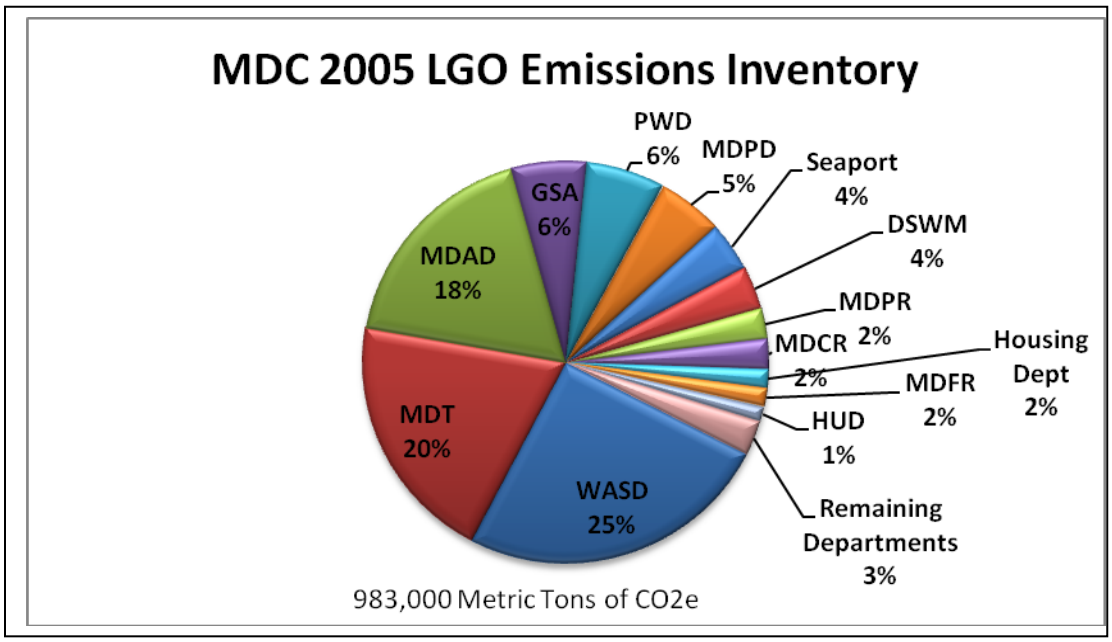
Miami-Dade County fleets and operations consumed approximately 7.5 million gallons of unleaded fuel and approximately 20 million gallons of diesel fuel in 2005. This fuel is used for a wide variety of purposes such as light duty passenger cars; heavy duty vehicles such as buses, fire trucks and garbage trucks; heavy duty equipment such as mowers, bulldozers, and bucket trucks; and pumps for water and sewer services and storm water control (See Energy and Government Operations Areas). Each of these uses offers various opportunities for fuel use and/or emissions reduction, ranging from more efficient motors and engines, to use of alternative fuels, to a decrease in the use of vehicles overall through improved efficiencies and increased use of video-conferencing and telecommuting. Due to the high volume of use and variety of uses, an effective emissions reduction program must employ many different technologies.

In addition to VMTs and VHTs, other indicators can be used to track fuel-derived emissions and emissions reductions for the community as well as for internal local government operations (LGOs). These indicators include but are not limited to the following (See Energy, Transportation, & Government Operations Areas for more detailed discussion of these indicators):

- Fuel consumption by community sectors and departments
- Public transportation ridership
- Overall and individual County fleet fuel efficiency (garbage trucks, buses, heavy equipment, light duty fleet, etc.)
- Ratio of bio-diesel to standard clean diesel fuel consumed
- Ratio of hybrid technology vehicles to standard vehicles in County fleets

Chart 4 below shows the County departments' relative contribution to the government operations emissions baseline when fuel and electricity are combined. These emissions are primarily from electricity used to power buildings and equipment, in addition to fuel and electricity to run vehicles and equipment that provide services to the community. It is important to note that some of the emissions generated from county facilities, such as landfill gases from waste degeneration and emissions from private aircraft and marine vessels, are accounted for in community-wide emissions summaries, but are not included in the diagram below. The "Remaining Departments" component is comprised of the other 48 departments whose contributions to the baseline are less than one percent of the total.

Chart 4



(Source: Miami-Dade Department of Environmental Resources Management)

It is important to note here that the majority of departments with the most substantial emissions contributions are those departments that provide significant and essential services directly to the community. One exception to this is General Services Administration (GSA), whose bulk of emissions (86 percent) are due to electricity use from the buildings they manage, which is a service provided to other County departments as opposed to the community. Further breaking down the emissions to the primary sources within each department, as below, helps identify both challenges and opportunities for GHG emissions reductions.

DEPT	Source	Emissions (mt)	%
WASD	Buildings	175,109	70.69%
	Pumps (etc.)	60,035	24.24%
	Fleet	11,260	4.55%
	Other (Equip.)	1,306	0.53%
	TOTAL	247,711	100.00%

Approximately 95 percent of the Miami-Dade Water and Sewer Department (WASD) emissions are for water supply and sewer services.

DEPT	Source	Emissions (mt)	%
MDT	Transit Buses	114,729	58.13%
	Metrorail	47,548	24.09%
	Refrigerant (HFC-134a)	16,876	8.55%
	Buildings	14,723	7.46%
	Fleet	3,064	1.55%
	Other (Equip.)	439	0.22%
	TOTAL	197,380	100.00%

Approximately 82 percent of Miami-Dade Transit (MDT) emissions are from providing public transportation (buses and MetroRail).

DEPT	Source	Emissions (mt)	%
MDAD	Buildings	171,660	97.49%
	Fleet	2,844	1.62%
	Other (Equip.)	1,578	0.90%
	TOTAL	176,082	100.00%

Approximately 97.5 percent of Miami-Dade Aviation Department (MDAD) emissions are from powering the buildings at Miami International Airport. *(The summary provided here reflects those emissions resulting from support operations at airport facilities. Emissions from aircraft during take-offs and landings is captured in the community-wide emissions summaries, but are not included here.)*

DEPT	Source	Emissions (mt)	%
PWD	Street Lts/Traffic Sig	54,316	87.67%
	Buildings	3,649	5.89%
	Fleet	3,623	5.85%
	Other (Equip.)	364	0.59%
	TOTAL	61,952	100.00%

Approximately 88 percent of Public Works Department (PWD) emissions are from operation of street lights and traffic signals.

DEPT	Source	Emissions (mt)	%
MDPD	Fleet	34,083	65.63%
	Buildings	10,365	19.96%
	Equipment	4,245	8.17%
	Planes/Helicopters	1,702	3.28%
	Generators	1,081	2.08%
	Motorboats/Cycles	453	0.87%
	Total	51,929	100.00%

Approximately 66 percent of Police Department emissions are from the operation of patrol and non-patrol vehicles.

DEPT	Source	Emissions (mt)	%
DSWM	Fleet	27,113	93.82%
	Buildings	1,391	4.81%
	Other (Equip.)	395	1.37%
	Total	28,898	100.00%

Approximately 94 percent of Department of Solid Waste (DSWM) emissions are from fleet fuel use, 85 percent of which is from the operation of garbage and recycling trucks. *(The summary provided here reflects those emissions from waste collection and processing operations. Landfill gas emissions are accounted for in the community-wide emissions summaries, but are not included here.)*

It is a significant challenge for the County to maintain or increase these essential community services while simultaneously reducing emissions from the fuel and electricity used to provide them, and will require further improvement in efficiency, innovation, and resourcefulness.

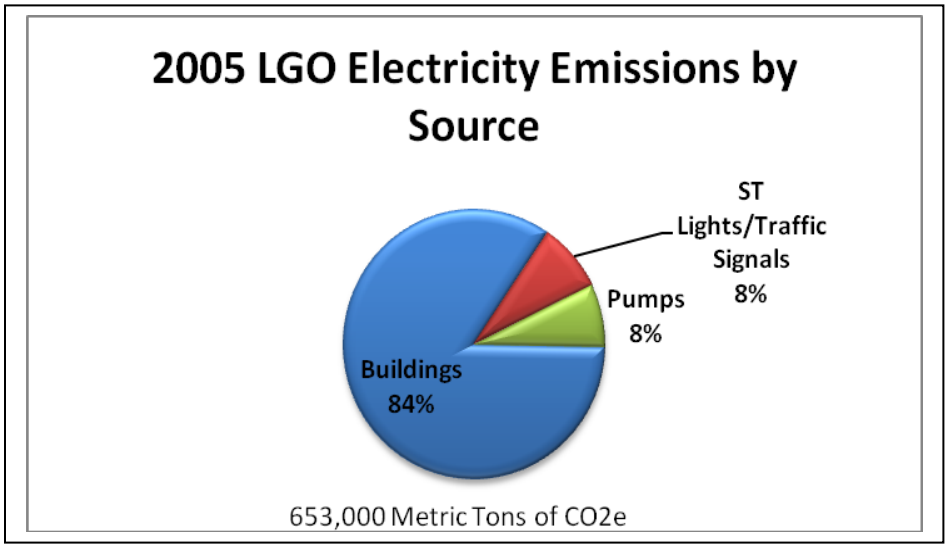
Emissions from Electricity Use

Greenhouse gas emissions and introductory information on energy as it relates to Climate Change is provided in this section. More detailed information on electricity production and use is located in both the *Energy* and *Government Operations Areas* of this report.

All electricity consumption and electricity consumption data for both the community and internal county operations is obtained from the utility provider, Florida Power & Light, Inc. (FPL), and is provided in Kilowatt Hours (kWh) units. The only exception to this is the electricity provided by the single municipal-owned utility in the County, Homestead Electric Company, which provides electricity for Homestead and comprises approximately 1.4 percent of the overall community electricity derived emissions. As shown in Chart 2 above, electricity use contributes approximately 49 percent of the total community-wide GHG emissions. As detailed in the *Energy Area* of this report, electricity consumption in the County has grown roughly two percent per year since 1995. The most efficient and cost effective method for reducing emissions from electricity generation is through increased energy efficiency.

Chart 5 below reveals that approximately 84 percent of the County's operational emissions from electricity usage results from energy used to operate and power buildings. The remaining 16 percent is divided evenly between electricity used to provide water, sewer and flood protection services for the community, and street and traffic lighting for the community. Once again, as highlighted above, significant emissions result from providing essential services to the community. As the climate action strategy is developed, this information will be used to help target initiatives for emissions reductions, which will be evaluated and measured on a regular basis to determine the progress in reaching reduction goals.

Chart 5



(Source: Department of Environmental Resources Management)

Successful and measurable efforts to reduce GHG emissions are already being implemented to improve energy efficiency and will continue, such as energy performance contracting to retrofit county buildings and retrofitting traffic lights to Light Emitting Diode (LED) bulbs. For example, as of April 2009, 80,000 incandescent traffic light bulbs have been converted to LED, resulting in an annual reduction of approximately 18,000 mega watt hours (MWh), which equates into an annual emissions reduction of approximately 10,000 metric tons of CO2 equivalents and an annual savings of approximately $1.8 million.

For the County's climate action strategy, initiatives to further reduce GHG emissions will be developed based on the opportunities for reduction that are identified within each department and community sector, based on energy use. The following indicators can be used to determine

progress towards the GHG emission reduction targets (mitigation), and will be converted to CO_2 Equivalents as appropriate. These indicators include, but are not limited to:

- Energy consumption/GHG emissions per Community Sector (Residential, Commercial, Industrial, Transportation, Waste)
- Energy consumption/GHG emissions per County department
- Kilowatt hour (KWh) Per capita consumption
- Kilowatt hours (KWh) per square foot consumption
- The number of certified Green buildings

In addition to measuring overall GHG emissions, individual programs to reduce emissions will be measured and the amount of emissions avoided or reduced will be calculated and tracked. This is particularly applicable to pertinent grant projects associated with American Reinvestment and Recovery Act (ARRA) funding, such as the Energy Efficiency & Conservation Block Grant (EECBG) program.

Recycling Rates

Although solid waste only comprises four percent of the community-wide emissions, it bears mentioning in this section because past experience has shown that recycling can result in significant emissions reductions. As a result of the County's original GHG mitigation efforts from 1990 to 2005, over 34 million tons of equivalent CO2 greenhouse gas emissions were reduced or avoided overall. Approximately 76 percent, or 26 million tons, of these avoided GHG emissions were due to recycling. By diverting waste, recycling realizes significant emissions reductions through avoidance of methane gas production from landfills. Therefore efforts to increase recycling rates should continue, which will also align with The Energy, Climate Change, and Economic Security Act of 2008 (House Bill 7135) signed into law by Governor Crist, which established a new statewide recycling goal of 75 percent to be achieved by the year 2020. Therefore, recycling rates will also serve as an indicator of GHG emissions and emissions reductions.

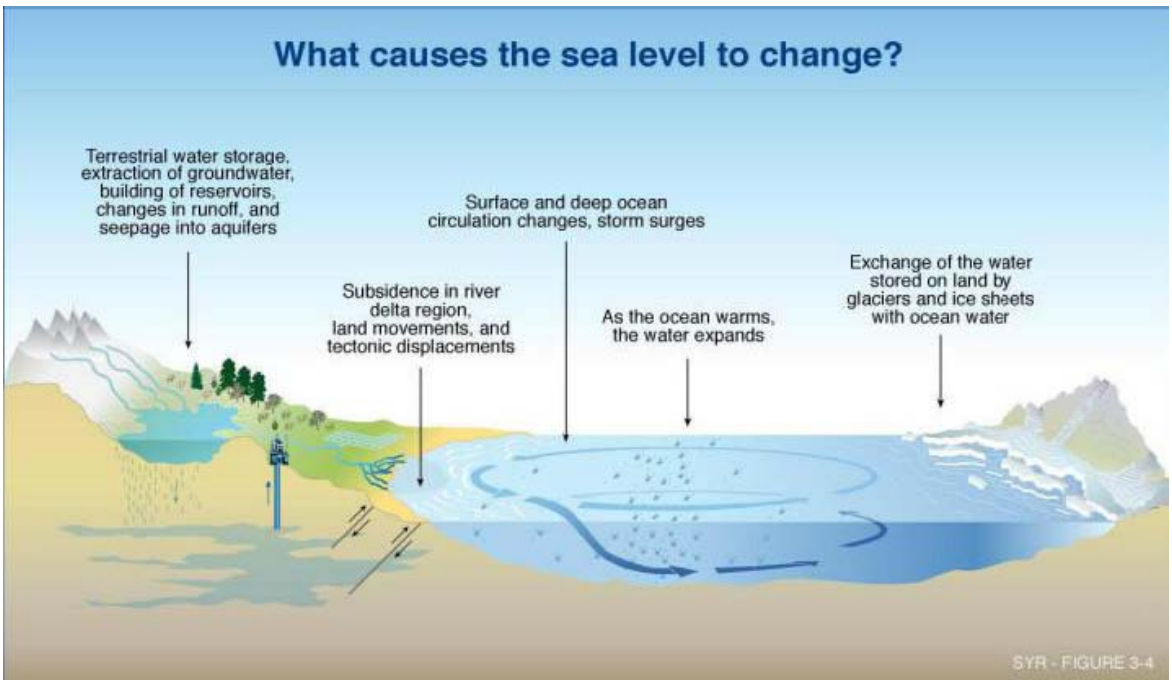
Climate Change Adaptation

Miami-Dade County, and in general southeast Florida, is a low-lying coastal community with a distinct climate and natural resources, and as such, is extremely susceptible to certain projected climate change impacts. Because of the low elevation and porous substrate, the area will be very susceptible to impacts from sea level rise, which will adversely affect infrastructure and drinking water availability and will lead to flooding, storm surge, and stormwater issues. The unique climate will be impacted from changing weather patterns such as increased strength and frequency of severe storm events, as well as variations in precipitation and temperature patterns. Many factors and interrelated systems form complicated feed back loops that are affected by climate change and in turn may either diminish or intensify climate change impacts. Some of the interrelated factors and systems include, but are not limited to: atmospheric temperature and composition; ocean temperature and currents; thermal expansion; solar radiation and cloud cover; the albedo effect, and the amount of ice cover and melting; and the extent of human activities. It is these complex interrelationships that make the extent and timing of climate change impacts so difficult to predict and therefore the development of scenarios and planning regimes so challenging. There are certain primary indicators, such as those detailed below, that will be monitored and studied in order to develop scenarios for use in climate change adaptation planning.

Rate and Timing of Sea Level Rise

Sea level is considered to be one of the primary indicators and challenges of climate change. "Global Sea Level" is the average height of the Earth's oceans world wide and provides a good

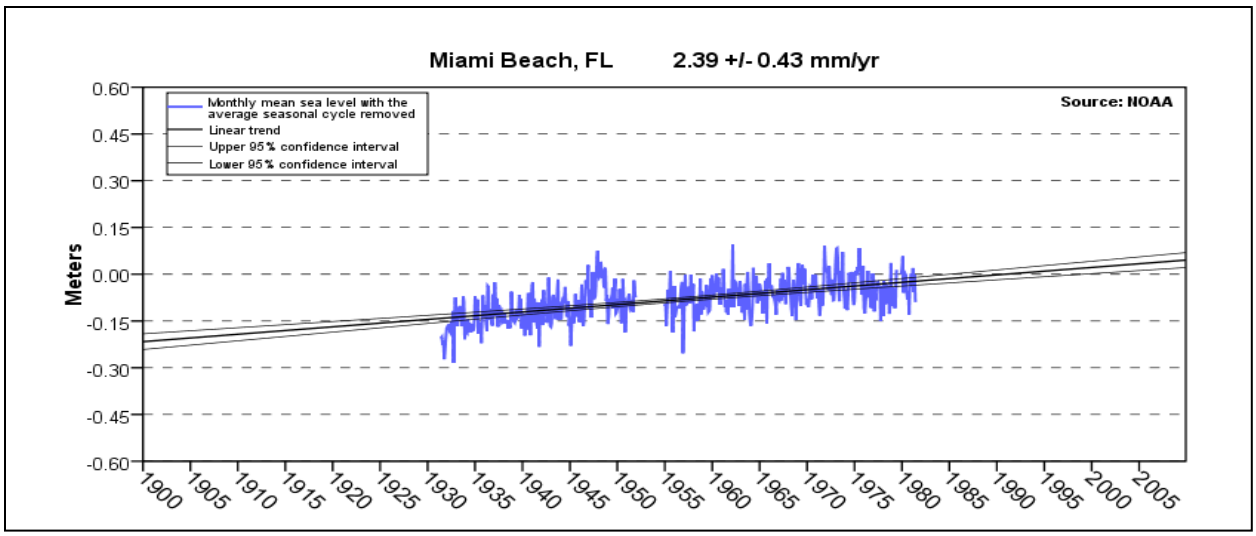
example of the complicated interrelationships mentioned above. It is affected primarily by changes in the ocean's volume from ice melt and thermal expansion. These processes are affected by atmospheric temperatures, and reflectance (the albedo effect), which in turn forms a positive feedback loop whereby increased atmospheric temperatures lead to more thermal expansion and ice melt. This, in turn results in less reflectance due to diminishing ice sheets, and therefore more ice melt, leading to increased freshwater input into the oceans, further amplifying melting. It is these complicated and closely tied systems which make the rate, timing, and extent of sea level rise so difficult to predict. "Local Sea Level" is a measurement of the height of the ocean water in reference to a specific point on land and is based on Global Sea Level, in conjunction with any vertical movement of land elevation due to natural occurrences such as tectonic motion or subsidence, as well as tidal trends. The diagram below[1] helps illustrate the various factors affecting global and local sea level.



It is important to note that relative sea level trends vary through out the world and therefore, it is the Local Sea Level or local Mean Sea level Trend that will be monitored and used for various planning needs associated with coastal zone mapping, management, restoration, and now, climate change adaptation planning.

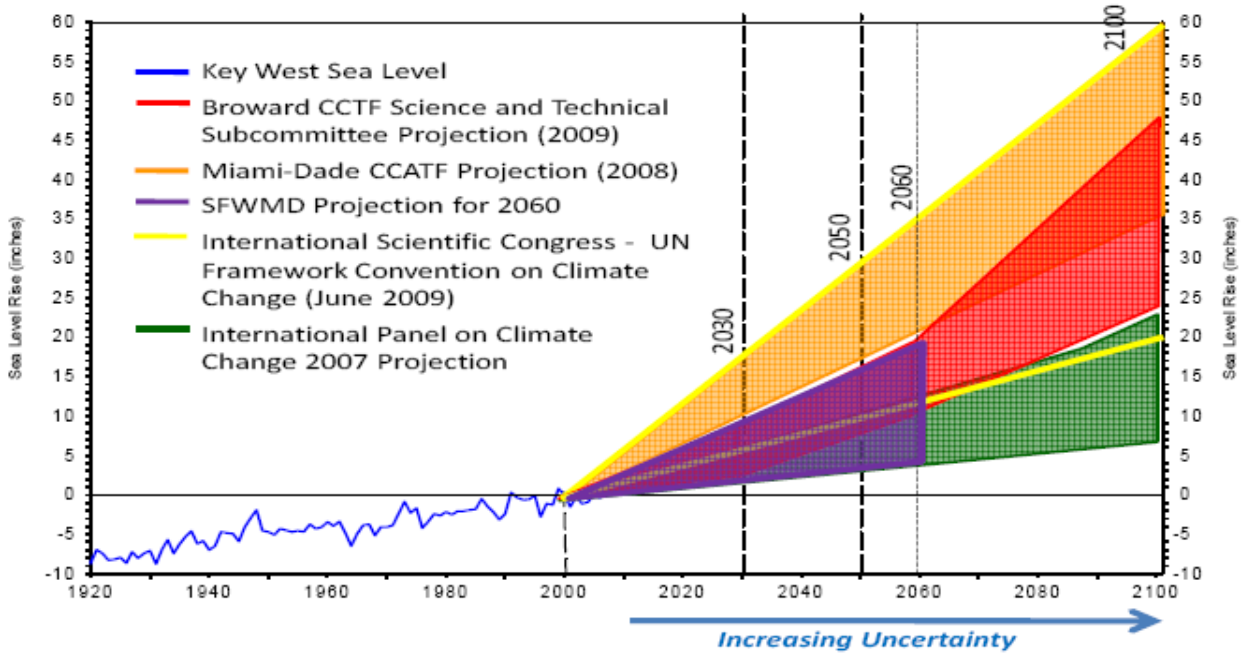
The National Oceanographic and Atmospheric Administration (NOAA) has three gauges located in the SE Florida region that measure mean sea level trend; Miami Beach, Vaca Key, and Key West. The graph below reflects the mean sea level trend at the Miami Beach Tide gauge from 1931 to 1981.

[1] **IPCC**, 2001: *Climate Change 2001: Synthesis Report. A Contribution of Working Groups I, II, and III to the Third Assessment Report of the Integovernmental Panel on Climate Change* [Watson, R.T. and the Core Writing Team (eds.)]. Cambridge University Press, Cambridge, United Kingdom, and New York, NY, USA, 398 pp.



According to NOAA, the mean sea level trend is 2.39 millimeters/year with a 95 percent confidence interval of +/- 0.43 mm/yr based on monthly mean sea level data from 1931 to 1981 which is equivalent to a change of 0.78 feet in 100 years.

Various organizations have published predictions on the amount of sea level rise expected in this century. The CCATF Science Committee released their "Statement on Sea Level in the Coming Century," predicting that Southeast Florida would experience a rise in sea level of at least 1.5 ft.-3.0 ft. by 2060 and a total of at least 3 ft.– 5 ft. by the end of the century. The chart below, was presented by Dr. Nancy Gassman, Natural Resources Administrator, Broward Environmental Protection and Growth Management Department, at the Southeast Florida Regional Climate Leadership Summit and shows the variations in sea level rise projections by several different organizations.

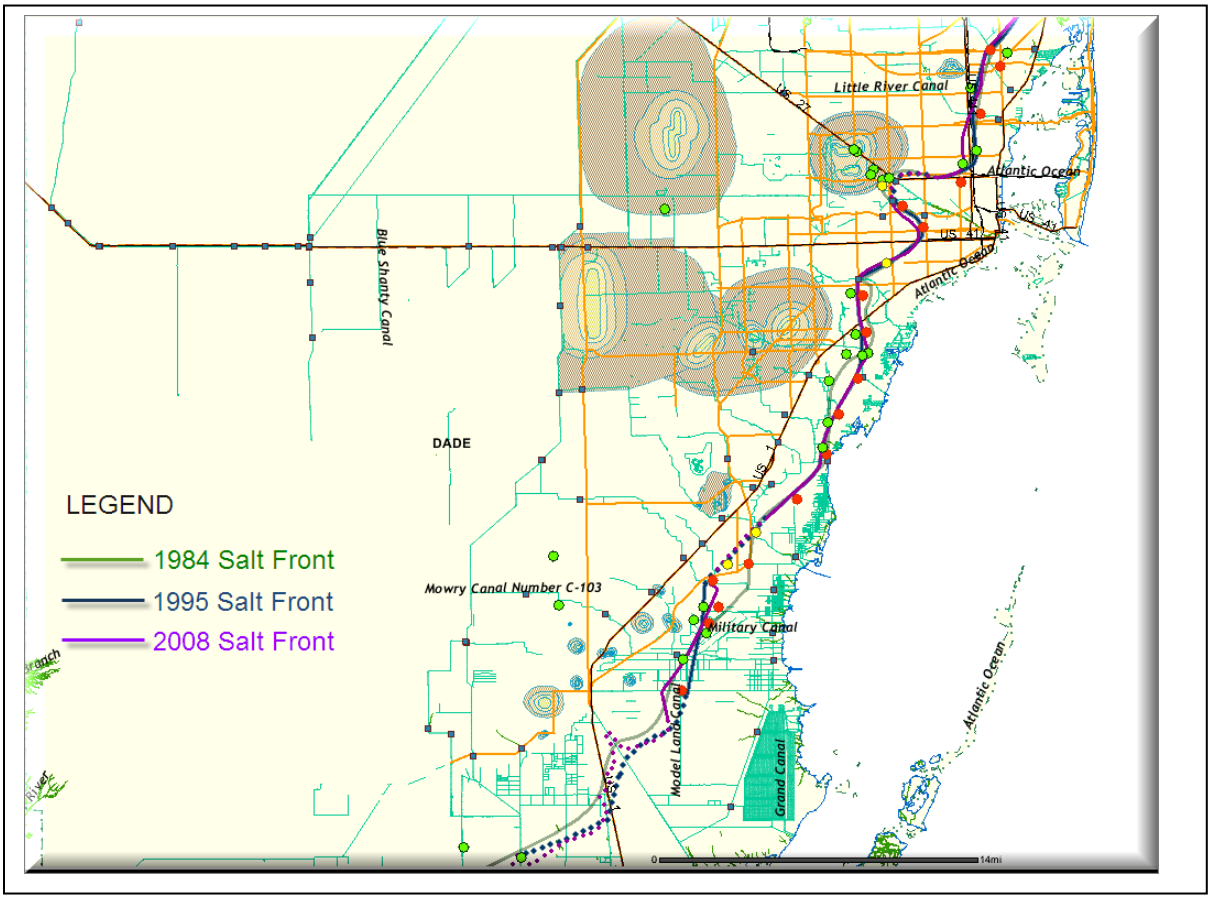


This clearly highlights the need for regional collaboration on climate change models and planning scenarios. This regional collaboration was initiated at the Regional Climate Change Leadership Summit on October 23, 2009, when all four participating counties; Monroe, Miami-Dade, Broward, and West Palm Beach, all agreed to sign the Southeast Florida Regional Climate Change Compact. By signing this Compact, these southeast Florida counties, representing approximately 30 percent of the population in the State of Florida, agreed to develop joint policy positions and legislation with respect to climate change issues, and committed to developing a Southeast Florida Regional Climate Change Action Plan. The challenge, in addition to uncertain data and timelines, will be putting this Compact in to action and including other key regional stakeholders such as the Regional Planning Council and the South Florida Water Management District, while simultaneously addressing other key needs and strained resources and budgets.

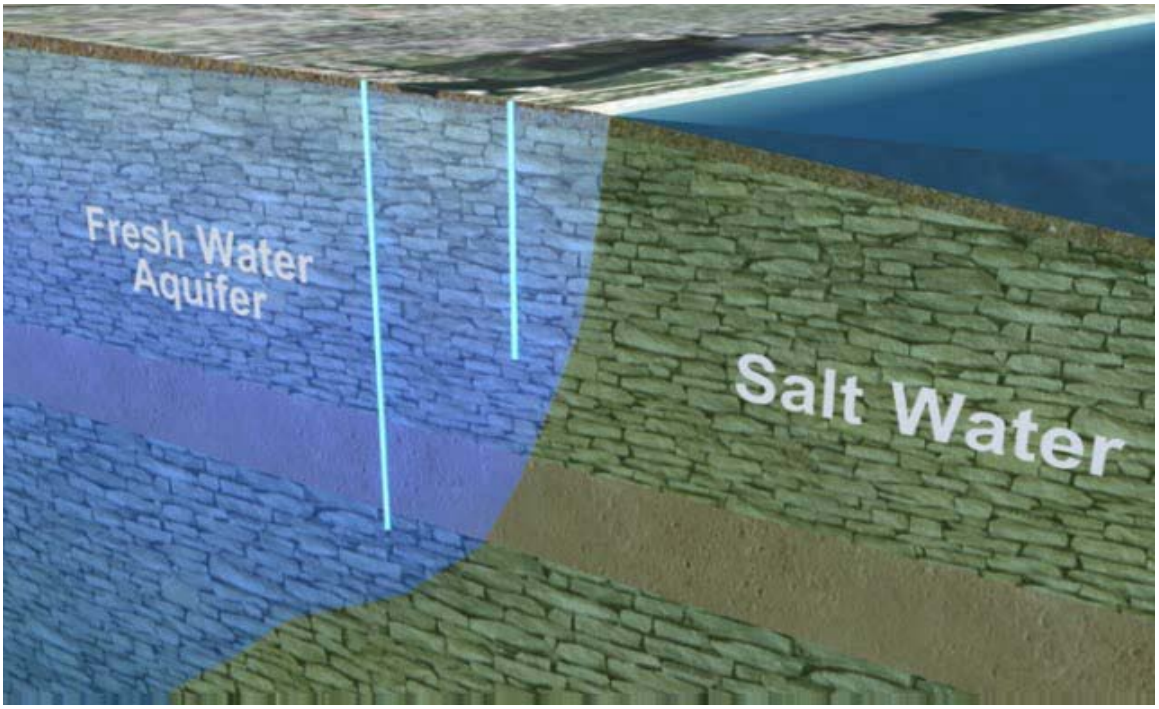
Variations in Salt Water Intrusion Lines

Underlying all of South Florida is the Biscayne Aquifer, a shallow, porous limestone formation that has historically provided all urban and agricultural freshwater supply. Due to the porous nature of the substrate, this groundwater table is hydrologically connected to the ocean. As described in more detail in the Environment Area of this Report, early and on-going practices of excavation, drainage, and consumption have facilitated salt water intrusion into the freshwater aquifer. As sea level rises the hydrologic pressure will drive the isochlor line, or "salt-freshwater boundary," further inland, threatening contamination of the County's drinking water wells. The map below illustrates the change of the isochlor line from the time period of 1984, 1995, and 2008 with respect to the spatial distance of the wellfield protection areas (tan ovals).

Map1



The image below by Dr. Jayantha Obeseykera, Chief of Hydrologic and Environmental Systems Modeling, South Florida Water Management District, provides a visual illustration of the isochlor line below the ground surface, showing the relative proximity and vulnerability of Miami-Dade's freshwater drinking wells. This anticipated impact to potable water availability will be a key challenge that the County must address in preparing for climate change. One of the primary methods for protecting fresh groundwater from salt water intrusion is to allow increased flow of freshwater from the west, building up a "freshwater head" that increases the hydrologic pressure eastward, staving off further saltwater intrusion. In order to do this effectively, the outflow of freshwater from canals must be reduced by keeping flood gates closed, which results in an increased groundwater table height, bringing it closer to the ground surface. This becomes an inherent conflict with storm water management, which is based upon managing canal flood gates and the level of groundwater whereby storm water will be quickly and effectively "absorbed" underground and/or released to the ocean. Therefore, this intrinsic conflict will pose a significant challenge as the County addresses reduced potable water availability and increased flooding, both of which are anticipated future impacts from climate change.



Seasonal/Annual Precipitation & Temperature Trends

Although the specifics are unclear, it is certain that climate change will have a direct affect on weather patterns in the region, including seasonal and annual precipitation and drought trends, seasonal and annual temperature trends, and frequency and strength of severe storm events. These weather patterns are affected by naturally occurring weather phenomena such as the Atlantic Multi-Decadal Oscillation (AMO), and the El Nino Southern Oscillation (ENSO). The climate trends associated with these phenomena are summarized in Chart 6 below. It is important to note that these are general trends and that annual and seasonal variations are known to occur.

Chart 6

Natural Variability: Climate Tendencies

	Rainfall		Atlantic Hurricanes
	Wet Season	Dry Season	
El Niño	No clear pattern	Wetter	Less activity
La Niña	No clear pattern	Drier	More activity
AMO Warm Phase	Wetter decades; droughts still occur		Greater # of major storms
AMO Cold Phase	Drier decades; very wet years still occur		Lesser # of major storms

HYDROLOGIC & ENVIRONMENTAL SYSTEMS MODELING

Presented on August 12, 2009, at the University of Miami Rosenstiel School of Marine & Atmospheric Sciences, by Dr. Jayantha Obeseykera, Chief of Hydrologic and Environmental Systems Modeling, South Florida Water Management District.

Although global trends are uncertain, they are being predicted with more confidence than local and regional trends. Therefore, bringing this data and modeling down to the regional and local level is a significant challenge. Even models for the Southeastern United States region may not accurately reflect weather patterns for southeast Florida, since the local climate is much different from even that of northern Florida.

While there is ongoing research and modeling to bring these trends and predictions down to the local level, a recent report by the U.S, Global Change Research Program[2] provides some of the most current information for precipitation and temperatures trends. The chart below from this report summarizes the observed temperature and precipitation changes in the Southeast.

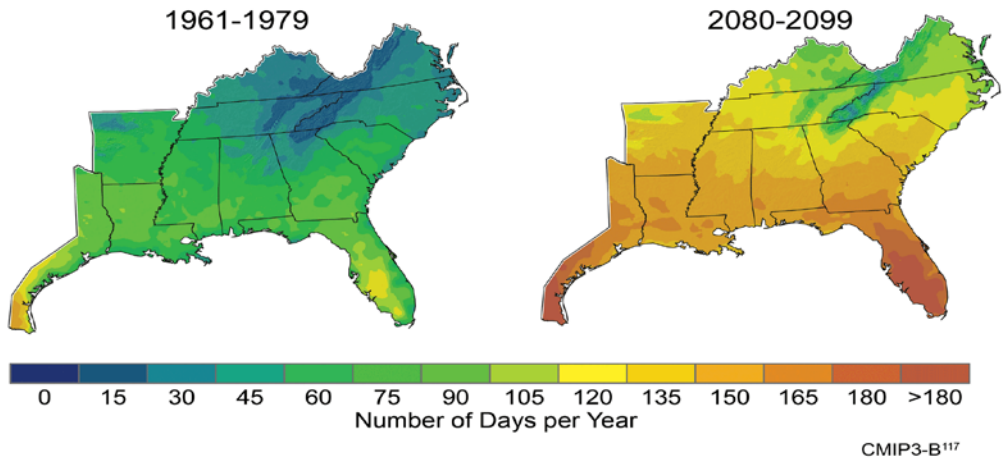
Average Change in Temperature and Precipitation in the Southeast

	Temperature Change in °F			Precipitation change in %	
	1901-2008	1970-2008		1901-2008	1970-2008
Annual	0.3	1.6	Annual	6.0	-7.7
Winter	0.2	2.7	Winter	1.2	-9.6
Spring	0.4	1.2	Spring	1.7	-29.2
Summer	0.4	1.6	Summer	-4.0	3.6
Fall	0.2	1.1	Fall	27.4	0.1

Observed temperature and precipitation changes in the Southeast are summarized above for two different periods.[380] Southeast average temperature declined from 1901 to 1970 and then increased strongly since 1970.

[2] Global Climate Change Impacts in the United States, Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson, (eds.). Cambridge University Press, 2009

According to the illustration below[3] there is expected to be a significant future increase in the number of days with temperatures over 90 degrees. In addition, "climate models project continued warming in all seasons across the Southeast and an increase in the rate of warming through the end of this century."[4] These temperature changes will also impact evapotranspiration and precipitation, and may lead to a future increase in heat-related illnesses, as well as additional demands on water supply.



The number of days per year with peak temperature over 90ºF is expected to rise significantly, especially under a higher emissions scenario[91] as shown in the map above. By the end of the century, projections indicate that North Florida will have more than 165 days (nearly six months) per year over 90ºF, up from roughly 60 days in the 1960s and 1970s. The increase in very hot days will have consequences for human health, drought, and wildfires.

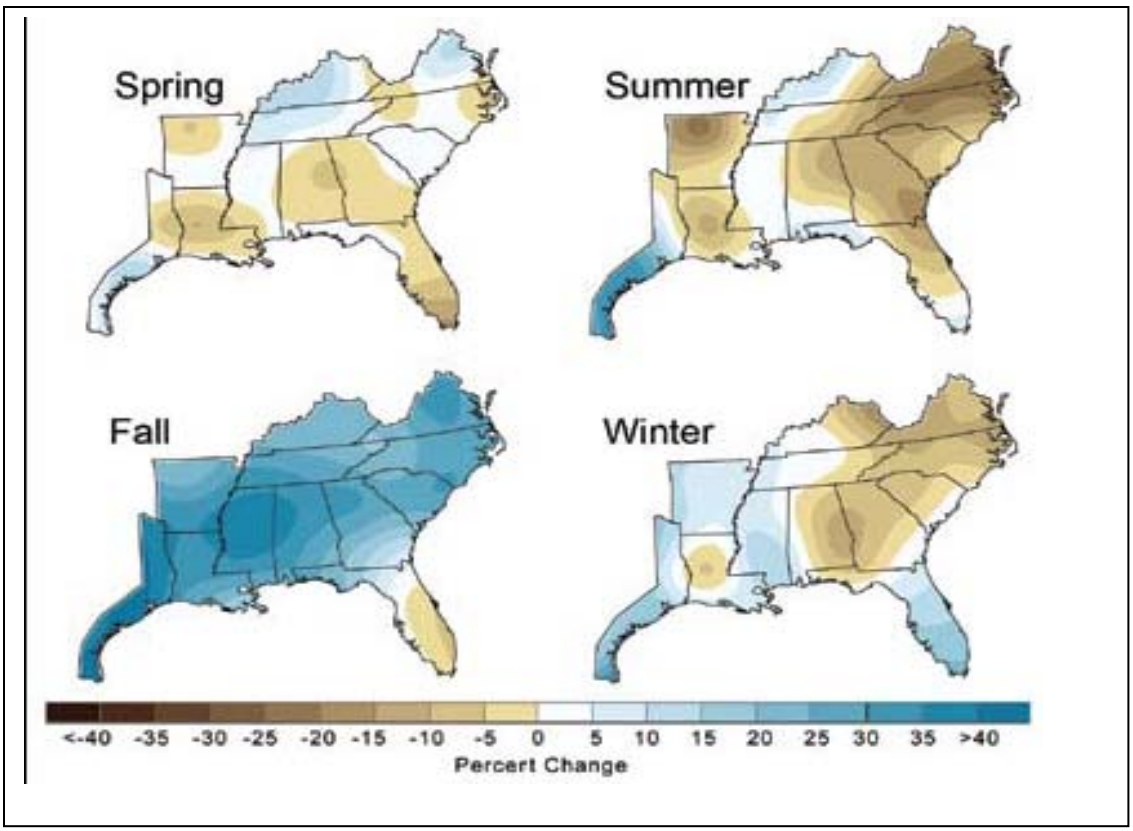
The illustration below[5] from NOAA's National Climatic Data Center, shows observed changes in precipitation from 1901 to 2007. In addition to the general temperature trends illustrated above, the "…decline in fall precipitation in South Florida contrasts strongly with the regional average (autumn precipitation increase of 30 percent),"[6] and may further impact future water supply if the trend continues.

[3] Global Climate Change Impacts in the United States, Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson, (eds.). Cambridge University Press, 2009, p.111.

[4] Ibid, p. 111.

[5] Global Climate Change Impacts in the United States, Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson, (eds.). Cambridge University Press, 2009, p.111.

[6] Ibid, p. 111.



While average fall precipitation in the Southeast increased by 30 percent since the early 1900s, summer and winter precipitation declined by nearly 10 percent in the eastern part of the region. Southern Florida has experienced a nearly 10 percent drop in precipitation in spring, summer, and fall. The percentage of the Southeast region in drought has increased over recent decades.

[7]

The South Florida Water Management District released in February 2010 a white paper entitled, "Climate Change and Water Management in South Florida". It provides further information and discussion specific to the south Florida region.

Severe Storm Events

There is much debate about how climate change is affecting the frequency and intensity of severe storms such as hurricanes and some of the models vary widely in their predictions. As shown above in Chart 6, the frequency of Atlantic hurricanes is affected by naturally occurring weather phenomena such as AMO and ENSO. The strong correlation between the strength of hurricanes and warm ocean surface temperatures is well documented, which supports the projection that hurricanes may become stronger as ocean temperatures increase with climate change. Wind shear may also increase with warmer atmospheric and ocean temperatures, which may serve to reduce the number of storms in the Atlantic Ocean.[8] It is hoped that the intensity and frequency of tropical storms will become more predictable as more data and better models become available.

[7] Ibid, p. 111.

[8] Florida Oceans and Coastal Council. 2009. The Effects of Climate Change on Florida's Ocean and Coastal Resources. Tallahassee, FL. 34 pp.

Flooding Frequency and Patterns
Due to the porosity of the substrate and the hydrologic connection between the ocean and the groundwater table, the groundwater level will rise concurrently with sea level, bringing the water table closer to the ground surface. This will affect the frequency of flooding during heavy rain events and, as discussed above, will also affect the ability of the ground and canal systems to absorb and dissipate stormwater during heavy rain events, severe storm events, and storm surges.

Additional/Secondary Impacts & Costs
In addition to the impacts specifically mentioned above, the County will likely experience other primary or secondary impacts. These include, but are not limited to:

- Increased susceptibility to high tide and storm surge flooding impacts
- Increased flooding from heavy rain events
- Increased beach erosion and damage and/or loss of coastal wetlands
- Infrastructure damage
- Population displacement
- Loss of crucial economic drivers such as tourism & agriculture
- Land use changes
- Displacement or die off of non-salt tolerant plant and animal species
- Loss of biodiversity
- Increased disease vectors and infectious diseases
- Increased heat-related illnesses
- Increased energy demand
- Increased wildfires

A critical, yet difficult adaptation planning step will be to estimate the costs of action versus inaction associated with these impacts. According to a 2007 study, "Ranking the World's Cities Most Exposed to Coastal Flooding Today and in the Future," by the Organization for Economic Co-operation and Development, Miami ranked first in terms of assets exposed to coastal flooding in the 2070's, with a projected potential cost estimated at ~ $3.5 trillion. Furthermore, a 2007 publication, "Florida and Climate Change, the Costs of Inaction," by the Global Development & Environment Institute at Tufts University, projected an annual cost of inaction to the state of Florida to total $92 billion by 2050. This estimate only considered impacts from loss of tourism revenue, increased hurricane damages, at-risk residential real estate and increased electricity costs. Based on the list of additional impacts above, this estimate is probably very conservative. Therefore, it will be critical for the County to address and estimate these costs so they may be properly factored in to adaptation planning decisions.

Communications
There are numerous reasons why communication about climate change is one of the most challenging efforts associated with climate change adaptation planning. The inherent unpredictability of the extent and timing of impacts is a significant challenge, further amplified by the long term nature of suspected impacts. Communicating to stakeholders and decision makers the urgency of actions needed now to address impacts that may not be apparent or experienced for another 10 to 30 years is a challenge. This is particularly true when other more immediate and acute problems are being experienced, such as the current economic crisis. There is a need to evaluate and calculate the cost of action versus non-action to clearly justify the need for action *now* and to communicate this to all stakeholders in a common language that is easily understood.

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

As stated repeatedly in this section, other programs and initiatives which lead to decreased fuel and electricity usage will help reduce GHG emissions. Therefore, goals and initiatives in the Fuel and Energy Sections of this Report will be pertinent to this section, as well as land-use policies promoting Transit Oriented Development (TOD), infill, and smart growth.

Comprehensive Development Master Plan

The CDMP's Conservation, Aquifer Recharge and Drainage Element contains one goal and one objective contributing to climate change. The goal is to provide for the conservation, environmentally sound use, and protection of all aquatic and upland ecosystems and natural resources and protect the functions of aquifer recharge areas and natural drainage features in Miami-Dade County. Objective CON-1J specifically addresses climate change and states that Miami-Dade County shall continue to implement its CO2 Plan recommendations to reduce CO2 levels.

There are several other county plans containing goals and objectives that while not directly addressing climate change, contribute to overall climate change mitigation goals through the implementation of various fuel and energy reduction strategies. Some of the plans include the Long Range Transportation Plan, the Open Space Master Plan, and the 2003 Strategic Master Plan.

Existing Legislation

Federal, state and local legislative efforts all have and will continue to impact climate change mitigation and adaption, transportation, fuel and energy supply and demand.

Federal

There are several new federal legislation items at various stages of implementation, some of which will have a direct affect on local regulated industries.

- *Proposed Greenhouse Gas Permitting Requirements on Large Industrial Facilities:* On September 30, 2009 EPA proposed new thresholds for GHG emissions that define when Clean Air Act permits under the New Source Review and Title V operating permits programs would be required. The proposed thresholds would tailor these permit programs to limit which facilities would be required to obtain permits and would cover nearly 70 percent of the nation's largest stationary source GHG emitters—including power plants, refineries, and cement production facilities, while shielding small businesses and farms from permitting requirements.

- *Final Mandatory Reporting of Greenhouse Gases Rule:* EPA has issued the Final Mandatory Reporting of Greenhouse Gases Rule. Signed by the Administrator on September 22, 2009, the rule requires in general that suppliers of fossil fuels and industrial greenhouse gases (GHGs), manufacturers of vehicles and engines outside of the light duty sector, and facilities that emit 25,000 metric tons or more of GHGs per year to submit annual reports to EPA. The rule is intended to collect accurate and timely emissions data to guide future policy decisions on climate change.

- *EPA and NHTSA Propose National Program to Cut Greenhouse Gas Emissions and Improve Fuel Economy for Cars and Trucks*: On September 15, 2009, EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) proposed a new national program that would reduce greenhouse gas emissions and improve fuel economy for all new cars and trucks sold in the United States. EPA proposed the first-ever national GHG emissions standards under the Clean Air Act, and NHTSA proposed Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act. This proposed national program would allow automobile manufacturers to build a single light-duty national fleet that satisfies all requirements under both Federal programs and the standards of California and other states.

State

- *State of Florida Executive Order 07-126: Establishing Climate Change Leadership by Example: Immediate Actions to Reduce Greenhouse Gas Emissions from Florida State Government*

- *State of Florida Executive Order 07-127: Establishing immediate actions to reduce Greenhouse Gas emission within Florida*

- *State of Florida Executive Order 07-128: Establishing the Florida Governor's Action Team on Energy and Climate Change*

Local

The following list includes some of the Board's adopted legislation related to climate change. A complete inventory of sustainability related legislation is provided as an appendix.

- *R-35-91: Resolution authorizing Dade County's participation in ICLEI's Cities for Climate Protection Campaign*

- *R-335-91: Resolution authorizing application to the International Council for Local Environmental Initiatives to participate in the urban CO2 Initiative, committing staff resources, stating intent to implement specific CO2 reduction projects and develop a long term CO2 plan by 1993*

- *R-1323-97: Resolution urging Congress to support House concurrent resolution 106 to protect the earth's climate*

- *R-111-97: Resolution ratifying the County Manager's actions of applying for, accepting, and executing a grant from the EPA and the Dept. of Energy for the ClimateWise Program*

- *R-1148-98: Resolution ratifying the County Manager's action to apply for, accept and execute a grant in the amount of $60,000 from the International Council for Local Environmental Initiatives for the Climate Wise Program*

- *R-1356-99: Resolution ratifying the County Manager's action of executing a grant from the International Council for Local Environmental Initiatives for the Climate Wise Program; and authorizing the County Manager to exercise the modification provisions therein*

- *R-132-99: Resolution authorizing Miami-Dade County's participation in the Cities 21 Project sponsored by the International Council for Local Environmental Initiatives*

- *R-966-00: Resolution urging State and Federal action and response planning regarding global warming*

- *O–06-113: Ordinance creating the Miami-Dade County Climate Change Advisory Task Force (CCATF)*

  In July of 2006, the Board of County Commissioners passed an ordinance that established the CCATF. The task force's 25 appointed members are a diverse and highly knowledgeable group of individuals representing various sectors of the community who are charged with reviewing and analyzing climate change data and information, and subsequently providing recommendations to the Board for actions that should be taken now and in the near future to further reduce greenhouse gas emissions, and plan and prepare for future projected climate change impacts. Six task force committees have been established to focus on specific areas of climate change mitigation and adaptation. The original 34 recommendations are in Appendices section of this report. The recommendations are in varying stages of evaluation and implementation and will be incorporated into GreenPrint as appropriate.

- *R-324-07: Resolution authorizing and directing the County Manager to apply for and obtain Miami-Dade County membership in the Chicago Climate Exchange as a Phase II Member for direct emissions*
  Miami-Dade County became a member of the Chicago Climate Exchange in 2007 which requires the County to reduce fuel-related emissions six percent below the year 2000 baseline by 2010.

- *R-1431-08: Resolution endorsing Miami-Dade County's participation in U.S. Cool Counties Program and its goals and objectives including the Climate Stabilization Declaration*
  Through our participation in U.S. Cool Counties Program and its goals and objectives including the Climate Stabilization Declaration, the County commits to reducing its Greenhouse Gas emissions by 80 percent by 2050.

- *R-1388-09: Resolution establishing Southeast Florida Regional Climate Change Compact*

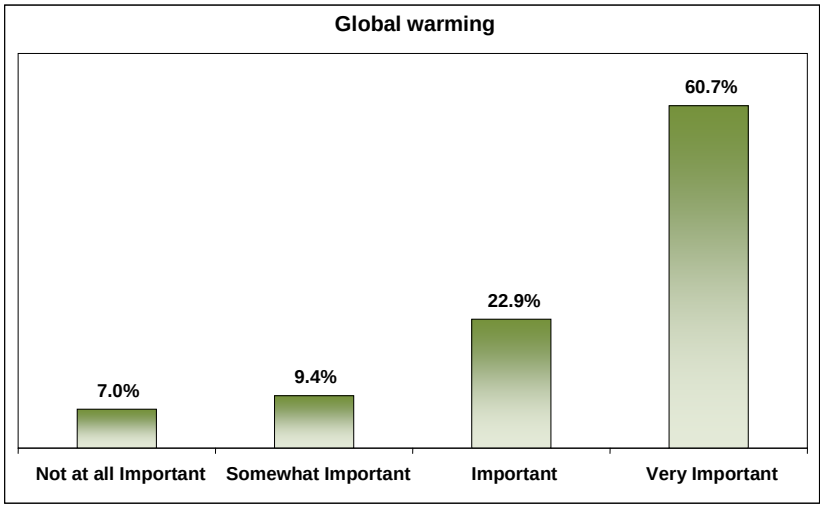
US Conference of Mayor's Climate Protection Program
Mayor Carlos Alvarez signed the US Conference of Mayor's Climate Protection Agreement in July 2007, in which the County agrees to meet or beat the Kyoto Protocol of reducing global warming pollution levels to seven percent below 1990 levels by 2012.

COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

2035 Miami-Dade County Long Range Transportation Plan
Public Involvement Survey – October 2008
Public feedback was collected through both an online survey and the use of the Option Finder Technology during public involvement sessions held throughout the County. A total of 417

responses were collected through the online survey, while a total of 294 responses were collected during public involvement sessions. The following is the result of the climate change-related question:



Major Issues related to climate change as identified during public workshops for the 2010 Evaluation and Appraisal Report – Summer 2009

During the summer of 2009, several public workshops were held to solicit community feedback on the County's Comprehensive Development Plan, as part of the Evaluation and Appraisal Report process required by the State of Florida. From the input received, the following issues were identified as preliminary "Major Issues" to be addressed specifically in regard to Climate Change/Sea Level Rise.

- Address the Interrelationship of Federal, State, Regional, and Local studies on climate change (including impacts of sea level rise and reduction of greenhouse gas emissions) and the applicability of these studies to Miami-Dade County;
- Summarize the County's work to date regarding Mitigation and Adaptation Strategies;
- Evaluate the current Comprehensive Plan Policies with regard to HB 697; and
- Explore New Comprehensive Plan Policy options.

Furthermore, since growth management and transportation issues are closely tied to climate change mitigation (GHG emissions), several other issues identified under Growth Management and Transportation/Mobility were identified:

- Explore Potential Strategies and Incentives for Directing Growth to existing and future urban centers, densifying major corridors, creating new employment centers
- Protect of Natural resources;
- Address Redevelopment and Infill potential;
- Address Comprehensive Everglades Restoration Plan impacts;
- Address the transportation component of HB 697 (Energy);
- Discuss how the County can more effectively achieve pedestrian friendly and walkable communities;
- Promote park connectivity on a countywide basis;
- Explore concepts such as mobility fee zones to help supplement existing transportation facilities and services; and
- Evaluate potential incentives for transit oriented development.

Energy

Twenty-four seven access to reliable energy in Miami-Dade is critical to support the power consuming buildings, equipment and vehicles that we depend upon every day. Sustaining our ability to use energy the way we do, absent a critical and deliberate effort to increase efficiency and use alternative sources, is growing ever more challenging, due to the costs to our economy, geo-political stability, and the natural environment (e.g. climate change, air pollution, natural resources extraction). These costs have long-term ramifications on the quality of life we want to maintain and pass along to future generations.

Electricity and transportation together account for roughly 90 percent of Greenhouse Gas emissions in the County. Stakeholders will have to work together to determine targets and initiatives to achieve goals addressing climate change, local and regional economic diversification and growth, and reducing demand for energy.

Energy - Electricity & Fuel

Assessment Area

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Electricity and transportation together account for roughly 90 percent of Greenhouse Gas (GHG) emissions in the County. A majority of the fuels used to power homes, businesses and transport are imported either from foreign producers (oil) or other states/neighboring countries (coal and natural gas). Fossil fuel extraction, transport and combustion have an impact or can be hazardous to the health of natural systems, as well as human health. Nuclear energy, while having a small GHG footprint, has environmental impacts including water consumption and water quality, as well as the long-term contamination liability associated with nuclear waste. To realistically achieve existing sustainability goals and aspirations around climate change, local and regional economic diversification and growth and reducing demand for energy, targets and initiatives to achieve those targets will have to be determined and stakeholders will have to work together to meet those targets.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Ensure adequate energy supply to meet current and expected growth in demand.
- Improve energy efficiency in a cost-effective manner.
- Decrease peak load to reduce our reliance on relatively dirtier and less efficient power generating fuels.
- Increase the use of renewable energy resources, with a preference for local and regional sources to support both long-term and sustainable economic development and climate-friendly energy generation.
- Obtain a breakdown of energy consumption by industry types to understand and target energy consumption reductions from the commercial sector, which is increasing at the highest rate.
- Minimize the potential environmental impacts from nuclear power generation, including water consumption and water quality as well as the long-term contamination associated with nuclear waste.

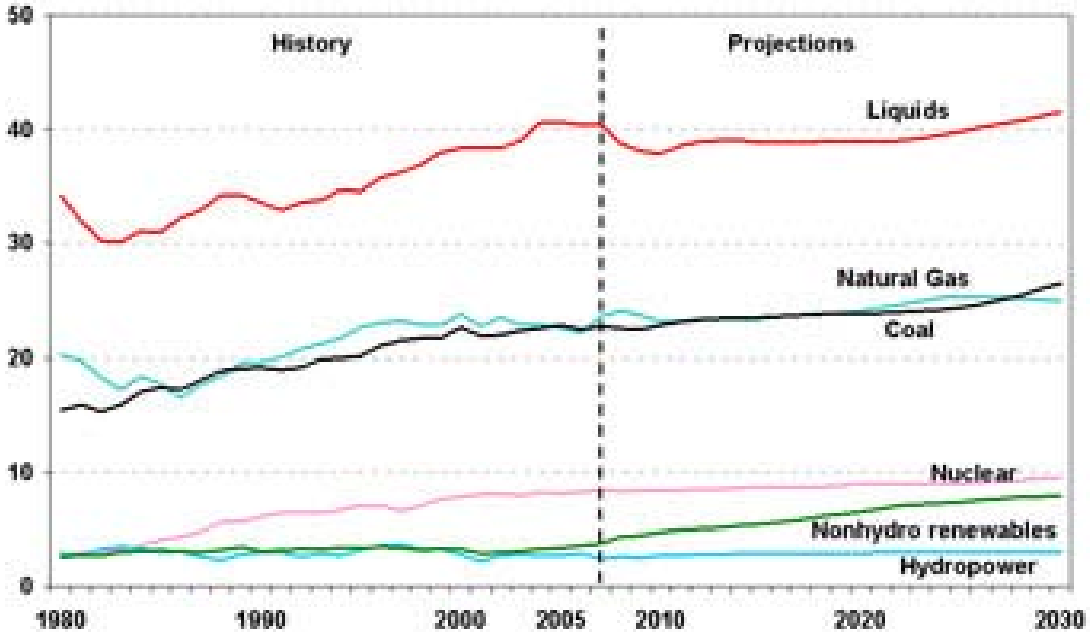
ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

National Perspective of Energy Consumption

Figure 1 illustrates the general upward trend in energy consumption by energy source type in the United States over the period spanning 1980 to 2007. Despite this trend and projections of further long-term increases in consumption, there is an unrealized opportunity for energy-efficiency and increased use of renewable energy.

Figure 1: US Energy Consumption: Historical Use and Projections (Quadrillion British Thermal Units (BTUs)



In a recent report by the consulting firm McKinsey, the implementation of a variety of end-use energy efficiency measures from now until 2020 is evaluated. The result is that through a $520 billion investment in energy efficiency, $1.2 trillion in savings could be accrued – for every dollar spent we gain roughly $2 in savings.[i] This is a critical message to apply locally; the investing in energy efficiency and renewables now will return significant economic savings in the future, in addition to improving our economic development potential, furthering energy independence, and significantly curbing our greenhouse gas emissions. The latter is of particular importance with regards to sustainability, given that electricity and transportation together account for roughly 90 percent of our greenhouse gas emissions in the County.

State Perspective - Electricity

The regional utility provider, Florida Power and Light (FPL), has indicated in its "Ten Year Power Site Plan, 2009-2018" recently filed with the State Public Services Commission (PSC), a decreased projection of electricity load growth relative to the previous year's Site Plan due to: (1) lower forecasted rates of population growth, (2) the multi-year economic downturn, and (3) increased energy efficiency resulting from federal appliance and lighting efficiency standards. The projected increases, however, are still being characterized by the utility as "substantial" and are described in Table 1. In the long-run it can be expected that increasing funding for energy-efficiency from the federal and state government and policies that continue to increase minimum standards for energy efficiency will continue to decrease load projections. This in turn could impact the magnitude and timing of anticipated additional generation capacity.

Table 1: FPL 2008 Florida Service Area Electricity Load Summary & 2018 Projections

Consumption Measure	2008 Actual	2018 projection
Summer Peak	21,077 MW	26,143 MW
Net Energy for Load (NEL)	90,784 GW	132,136 GWH

Source: FPL's "Ten Year Power Site Plan, 2009-2018" filed with the State PSC

A critical variable in determining load projections and generation capacity planning is the "peak" load. Peak load is defined as the maximum instantaneous load or the maximum average load over a designated time interval. Naturally, peak electricity use sets the upper boundary of energy generation capacity the utility has to be prepared to provide. According to FPL, "the rate of absolute growth in FPL system peak load has been a function of a growing customer base, varying weather conditions, projected economic growth, changing patterns of customer behavior (including an increased stock of electricity-consuming appliances), and more efficient appliances and lighting."

The bottom line for county residents, industry and businesses is that we have to collectively look at not only our total electricity consumption, but the peak demand pressure placed on the electricity grid. Peak load also has a significant impact on electricity costs as the Utility has to transfer its increased cost of provision of peak power onto customers. Less efficient and higher polluting sources of peak power contributes to increased health and environmental impacts. FPL does utilize demand-side management (DSM) programs to help "shave" peak load and the impact of these programs are reflected in their projections. We have identified as a data gap the participation rate and energy consumption reduction information associated with FPL's DSM programs for residential and commercial/industrial clientele and are currently pursuing the collection and compilation of this information.

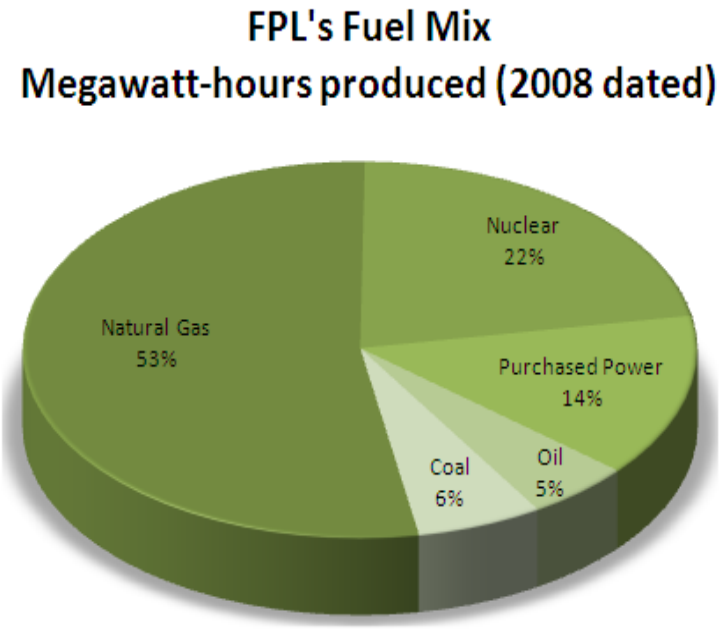
Load projections are behind the specific generation capacity increases that FPL has planned. While the Utility is seeking approval for two additional nuclear plants at Turkey Point to be online by 2018, in the near term, additional power plants and expanded capacity in the Southeastern part of the state are in the works due to what FPL characterizes as the "Southeastern Imbalance" (load – generation imbalance). Essentially during peak load periods, transmission systems from outside the region have been providing a significant amount of energy capacity. This transmission of electricity from outside the region adds additional inefficiency (e.g. transmission loss) and cost for to the utility provider and ultimately to customers. FPL's strategy to ameliorate this "imbalance" situation includes:

- Recent capacity additions at Turkey Point Unit 5, and WCEC Units 1, 2, & 3: provides lower transmission related costs,
- 2011/2012 increased nuclear generation capacity at Turkey Point, and
- Riviera Plant planned capacity increases.

Fuel Mix, Sourcing and Energy Supply Management

The electric energy relied upon results from the operation of various power plants that are themselves powered by fuels. Relative to the rest of the nation, the fuel mix (see Figure 2) that drives FPL's energy generation activities is much less carbon intensive (referring to the carbon content of fossil fuels) with only a six percent reliance on coal versus the national average of 50 percent, and a significant reliance on natural gas, a relatively low carbon content fuel. While this fuel mix is more "climate friendly" than other fuel mix portfolios, it is still comprised of over 70 percent fossil fuels. Nuclear energy generation, while being low-carbon, has other impacts with respect to water use (quality and quantity) and the environmental impacts from the mining of uranium ore and the re-depositing of radioactive tailings. Radioactive waste is a production externality that represents a liability for humans and the natural environment now and well into the future.

Figure 2: 2008 Florida Power and Light Fuel Mix

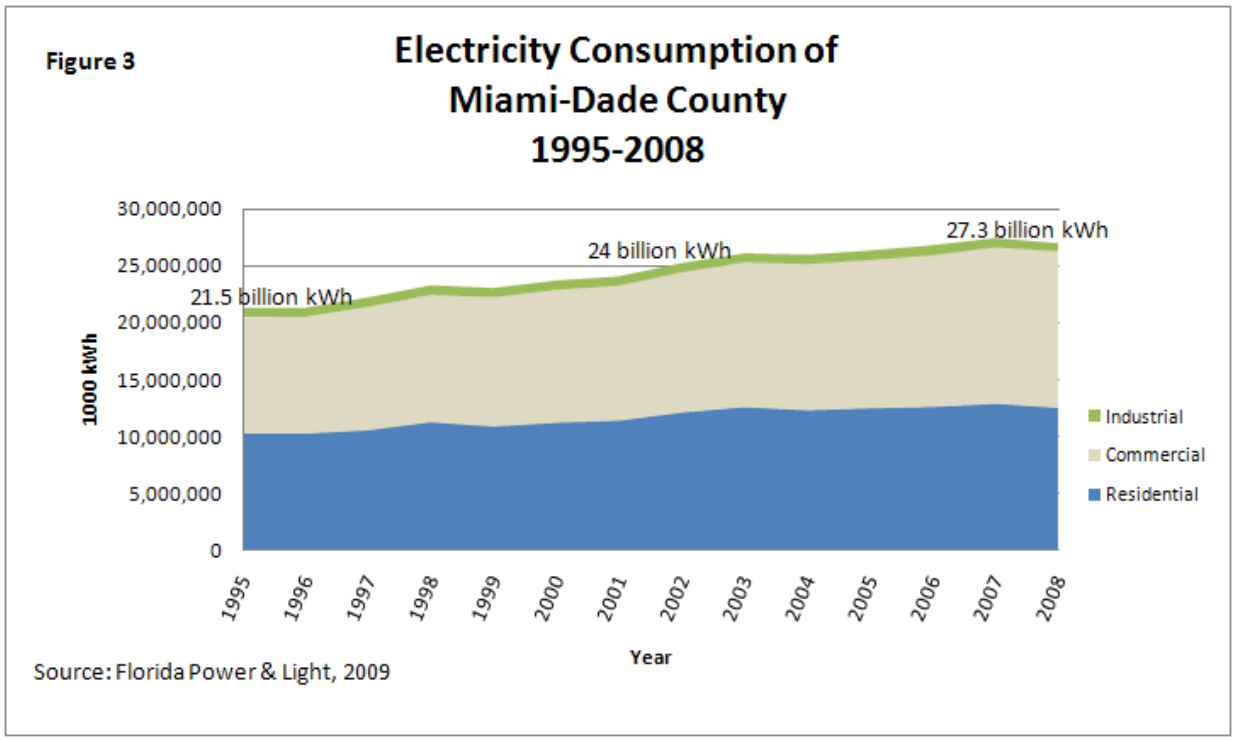


Our reliance on a grid-based and centralized public utility provider model for electricity supply makes us dependent on the utility for determining the fuel supply utilized in the generation of electricity.[1] While efficiency is first priority in decreasing the environmental impacts and economic risk associated with electricity use, the use of distributed renewable energy systems (e.g. rooftop solar photovoltaic systems) can enable more control over what fuels energy generation at the home, business, municipality and regional levels. Many states have passed Renewable Portfolio Standards (RPS) that require a state's fuel mix to made up of a particular percentage of renewable energy. Florida has been considering this as well. Naturally, the level of renewable energy generation activity that occurs at the home, business and local levels vs. centralized solutions impacts the extent of a community's or individual household or business' "energy independence", economic diversification and share of economy that is associated with the sustainable or "green" economy.

Local Perspective

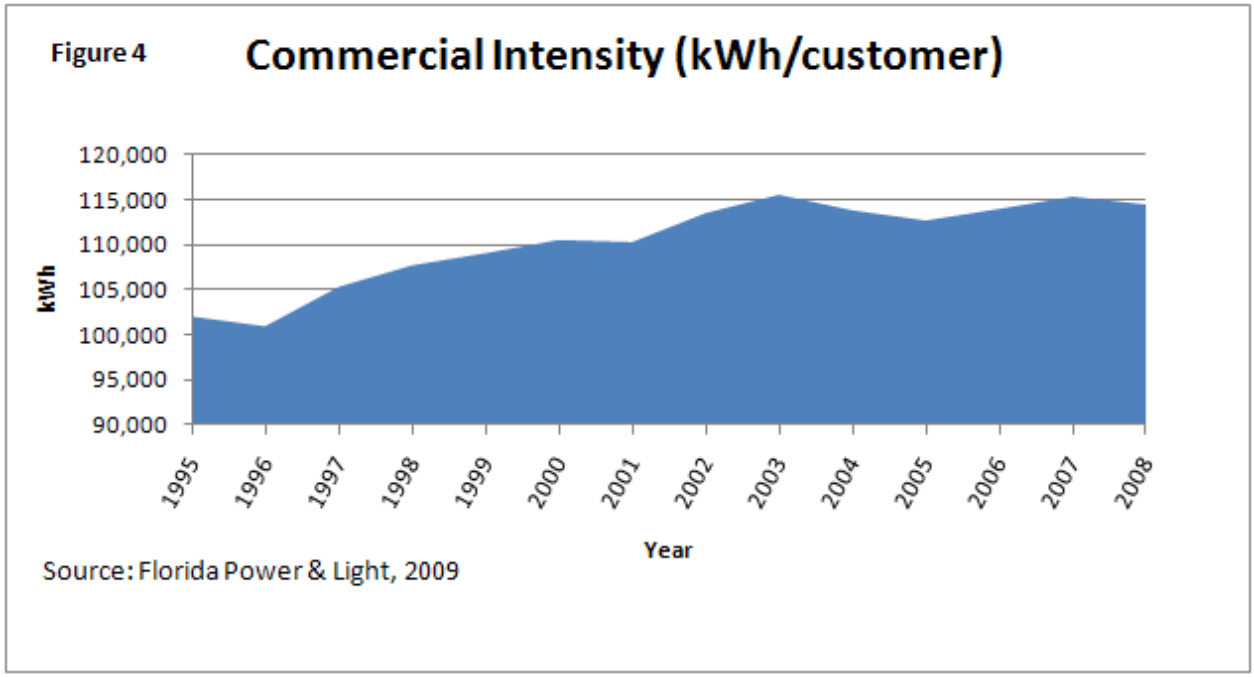
Electricity and fuel consumption of Miami-Dade residents, businesses and industry continues to increase, and business as usual will see even more increases in consumption in the future (see Figure 3). Since 1995, electricity consumption has grown roughly at a two percent per year, and at this point our major utility provider is pursuing additional generation capacity to meet anticipated future demand (see previous section).

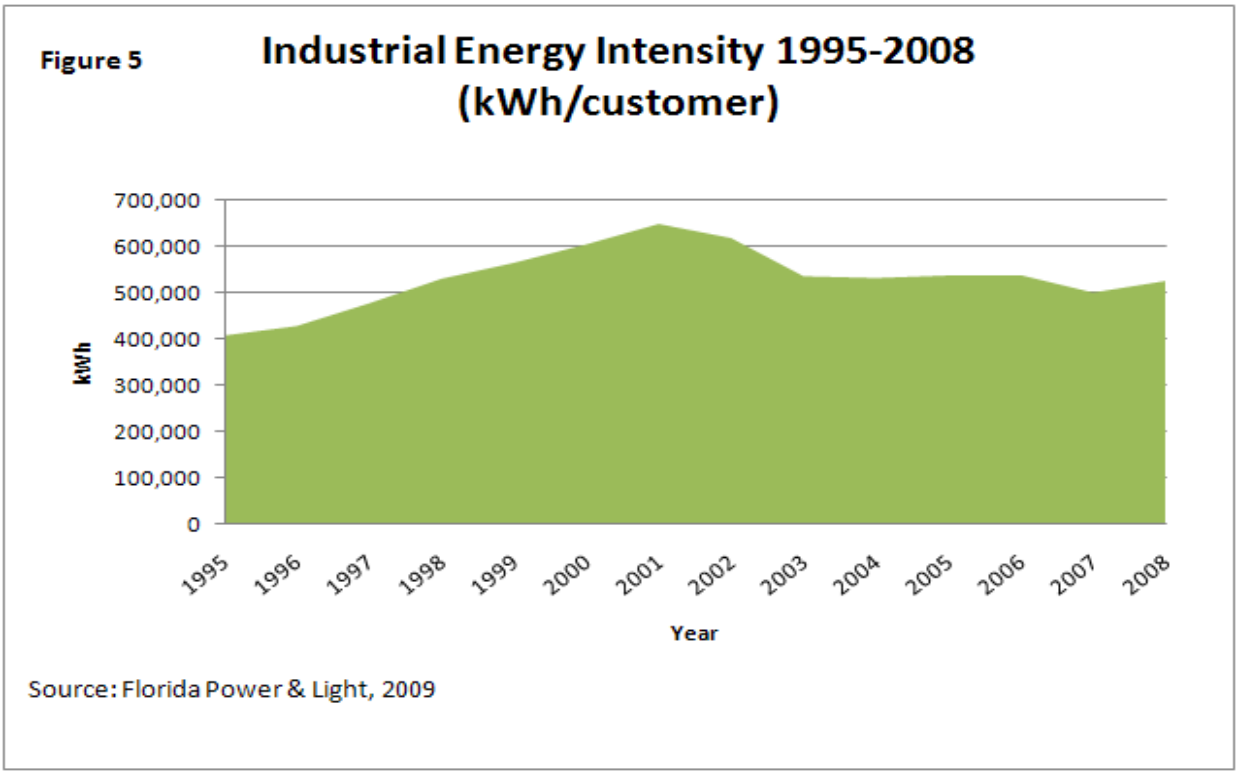
[1] The information for Homestead Utility, which provides electric utility services for the City of Homestead, has not been assessed in this analysis.



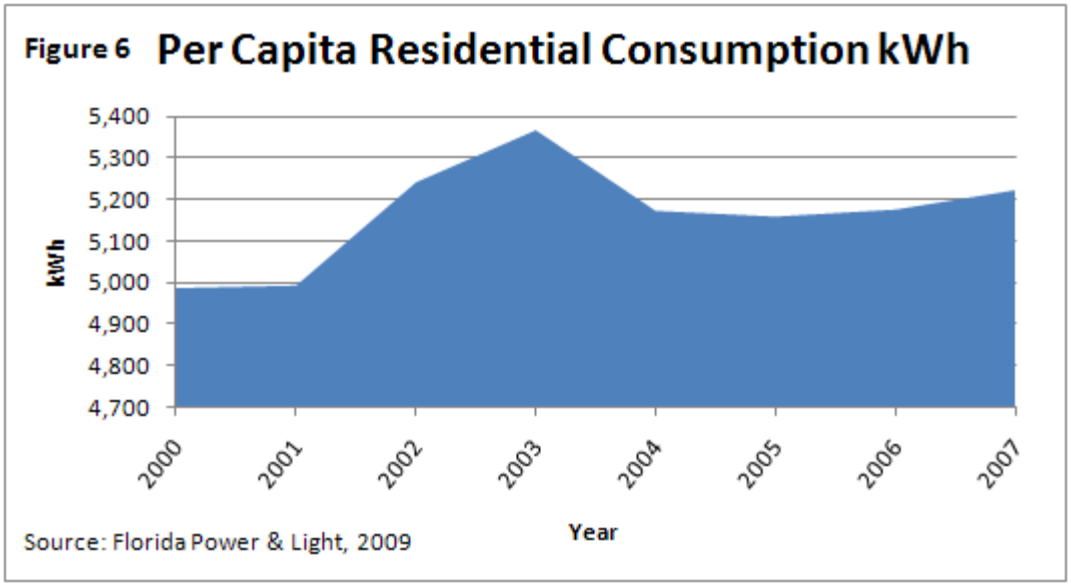
Electricity Consumption & Intensity by Sector

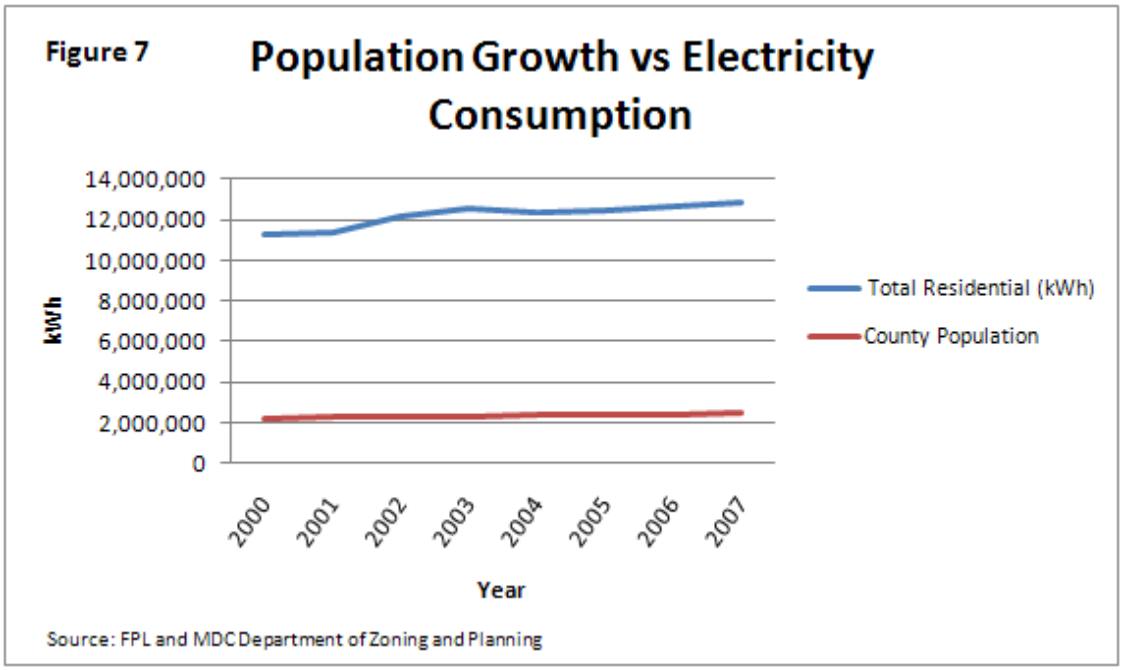
Of all three sectors, commercial energy consumption in Miami-Dade has seen the largest increase (see Figure 3) and the South Atlantic region commercial buildings have some of the highest energy use (billion kWh) and energy intensity (kWh/square foot) nationwide (see Appendix B for excerpt from Table C21 from the US Department of Energy's (DOE) Energy Information Administration: www.eia.doe.gov). Figures 4 and 5 examine energy intensity for commercial and industrial sectors over time based on consumption per customer (average annual consumption).





Intensity for residential consumption is shown on a per capita basis in Figure 6 which provides an intensity assessment based on the individual end use influenced energy consuming behavior that typifies residential electricity consumption. FPL has not reported the cause(s) of the 2001-2003 increase. Both total residential consumption and total County population are compared in Figure 7 to underscore the increasing per capita consumption's link to increasing energy consumption. KWh per square foot consumption measures for residential and commercial consumption would provide an even more enhanced snapshot of the increasing consumption in both the residential and commercial sectors. Even more a commercial consumption breakout by commercial industries (e.g. office building, retail, hospitality, etc.) is required to fully understand the dynamics of commercial energy consumption. Finally, total industrial energy consumption has been decreasing (total kWh per annum consumption for this sector) while intensity (kWh per customer per year) has increased slightly.





As part of the County's Comprehensive Development Master Plan's (CDMP) Land Use Objective 10 indicators, Adopted Measure B required that the County monitor electrical power consumption countywide and compare this rate with historical consumption rates. Table 2 below shows increases in electricity consumption, per residential unit and per capita by 3.3 percent and 4.8 percent respectively, between 2000 and 2007. Worth noting is the significant reduction in electricity usage per residential unit (-3.8 percent) and per capita (-2.8 percent) between 2003 and 2007.

Table 2: Consumption of Electricity, Miami-Dade County, 2000-2007

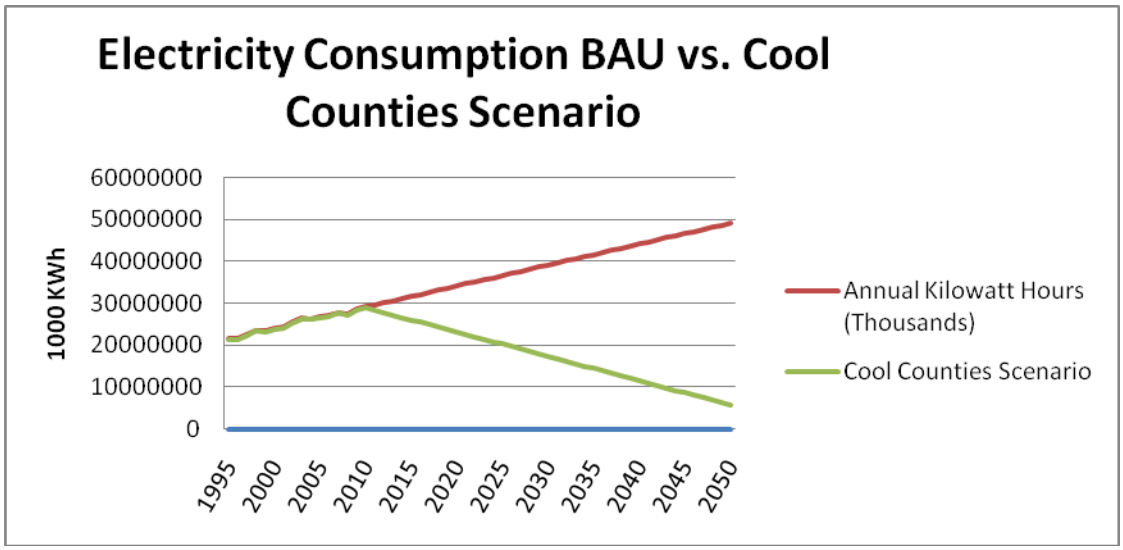
Year	Total Countywide	Total Residential	Per Residential Unit	Per Capita	Total Costumers	Residential Costumers	County Population
2000	23,951,899	11,234,637	14,242	4,986	896,736	788,839	2,253,362
2001	24,328,587	11,411,103	14,285	4,992	908,597	798,815	2,285,869
2002	25,512,650	12,122,334	14,975	5,242	920,563	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 Zoning, 2008
Notes: Consumption is measured in 1000s kilowatt hours (KwH) Figures are based on an annual average and not just taken at end of year

Measuring Consumption Against Reduction Targets

To get an idea of what specific targets would have to look like to reduce electricity consumption for the commercial and residential sectors we can evaluate the impacts of various levels of reduction in kWh against (1) business as usual, (2) freezing of demand levels and (3) 2050 climate change mitigation goals (2 percent reduction per year) scenarios. Figure 8 illustrates that if we continue consuming electricity at the business as usual rate, the gap between our actual consumption and the *Cool Counties* GHG mitigation emissions reduction rate may double each consecutive year.

Figure 8: Business as Usual Electricity Consumption Projection vs. Cool Counties GHG Emissions Reduction Goals[2]



Low-Income Home Energy Assistance Programs

Since 1996, Miami-Dade Community Action Agency (CAA) has provided a wide range of energy conservation services designed to assist low-income home owners, many of whom are elderly. Energy expenses comprise an economic drain on low-income communities. On average, energy bills account for about 14 percent of a low-income families gross income, and for many it may account for 20 percent or more. Economists estimate that more than 80 percent of energy expenses leave low-income communities, and thus do not circulate and generate additional economic activity inside those communities.

The services provided through CAA's energy programs, range from home weatherization which enables low-income families to permanently reduce their energy bills by making their homes more energy efficient, to services that address minor home repairs, to home rehabilitation and mitigation. These services are provided through partnerships with federal, state and county government and include:

- Weatherization/Weatherization Low-Income Home Energy Assistance Programs (LIHEAP)
- Home Repair Program
- Single Family Home Rehabilitation Program
- Solar Water Heater Program

CAA's Weatherization (WAP) and Weatherization/Low Income Housing Energy Assistance Program (WAP/LIHEAP) helps to reduce energy cost for low-income and senior homeowners while keeping its investments circulating in local economies. On average, Weatherization measures reduce overall energy bills by $358 per year at current prices. Although modest, these savings are significant for many low-income families and directly benefit the community.

Historically, WAP and WAP/LIHEAP weatherize approximately 75 homes a year. However, with increased funding for these programs, estimated at nearly $7 million, including additional

[2] The Cool Counties Scenario kWh consumption trend line assumes that the existing percentage contribution of GHG emissions by sector (each having its own carbon intensity) remains the same through the future and that all sectors reduce emissions by the same percentage (2% per annum beginning in 2010). This line would have to be adjusted down or up depending on any changes in the percentage contribution of sectors over time. Please see the Climate Change Mitigation section for the GHG emissions inventory of the County.

American Recovery and Reinvestment Act funds, CAA anticipates weatherizing an estimated twelve hundred (1,200) homes by September 2012.

We have identified as a data gap a historic record of the difference between pre- and post-blower door tests scores for the weatherized homes. This score measures the extent to which outside air is infiltrating into the home and the weatherization process should lower the score. A higher score equates to more infiltration of outside air and lower energy efficiency and decreased thermal comfort.

Energy Efficiency in the Commercial & Industrial Building Sectors

Commercial Building Owners and Managers are taking steps to conserve energy as it makes good business sense and improves their and their tenants' corporate social and environmental profiles. The Environmental Protection Agency's (EPA) Energy Star Portfolio Manager (PM) tool is one way commercial buildings can be benchmarked for energy performance and monitored over time on a month-to-month basis. Using both utility billing history and space utilization characteristics including building type, square footage, number of occupants/visitors, etc., the PM software calculates a score each time new utility bill information is entered into the system. A score of 50, for example, signifies that the building performs better than 50 percent of building of a similar type across the nation.

The EPA has identified the Miami urban area as among the top 25 cities with Energy Star certified buildings (see Figure 9). For 2008, there were 38 Energy Star certified buildings, representing 8.3 million square feet, a cost savings of $8.8 million, as well as GHG emissions avoided equivalent to the annual electricity use of 6,800 homes. Miami-Dade County has over 30 of its facilities currently being tracked through Energy Star PM and several that are certifiable (Energy Star score > 75) but not yet certified (see *Government Operations—Electricity* section).

Figure 9: Top 25 Cities with the Most Energy Star Qualified Buildings in 2008

LEARN MORE AT energystar.gov

Top 25 Cities With the Most ENERGY STAR Qualified Buildings in 2008

Metropolitan Area*	Number of ENERGY STAR Qualified Buildings in 2008	Amount of Floorspace (Million square feet)	Cost Savings (Millions)	Emissions Savings Equivalent to How Many Households' Electricity Use?
1. Los Angeles, CA	262	73.9	$87.2	35,800
2. San Francisco, CA	194	60.0	$83.8	32,100
3. Houston, TX	145	58.3	$70.6	56,500
4. Washington, DC	136	42.3	$42.2	30,700
5. Dallas-Fort Worth, TX	126	32.4	$31.9	26,200
6. Chicago, IL	125	51.0	$42.2	50,700
7. Denver, CO	109	30.5	$32.9	44,600
8. Minneapolis-St. Paul, MN	102	33.2	$36.3	49,000
9. Atlanta, GA	97	24.0	$16.4	19,700
10. Seattle, WA	83	22.0	$16.3	14,400
11. Boston, MA	79	25.0	$34.5	13,600
12. New York, NY	78	41.9	$55.9	26,900
13. Austin, TX	77	10.9	$13.6	11,900
14. Detroit, MI	65	10.2	$52.7	8,400
15. Milwaukee, WI	62	7.6	$3.0	3,200
16. San Antonio, TX	56	9.8	$14.6	14,400
17. Philadelphia, PA	50	11.9	$12.4	7,900
18. Charlotte, NC	45	5.8	$4.6	5,200
18. Portland, OR	45	14.0	$8.0	6,600
20. Grand Rapids, MI	42	4.1	$1.8	1,700
21. Sacramento, CA	41	6.5	$7.9	3,600
22. Phoenix, AZ	39	7.3	$7.0	6,900
23. Miami, FL	38	8.4	$8.8	6,800
24. Riverside, CA	34	3.6	$3.2	1,200
25. Madison, WI	33	3.0	$1.1	1,300

EPA United States Environmental Protection Agency

*Metropolitan areas defined by U.S. Census • January 1, 2008 - December 31, 2008 • Numbers have been rounded

The EPA has been adding new building types over time to its list of qualifying Energy Star certifiable buildings. Other than commercial buildings such as office buildings, K-12 facilities, retail stores, houses of worship, financial institutions, government buildings, etc., there are also manufacturing/industrial type buildings that may be certified including water/wastewater utility operations, cement plants, petroleum refineries, etc.[3]

Building Owners and Management Association - 7-Point Challenge Program

Specific to the large commercial building sector, the Building Owners and Management Association (BOMA) (www.boma.org), has introduced its 7-Point Challenge program to help its members reduce the energy consumption of the buildings the own and/or manage. The market is pushing for energy efficiency as owners are able to provide more competitive lease rates to prospective tenants and tenants are looking to meet their corporate social and environmental responsibility objectives and reduce the cost of doing business. The 7-Point Challenges uses the Energy Star PM score as a means for measuring energy efficiency (see below). The Miami urban area has an active BOMA chapter (www.boma-miami.org) that can serve as an important resource in promoting energy efficiency for existing buildings in our community. As identified in Figure 3 of the *Business and Industry* section of the Assessment, the Real Estate, Rental and Leasing sector relative to other industrial sectors represents the largest share of the County's economic output or gross domestic product (GDP).

[3] For a full listing of qualifying Energy Star PM building types and rating systems, please visit http://www.energystar.gov/index.cfm?c=business.bus_bldgs

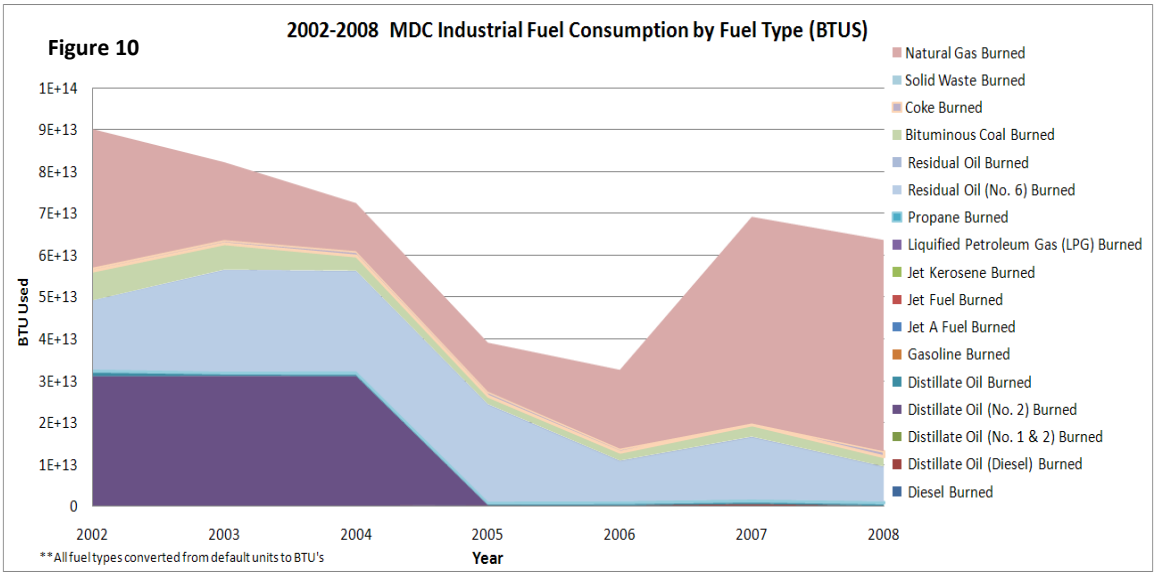
BOMA 7-POINT CHALLENGE

1. Continue to work towards a goal to decrease energy consumption by 30 percent across your portfolios by 2012 – as measured against an "average building" measuring a 50 on the ENERGY STAR® benchmarking tool in 2007.
2. At least once a year, benchmark your energy performance and water usage through EPA's ENERGY STAR benchmarking tool (and share your results with BOMA);
3. Provide education to your managers, engineers, and others involved in building operations, to ensure that equipment is properly maintained and utilized;
4. Perform an energy audit and/or retro-commissioning of your building, and implement low-risk, low-cost and cost effective strategies to improve energy efficiency with high returns;
5. Extend equipment life by improving the operations and maintenance of building systems and ensure equipment is operating as designed;
6. Through leadership, positively impact your community and your planet by helping to reduce your industry's role in global warming; and
7. Position yourself and the industry as leaders and solution providers to owners and tenants seeking environmental and operational excellence.

(Source: http://www.boma.org/getinvolved/7pointchallenge/Pages/default.aspx)

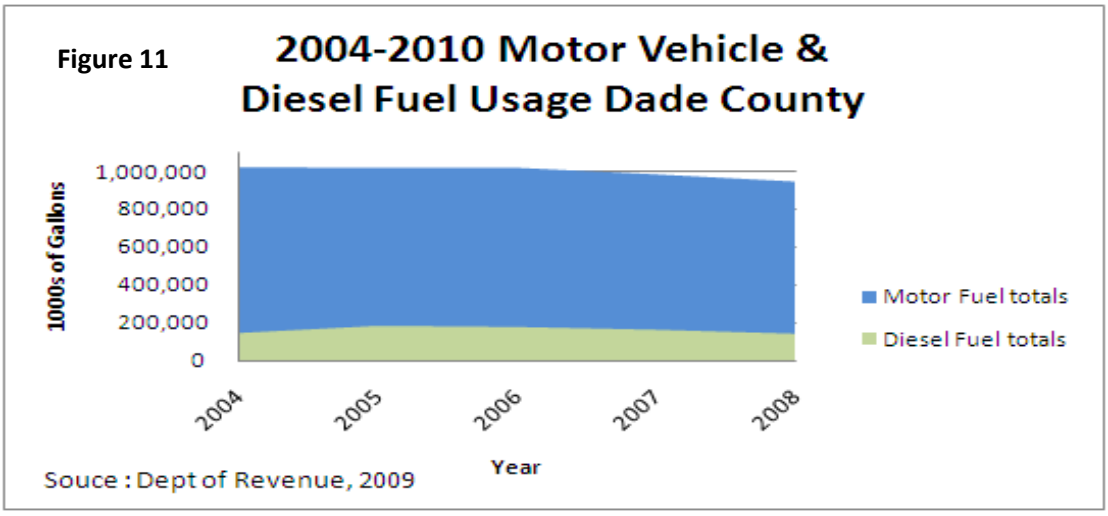
Fuel

Since 2002, there has been an overall decreasing trend in community wide industrial fuel consumption in terms of British Thermal Units (BTUs) equivalents across all fuel types (see Figure 10).[4]



We have identified as a data gap the consumption of fuel by the different industries that contribute to the industrial fuel data identified in Figure 9. We are currently evaluating existing data to develop consumption trend charts.

Since 2004, diesel and unleaded motor fuel consumption (gallons of unleaded and diesel fuel) has slightly decreased, a trend that most likely correlates with the economic downturn (see Figure 11). Over this time, the cost per kWh of electricity or per gallon of fuel has increased significantly as global energy demand is growing faster relative to supply. In the future a carbon constrained economy will translate into even higher costs for fossil-fuel (coal, liquids, natural gas) based electricity generation and transportation that will be passed on to consumers.



[4] Please note that only industrial fuel consumers that are required to report their emissions to the State Department of Environmental Protection for air pollution compliance are included in this analysis.

Transportation & Fuel Consumption
Along with tracking the direct consumption of fuel, the mobility choices that we make as a community and the transportation/transport options available for people and the movement of goods and services impacts motor fuel consumption rates (unleaded and diesel). Land Use Element 10 of the CDMP's Adopted Measure C monitors annual ridership rates for mass transit in Miami-Dade County and compares this rate to historical annual ridership rates. Tracking thus far indicates that in FY 2007, mass transit ridership increased by approximately 30.1 percent from FY 2000. More specifically, Metromover experienced a 103.8 percent increase in ridership between FY 2000 and FY 2007, the largest increase among the mass transit transportation modes; followed by Metrobus (26.8 percent) then Metrorail (24.3 percent). As a result, mass transit ridership per 1,000 persons increased by 18.6 percent during the same period. (*More details on these measures can be found in the Transportation Section of this report.)*

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

How and where we use land, build our buildings and configure our transportation modes and networks can impact both our total energy consumption and how efficiently we use what we consume. Both the Comprehensive Development Master Plan (CDMP) and Long Range Transportation Plan (LRTP) address energy consumption.

Comprehensive Development Master Plan
Land Use Element 10 (LU-10) of the CDMP states that energy efficient development shall be accomplished through metropolitan land use patterns, site planning, landscaping, building design, and development of multimodal transportation systems.[5] Monitoring measures employed include (1) monitoring of revisions to the Florida Building Code, Metro-Dade Zoning Code, and other County development regulations, which encourage, support, or require energy conservation, (2) average electrical power consumption per capita and per residential unit will be compared to historical rates, and (3) the comparison of ridership rate per 1,000 adult population on mass transit (Metrorail, Metromover, and MDTA buses) to historical rates on an annual basis.

Land Use Element 10 (LU-10) also sets forth policies that enable improved energy conservation including:

- *LU-10A:* Miami-Dade County shall facilitate contiguous urban development, infill, redevelopment of substandard or underdeveloped urban areas, high intensity activity centers, mass transit supportive development, and mixed-use projects to promote energy conservation.
- *LU-10B:* Solar design guidelines for such items as street and passageway alignments, landscaping, setbacks, building orientation, and relationship to water bodies shall be developed by 2008, and utilized in site plan reviews by the Department of Planning and Zoning.
- *LU-10C:* Miami-Dade County shall encourage energy conservation by adopting Florida Green Building Coalition, US Green Building Council Leadership in Energy and Environmental Design (LEED), or other acceptable commercial building standards for County-owned facilities.
- *LU-10D:* Miami-Dade County shall promote energy conservation by encouraging builders, remodelers, homeowners and homebuyers to implement Florida Green Building Coalition green home or other acceptable environmental standards and by encouraging site

[5] Other sections of the CDMP that encourage the development of pedestrian friendly mixed-use urban centers also have a direct impact on energy use - fuel use in particular. Please see the Land Use section of the Assessment for more information.

planners and land developers to implement Florida Green Building Coalition development standards.

- *LU10-E:* Miami-Dade County shall investigate incentives for developers and building owners to incorporate energy efficiency and other conservation measures that meet recognized green building standards into the design, construction or rehabilitation of their buildings.

Long Range Transportation Plan (LRTP)

The County's Long-Term Transportation Planning process has as a goal to protect and preserve the environment and quality of life and promote energy conservation. Specific objectives to meet the energy conservation goal include:

- Reduce fossil fuels use
- Promote projects that support urban infill and densification
- Promote transportation improvements that are consistent with adopted comprehensive development master plans
- Prioritize funding to favor intra-urban (within UDB) improvements
- Promote the use of alternative vehicle technologies
- Apply transportation and land use planning techniques, such as transit-oriented development, that support intermodal connections and coordination

Existing Legislation

Federal, state and local legislative efforts all have and will continue to impact energy supply and demand. The general direction of this legislation in the recent past as well as immediately following the energy crisis of the 1970s has been to promote increased energy efficiency and conservation. Except for land use policy, energy policy at this moment is still separated in government bureaucracies with certain departments/divisions that address building and infrastructure energy use and others that address energy use in the transportation sector.

At the federal level, legislative efforts can be directed towards both how we source and generate our energy, as well as how we use energy vis-a-vis the energy consuming products that we utilize through policies, incentives and direct funding of energy efficiency and other efforts (e.g. Energy Star Portfolio Manager, Energy Efficiency and Conservation Block Grants).

At the state level, the Public Safety Commission (PSC) regulates public utilities that provide a majority of Florida and Miami-Dade County's energy and related services including the demand-side management incentive and rebate programs that we as energy consumers utilize. In addition, the Florida Department of Community Affairs oversees and approves the land use planning that local governments undertake through the comprehensive development master planning processes as well as the Florida Building Code. The state also has in place a Climate and Energy Commission to help generate robust energy management policies. It has a supporting Energy Office for implementing policies, programs and incentives that enable energy consumers to improve their efficiency. This includes the provision of rebates for residential and small commercial renewable energy installations.

Locally, municipal governments can implement policies, programs and incentives that impact energy supply sources (e.g. use of off-grid renewable energy sources), promote increased efficiency and reduce demand but within the limitations of state-level utility regulations (e.g. current 2MW limit on renewable energy returned back to the grid that a non-utility energy generator can be compensated for). Provided below are legislative highlights that reflect the energy conservation trend described above.

State

Florida State House Bill 7135 (2008): Comprehensive energy bill with economy-wide impacts including utilities, construction and transportation industries, renewable energy developers,

biofuel companies, solid waste and recycling companies and local governments. The bill includes the following provisions:

- State government to "lead-by-example" in energy conservation and efficiency;
- Authorizes the Florida Department of Environmental Protection (FDEP) to develop a market-based regulatory program to reduce greenhouse gas (GHG) emissions from electric utilities;
- Amends the Florida Energy Efficiency and Conservation Act, requiring the PSC to adopt rules that encourage electric utilities to increase energy efficiency and demand-side renewable energy systems;
- Establishes a preference for climate-friendly products and "green" facilities for in the awarding of state contracts;
- Establishes a schedule to increase energy efficiency in buildings subject to the Florida Energy Efficiency Code for building construction
- Establishes increased energy efficiency standards for water heaters, dishwashers and swimming pools; establishes a renewable fuel standard for Florida and requires that by 2010, with limited exceptions, all gasoline sold in this state must contain at least 10 percent ethanol;
- And creates the new 12-member Florida Energy and Climate Commission that is charged with developing, coordinating and implementing energy policies for the state.[6]
- Provides for State funded solar energy rebates ($10 million in 2009)
- Provides for State funding of R&D for renewable energy

Florida State House Bill 697 (2008): HB 697 establishes new local planning requirements relating to energy efficient land use patterns, transportation strategies to address greenhouse gas reductions, energy conservation, and energy efficient housing. These new requirements became effective on July 1, 2008. Implementation of these requirements presents the Department and local governments with new challenges and opportunities.[7]

Local

The following list includes some of the Board's adopted legislation related to energy or climate change. A complete inventory of sustainability related legislation is provided as an appendix.

- *R-737-96 : DOE Funding for Rebuild Miami Resolution (1996)*
  Resolution accepting grant from US Department of Energy that will provide funding for the "Rebuild Miami" program that will allow Dade County to develop, participate in, and implement energy efficient programs to reduce energy consumption in residential households and local businesses. The grant was administered by the Department of Environmental Resources Management (DERM).

- *R-872-98: MOU for County-US EPA Green Lights Program (1998)*
  Authorizes County to enter into a voluntary agreement with the EPA for the EPA's Green Lights program. This program encourages corporations and local governments to install cost-effective, energy efficient lighting in their facilities thereby reducing operating costs and emissions of greenhouse gases.

- *R-756-01: ICLEI Energy Star Program for Businesses Grant Acceptance (2001)*
  Resolution accepting grant from the International Council for Local Environmental Initiatives for the promotion of County's Energy Star program for businesses

- *R-1341-06: Urge Natural Gas Utilities to Extend Service in Miami-Dade (2006)*

[6] Summary adapted from Holland and Knight summary of HB 7135
[7] Source: Florida State Department of Community Affairs website

- *R-324-07: Membership in Chicago Climate Exchange (2007)*
  County has to reduce direct fuel-based GHG emissions to six percent below 2000 levels by 2010 over a four year compliance period of 2007-2010 (1.5 percent annual reduction)

- *R-190-07: Solar Water Heater Installation for Low-Income Homeowners (2008)*
  Resolution urging the Florida State Legislature to provide matching funds to low-income homeowners for solar and other energy saving water heater installations

- *R-1431-08: Miami-Dade's Commitment through the Cool Counties (2009)*
  Commits to region-wide goal of reducing greenhouse gas emissions by 80 percent by 2050, and a 2 percent reduction each year beginning in 2010

- *R-228-09: Reduce Electrical Energy Consumption (2009)*
  Reduce electricity consumption from government operations by 20 percent over the 2007-2014 time period

- *R-928-09: Campaign Informing People of the New Energy-Savings Rebates (2009)*
  Mayor or Mayor's designee to prepare and implement an education campaign informing people of the new energy savings rebates

- *Signatory to US Conference of Mayor's Climate Protection Agreement*
  Community-wide emissions reduction 7 percent below 1990 levels by 2012

Energy Efficiency & Conservation Block Grant Program
The US DOE Energy Efficiency & Conservation Block Grant (EECBG) formula allocation in the amount of $12.5 million awarded to the County in September 2009 is currently spurring new activities addressed at the larger community. Federal grant dollars will go toward energy management and construction projects, citizen outreach and education, pilot programs and more. Funds from the grant will also help create local green jobs. The County's integrated Energy Efficiency Conservation Strategy combines projects such as:

- Community-wide Energy-Efficiency Behavior Change Campaign
- Community-based Organization Energy-Efficiency Re-Granting Program
- Targeted Industry Energy-Efficiency Revolving Loan Program

Other Initiatives
Per the adoption of Ordinance 05-91, Targeted Jobs Incentive Fund (TJIF) for stimulating a healthy economy and revitalization with a focus on green buildings and the renewable energy industry was created. Please see the Business and Industry Section for more information.

FPL is initiating a smart-metering retrofit for all of its customers in its Florida Service Area. This system will provide real-time energy consumption information to households and businesses which can instigate the increased long-term adoption of energy conserving behaviors and more effective energy use management. This effort should complement well the County's energy-efficiency efforts both in-house and across the larger community.

COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

No feedback is available at this point.

Environment

South Florida ecosystems are unique, diverse, and directly linked to water management. They range from coral reefs, subtropical estuaries, barrier island beaches, wetland habitats to pine rocklands and tropical hammocks that occur nowhere else in the continental United States. Underlying all of South Florida is the Biscayne Aquifer, a shallow, porous limestone formation that has historically provided all urban and agricultural freshwater supply.

Natural systems are nursery habitats for fish, wildlife, and tropical plant communities, including globally imperiled species. These settings contribute to recreational and economic opportunities for residents and visitors. Wetlands, forests, and submerged plant communities also sequester carbon, contributing to reduction in greenhouse gases. The beach dunes, reefs and mangrove shoreline provide a buffer against storm erosion. Wetlands and other open lands are natural water reserves, storing and filtering freshwater and recharging the aquifer. So valuable are these critical resources that two National Parks, a National Marine Sanctuary, State of Florida aquatic preserves and water conservation areas, and County environmental regulations and programs have been established to protect them.

Environment

Assessment Area

The environment is a core sustainability pillar along with the economy and social equity. Water, air, and natural systems must be sustained for the viability of current and future residents. Miami-Dade County has experienced major population growth, and continued careful management of environmental resources is crucial for sustainability.

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The topography and meteorological patterns of South Florida help remove harmful air emissions from our community. Although air quality is Good most of the time, days when the air quality falls within the Moderate and Unhealthy for Sensitive Groups categories are of concern. In April 2009, EPA made findings under the Clean Air Act that six key greenhouse gases (GHGs) constitute a threat to human health and welfare and as such shall be regulated air pollutants. Therefore, just as the sources of traditional and 'new' air pollutants are similar, initiatives to reduce those emissions will provide co-benefits for air quality and climate change mitigation.

The environment assessment area encompasses surface water, groundwater, stormwater, and air, as well as the following natural resources: environmentally endangered lands, coastal habitats, wetlands, and tree canopy.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Managing water to protect drinking water supplies, prevent flooding, and to support critical natural systems.
- Restoring and enhancing Biscayne Bay, vital coastal and freshwater wetlands, reef communities, beaches, and forest communities to protect fish and wildlife habitats, improve water quality, protect the shoreline from erosion, and promote aquifer recharge, especially in light of increasing populations and other external factors including storms and the impacts of climate change.
- Addressing state ocean outfall legislation, including the elimination of outfalls and implementing the 60 percent wastewater reuse requirements.
- Ensuring that the proposed reuse of treated wastewater, while progressive and important to sustain water quantity, does not degrade groundwater quality or sensitive natural systems.

- Preventing further salt water intrusion that threatens drinking water wellfields and sensitive natural areas through water management and improved water control structure operations and infrastructure.
- Continuing acquisition and management of strategically located environmentally sensitive lands to protect rare or imperiled communities and complement regional conservation land management and restoration programs. Securing additional funding is the greatest challenge for furthering these efforts.
- Increasing the tree canopy through planting 'the right tree in the right place' to minimize the costs of planting and maintenance and the potential damage and removal from storms.
- Adapting water management and stormwater infrastructure to address flooding that may increase with rising groundwater levels. Continued collaboration with federal and state agencies will be needed to assess effectiveness of the existing canal network. Over the long-term, canals and other drainage infrastructure may not function effectively if sea level increases.
- Planning in the absence of regional monitoring of agreed upon "vital indicators" of climate change.
- Implementing the Comprehensive Everglades Restoration Plan (CERP).
- Reducing the number of days when overall ambient air pollution levels in Miami-Dade are harmful to sensitive populations.
- Reducing exposure of sensitive populations to air toxics, including diesel emissions and asbestos. While comprehensive monitoring data for air toxics is not available, the likelihood of exposure to air toxics such as emissions from diesel engines and asbestos fibers from renovation and demolition building activities is well understood and should be reduced through the continued implementation of programs at the federal, state and county levels.

Natural resources have been altered throughout the years. The low-lying terrain and porous aquifer are especially vulnerable to contamination and to projected impacts from sea level rise and related elements of climate change. In particular, as sea level continues to 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 and human-related benefits that the natural communities provide. New water treatment technologies promise more sustainable alternative water supply through the beneficial reuse of wastewater, but are energy intensive. Conservation and restoration of natural resources will create a healthier and more resilient environment more adaptable to climate change.

A multi-billion dollar federal and state program, the Comprehensive Everglades Restoration Plan (CERP), has been authorized by Congress 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.

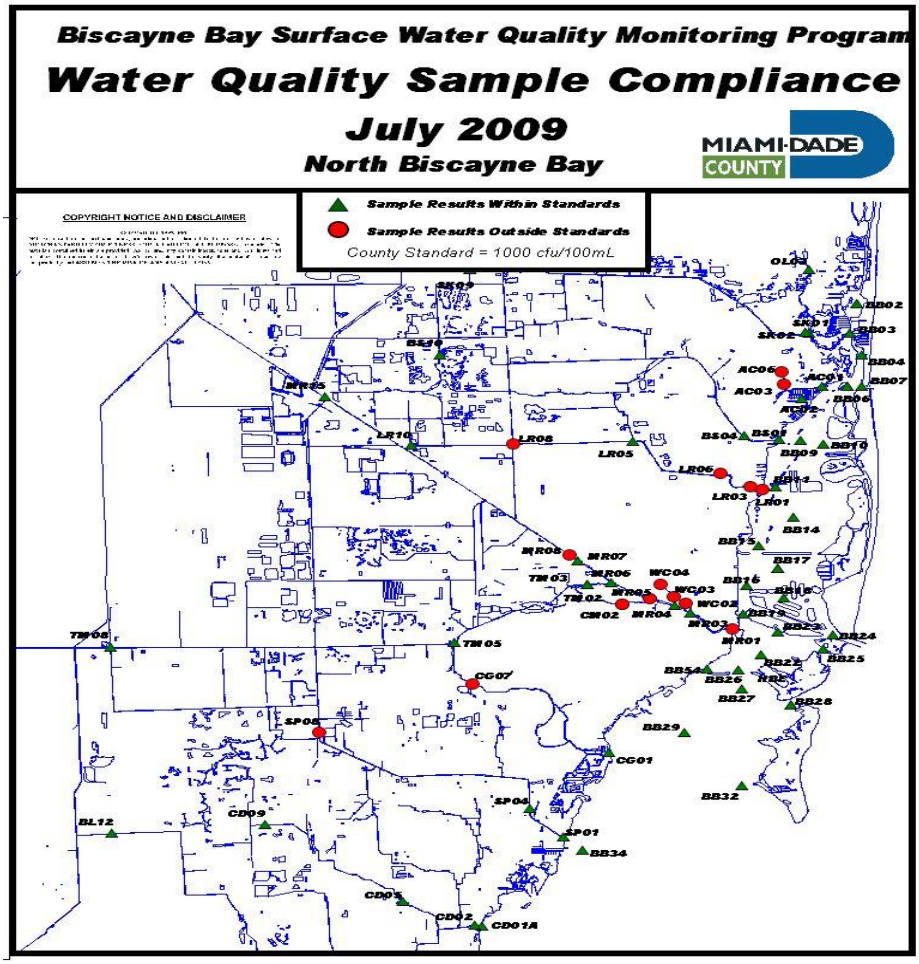
The County implements a broad array of regulatory, monitoring and assessment, restoration, endangered land acquisition, and water management programs to protect, maintain or improve air, ground and surface water quality and to conserve or enhance environmentally sensitive natural habitats. These programs include initiatives undertaken pursuant to the County's own local authority, as well as collaborative efforts with federal, state, other local government and non-government resource management partner organizations.

SURFACE WATER QUALITY

In Biscayne Bay, water quality is generally good and meets standards in most cases. Exceptions are the Miami River and some canals, which were designed to capture stormwater runoff and are heavily influenced by interconnection with groundwater. Issues with quality include nitrogen associated with agricultural practices and bacteria due to an aging wastewater infrastructure.

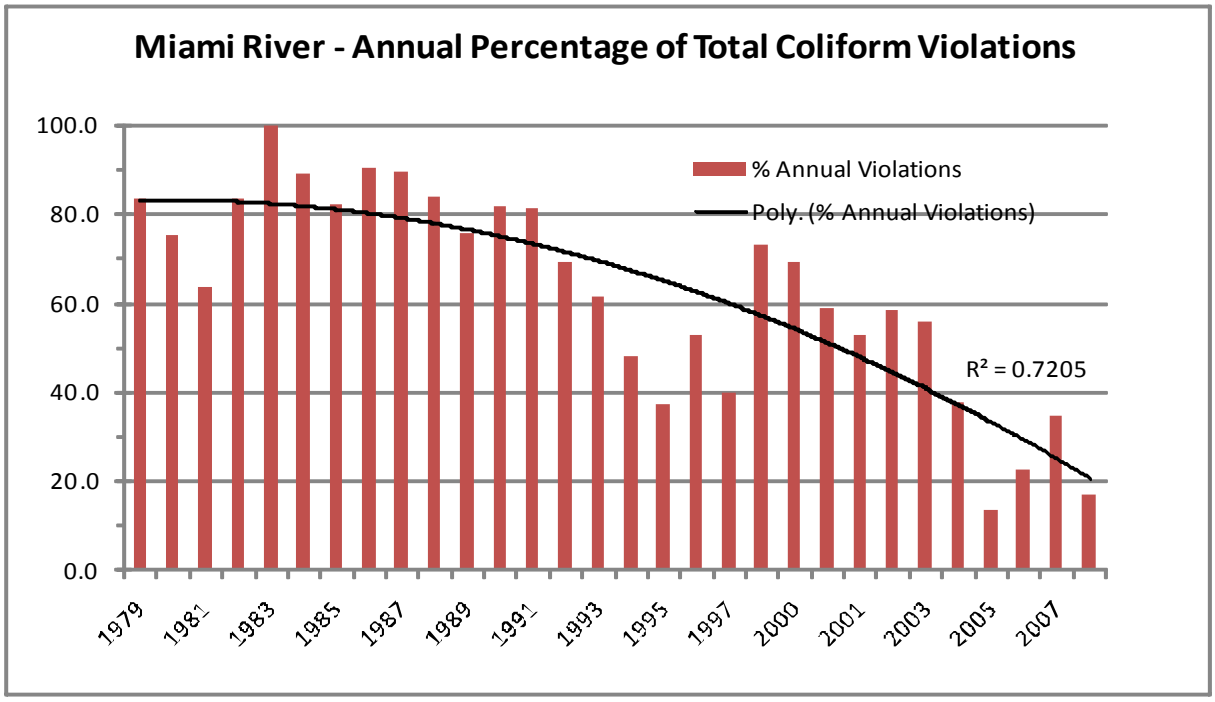
As part of a comprehensive long-term surface water quality monitoring program, samples from approximately 100 locations in Biscayne Bay and its watershed are collected each month and tested for coliform bacteria, an indicator of sewage pollution. Standards have been established for various bacterial indicators to determine levels safe for human recreational uses involving water contact, such as swimming or fishing. Bacteria concentrations may be related to illegal discharges, human uses, other natural sources, or physical factors such as salinity or temperature. The open waters of Biscayne Bay are designated as Outstanding Florida Waters and rarely exhibit concentrations of bacteria that exceed any established standards. However, some tributaries and canals suffer from chronic contamination. Figure 1 illustrates the spatial extent of the sampling program and analysis resulting from this program and the samples that exceed coliform bacteria standards.

Figure 1



There continues to be a general decrease over time in the concentration of bacteria, and the number of violations. Figure 2 shows the percentage of samples annually in violation of the County bacteria water quality standard. The past four years have had the lowest percentages of violations since 1979, the beginning of data collection. The County's water quality standard for Total Coliform is 1,000 ppm.

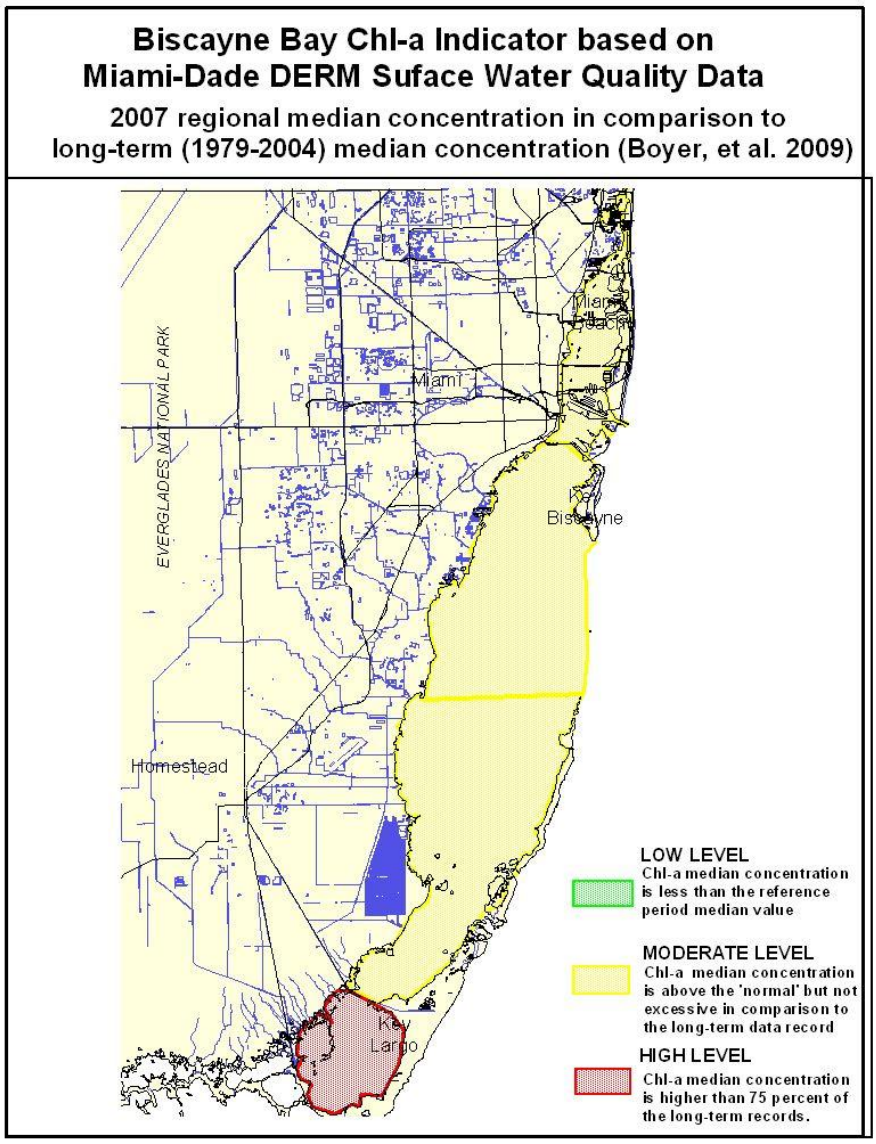
Figure 2



Ecological indicators have been developed by a team of Comprehensive Everglades Restoration (CERP) scientists to help evaluate the status of the South Florida ecosystem and how its key components are responding to restoration and water management activities. Biscayne Bay is a clear-water estuary and is typically characterized by very low concentrations of nutrients and algae. An algal bloom measure, based on chlorophyll concentrations in the water is used to gauge its ecological health. Algal blooms result from increased inputs of nutrients into the coastal waters and are indicative of discharges or disturbance of the natural balance.

In 2006-2007, Biscayne Bay experienced persistent algal blooms, correlated with increased concentrations of the nutrient phosphorous. During this period, there were severe storms and a large construction project in southern basins. Barnes Sound “stoplight” rating was red, and all other basins were rated yellow. This indicator is based on a comparison of chlorophyll concentrations in specific basins of the Bay to a reference baseline documented over more than a decade. Figure 3 is a “stoplight” graphic is used to illustrate comparative trends: a basin is shown in “green” if annual chlorophyll levels are equal to or less than the long-term baseline; “yellow” represents annual chlorophyll levels modestly higher than the reference; and “red” for annual chlorophyll levels in the highest bracket.

Figure 3

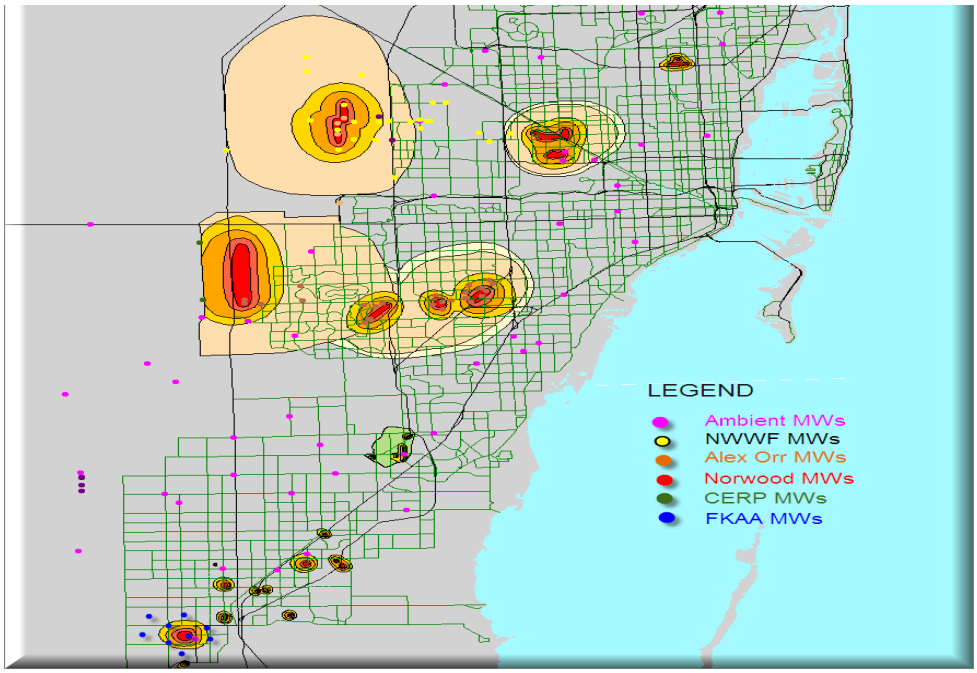


GROUNDWATER QUALITY

Groundwater quality in Miami-Dade is generally good, however there are new threats to water quality protection including sea level rise, salt intrusion, environmental stress as population increases, mandates towards alternative water supply, wastewater reuse and groundwater recharge (described at more length in the Water & Sewer Section).

The County maintains a network of groundwater monitoring locations pursuant to regulatory and voluntary programs. The two main water quality monitoring programs are the Wellfield Protection Monitoring (WPM) program and the Ambient Groundwater Monitoring (AGW) program. The WPM targets four of the County's major Wellfield Protection areas. The program consist of a network of monitoring wells located radially around and at varying distances from the drinking water production wells in each wellfield. The monitoring wells are sited between the wellheads and major potential pollutant sources to intercept any contaminant migrating towards the wellheads and therefore providing early warning of any contaminant threats to the production wells. These wells are constructed to intercept different vertical intervals in the aquifer including the production zone. The WPM program consists of approximately one hundred and seventy monitoring wells which are sampled quarterly for a variety of parameters. Figure 4 shows spatial distribution of the monitoring locations.

Figure 4: Miami-Dade County Ambient Groundwater and Wellfield Protection Water Quality Monitoring Locations



The Ambient Groundwater Monitoring Program (AGW) consists of a network of wells located outside wellfield protection areas and is designed to monitor major land uses and potential pollution sources. The AGW program consists of 56 wells which are sampled bi-annually. Approximately 18,000 measures are recorded in groundwater annually, approximately 8,000 in the WPM program (2008-2009 DERM data) and approximately 10,000 in the AGW program.

Wastewater Reuse

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. Now the situation has changed dramatically. 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.

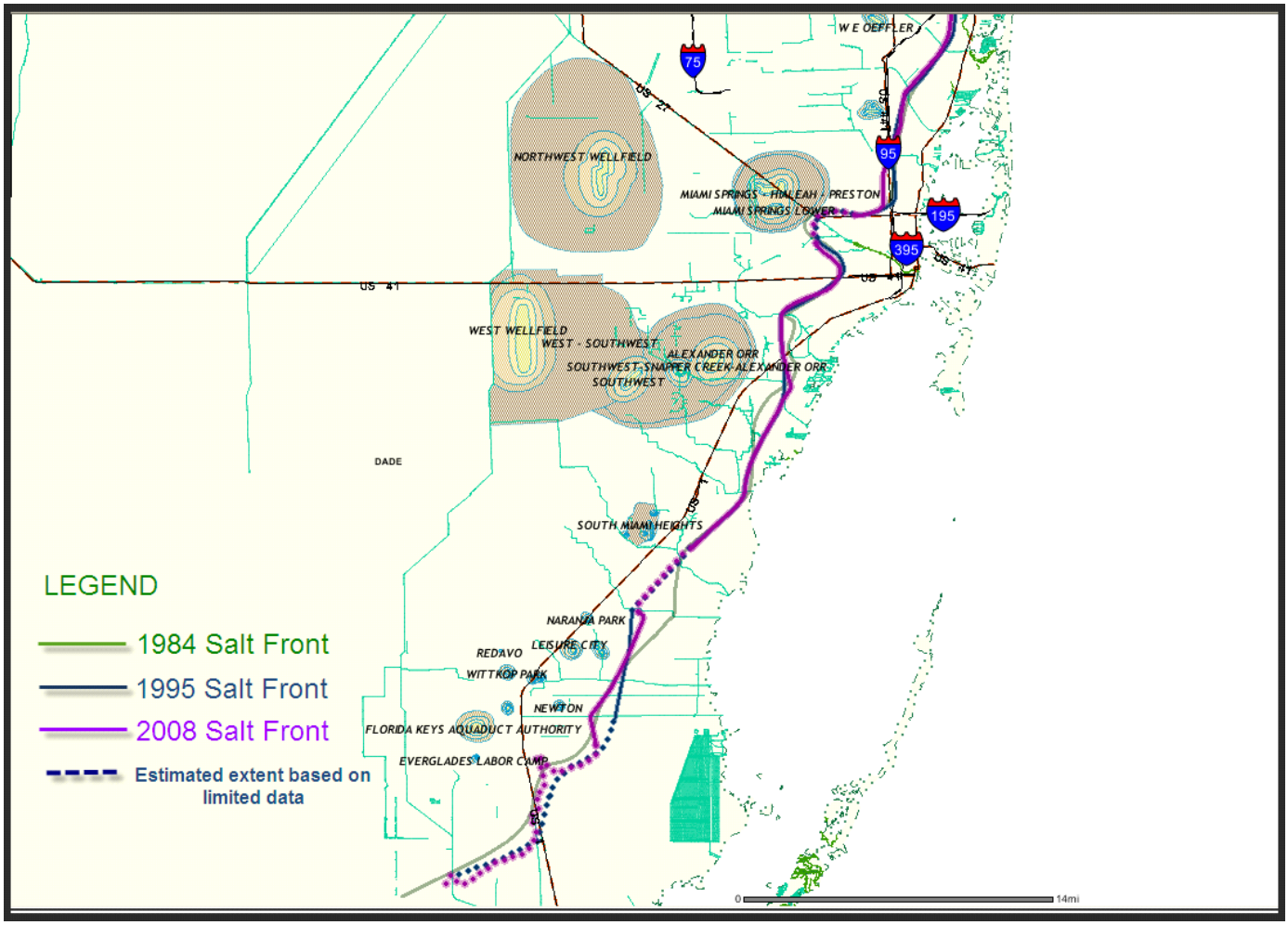
In addition, a 2008 State law requires that ocean outfalls cease being used for disposal of treated wastewater by 2025, with at least 60% of those flows being reused. A plan to comply with these requirements must be prepared and submitted to the State no later than 2013. The Water and Sewer Department is evaluating the significant projected cost, increase in energy use, and potential impact on hydrology necessary to meet these requirements. The types of projects already identified to meet water supply needs include reclaimed water for irrigation purposes, industry (such as cooling water for power plants), and replenishment of ground water, as is currently being done in other parts of the nation. Very highly treated wastewater may be suitable for environmental restoration projects such as rehydration of coastal wetlands to help restore the Everglades. A critical component to these projects is ensuring that the treated wastewater slated for groundwater recharge or wetland restoration meets all applicable criteria and does not pose a threat to the potable water supply, drainage system, or sensitive ecological receptors. Existing monitoring networks will require evaluation to ensure continued and appropriate coverage of major pollutant sources and enhanced for possible new non-regulated contaminants and emerging pollutants of concern. Best available treatment technology will be used to address these potential issues. As all of these options and opportunities are evaluated,

it will be important to have the flexibility to select alternative water supply options that are cost-effective, protective of public health and natural resources, and truly sustainable in terms of all long term consequences.

Saltwater Intrusion

In the coastal area, saltwater extends landward underground and is overlain by a shallow layer of less dense freshwater. As sea level rises, or as freshwater is drained from the land or withdrawn at wellfields, the saltwater boundary can move farther inland. The excavation of canals, lakes, and navigation channels in the coastal areas and lowering of the water table for flood protection had the consequence of providing an inlet for saltwater intrusion into the aquifer. Since the 1940s, control structures have been built in key drainage canals to control the migration of saltwater upstream. Engineered solutions have partially stabilized the rate of the saltwater intrusion towards the west. However, due to consumption of freshwater, drainage, and sea level rise, the migration of the salt front to the west has brought up legitimate concerns especially for the protection of coastal drinking water supply wellfields. This especially holds true in the southeastern portion of Miami-Dade where the salt-freshwater boundary at the base of the aquifer) has migrated to the west, in some areas at an approximate rate of 460 feet/year. Figure 5 illustrates the change of the isochlor line from the time period of 1984, 1995, and 2008 with respect to the spatial distance of the wellfield protection areas.

Figure 5: Salt Intrusion Threats



Additionally, the County in conjunction with the United States Geological Survey (USGS) monitors a network of groundwater monitoring wells and surface water stations for indicators of sea level rise and salt water intrusion, specifically; water level, specific conductivity, and chloride concentrations.

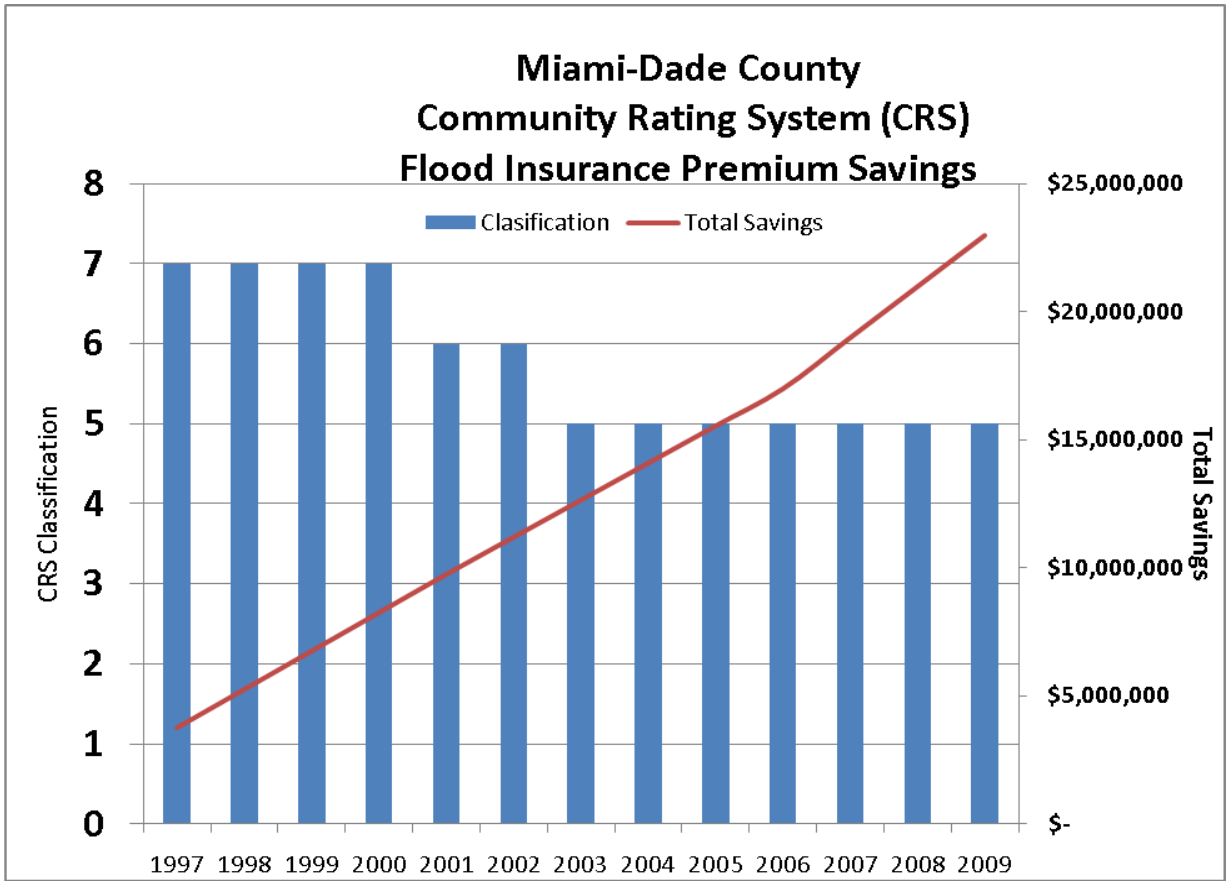
STORMWATER MANAGEMENT

Miami-Dade County is low-lying and stormwater management will need to adapt to rising sea levels to ensure adequate drainage. Proactive and effective ways are used to monitor and adapt the stormwater system to changing environmental conditions. The Stormwater Master Plan (Master Plan) and participation in the Federal Emergency Management Agency (FEMA) Community Rating System (CRS) ensure there is careful planning and response to flooding. The primary canals are maintained by the South Florida Water Management District (SFWMD). The portion of the drainage system maintained by the County consists of the following elements; Secondary Canal System of 187 miles, water control structures/gates, culverts, weirs, pump stations, ditches, swales, retention and detention ponds, drainage wells, and street drainage systems. Planning, design, construction, and maintenance of this system are the responsibility of the Miami-Dade County Stormwater Utility (Utility).

The Master Plan is an overall approach to identifying the flood potential of all areas of the County and charting the need for drainage improvements. The Master Plan is used by the County's water managers to determine the priorities for managing stormwater across the County. Improvements to the water control structures, secondary canal improvements and maintenance needs, culvert upgrades or replacement, and hydraulic connections to the area-wide SFWMD Primary Canal System are all identified by the Master Plan.

The goals of FEMA's CRS program are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. Communities that regulate new development in their floodplains are able to join the FEMA's National Flood Insurance Program (NFIP), which provides federally-backed flood insurance for properties in participating communities. The CRS, part of the NFIP, is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. The County is currently rated at Class 5 resulting in an annual reduction in flood insurance premiums for its residents of over $20 million. Class 5 puts the County in the top 5 percent of all 1,055 communities in the country that participate in the CRS Program. Only six communities nationwide are currently rated at Class 4 or better. The County currently receives the highest savings in flood insurance premiums nationwide (among all participating communities). Figure 6 shows the County's progression to Class 5 rating and the savings.

Figure 6



Repetitive Losses

Key indicators in flood management and control activities are the annual FEMA reported Repetitive Losses, which the County must mitigate and close out. Repetitive loss refers to properties where FEMA has validated more than one flood insurance claim. Since 1991, there have been 2,125 Repetitive Losses. 579 of these are considered mitigated by county, state, and federal programs. 477 are located within private systems and need to be mitigated by the Homeowner's Associations, and 1,069 remain to be mitigated. FEMA maintains a process to identify repetitive losses that are primarily the results of major storm events. Implementation of mitigation strategies is prioritized according to the regional severity of the flooding and number of losses in the same drainage area. In addition, the county has a Flood Inspection Program that monitors critical areas where flood events have been documented or Master Plan modeling has identified as needing attention. Results from these monitoring activities are used to program stormwater capital infrastructure improvements and maintenance cycles throughout unincorporated Miami-Dade County.

NATURAL RESOURCES

Environmentally Endangered Lands

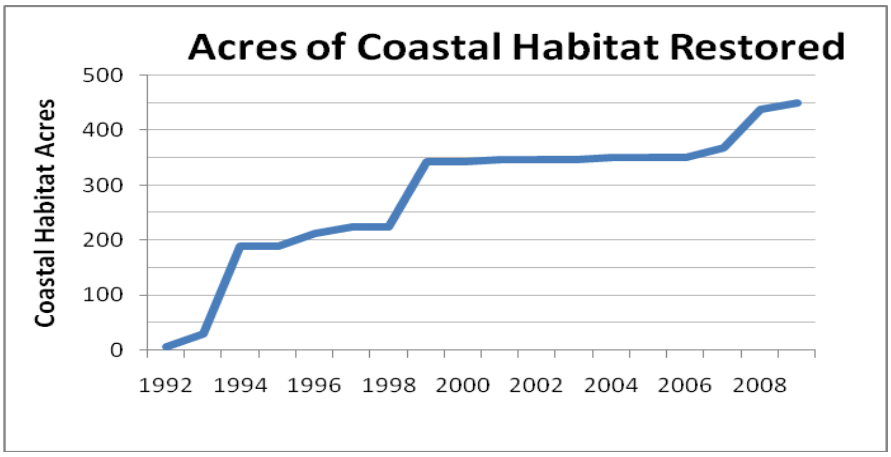
The Environmentally Endangered Lands (EEL) Program was established in 1990 through a countywide referendum which approved a two-year tax increase to acquire, restore, and maintain environmentally endangered lands. In 2004, an additional $40 million was approved for EEL projects as part of the Building Better Communities Bond. As of December 2009, EEL and its partners had acquired over 20,000 acres of land. Over 53 percent of acres on the Board of County Commissioners approved lists have been acquired. In addition 2,800 acres of park

natural areas have been designated as EEL sites. In total the EEL Program funds active management of approximately 22,800 acres of natural areas.

Coastal Habitat Restoration

Following recommendations of the 1981 Biscayne Bay Management Plan, the Biscayne Bay Restoration and Enhancement Program was established within the Department of Environmental Resources Management (DERM), to improve and restore coastal habitats in Miami-Dade. Since 1985, DERM has been conducting coastal habitat restoration and enhancement projects throughout the County. As of the beginning of FY 2009, 451 acres of coastal habitat had been enhanced over the program history. Projects include creation or enhancement of mangroves, coastal wetlands, dunes, and hammocks along Biscayne Bay, shoreline stabilization, bay island enhancement, and access improvements. These activities are funded primarily through mitigation payments derived from permits for coastal construction and matching revenues from state appropriations or grants. Figure 7 shows the cumulative acres of coastal habitats restored or enhanced.

Figure 7



Wetlands

Wetlands in Miami-Dade serve several vital functions which are essential to the ecological health of South Florida and the welfare of the people and wildlife. Much of Miami-Dade sits at an elevation that is in close proximity to groundwater levels, and this is especially true of wetlands, which tend to be found in lower lying, poorly drained, depressional areas. As such, one of the most important functions of wetlands is to provide direct recharge of water to the Biscayne Aquifer, the County's main source of drinking water. Moreover, because they are often at a lower elevation than surrounding areas and do not drain as quickly, wetlands act as storage areas for containing storm runoff to help minimize flooding and serve to filter and purify surface and ground waters that flow through them. Wetlands also provide habitat for wildlife, including many rare, threatened, and endangered species.

The County seeks to protect and manage the intrinsic value of the wetlands through the wetland regulatory program. Much of the remaining wetlands left today in Miami-Dade are part of the current Everglades National Park and Biscayne National Park, or were historically part of the original natural boundaries of these two protected areas.

Miami-Dade County Code requires that a Miami-Dade County Class I or IV Wetland Permit be obtained for all work within wetlands. While a Wetland Basins map exists showing areas that are likely to contain wetlands, the boundaries shown are approximate and it does not encompass all possible wetlands areas within the County. Therefore, it is a guidance document and not an absolute location map. For regulatory purposes, the Department of Environmental

Resources Management can provide onsite evaluation to determine the location. As part of this Sustainability Assessment, the acreage of existing wetlands within the County was estimated using the best available technology. Wetlands within the boundaries of Everglades National Park, Biscayne National Park islands, and the Water Conservation Areas were excluded from this effort as they would skew any attempt to quantify wetlands losses as a result of the wetlands regulatory program. Figure 8 represents the closest approximation possible to the current number of acres that fall inside and outside of the Urban Development Boundary (UDB) that meet the regulatory definition of wetlands.

Figure 8: Acres of existing wetlands within Miami-Dade County (excludes Everglades National Park, Water Conservation Areas and Offshore Islands in Biscayne National Park)

Location	Number of Acres
Inside the UDB	7,200
Outside the UDB	141,000
Total:	148,200

The determination of acres of mitigation lands within the County is more accurate as it includes the largest parcels that have been tracked as part of the mitigation banking process or as part of the Lake Belt Mitigation Committee purchase program. Between them, the two mitigation banks and the Pennsucco Wetlands make up a large percentage of the wetlands mitigation acreage in the County. Figure 9 shows the approximate acres of mitigation wetlands within Miami-Dade County, with 6,000 of those falling within the Everglades Mitigation Bank (owned and operated by FPL), 4,100 of those falling within the Hole-in-the-Donut Mitigation Bank in Everglades National Park and 11,250 of those falling within the Pennsucco Wetlands or onsite at the locations of the impacts.

Figure 9: Acres of mitigated wetlands within Miami-Dade County

Mitigation Area	Number of Acres
Hole-in-the-Donut	4,100
Everglades Mitigation Bank	6,000
Others (Pennsucco, onsite	11,250
Total:	21,350

As part of the wetlands regulatory program, tracking of permits and their associated authorized impacts is essential to any effort to quantify the effects of the program as a whole. Since 1999, there have been 521 Class IV permits issued totaling approximately 13,371 acres of impacts to freshwater wetlands. This number represents approximately 10 percent of the total wetland acreage existing within the County currently (excluding the National Parks and Water Conservation Areas).

Tree Canopy

A community's green infrastructure provides many environmental, social, and economic benefits. A healthy urban forest, in particular, provides environmental benefits by slowing stormwater runoff, improving water quality, protecting soil from erosion, improving air quality, and storing atmospheric carbon. Urban forests are important because having an adequate amount of tree canopy offsets the negative effects of carbon in the atmosphere.

The introduction to the Executive Summary of the County's Street Tree Master Plan (STMP) adopted in 2007 states:

> *"The urban forest is stressed in many cities around the country, but in Miami-Dade County our urban trees are in critical condition. A number of factors have contributed to the diminished tree cover in Miami-Dade, but the problem became even more significant after the tree destruction by the 2005 hurricanes, Katrina, Rita and Wilma. Hurricanes and windstorms do not account for the entire deficit in tree cover. Further causes include development activities, increased impervious areas, and the removal of trees due to citrus canker."*

There are several studies that discuss the social and economic benefits of a healthy urban forest. Healthy tree canopy increases property values, protect property from hurricanes by serving as a wind break, increase and improve wildlife habitat, reduce noise levels by up to 50 percent, contribute to economic sustainability and enhanced 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".

In 2006, Miami-Dade County adopted the Street Tree Master Plan that sets a target of 30 percent tree canopy cover for our County by 2020. This target is a national average at which a metropolitan area reaps the optimal benefits that a healthy urban forest provides. An Urban Ecosystem Analysis conducted by American Forests in 2007 reported that Miami-Dade County has 18 percent tree canopy coverage within the Urban Development Boundary in comparison to less than 10 percent in 1996. "The Structure, Function, and Value of Miami-Dade County's Urban Forest" is a separate study based on the Urban Forests Effects model conducted by Dr. F. Escobido of the University of Florida in 2008. The study reported canopy coverage of approximately 12 percent translating into 13.9 million trees in our urban forest. Efforts are underway to increase the tree canopy in areas that are deficient and to develop systems to monitor the overall health and function on Miami-Dade's urban forest.

AIR QUALITY

The topography and meteorological patterns of South Florida help remove harmful air emissions from our community. The indicators reveal that the overall air quality in Miami-Dade falls within the "Good" range of the Environmental Protection Agency's (EPA) National Ambient Air Quality Standards over 80 percent of the days of the year. While this is true, the days when the air quality falls within the Moderate and Unhealthy for Sensitive Groups categories are of concern for the populations more sensitive to air pollution, such as the elderly and very young, and those suffering from respiratory illnesses and diseases.

Additionally according to the Florida Department of Health, the County's asthma hospitalization rate has more than doubled in the last 10 years. The hospitalization and death rate associated with heart disease are higher than the national average. Furthermore, the imminent strengthening of the National Ambient Air Quality Standard (NAAQS) for ozone in 2010 will likely result in exceedances of these health-based standards in the near future.

In April 2009, EPA made findings under the Clean Air Act that six key greenhouse gases (GHGs) constitute a threat to human health and welfare and as such shall be regulated air pollutants. The regulation of these emissions will result in future indicators and key challenges as they relate to air pollution. While climate change is discussed at length in a separate section, it is important to note its interconnection with air pollution. In fact, while transportation is the largest contributor to local smog-forming air pollutants it is the second largest contributor to local CO2 emissions. Therefore, just as the sources of traditional and 'new' air pollutants are similar, initiatives to reduce those emissions will provide co-benefits for air quality and climate change mitigation.

National Ambient Air Quality Standards (NAAQS)

The Clean Air Act of 1970 defined the following six criteria pollutants and established ambient concentration limits to protect public health and welfare: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO2), fine particulates (PM2.5), sulfur dioxide (SO2), and lead (Pb).

Miami-Dade County currently meets all NAAQS standards. This is determined by measuring the concentration of the criteria pollutants in air samples collected from a network of ambient air quality monitors located throughout Miami-Dade. Ozone and fine particulate matter are the two pollutants closest to the established NAAQS Attainment Values. Figure 10 depicts Miami-Dade County's ozone attainment status over a 10 year period. The line graphs represent the attainment averages for each of the two ozone monitoring sites in Miami-Dade County. The ozone standard was made more stringent in 2007 (red line) and monitoring data reveals that ambient concentrations are nearing those health-based standards (triangles and squares are individual daily readings and green and blue lines are annual averages).

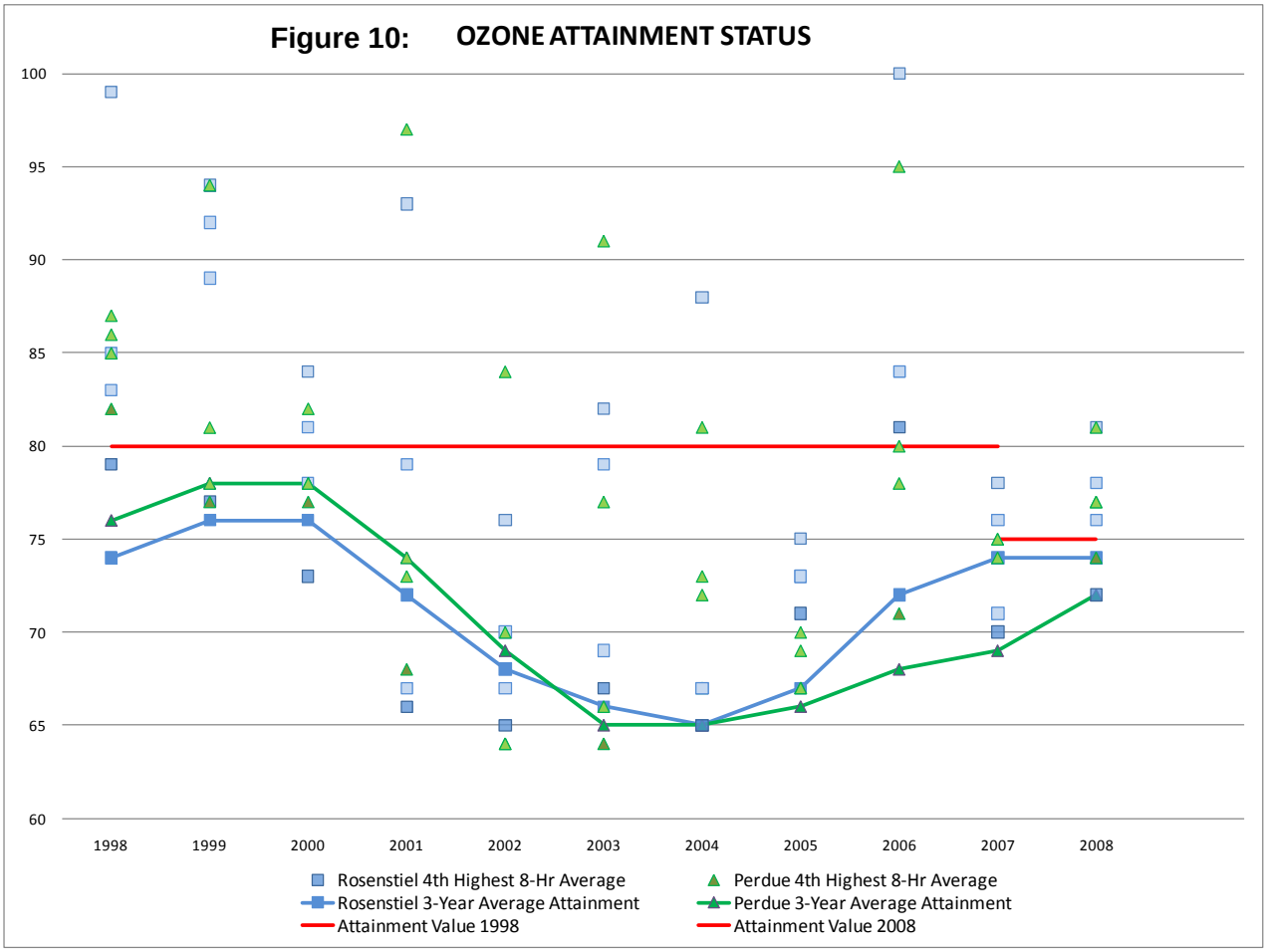
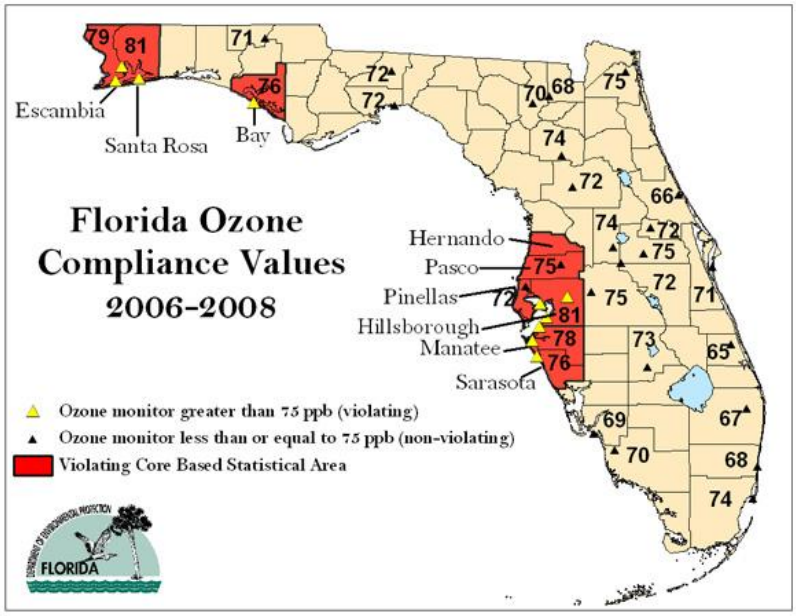


Figure 11 is a map depicting the 2006-2008 Ozone Attainment Status for all counties in the State of Florida (Ozone NAAQS is 75 ppb).

Figure 11

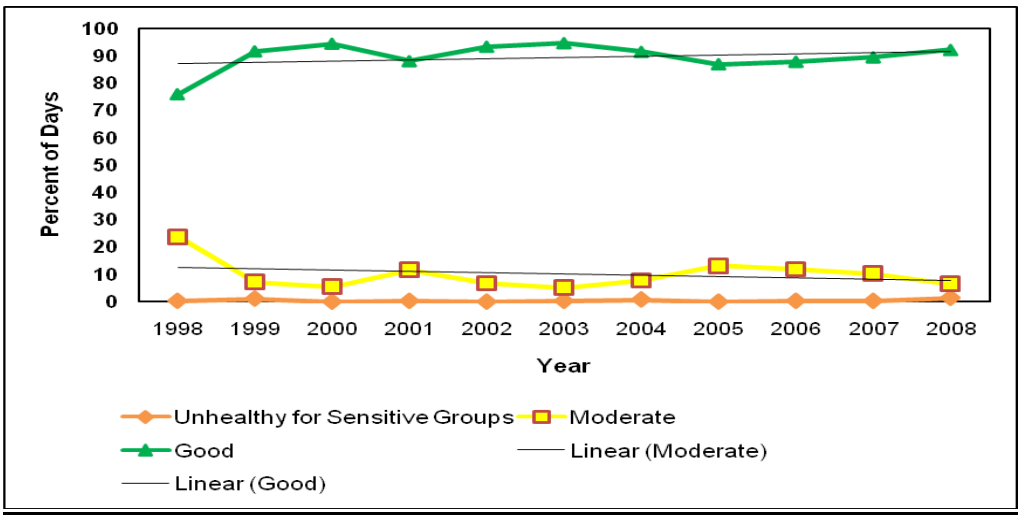


Air Quality Index Results

The Air Quality Index (AQI) was established as a reporting mechanism for the measurement of pollutants with NAAQS. The AQI converts the concentration of each measured pollutant present in the air to a number on a scale of 0 to 500, to which a category and color is assigned. Each category corresponds to a different level of health concern. The pollutant with the highest reading for a given day is reported in the daily Air Quality Index. Ozone and PM2.5, fine particulate matter, are the pollutants that are usually the governing (reported) pollutant for the AQI. In 2007-2008, Ozone was reported 72 percent of the time (days) and PM2.5 was reported 38 percent of the time.

The comparison of the AQI over the last 10 years (1999 to 2008) shows that the air quality in Miami-Dade has remained constant. The percentage of over 80 percent of days every year is in the Good range as shown in Figure 12.

Figure 12: Air Quality Index (AQI) Results



Air Pollution Sources

There are many different types and sizes of sources such as factories, power plants, dry cleaners, cars, buses, trucks and even windblown dust and wildfires. Emissions inventories conducted in the past reveal that emissions from mobile sources account for approximately 70 percent of the smog-forming ozone pollution in Miami-Dade County. Local industry also contributes to air pollution. These may range from smaller 'area sources' that collectively contribute emissions, such as vehicle repair and painting facilities, to larger 'point sources' such as power plants, cement manufacturing facilities, metal foundries, and landfills. Figure 13 is a list of facilities with Title V Major Source Air Pollution Permits.

Figure 13: Active Title V Major Source Air Pollution Permits

Industry Type	Facility Name
Aerospace Repair	AAR Landing Gear
	Goodrich Corporation
	Aero Kool Corp.
Cement Manufacturer	Titan America
	CSR Rinker Materials
Fiberglass Boat Manufacturer	RAM Investments
	Angler Boats
	Bertram Yacht
	Contender Boats
	Cigarette Racing Team
Fiberglass Products	DM Industries
Food Production/Baking	Flowers Baking
Grey Iron Foundry	US Foundry
Hospital/Incineration	VA Hospital
Inflatable Product Manufacturer	Eastern Aero Marine
Power Generation	City of Homestead Electric Utility
	FPL (Turkey Point)
	FPL (Cutler)
Surface Coating	Benada Aluminum
	Dyplast Products
	Exteria Building Products
	Fine Arts Lamps
Waste Operations	North Dade Landfill
	South Dade Landfill
	Resources Recovery (Waste Handling)
	Waste Management Landfill
Water/Wastewater Treatment	WASD-Virginia Key
	WASD - South District
	WASD - North District
	WASD - Hialeah/Preston
	WASD -Alexander Orr

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Comprehensive Development Master Plan

The Comprehensive Development Master Plan (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. As such, it is a framework for use by other programs to be developed to support its long-range planning goals. For each of the master plan elements, there are goals, objectives and policies, measures to be monitored and maps of planned future facilities.

The CDMP establishes a growth policy that encourages development:

- At a rate commensurate with projected population and economic growth.
- In a contiguous pattern centered around a network of high-intensity urban centers well-connected by multi-modal intra-urban transportation facilities.
- In locations which optimize efficiency in public service delivery and conservation of valuable natural resources.

The goal for the conservation, aquifer recharge and drainage element is to "PROVIDE FOR THE CONSERVATION, ENVIRONMENTALLY SOUND USE, AND PROTECTION OF ALL AQUATIC AND UPLAND ECOSYSTEMS AND NATURAL RESOURCES, AND PROTECT THE FUNCTIONS OF AQUIFER RECHARGE AREASAND NATURAL DRAINAGE FEATURES IN MIAMI-DADE COUNTY."

- *Objective CON-1:* Improve air quality in the County to meet all National Ambient Air Quality Standards set by the Environmental Protection Agency (EPA) and their respective deadlines; and reduce human exposure to air pollution. Policies: CON-1A, CON-1B, CON-1C, CON-1D, CON-1E, CON-1F, CON-1G, CON-1H, CON-1L, CON-1J, CON-1K, CON-1L
- *Objective CON-2:* Protect ground and surface water resources from degradation, provide for effective surveillance for pollution and clean up polluted areas to meet all applicable federal, state and County ground and surface water quality standards. Policies: CON-2A, CON-2B, CON-2C, CON-2D, CON-2E, CON-2F, CON-2G, CON-2H, CON-2I, CON-2J, CON-2K, CON-2L
- *Objective CON-3:* Regulations within wellfield protection areas shall be strictly enforced. The recommendations of the NW Wellfield Protection Plan shall continue to be fully implemented, as are recommendations that evolve from the West Wellfield and South Dade Wellfield planning processes. Policies: CON-3A, CON-3B, CON-3C, CON-3D, CON-3E, CON-3F, CON-3G, CON-3H
- *Objective CON-4:* The aquifer recharge and water storage capacity of the presently undeveloped areas in western and southern Miami-Dade County shall be maintained or increased. Policies: CON-4A, CON 4B, CON-4C, CON-4D, CON-4E, CON-4F, CON-4G
- *Objective CON-5* Miami-Dade County shall continue to develop and implement the Stormwater Master Plans comprised of basin plans for each of the twelve primary hydrologic basins being addressed by the County, and cut and fill criteria as necessary to: provide adequate flood protection; correct system deficiencies in County maintained drainage facilities; coordinate the extension of facilities to meet future demands

throughout the unincorporated area; and maintain and improve water quality. The Stormwater Master Plan is projected to be completed in 2005, and implementing actions recommended in each basin plan shall continue to commence immediately after the applicable plan is approved. Outside of the Urban Development Boundary the County shall not provide, or approve, additional drainage facilities that would impair flood protection to easterly developed areas of the County, exacerbate urban sprawl or reduce water storage. Policies: CON-5A, CON 5B, CON-5C, CON-5D, CON-5E, CON-5F, CON-5G, CON-5F, CON-5G, CON-5H

- *Objective CON-6:* Soils and mineral resources in Miami-Dade County shall be conserved and appropriately utilized in keeping with their intrinsic values. Policies: CON-6A, CON-B6, CON-6C, CON-6D
- *Objective CON-7:* Miami-Dade County shall protect and preserve the biological and hydrological functions of the Future Wetlands identified in the Land Use Element. Future impacts to the biological functions of publicly and privately owned wetlands shall be mitigated. All privately owned wetlands identified by the South Florida Regional Planning Council as Natural Resources of Regional Significance and wetlands on Federal, State, or County land acquisition lists shall be supported as a high priority for public acquisition. Publicly acquired wetlands shall be restored and managed for their natural resource, habitat and hydrologic values. Policies: CON-7A, CON-7B, CON-7C, CON-7D, CON-7E, CON-7F, CON-7G, CON-7F, CON-5G, CON-7H, CON-7I, CON-7J
- *Objective CON-8:* Upland forests included on Miami-Dade County's Natural Forest Inventory shall be maintained and protected. Policies: CON-8A, CON-8B, CON-8C, CON-8D, CON-8E, CON-8F, CON-8G, CON-8F, CON-8G, CON-8H, CON-8I, CON-8J, CON-8K, CON-8L, CON-8M, CON-8N
- *Objective CON-9:* Freshwater fish and wildlife shall be conserved and used in an environmentally sound manner and the net amount of habitat critical to federal, state or County designated endangered, threatened, or rare species or species of special concern shall be preserved. Policies: CON-9A, CON-9B, CON-9C, CON-9D, CON-9E, CON-9F

The Street Tree Master Plan

The 2007 The Street Tree Master Plan and the CDMP established a goal of 30% canopy coverage. The STMP also calls for the planting of quality trees in public rights-of-way, educating policy makers and the public on the importance of adequate tree canopy, promoting the design of urban spaces that adequately fit trees, developing and executing a tree management plan to craft sustainable tree structure, and encouraging local growers to produce the quality and species for public rights-of-way.

The Stormwater Master Plan

The Stormwater Master Plan goal is to develop and maintain plan for Miami-Dade County's hydrological basins through inter-agency grants, Stormwater Utility Funds or contractual agreements. The purpose of the master plan is to: document background investigations, evaluate existing water quantity and quality problems, and present recommended stormwater management solutions

The Stormwater Management Master Plan is an essential step towards identifying and solving the drainage related water quality problems in the County's Canal system, which discharges to Biscayne Bay. The Master Plan identifies and maps existing stormwater systems, estimates the effects of existing and future land uses on flood protection and water quality, and developing "Best Management Practices" (BMPs) for flood reduction and water quality improvement.

Existing Legislation

- Numerous federal, state, and local regulations protect water and natural resources, including Chapter 24 Miami-Dade Environmental Protection Code, Chapter 62 Florida Administrative Code (multiple sections), Code of Federal Regulations 40-403, Chapters 373, 376, 403, and 253 of Florida Statutes and the Clean Water Act.

- The 2007 Miami-Dade County Water Use Permit requires the County to develop and implement alternate water supply projects to meet the County's future water supply needs.

- The Florida legislature in 2008 approved a bill prohibiting most ocean outfalls of treated waste water after December 31, 2025.

- The Miami-Dade County Stormwater Utility operates through Article V, Chapter 24 of the Environmental Protection Code of Miami-Dade County which was created and established by the authority of Section 403.0891(3) Florida Statutes. Explicit authority is granted to the Utility to adopt stormwater utility fees sufficient to plan, construct, operate, and maintain stormwater management systems as set forth in the local program.

- Numerous federal, state, and local regulations to control and/or reduce emissions of air pollution from stationary and mobile sources of air pollution. Examples include the Clean Air Act, the Florida Administrative Code, and Chapter 24 of Miami-Dade County.

Federal

- *Proposed Greenhouse Gas Permitting Requirements on Large Industrial Facilities*
  On September 30, 2009 EPA proposed new thresholds for GHG emissions that define when Clean Air Act permits under the New Source Review and Title V operating permits programs would be required. The proposed thresholds would tailor these permit programs to limit which facilities would be required to obtain permits and would cover nearly 70 percent of the nation's largest stationary source GHG emitters—including power plants, refineries, and cement production facilities, while shielding small businesses and farms from permitting requirements. These thresholds would expand local regulatory programs.

- *Final Mandatory Reporting of Greenhouse Gases Rule*
  EPA has issued the Final Mandatory Reporting of GHG Rule. Signed by the Administrator on September 22, 2009, the rule requires in general that suppliers of fossil fuels and industrial greenhouse gases (GHGs), manufacturers of vehicles and engines outside of the light duty sector, and facilities that emit 25,000 metric tons or more of GHGs per year to submit annual reports to EPA. The rule is intended to collect accurate and timely emissions data to guide future policy decisions on climate change.

- *EPA and NHTSA Propose National Program to Cut Greenhouse Gas Emissions and Improve Fuel Economy for Cars and Trucks*
  On September 15, 2009, EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) proposed a new national program that would reduce greenhouse gas emissions and improve fuel economy for all new cars and trucks sold in the United States. EPA proposed the first-ever national greenhouse gas (GHG) emissions standards under the Clean Air Act, and NHTSA proposed Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act. This proposed national program would allow automobile manufacturers to build a single light-duty national fleet that satisfies all requirements under both Federal programs and the standards of California and other states.

Current Initiatives

- The County implements a broad array of regulatory, monitoring and assessment, restoration, endangered land acquisition, and water management programs to protect, maintain or improve air, ground and surface water quality and to conserve or enhance environmentally sensitive natural habitats. These programs include initiatives undertaken pursuant to the County's own local authority, as well as collaborative efforts with federal, state, other local government and non-government resource management partner organizations.

- Federal, state, and local water managers are beginning to develop regional models to more effectively assess sea level rise and establish consistent, shared planning scenarios and climate data for South Florida. The County has already contributed by collecting improved topographic data and developing landscape models to illustrate the potential extent of inundation. Because the aquifer is very porous and South Florida peninsula is low-lying and surrounded by the sea, rising water will approach from all sides and through the underlying substrate.

- CERP and CERP-related projects that directly affect Miami-Dade County include the Tamiami Trail component of the Modified Water Deliveries, the C-111 Spreader (Western), and the Biscayne Bay Coastal Wetlands. Groundbreaking on initial construction phases of the Tamiami Trail and C-111 Spreader projects occurred in December 2009 and January 2010, respectively. Construction of initial components of the BBCW awaits Congressional authorization and funding, but may begin within the next fiscal year. Completion of all phases of these projects will occur over a decade or more. Federal authorities are also updating operation plans for canals, pump stations and other infrastructure that is already in place to improve delivery of water for ecological restoration, water supply, and flood protection.

- DERM is in the process of identifying spatial gaps in the data gathering in order to provide recommendations for the proper coverage when establishing the salt front lines. The process will include the identification of possible monitoring wells needed, along with appropriate depth recommendations, in order to delineate the horizontal and vertical extent of the chloride concentrations.

- The proposed construction of a control structure at the Card Sound Road Canal has been identified as one element to help combat the saltwater intrusion issues noted in the groundwater and surface water monitoring stations.

- In 2008 the County approved the design and construction of a 23 million gallons per day (mgd) advanced waste water treatment plant with recharge to the Biscayne Aquifer and indirect potable use and recently concluded a five month pilot test of the proposed treatment system. As reuse/recharge projects are implemented, the existing monitoring network will be evaluated and monitoring locations and indicator contaminants strategically added especially in areas of recharge. With the implementation of the advanced treatment South District Water Reclamation Plant, the County will join California among the elite in the nation with respect to producing high quality reclaimed water.

- US EPA National Clean Diesel Campaign Grant Projects: Transit Hybrid Bus Replacement Project, Clean Diesel Repower Rebate Program for Local Farmers, Project RIDE (Reducing In-Cabin Exposure to Diesel Emissions) – School Bus Clean Diesel

Exhaust Retrofit Grant, Community Bus and Non-Road Clean Diesel Exhaust Retrofit Grant

COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

2035 Miami-Dade County Long Range Transportation Plan Public Involvement Survey October 2008

Public feedback was collected through both an online survey and the use of the OptionFinder Technology during public involvement sessions held throughout the County. A total of 417 responses were collected through the online survey, while a total of 294 responses were collected during public involvement sessions. The following is an air pollution-related question and result:

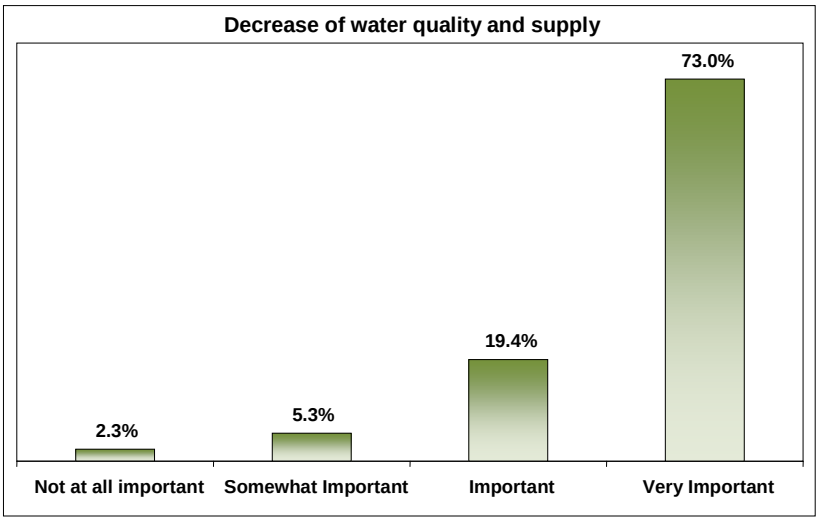
Environment

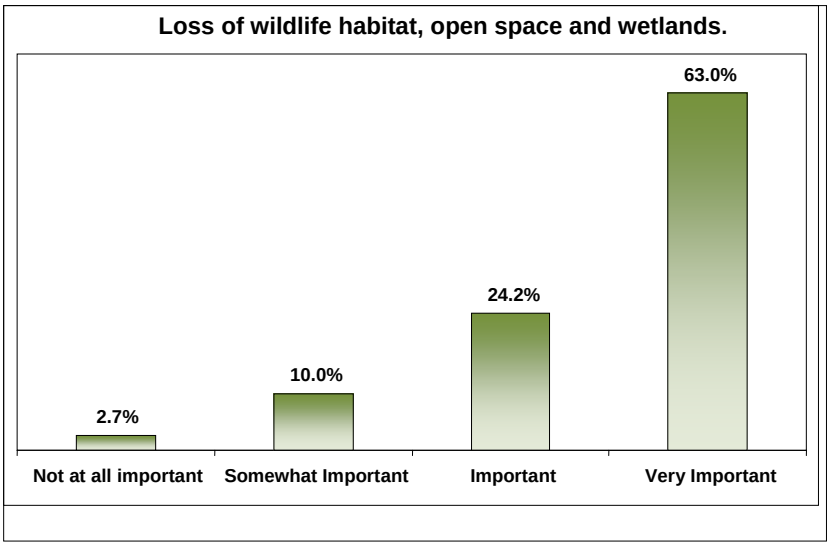
When asked about environmental issues, respondents were asked to rate the importance of each in a list of concerns that could be impacted by future transportation improvements on a four-point rating scale, where 1=Not At All Important, 2=Somewhat Important, 3=Important, and 4=Very Important. **Table 4** shows the list in rank order from highest to lowest level of importance.

According to **Table 4**, each of the four environmental issues received a high average rating, ranging from 3.4 to 3.6. This shows that respondents believe that these issues are all important. **Figures 16 through 19** show the percentage breakdowns of the responses to each of the individual issues.

Table 4

Item	Frequency of Responses					Average
	1 Not At All Important	2 Somewhat Important	3 Important	4 Very Important	Total Responses	
Decrease of water quality and supply	15	35	129	485	664	3.6
Decline of air quality	16	61	133	456	666	3.5
Loss of wildlife habitat, open space and wetlands	18	66	160	416	660	3.5
Global warming	47	63	154	408	672	3.4





Miami-Dade County Resident Satisfaction Survey 2008

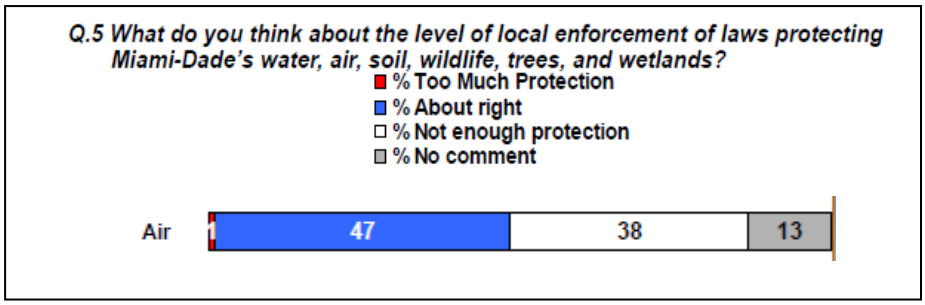
2008 County Resident Survey	Percent Positive Ratings (4&5)	Change since 2005
Cleanliness of waterways near your home	60.1%	11.1%
Prevention of street flooding on major streets	48.9%	9.9%
Prevention of street flooding on side streets	47.6%	6.6%
Tree canopy along major streets*	58.9%	18.9%
Tree canopy along side streets	57.7%	14.7%

**Highest positive percent change in 2008 survey and most improved area 2005 vs. 2008*

DERM's Resident & Permitted Business Survey, Hay Group 2003

Public feedback was collected in 2003 through a sample of 2,000 Miami-Dade County residents and 3,000 permitted businesses. Summary of results:

- 79 percent of residents responded that environmental protection is extremely important
- 42 percent of residents responded that the level of local enforcement of laws supporting wetlands is not enough protection
- 35 percent of residents feel that laws protecting all environmental resources (*water, air, soil, wildlife, trees, and wetlands)* are not enough
- As opposed to businesses, residents view DERM's application of regulations as too lenient across many resources, especially wetlands.



Results indicate that air and water pollution are considered the most important resources to address.

Resources Important to Address	Most	Least
Air Pollution	57	7
Coral Reef Damage and Disease	15	27
Global Warming	17	26
Space for Future Landfills	7	37
Littering & Illegal Dumping	21	18
Loss of Tree Canopy	13	26
Loss of Wetlands	14	20
Any type of Water Pollution	53	2

Air and Water pollution most important (and, as seen earlier, many feel not enough done to protect these resources)

Government Operations

Miami-Dade County government is comprised of 58 departments with more than 28,000 employees working to serve the needs of the County's residents and businesses. The County provides countywide services for all residents such as emergency management, mass transit and elections. Municipal-type services such as police, parks, public works, and zoning are also provided by the County to the approximately 1.081 million residents living in the Unincorporated Municipal Service Area (UMSA).

This section examines the consumption of fuel, electricity and water for all county operations, and the scope of county purchasing. It also examines airport and seaport operations and their importance as an economic engine for the local economy. This self-assessment identifies challenges, establishes a sustainability baseline, and will position county government to lead the community-wide sustainability planning effort.

Government Operations

Assessment Area

Miami-Dade County government is comprised of 58 departments with more than 28,000 employees working to serve the needs of the County's residents and businesses. The County provides countywide services for all Miami-Dade residents such as emergency management, mass transit and elections. Municipal-type services such as police, parks, public works, and zoning are also provided by the County to the approximately 1.081 million (or 43.8 percent) residents living in the Unincorporated Municipal Service Area (UMSA). If UMSA was declared a city, it would form the largest city in Florida and one of the largest in the nation.

Providing services requires significant purchases of materials and services and access to reliable energy, both electricity and fuel, to support operations, equipment and vehicles. And, in the process of providing services to the community, government operations consume millions of gallons of fuel for a variety of purposes such as light duty passenger cars; heavy duty vehicles such as buses, fire trucks and garbage trucks; heavy duty equipment such as mowers, bulldozers, and bucket trucks; and pumps for water and sewer services and storm water control. In addition, the County owns or leases nearly 1,500 facilities with a combined floor area of over 48.2 million square feet. About 96 percent of these facilities are county-owned, and vary widely in size and function.

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The Miami-Dade Aviation Department's (MDAD) mission is to cost effectively operate airport facilities that are safe, efficient, customer friendly, environmentally responsible and contribute to the economic growth of the community. MDAD must ensure the quick and safe transport of people and goods via multiple methods of transport: aircraft, truck, and passenger vehicles. The internal operations of the airport itself, from aircraft to ground support vehicles, as well as the operations of industrial tenants and companies that transport passengers and cargo, have a great potential for impacting the surrounding natural environment and resources.

The Seaport Department provides service to cruise passengers, cargo shipping commerce, and other members of the maritime community. The Port operates as a tenant-landlord port with container terminals operated by several private terminal companies. Tenants and ancillary services that transport passengers and goods have a great potential for impacting the surrounding natural environment and resources. Moving people and goods efficiently naturally translates to environmental benefits through a reduction in the consumption of resources and emissions.

The County is positioned to leverage its purchasing power to influence the market in both price and availability of environmentally-preferred products in the marketplace. "Green" or Environmentally Preferable Purchasing (EPP) includes the selection of products and services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose.

To date, much has already been accomplished. To facilitate the sustainable transformation of the County with respect to organizational culture, operations, infrastructure, and service delivery, the Office of Sustainability was created in 2007. The office assists departments and leads initiatives that enable the County to target and realize improved performance that simultaneously values economic, social and environmental impacts and opportunities. And, working together with the Office of Strategic Business Management, for the first time all departments are required to include sustainability efforts in their FY 2009-10 business plans and link them to their performance scorecard, as well as track their fuel and electricity consumption.

Our challenge is to continue providing these essential services and shift our business operations to a more sustainable, energy efficient and, in the long run, more economical model. This assessment, the first milestone in creating a community sustainability plan, is a huge step in the right direction towards achieving our energy and greenhouse gas reduction goals.

Electricity – Government Operations

Assessment Area

Miami-Dade County government operations account for approximately four percent of the total energy consumed community wide. In 2008 the County used approximately 1.18 billion kilowatt hours (kWh) in 2008 at a cost of $117 million dollars (at the time of this assessment, 2009 data had not been finalized). Initiatives to reduce energy consumption have been in place for years including the extensive program for the energy-efficiency retrofit of existing buildings as well as more recent initiatives like the Sustainable Buildings Ordinance in 2007. Even more recent is the new array of projects to be funded through several million dollars in federal energy-efficiency grant dollars designed to greatly improve centralized management of electricity consumption, improve energy efficiency of facilities and pilot the use of innovative and emerging energy efficiency and alternative/renewable energy technologies. Challenges implementing these existing programs remain as do opportunities to embark on new ones, due to the sheer demand and diversity of electricity consumption in county operations.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Meeting the goal of reducing electricity consumption in county operations by 20 percent by 2014. This would require an approximate three percent reduction per year versus a current growth trend of more than two percent per year.
- Managing energy consumption in new energy intensive operations such as the High Level Disinfection (HLD) plant currently under construction. HLD is a precursor to the future reclaiming of wastewater.
- Improving our understanding of how we use electricity and the efficiency of existing facilities and their systems without costly energy management systems.
- Decreasing peak load demand. Peak load demand results in the use of less efficient and high polluting power generation fuels.
- Maximizing the energy-efficiency of new and existing buildings by improving current capital planning, budgeting, design, construction and operations procedures.
- Increasing the awareness and use of the energy performance contracting program as a critical tool in achieving energy and water reduction target reductions.
- Securing financing of energy-efficiency and conservation improvements for both low-cost behavior-based and higher cost retrofit opportunities. This includes currently underutilized Federal tax credit incentives for retrofits, tax credit bonds and rebates and incentives available through our utility, as well as significantly increasing the use of performance-based contracting amongst County departments.
- Securing financing for renewable energy projects/production. Making energy (both electricity and fuel consumption) an important performance issue for the entire Miami-Dade County enterprise including the development and implementation of an energy master plan.

ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

Addressing our energy management challenges will require a coordinated and performance-oriented effort across the enterprise. Figure 1 provides information on a current preliminary self assessment of Miami-Dade's energy management capabilities across a series of parameters.[1]

[1] Source: Energy Management and Research Associates: www.emra.com

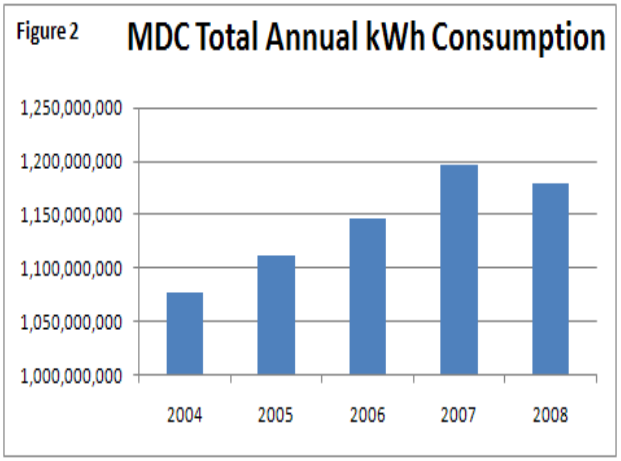
Some of these scores below are quite different than if they were reported a year or even six months ago due to the emerging energy management initiatives. Just like any other significant performance issue for an organization, effective and strategic planning for the use of energy requires an emphasis on policy, organizational coordination, behavior/cultural change, information management, marketing and investment.

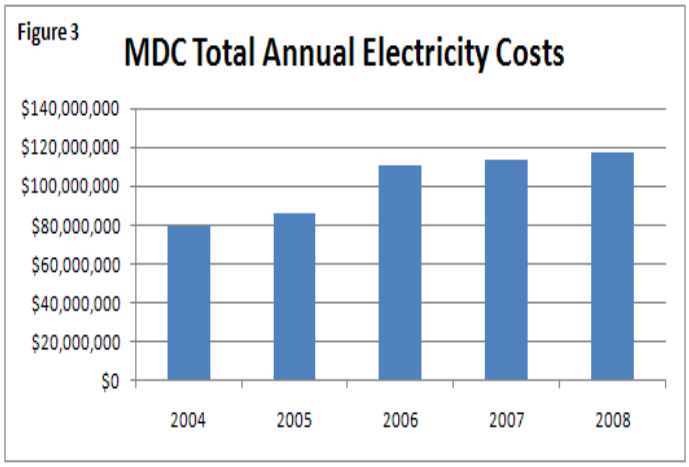
Figure 1: Self-Evaluation of MDC Energy Management Capabilities

ENERGY MANAGEMENT PARAMETER	SCORE (0-4)
Energy Policy: components of a formal policy → active management commitment	3
Organizing: Part-time → full-time Energy management responsibility	1.5
Motivation: Informal contacts between engineers → contact with major users through committee	1.5
Information Systems: Cost reporting based on invoice data; engineer compiles reports for tech depts → upgrades planned	1.5
Marketing: Informal contacts used to promote energy-efficiency /some training → regular staff awareness	2
Investment: Short term payback → Some payback criteria employed as for all other investment	2.5

Energy Demand/Consumption

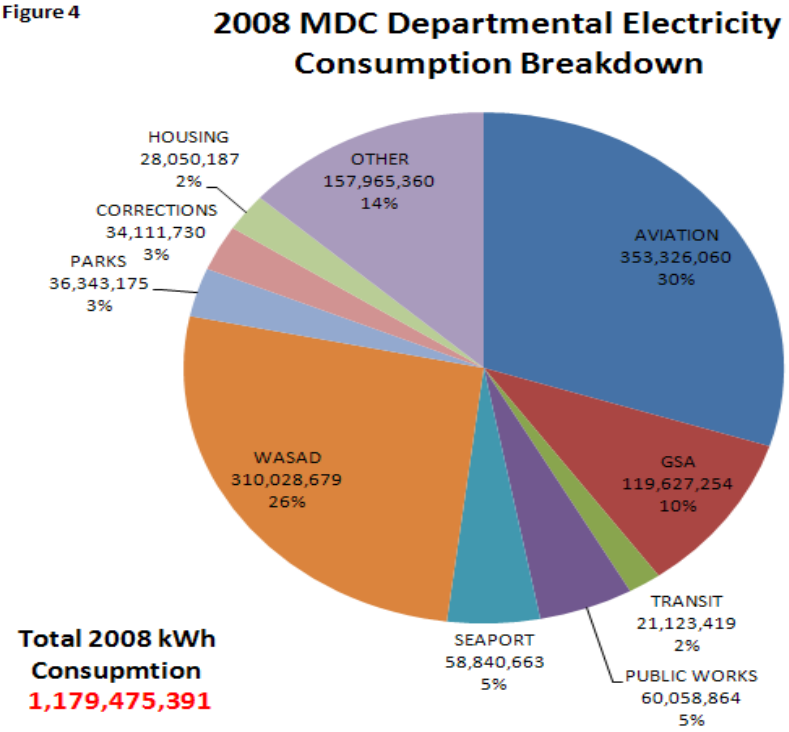
Electricity consumption (kWh) related to County government operations has seen an average annual increase of 2.35 percent since 2004 (Figure 2), and an associated 12.04 percent average annual increase in costs (Figure 3).





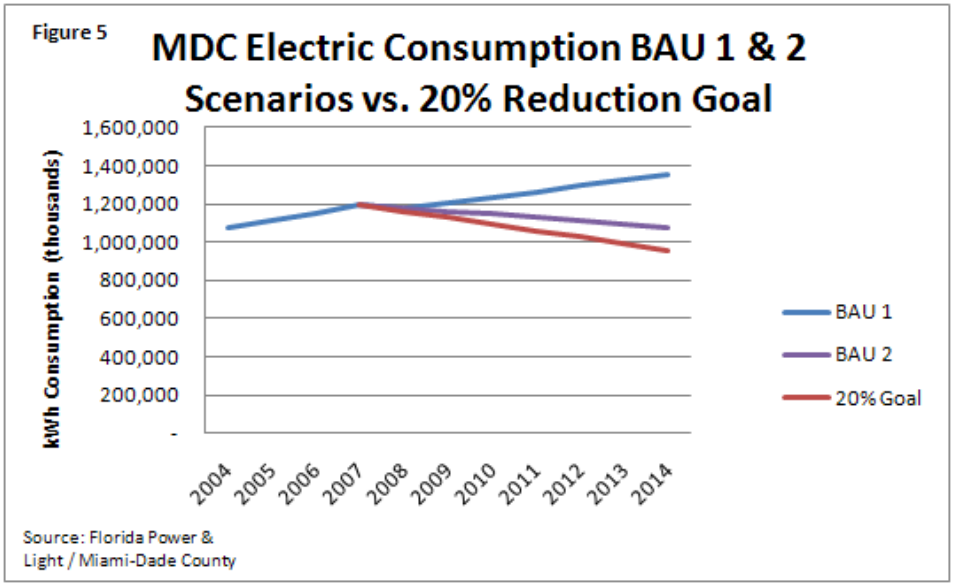
Aside from total consumption and departmental breakdown of consumption (Figure 4), a better understanding of the efficiency of each energy account, facility or energy consuming asset within a department will enable better energy management.

Figure 4



Reducing Energy Consumption

In 2009, the County committed to a 20 percent reduction in electricity consumption by 2014 from a 2007 baseline. Figure 5 illustrates how the County's business as usual (BAU) consumption looks based on the consumption growth rate over the 2004-2008 period (BAU Scenario 1) and based on the rate of decrease in consumption observed from 2007-2008 (BAU Scenario 2) versus the 20 percent reduction goal. Currently, the County is undergoing an energy consumption survey of planned capital projects that will be online by 2014 to better understand our business as usual consumption.



EPA Energy Star Portfolio Manager

The County is embarking on improved tracking of energy efficiency beginning with its use of the EPA Energy Star Portfolio Manager (PM) facility energy performance benchmarking tool to evaluate energy performance of facilities on an on-going basis. In an effort to improve the understanding of how energy-efficient many of the facilities the County owns and operates are, the County began benchmarking the energy performance of facilities in 2008 utilizing EPA Energy Star PM online software tool.

PM provides a score for a facility which is relative to the performance of a similar building elsewhere in the US normalized for weather conditions. The score is derived from a combination of electricity consumption and space utilization data (e.g. number of occupants, square footage, number of computers, use type information, etc.). A score of 50, for example, equates to performance that is better than 50 percent of buildings of the same type - verify. Building with scores of greater than or equal to 75 can apply for certification. While 30+ General Services Administration (GSA) buildings are currently tracked through PM, seven are certifiable:

Facility	As of 2nd Quarter 2009 Score
State Attorney Building	97
Gerstein Justice Building	91
Cooperative Extension Service	77
Metro Annex Building	77
Elections/311Building	75

Once a baseline score is established for a facility, building users together with building/facility managers can together implement an appropriate sequence of low-cost/no-cost behavior changes and facility improvements to improve the energy efficiency and potentially increase the PM score of the facility. Future indicators that this program will provide include (1) number of facilities tracked through PM and (2) change in Energy Star scores for facilities from year to year (choose a month within the year to compare scores from year to year).

Performance Contracting on Existing Buildings

On June 2, 1998, the Board adopted R-614-98, which authorized four contracts that effectively created the County's first energy conservation performance program. The County subsequently

utilized the contracts approved under this resolution to perform over $50 million in energy conservation improvements in County facilities, the result of which has been to create a *recurring* reduction in consumption of nearly 76.7 million kilowatt hours of electricity and over 95.6 million gallons of water every year.

Although that program expired in 2008, the County has utilized a State of Florida term contract to be able to continue and expand upon the energy performance contracting work done by the County. This has enabled the County to establish a new pool of vendors pre-qualified to provide Energy Performance Contracting services. The pool currently has 10 vendors, including the three employed by the County under the prior contracts. Among these 10 firms are several of the largest, most experienced firms in the industry. The larger size of the pool, together with the depth of experience on the part of individual firms, provides the County with increased competition and capacity to perform energy performance improvement projects.

Energy performance contracting provides an invaluable tool for local, state, and federal government agencies to identify, finance and perform energy conservation improvements. Such programs generally offer three major advantages to other capital improvement options. First, projects are typically performed significantly faster than through traditional procurement methods, due to the use of pre-established contractor pools and a design/build project structure. Second, financing for such projects is typically provided via non-capital lease-purchase agreements. The projects qualify for tax-exempt municipal lease rates, which lowers the overall cost of financing. Governments incur no capital obligation and lease payments are contingent only upon annual budget appropriations. And third, the vendors assigned work – each of which is a highly qualified Energy Services Company (ESCO) – contractually guarantee that the equipment procured and installed will achieve the promised energy savings. Thus, each project is backed by a guarantee from an ESCO that project savings will be sufficient to cover the customer's debt service or lease payments. Should project savings (in energy and maintenance expense) fall short of the amount needed to cover the debt, the ESCO pays the difference.

In order to achieve the greatest results, the program has generally focused on the largest accounts e.g. those consuming over 500,000 kilowatt hours (kWh) per year. With respect to the 2007 tally of accounts, a total of 331 of 3,708 or 8 percent of accounts consumed above this level and their collective consumption accounted for 83 percent of the County's total electricity consumption. Potential retrofit activities include energy efficient lighting systems and ballasts, high-efficiency chillers, more efficient water heating systems, building envelope improvements (insulation, storm windows and doors, etc.), low-water consumption toilets, higher efficiency electric motors and drives, replacement of process pumps (e.g. at water and sewer treatment plants), upgrading of heating, ventilation and air conditioning systems, automatic energy control systems, and renewable energy systems (solar, wind, biomass). The projects implemented to date are listed below, together with the reductions in electricity and water consumption for each project. As mentioned above, the annual reduction in electricity consumed totals 76,678,200 kilowatt hours, while the annual reduction in water use totals 95,663,800 gallons.[2] Total electricity savings from these projects (calculated at 2009 utility rates) is $7.948 million per year.

[2] Please see the Water sub-section of Government Operations for more information on water use reduction initiatives for County facilities.

Miami-Dade County - Annual Energy Performance Contract Retrofit Projects

PROJECT	Annual Savings (kWh)	Annual Savings (Gals)	General Description of Retrofits
Public Defender's Building	264,800	N/A	Lighting and Building Controls
Women's Detention Center	597,900	12,782,700	Lighting, air conditioning, plumbing fixtures
GSA Buildings/(FPL). Countywide. Phase I	2,703,800	4,216,500	Lighting, air conditioning, plumbing fixtures
GSA Buildings/(FPL). Downtown facilities. Phase II	4,449,100	7,793,500	Lighting, air conditioning, plumbing fixtures
GSA Buildings/(FPL). Phase III	2,621,800	N/A	Lighting
GSA Buildings/(FPL). Downtown loop	1,677,000	N/A	Improvements to chilled water system
Metro Annex	280,500	N/A	Lighting and air conditioning
MDCR - Metro West & PTDC	5,200,000	45,298,900	Lighting, air conditioning, plumbing fixtures
WASD. Hialeah & NDWWTP	4,813,400	N/A	Lighting and plant motors
MDPD - Headquarters	2,349,100	N/A	Lighting and air conditioning
MDFR - Headquarters	1,972,600	N/A	Lighting and air conditioning
Libraries - 10 locations	1,443,600	N/A	Lighting and air conditioning
GSA Buildings (Siemens). Countywide. Phase I	1,672,500	N/A	Lighting, air conditioning and building controls
GSA Buildings/(Siemens). Countywide. Phase II	3,327,500	N/A	Lighting, air conditioning and building controls
TGK Correctional	4,723,200	17,886,100	Lighting, air conditioning, building controls and plumbing
Justice Center chilled water system	3,265,100	N/A	Improvements to chilled water system
MIA - Various buildings	7,336,000	3,425,200	Lighting, air conditioning and plumbing
MIA - Chilled Water Plants	7,847,000	N/A	Improvements to chilled water plants
MIA - Terminal	10,775,000	N/A	Lighting and air conditioning
MIA - Building 60	1,361,500	N/A	Air conditioning. Replacement of chilled water plant
South District WWTP	5,246,100	N/A	Improvements to digester gas fuel system
MDFR - 32 fire stations	1,410,900	2,104,900	Lighting, air conditioning and plumbing
MDPD- Six stations and Training Bureau	1,339,800	2,156,000	Lighting, air conditioning and plumbing
Totals	**76,678,200**	**95,663,800**	

Sustainable Buildings Program

The County adopted Resolution R-1200-05 in August of 2005 which established a Sustainable Buildings Program and the policy that all future county-owned buildings, either built or renovated, would be done so using “green building” standards. In December 2007, the green buildings criteria for County buildings was further defined, requiring that buildings constructed be done so to U.S Green Buildings Leadership in Energy and Environmental Design (LEED) Silver certification or higher, while renovations must obtain LEED “Certified” status or higher.

The County also encourages private builders to do the same, with incentives such as permit expedites for green building projects approved via Ordinance 05-115 adopted in June 2005. The number of building projects seeking or having achieved LEED certified status or alternative rating is tracked. Green buildings have the potential to save more energy over the baseline design as well as can improve water efficiency, indoor air quality, sustainability of site management and the use, reuse and discarding of materials and resources.

The latest version of the US Green Building Council's LEED standard includes a requirement that certified projects submit their energy performance data over time. This is to ensure that actual consumption is meeting the intended design-based consumption. As such we can expect the green building design and construction process to be an important part of managing our energy growth for new capital construction and the renovation of existing facilities. The Sustainable Buildings Program Annual Report was released in January of 2010 and provided the latest update on all capital projects seeking green building certification or the integration of sustainable measures. Future indicators include tracking of the design determined energy consumption for each ordinance-qualifying building project and tracking of actual vs. planned energy consumption for completed buildings.

Improving Management & Measurement of Energy Use

As the County further improves and integrates a culture of energy management across departments, tools, process and control strategies and behavior-based conservation programs will enable us to continuously maximize energy efficiency. Some areas where we can make significant improvements include centralized coordination of energy policy, making available and using real-time information on energy consumption. This would enable "continuous commissioning" of energy consuming mechanical, electrical and plumbing systems. Ultimately, energy performance would be linked organizational performance across lines of service delivery and operations management.

With respect to commissioning, or the periodic assessment of mechanical, electrical and/or plumbing systems such as air conditioning handling units to ensure they are continuing to operate to meet the needs of facilities while maximizing energy efficiency, we do practice a standard building commissioning of new buildings and the retro or re-commissioning of existing facilities. Wear and tear on mechanical equipment impacts electricity load and timely maintenance can increase both the life expectancy and efficiency of equipment. Similarly the use of facilities and equipment changes over time and requires mechanical systems to be adjusted. This assessment process has shown that we have a data gap which is the commissioning history of County facilities.

The Green Building movement is raising the standard for commissioning, encouraging "enhanced commissioning," and new technology is making the idea of "continuous commissioning" a reality. Miami-Dade's Capital Improvement Department's Equitable Distribution Pool (EDP) has identified a pool of contractors that will enable capital departments to access commissioning services for our sustainable building projects.

Through the Energy Efficiency and Conservation Block Grant (EECBG) Program the County is currently developing a strategy and pilot project to put in place the software, hardware and management/coordination capabilities to enable culture of "continuous commissioning." This will result in timely predictive maintenance versus routine preventative maintenance as well as prompt end-users to conserve energy. Currently some real-time information is utilized for improved mechanical systems management through Building Management Systems equipment and software in place in various facilities in the County.

In relating energy use to our actual organization performance for the services we deliver and the efficiency of our operations, we can increase the use of Energy Use Indices (EUIs) which track energy consumption across various operating parameters. For example, the Miami-Dade Water and Sewer Department (WASD) has the ability to track BTUs required to produce a particular amount of treated water or wastewater. This EUI metric could provide important information for WASD's business model development over time with impacts on capital planning and conservation programs.

Energy Efficient & Alternative Energy Technologies
The aggressive integration of energy efficient and alternative energy generation technologies will be required for the County to meet electricity reduction, climate change mitigation goals and improve resiliency of operations during natural disaster events that disable the electricity grid. Since the up-front capital costs are the most significant obstacle to implementing renewable energy projects, the County has to seek innovative ways of financing including (1) performance-based contracting to bundle long-term payback of renewable energy with the shorter-term payback associated with energy efficiency improvements, (2) Federal tax-credit bonds that enable a discounted interest rate on bonds utilized for clean and renewable energy projects and (3) power purchase agreements (contracts between the County and an energy provider to buy solar energy services, for example, over a fixed period of time). The 'Existing Efforts' category of this section details several current efficiency and alternative energy projects.

Future indicators include (1) anticipated percent of grid-sourced electricity displaced through the use of energy-efficient and alternative energy technologies for new construction and retrofit projects and (2) measured kWh generated annually through the implementation of these technologies.

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Comprehensive Development Master Plan
How and where we build County buildings impact both our total energy consumption and how efficiently we use what we consume. The Comprehensive Development Master Plan (CDMP) addresses energy consumption. Land Use Element 10 (LU-10) of the CDMP states that energy efficient development shall be accomplished and LU-10C states that Miami-Dade County shall encourage energy conservation by adopting Florida Green Building Coalition, US Green Building Council Leadership in Energy and Environmental Design (LEED), or other acceptable commercial building standards for County-owned facilities.

Existing Legislation

State
The Florida State Statute 255.2575 on Energy-efficient and Sustainable Buildings (2009) - All county, municipal, school district, water management district, state university, community college, and Florida state court buildings shall be constructed to meet the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) rating system, the Green Building Initiative's Green Globes rating system, the Florida Green Building Coalition standards, or a nationally recognized, high-performance green building rating system as approved by the Department of Management Services.

Local
The following list includes some of the Board's adopted legislation related to energy and government operations. A complete inventory of sustainability related legislation is provided as an appendix.

- *Ordinance 07-65, Sustainable Buildings Ordinance* (described above)

- *R-502-07: Energy Star Qualified Compact Fluorescent Lamps Resolution (2007)*
  Requires the phased replacement of incandescent light bulbs in County-owned and County-operated buildings with Energy Star qualified compact fluorescent lamps (CFLs)

- *R-737-07: Establish system to buy, sell and trade renewable energy credits from Landfill Gas Project and future projects (2007)*

- *R-740-08: Create Energy Performance Contracting Program in the amount of 40 million dollars for a period of 5 years (2008)*

- *R-1244-08: Explore use of high frequency plasma electrodeless induction lamps in County buildings and facilities (2009)*

- *R-1431-08: Miami-Dade's Commitment through the Cool Counties (2009)*
  Commits to region-wide goal of reducing greenhouse gas emissions by 80 percent by 2050, and a 2 percent reduction each year beginning in 2010.

- *R-228-09: Reduce County Electrical Energy Consumption (2009)*
  Reduce electricity consumption from government operations by 20 percent over the 2007-2014 time period

- *R-746-09: LED City Partnership Pilot study of Light Emitting Diode (2009)*
  Evaluate the potential for the County to join the LED City Partnership; indentify an appropriate project, funding sources, potential grants, and expected efficiency and carbon emission gains for a pilot study of LED outdoor lighting and provide recommendations to the Board.

Current Initiatives

Energy Efficiency Conservation Block Grant
The US DOE Energy Efficiency & Conservation Block Grant (EECBG) formula allocation in the amount of $12.5 million awarded to the County in September 2009 is currently spurring new activities addressed at the larger community. Federal grant dollars will go toward energy management and construction projects, citizen outreach and education, pilot programs and more. Funds from the grant will also help create local green jobs. The County's integrated Energy Efficiency Conservation Strategy includes the following projects:

- Enterprise-wide and Facility-based Energy Management Systems Upgrade and Coordination
- Development of Sustainable Capital Improvement Procedures and Guidelines
- Methane Sequestration from Landfill and Digesters to Power Operations of Facilities
- Energy-Efficient +Sustainable Buildings Evaluation of Building Codes & Permitting Processes
- Urban Wind Energy Harvesting Demonstration and Pilot Project
- Libraries Daylight Cool Roof Retrofit Demonstration Project
- Libraries Daylight Harvesting Demonstration Project
- Pilot Desktop Virtualization Project (Thin Clients)
- Energy Efficient Lighting on "Green Roadway" Demonstration Project
- Solar Power Systems Demonstration for Powering of Three County Park Buildings
- Sustainable Technologies Demonstration Program

Existing energy efficiency and alternative energy technology projects include, but are not limited to:

- **LED Traffic Signal Head Conversion – Public Works Department**
  Miami-Dade County completed its 12-inch (12") Traffic Signal Head Light Emitting Diode (LED) Conversion Project in March 2009. During the 18 months prior to this date, 65,000 incandescent bulbs were converted to LED modules with a coverage of 3400 powered traffic control devices between Florida City and Broward County line. The conversion has reduced annual electricity consumption by 18,000 mWh and costs by roughly $1.8 million with an estimated payback of four years. The County is investigating the possibility of using remaining project funds to upgrade about 300 8-inch (8") incandescent signal heads to 12-inch (12") LED heads.

- **LED Pedestrian Crosswalk Signal Heads Conversion – Public Works Department**
  The County is currently converting 10,300 pedestrian crosswalk neon signal heads to LED. So far 1,020 heads have been converted, representing an estimated annual reduction in electricity consumption of 44,676 kWh and cost of $4,468. This conversion will continue incrementally over a five-year period as existing neon heads fail.

- **Digester Gas Recovery and Co-generation – Water and Sewer Department**
  The recovery of digester gas at both the County's South District and Central District Water Treatment Plants for the generation of electricity helps run the operations of both these treatment plants. Based on operational data over the 1997 to 2007 time period, the average annual kWh generated through this process is 8,463,586 kWh at the South District plant and 14,631,700 kWh at the Central District Plant. The annual average avoided electricity cost for each of these plants respectively is $491,858 and 793,362.

- **Solar Powered Infrastructure**
  This has been identified as a data gap information on electricity generated from solar photovoltaic (PV) systems installed as part of County infrastructure including solar powered crosswalk signals and solar powered bus shelters.

COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

No feedback is available at this time.

Fuel – Government Operations

Assessment Area

In the process of providing services to the community, government operations consume millions of gallons of fuel (see indicators below), producing hundreds of thousands of tons of greenhouse gases (GHG) and other air pollutants. Fuel is used for a variety of purposes such as light duty passenger cars; heavy duty vehicles such as buses, fire trucks and garbage trucks; heavy duty equipment such as mowers, bulldozers, and bucket trucks; and pumps for water and sewer services and storm water control. Each of these uses offers opportunities for fuel use and/or emissions reductions.

Due to the high volume of use and variety of uses, an effective emissions reduction program will need to employ many different strategies. These set of strategies might include installing more efficient motors and engines, selecting equipment or fleet that can use a fuel type with lower net life-cycle emissions, or simply decreasing vehicle use through route optimization, video-conferencing, and telecommuting. Overall, the County is challenged with determining which combination of strategies it will utilize to achieve its commitment to reducing fuel-related emissions.

While many of the County's internal policies and actions provide an opportunity for fuel/emissions reductions, some also have the potential to increase fuel consumption. For example, take-home (24-hour) vehicle programs increase County fuel consumption. And the County fleet vehicle replacement policy (requiring replacements every 10 years or 100,000 miles), which was extended in line with manufacturer's recommendations, results in the delay of the introduction of newer, more efficient vehicles. For obvious fiscal reasons, studies are conducted and policies are in place to serve other needs (minimizing costs during times of economic contraction). For example, in 2007 the County performed a light duty vehicle analysis (County Review of County Owned Light Vehicles). As a result of the analysis, the County now has a surplus of replacement vehicles while it continues to operate older less fuel-efficient vehicles with higher fuel consumption and emissions. The challenge is to conduct these reviews by balancing the short term necessity with long term effects.

In addition, County infrastructure, policies, and procedures greatly influence the fuel consumption of residents and businesses, described in more detail in the Energy and Climate Change sections of this Assessment Report.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Reducing fuel consumption while still meeting needs of internal and external customers.
- Continuing reductions in fuel consumption to save money and also maintain a fuel efficient fleet.
- Recognizing that it is acceptable for the County to see an increase in fuel consumption and emissions resulting from an increase in ridership on public transportation.
- Keeping resources and attention focused on strategies and technologies that both increase fuel efficiency (miles per gallon or MPG) and reduce vehicle miles traveled (VMT) instead of simply displacing fossil fuels with alternative fuels.
- Reducing air pollutant and greenhouse gas emissions from older diesel-powered vehicles and equipment in the County fleet through retrofit, repower, or replacement projects.

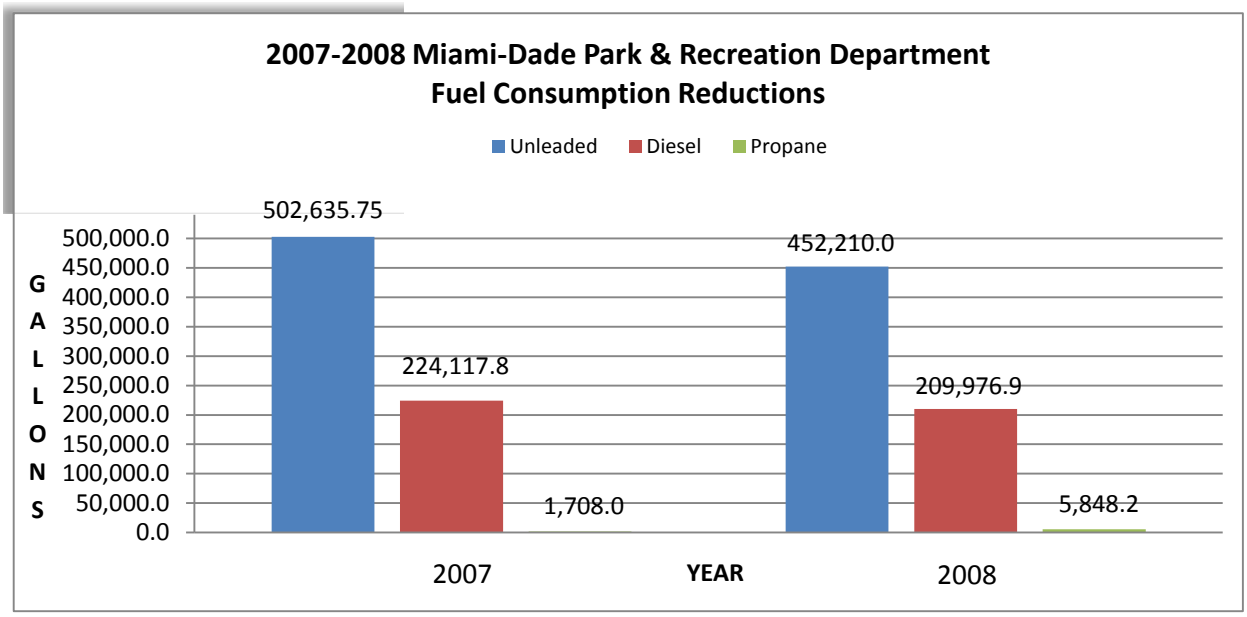
- Making fuel choices based on net benefits, including life-cycle analysis to address the misconception that all alternative fuels are environmentally preferable.
- Introducing greener fuels in the face of associated infrastructure modifications and expenses.
- Establishing department specific fuel reduction targets as opposed to overall reduction targets - from broad fuel reduction policies to measurable implementation.

ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

Fuel Types

Miami-Dade County utilized seven fuel types in 2008: Diesel, Propane, Jet Fuel (Kerosene), Unleaded Gasoline, Liquified Petroleum Gas (LPG), E-10 Ethanol, and Natural Gas. As a result of state legislation (see "Existing Efforts" below), the County first began purchasing E-10 ethanol (a blend of 10 percent ethanol and 90 percent unleaded gasoline) instead of traditional unleaded gasoline in 2008. In 2009, the County began purchasing B-5 biodiesel, with plans to slowly increase to a B-20 blend. Some fuel types generate lower emissions relative to other fuel types. Therefore, while fuel volumes for certain fuel types might increase, overall emissions may decrease. As an example, Miami-Dade Park and Recreation Department (MDPR) began to use more propane in select equipment. Although the volume of propane has increased (see graph below), MDPR has reduced its emissions because they are using less fuel overall. Propane, while less fuel efficient than unleaded and diesel fuel, creates less emissions gallon per gallon compared to unleaded and diesel. As the County moves forward in strategies to reduce emissions, it will need to consider both emissions and fuel efficiency associated with different fuel types. It is important to carefully evaluate these alternatives in order to achieve the most GHG emission reductions and net environmental benefits. From an environmental and sustainability perspective, not all alternative fuels are equal, nor do all alternative fuels provide net emission reductions.



Fuel Consumption

As a result of the County's membership in the Chicago Climate Exchange (CCX), the County has been rigorously tracking fuel consumption over the past few years (see "Existing Efforts below for more details on CCX). Miami-Dade County fleet and operations consumed over seven million gallons of unleaded fuel and over 19.5 million gallons of diesel fuel in 2008. Overall, fuel consumption (for all fuel types combined) increased from the County's baseline year of 2000 (as determined by CCX) to 2007, but decreased slightly from 2007 and 2008. Fuel consumption facts that might be of particular interest include:

- Unleaded fuel consumption fell by 12 percent from FY 2001-02 to FY 2007-08, excluding law enforcement vehicles.
- Based on 2008 data, the Miami-Dade Police Department (MDPD) owned 39 percent of the County's light fleet vehicles and used 58 percent of the County's total unleaded gasoline.
- Based on 2008 data, the County's bus fleet, operated by Miami-Dade Transit (MDT), consumes the majority of diesel fuel in the County's heavy fleet (12,294,947 gallons).

Miami-Dade County 2008 Fuel Consumption*

Diesel	Propane	Jet Fuel (Kerosene)	Unleaded Gasoline	Liquified Petroleum Gas (LPG)	E10 Ethanol	Natural Gas
Gallons	**Gallons**	**Gallons**	**Gallons**	**Gallons**	**Gallons**	**Gigajoules**
19,657,469.53	39,203.56	258,734.30	6,586,736.46	22,921.10	3,971,205.20	651,240.57

**based on provisional data*

The County provides a myriad of services to the community and many of these services are provided through the use of fuel-consuming County vehicles or equipment. For example fire rescue employees must use vehicles to attend to emergencies and fuel-powered water treatment equipment must be kept running to provide clean drinking water to the community. Because the County cannot simply eliminate or reduce certain services, it must strive to provide services in different or more efficient ways to reduce fuel consumption.

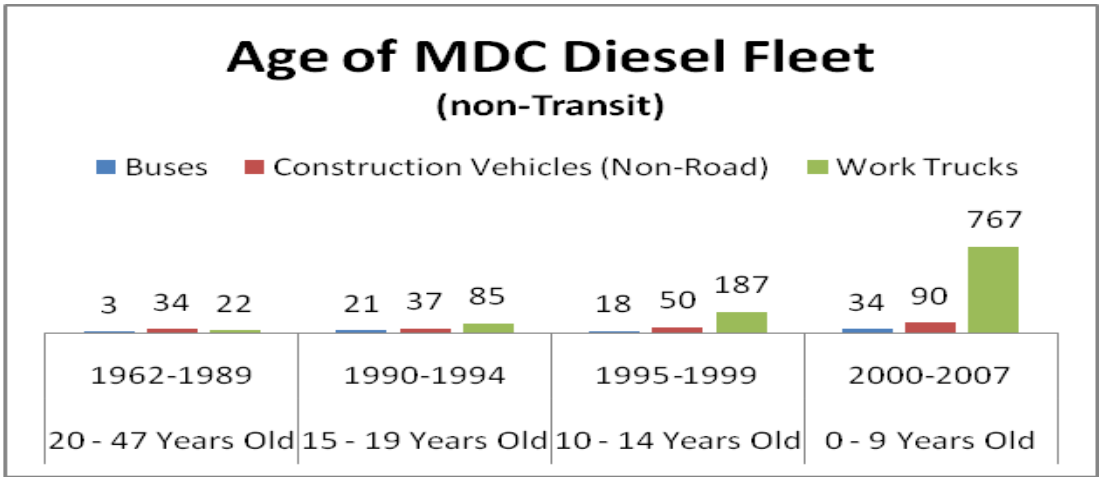
One particular challenge is that an increase in emissions due to the expansion of public transportation (expansion of ridership as well as routes and/or trip frequency) will correspond with a reduction in countywide emissions generated by personal vehicles (i.e. getting more people out of their cars and riding buses and trains will decrease countywide emissions, but increase County operation emissions). A method to measure or directly correlate this trade-off does not currently exist.

Increases in efficiency standards of just one mile per gallon for all cars and light trucks can cut fossil fuel consumption even more than alternative fuels efforts. Careful vehicle selection, route management, and other strategies such as changing driver behaviors can also bring about significant fuel reductions. Alternative fuels need to be examined carefully, as many are not necessarily greener when considering ecosystem destruction, competition with food resources, and net full life cycle emissions.

Vehicle Efficiency - Age

One way to achieve fuel and emission reductions is to increase the fuel efficiency of the County's fleet vehicles. Older vehicles, generally speaking, are more inefficient while other County-owned vehicles may be newer, but do not have top fuel efficiency ratings respective to other commercially available vehicles in their same class. As seen by the graph below, data

gathered by the County on vehicle age and type can help the County to implement the most effective strategies to increase overall fleet fuel efficiency, such as retrofitting existing vehicles, retiring inefficient vehicles earlier, and replacing expiring vehicles (those that have reached the end of their years of service) with vehicles that have higher fuel efficiency ratings. Nineteen of the buses included in the graph below are 15 years or older and operated by the Community Action Agency to transport young children and the elderly.



Emissions reductions can also be achieved by installing aftermarket emissions control devices on existing fleet vehicles. Environmental Protection Agency (EPA) has established progressively more stringent emission standards on the amount of pollution vehicles can emit starting with vehicles of Model Year 2004. The results of this historic program are comparable to the advent of the catalytic converter on cars, as the standards will for the first time result in the widespread introduction of exhaust emission control devices on diesel engines. Approximately 50 County diesel vehicles have been retrofitted with clean diesel technologies through EPA funding, but more than 1,348 County diesel vehicles (not including transit buses) do not meet EPA's new clean diesel standards. Since the standards only apply to engines manufactured after 2004 and 2007, these durable engines may continue to operate for 20 to 30 years, as demonstrated in the graph above.

Vehicle Efficiency - Type

In addition to reducing fuel consumption by increasing fuel efficiency, the County has purchased some vehicles specifically to reduce fuel consumption and/or to increase the flexibility of fleet vehicles in using different fuel types. Some of these vehicle types are more fuel efficient, while others facilitate the use of alternative fuels:

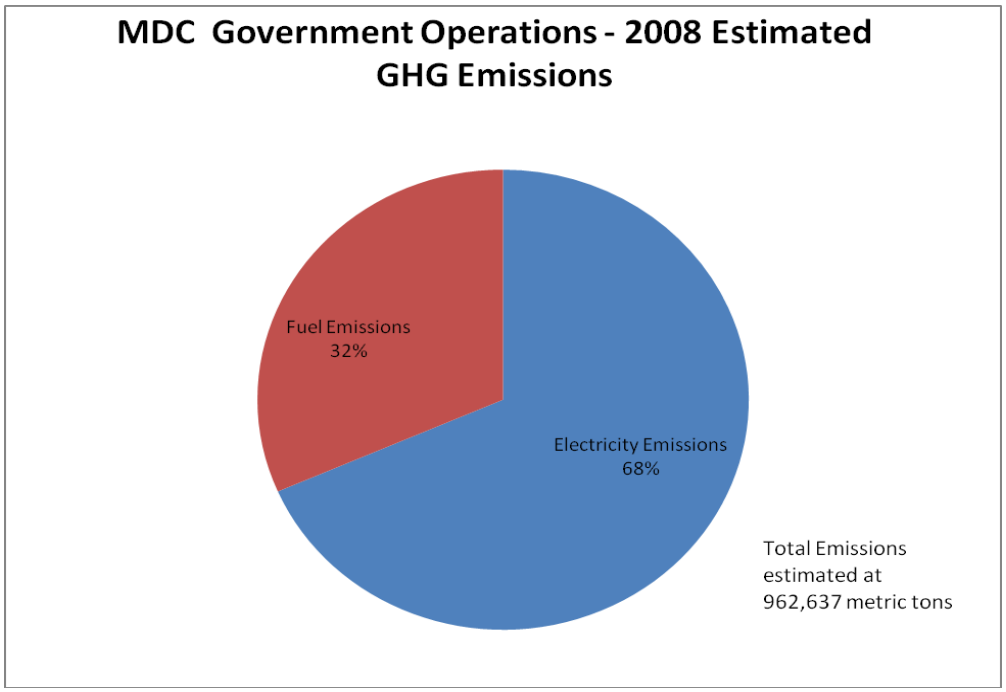
Vehicle Type	Number in Fleet	Number Active
Gasoline-Electric Hybrid Sedans	457	307
E-85 Flex Fuel Sedans**	940	940
Diesel-Electric Hybrid Buses	*43	0
Garbage Trucks with Hybrid Drive (uses stored hydraulic energy to power truck systems)	*6	0

**purchased but not yet delivered*

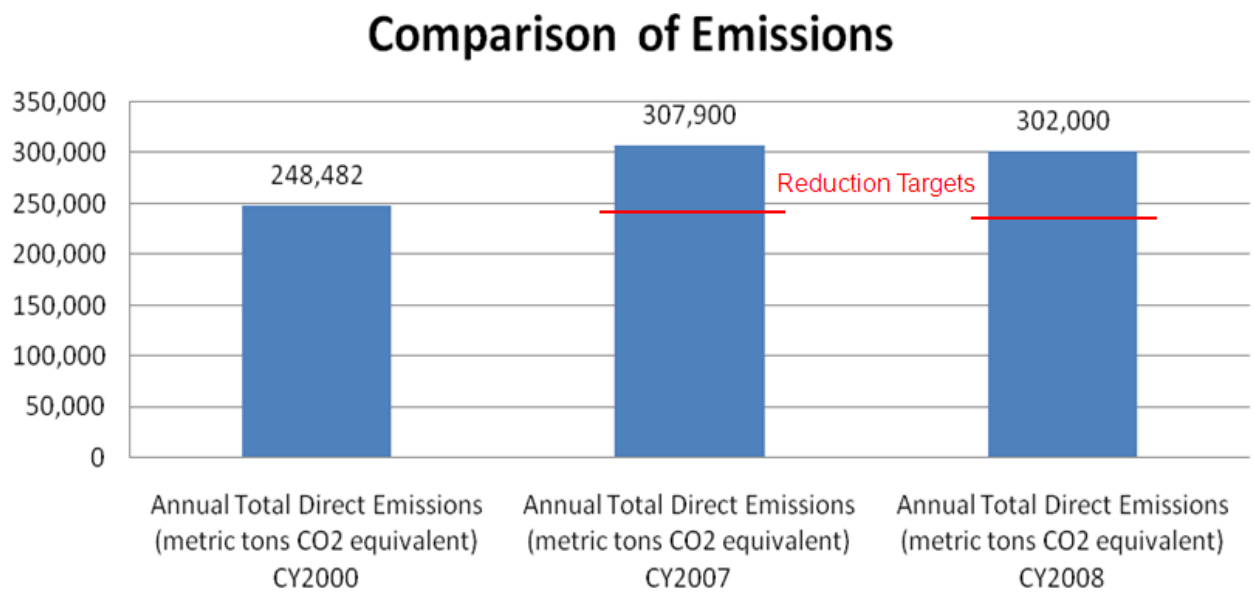
***these sedans have ability to run on E-85 ethanol, but are currently using E-10 as is the rest of the County light fleet.*

Greenhouse Gas Emissions

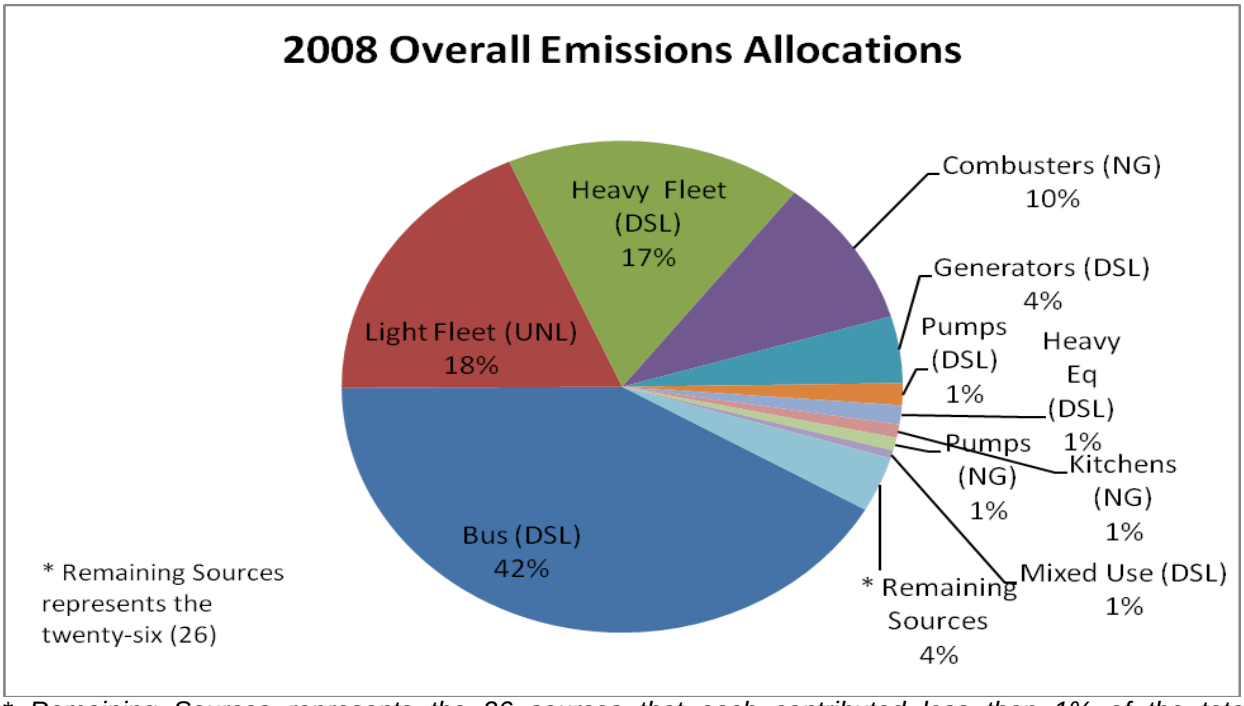
In 2008, 32 percent of County government greenhouse gas (GHG) emissions were generated by fuel consumption, while 68 percent were from electricity use (see below graph).



As shown in the graph below, emissions reported in 2008 were lower than those reported in 2007, but still did not meet the County's targets as established by its membership in the Chicago Climate Exchange (more details below under "*Existing Efforts*").



Analyzing the source of emissions (see graph below) can help the County understand where fuel consumption efforts should be focused.



** Remaining Sources represents the 26 sources that each contributed less than 1% of the total emissions.*

Other Emissions

In addition to GHG emissions, fuel combustion contributes to the release of other pollutants. For example, exhaust from diesel engines contains pollutants that contribute to:

- Lung cancer in humans and aggravated existing respiratory and cardiac diseases
- Global Climate Change
- the formation of ground level ozone (As noted in the Air Quality portion (5.a.) of this Report's Environment Section, the County is likely to be designated as non-attainment for ozone in the near future.)

Therefore, increasing fuel efficiency of the County fleet has additional health and environmental benefits.

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

The expansion of public transportation and improved operational efficiencies all contribute to a net reduction of emissions from fuel consumption. Specific fuel-related goals and objectives are outlined below.

Chicago Climate Exchange

Reflecting its leadership on climate change, the Board of County Commissioners authorized (Resolution No. R-757-07) the County to join the Chicago Climate Exchange (CCX) on June 26, 2007. CCX is a voluntary, but legally binding, market-based cap and trade program that requires members like Miami-Dade County to quantify, report, and reduce their greenhouse gas (GHG) emissions. Miami-Dade is one of the few governments in the United States that has made a contractual commitment to reduce its emissions related to fuel use in operations. Because emission reports are audited by a 3rd party independent contractor, Financial Industry Regulatory Authority (FINRA), CCX membership compels accountability among its members. While the County had been actively pursuing emission reductions in past decades, the legally binding and accountable nature of its CCX membership brought the County's commitment to a higher level. In addition to creating protocols for rigorous fuel data collection and reporting, the County's membership in CCX has also afforded the County with the opportunity to gain cutting edge experience in an active cap and trade carbon market system. As a member of CCX, the County has agreed to yearly fuel-related emissions reduction targets that lead to a six percent reduction below baseline 2000 calendar year levels by 2010 (roughly 15,000 metric tons CO2). The County has been obligated to purchase Carbon Financial Instruments (CFIs) for each year that it has not met reduction targets. The County's CCX membership and experience with the carbon market is particularly timely considering proposed federal cap and trade legislation. (See "Legislation" below for more details.)

2035 Long Range Transportation Plan

The Miami-Dade County Long Range Transportation Plan (LRTP) to the Year 2035 is a primary activity in the County's transportation planning process to meet federal and state requirements for an update of the Transportation Plan every five years. Federal law requires that the LRTP address minimum of a 20-year planning horizon. The LRTP ensures the proper management and efficient operations of transportation systems within the County as well as complements regional planning initiatives. The process, managed by the Metropolitan Planning Organization (MPO), requires analysis of current economic trends, an examination of socioeconomic conditions in planning areas, and the preparation of a final transportation vision for the Miami Urbanized Area. The LRTP includes the following:

- *Goal 5:* Protect and Preserve the Environment and Quality of Life and Promote Energy Conservation
    - *Objective 5.1*: Minimize and mitigate air and water quality impacts of transportation facilities, services, and operations
    - *Objective 5.1:* Reduce fossil fuels use
    - *Objective 5.7:* Promote the use of alternative vehicle technologies

Transit Development Plan, Major Update (TDP), FY2010 – FY2019

The TDP is a strategic development and operational guide for public transportation used by Miami-Dade Transit (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.

- *Objective 5.2:* Reduce fossil fuels consumption through the consideration of alternative fuel vehicle technology
    - Measure: Number of gallons of bio-diesel fuel consumed.
    - Measure: Ratio of bio-diesel to standard clean diesel fuel consumed.
    - Measure: Number of hybrid technology buses in MDT fleet.
    - Measure: Average miles per gallon of bus fleet.

Existing Legislation
Legislative initiatives at the federal, state, and local level regulate fuel standards.

Federal

- The American Clean Energy and Security Act of 2009 (ACES), known commonly as the Waxman-Markey Bill, proposes to establish a mandatory cap-and-trade program for greenhouse gas emissions nationwide. The program requires emissions reductions of 17% below 2005 levels by 2050 and would also require 20% of electricity to be produced from renewable resources. The bill was approved by the House of Representatives in 2009, but has yet to clear the full U.S. Senate. Additional proposed legislation related to emissions regulation is discussed under the Climate Change and Air Quality portions of this Assessment Report.
- The United States Energy Independence and Security Act (EISA) of 2007 required that renewable fuels result in lifetime greenhouse gas emissions reductions when compared to traditional fuels. The EPA was charged with creating a national Renewable Fuel Standard (RFS) program to enforce the EISA. The Renewable Fuel Standard specifies volume standards for cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel that must be used in transportation fuel each year. The revised statutory requirements also include new definitions and criteria for both renewable fuels and the feedstocks used to produce them, including new GHG thresholds for renewable fuels. The regulatory requirements for RFS will apply to domestic and foreign producers and importers of renewable fuel. EPA is expected to release the RFS final rule by November 30, 2009 setting the applicable standards for 2010.
- Proposed legislation related to emissions regulation and cap and trade are discussed under the Air Quality portion of this Assessment Report.
- EPA's new National Clean Diesel Standards affect diesel engines manufactured from 2007 and on, and will result in particulate (PM) and nitrous oxide (NOx) emission levels that are 90 percent and 95 percent below today's levels, respectively. The standards will for the first time result in the widespread introduction of exhaust emission control devices on diesel engines.

State

- In 2008, the State of Florida passed a bill specifying that, all gasoline sold or offered for sale in the state must contain 10 percent ethanol by volume (E10) by December 31, 2010 with exceptions provided. (Florida House Bill 7135, 2008).

- In addition, the state passed an anti-idling bill effective December 18, 2008 specifying that operators of heavy duty diesel engine motor vehicles are prohibited from idling more than five consecutive minutes with exceptions provided. (State of Florida, Rule 62-285.420 Florida Administrative Code)

Local
There have been many local resolutions that directly or indirectly relate to fuel consumption. Following is a non-comprehensive list of resolutions with abbreviated descriptions illustrating the history and variety of legislation that has been adopted.

- *Resolution R-1379-77:* Established the requirement for life cycle analysis and costing procedures for certain commodities including all types of passenger vehicles, multi passenger vehicles (excluding buses), and specialized vehicles

- *Resolution R-378-01:* Directed County to implement a program to enhance the utilization of alternative fuel in County

- *Resolution R-330-03:* Authorized County to purchase hybrid vehicles

- *Resolution R-969-03:* Directed County to develop and implement a plan to reduce gasoline consumption by 20 percent over a five year period and to increase fuel efficiency of the County fleet

- *Resolution R-1296-04:* Directed County to report on the feasibility and advisability of purchasing biodiesel for County fleet buses

- *Resolution R-936-05:* Directed County to evaluate potential cost savings of using "flex-fuel / gasohol" or other alternative fuel sources for County fleet

- *Resolution R-559-06:* Supporting development of commercially available plug-in hybrid electric vehicles and partnerships to facilitate

- *Resolution R-324-07:* County to obtain membership in the Chicago Climate Exchange (CCX)

- *Resolution R-461-07:* Directed County to assess the feasibility of local biofuels production

- *Resolution R-673-08:* Directed County to explore the use of ethanol in County gas stations and public/private partnerships to utilize ethanol

- *Resolution R-926-08:* Required County fleet vehicles to be turned off when unattended with exceptions specified

- *Resolution R-1372-08:* Directed County to analyze the feasibility and advisability of using vehicles fueled by compressed natural gas

- *Resolution R-83-09:* Directed County to develop a plan for modifying diesel-powered fleet vehicles to allow use of biodiesel or vegetable oil

- *Resolution R-86-08:* Authorized contractual agreement for a report analyzing the feasibility of using biodiesel in MDT buses.

- *Resolution R-996-09:* Directed County procurement procedures for fuel saving products to require a comprehensive report from US EPA along with other criteria

Initiatives

In addition to the Chicago Climate Exchange Initiative discussed above, R-969-03 directed County staff to develop and implement a plan to reduce unleaded gasoline consumption by 20 percent over a five-year period (by 2008) and to increase fuel efficiency of the County fleet. While the time period referenced in the resolution has ended, the Board directed staff to use the March 18, 2009 findings resulting from the initiative to continue reducing gasoline consumption.

In addition to overall County government goals and initiatives related to fuel consumption, many individual departments have their own goals and initiatives to reduce fuel consumption. For example, the Public Works, Park and Recreation, and the Aviation departments have all set their own internal fuel reduction goals. Below is an abbreviated list of department-level fuel related initiatives that target internal fuel consumption:

Department	Fuel/Emissions Reduction Initiative	Brief Description
Enterprise Technology Services	Promotion of Internal Video Conferencing Capability	Provide departments with information on internal video conferencing capability and encourage use.
General Services Administration	Fuel-Efficient Vehicle Acquisition	Guide departments in acquisition of hybrids or fuel efficient cars
Park and Recreation	Improve Supply Delivery and Management	Purchase larger quantities of supplies, combine delivery and pickup of supplies and recyclables, and limit the number of special deliveries to reduce VMT.
Transit	Kill-Switch Installation	Automatic engine shutoff mechanism installed on all transit buses to reduce prolonged idling.
Transit	Biweekly Tire Checks	Tires on buses checked to ensure proper inflation and better fuel efficiency
Water and Sewer Department	Solar Equipment Upgrades	Purchase of solar powered Movement of Traffic (MOT) equipment instead of traditional fuel powered equivalent.
Multiple Departments	Clean Diesel Retrofits	To date, approximately 50 county diesel vehicles have been retrofitted with clean diesel technologies through EPA National Clean Diesel Campaign (NCDC) funding.

Departments are also moving forward with initiatives that help with community-wide emissions. These initiatives are addressed in the Energy and Climate Change sections of this Assessment Report.

COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

No community feedback is available at this time.

Water – Government Operations

Assessment Area

Miami-Dade County consumes approximately 6.5 million gallons of water a day to carry out its operations. Most County facilities are located within the Miami-Dade Water and Sewer Department's (WASD) service area. Those County facilities not within WASD's service area are serviced by 13 municipal utilities located within the Miami-Dade. All consumption at County facilities is of potable water, since there is a limited amount of recycled water available for use.

Improving water efficiency in government operations is an overarching challenge because of the sheer number of facilities and the diversity of operations, as well as the perceived cost of the conversion. Despite this, the County has addressed this issue for years as a part of the energy efficiency performance contracting program. Most recently, the Board of County Commissioners adopted Resolution 468-06 mandating the development of a comprehensive and community wide water conversation plan for the County and a directive for County facilities to lead by example. The County's plan will include water use reduction goals and initiatives with timelines for meeting goals. Additionally, water conservation is being incorporated as a vital component of department action plans.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Implementing recommendations from water use audits conducted at 36 county facilities given the current budgetary constraints.
- Implementing new systems to better track and identify water use in county operations. The current system needs additional analysis and reporting capabilities to provide more detailed information for planning purposes. Additional technology such as Advance Meter Infrastructure would provide benefits in the areas of consumption tracking and water loss.
- Developing a process for the identification of current irrigation practices for all county owned green spaces as part of developing best management practices for the irrigation of public green spaces including medians.

ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

Total Water Consumption at Government Facilities

County facilities vary widely in size and function; some are serviced by WASD and others by municipalities. Many facilities were built at a time when water conservation was not a concern, therefore include less-efficient infrastructure. The graph below shows that the County uses approximately 6.5 million gallons daily (MGD).

Water Conservation Audits

The County facilities water conservation plan outlines a step-by-step process to help individual departments in the design and implementation of a successful water conservation program for county owned facilities. It also presents the various options for financing the conversion to water efficient operations.

Water use audits have been conducted at 36 County facilities, and a comprehensive plan is being developed to complete all audits and implement recommendations. A preliminary

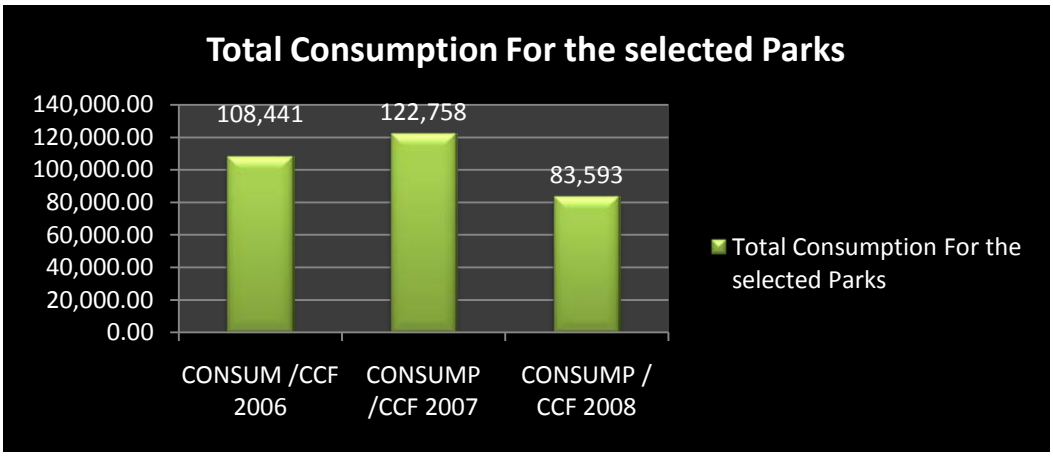
assessment of the results of the water use audits has been completed. The table below shows that a minimum of 17.6 million gallons of water per year could be saved at those facilities. Recommendations have been outlined and presented to each department.

Building Name	TOTAL CALCULATED ANNUAL DOMESTIC WATER USAGE*	
	Pre-improvement Calculated Annual Domestic Water Usage	Proposed Annual Domestic Water Reduction**
Caleb Center	1,588,884	693,529
C.G. Branch Court	206,050	39700
Graham Building	1,540,143	767,414
Public Defender	632,175	279,747
Courthouse Center	1,204,679	512,885
N.D. Justice Center	482,633	220,348
Central Support Facility	1,787,009	862,421
Cultural Center Plaza	1,429,225	562,542
Hickman Building	703,645	472,351
Courthouse	1,786,322	879,872
Metro Flagler	1,190,040	461,530
Gerstein Building	5,139,052	2,513,986
Juvenile Justice Center	157,407	73,351
Metro Annex	119,418	83,419
Hialeah B. Court	334,633	213,181
Co-op Extension	161,057	59,545
Fire Station	309,878	70,816
Library	270,396	126,658
Mosquito Control	45,519	15,811
Police Station	325,265	86,337
S.D. Government Center	576,370	261,064
Carol Day Care Center	272,569	120,817
Stephen P. Clark Complex	5,679,977	1,199,831
Water and Sewer	1,070,554	476,149
Records Center	191,854	91,901
West Dade Permitting Center	1,254,728	374,699
Samsung Building	672,679	239,552
WASD LeJeune Building	508,010	141,866
WASD Westwood Building	929,276	351,389
Landmark Property	6,408,350	3,511,248
Data Center	1,514,705	675,945
Data Center Annex	61,136	17,113
Radio Shop	161,411	69,822
Medical Examiner	723,592	87,299
Civic Park Plaza	392,900	118,914
Lightspeed Building	289,947	29,383
Total:	**40,121,488**	**17,723,134**

*This usage is calculated by Watergy and does not reflect water loss from cooling towers
**Possible water savings require all domestic water recommendation be followed

It is not feasible to make all facilities water-efficient at once. The first priority is to identify through a preliminary survey the facilities with the highest water use, the highest water and sewer cost, and the greatest incident of repair and leakage problems. To the extent that the survey covers the broadest possible range of facilities in the county, the resulting experience will be of the greatest benefit for all future actions. Similar actions should be implemented in facilities leased by the county.

Reduction at County Departments
A number of departments have implemented water conservation initiatives. In 2008, the Miami-Dade Park and Recreation Department achieved savings of over $2 million. The chart below shows the total reductions in consumption for the 10 parks included in this initiative.



EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Miami –Dade Water Use Efficiency Plan
In April 2006, the Board of County Commissioners adopted Resolution R-468-06, which approved the County's Water Use Efficiency Five-Year Plan that is goal based, accountable and measures water conservation efforts. Keystone to the plan is the implementation of the best management practices which enables the County to quantify its water savings. One of the components of the plan is the audit and retrofits of County facilities.

COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

Community feedback related to water is provided in the Water Area of this assessment and includes results from the following surveys:

- 2006 WASD Customer Satisfaction Survey
- Water Use Efficiency Survey
- Miami-Dade County Resident Satisfaction Survey

Procurement - Government Operations

Assessment Area

Miami-Dade County makes significant purchases of materials and services. As of September 2009, the County had 1,145 active multi-year contracts with a maximum available contact capacity valued at $4,904,894,211.73. (This is not the amount appropriated per year, this is only the maximum available contract capacity. Yearly appropriations are made through the County's budget process). The County is positioned to leverage its purchasing power to influence the market in both price and availability of environmentally-preferred products in the marketplace. "Green" or Environmentally Preferable Purchasing (EPP) includes the selection of products and services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose.

The Resources Conservation Committee (RCC) (formerly the Recycling Management Committee) was created in 1992 to establish a procurement policy for Metropolitan Dade County favoring waste-reduction and implementing a program to purchase commodities containing recycled or recyclable content. This Committee has historically been charged with facilitating and tracking the efforts of the County in recycling, recycled-content purchasing and EPP activities. Currently, the purchasing system allows departments to "opt-in" to green purchasing, depending on their commitment to buying green products. Continued leadership requiring green purchasing is needed to further expand these efforts. While legislation has been passed that broadly supports environmentally preferable purchasing, establishing targets would facilitate a shift from policy to implementation.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Achieving a shift in institutional culture to facilitate green purchasing.
- Assessing goods and services to ensure sustainability through use of third party certification and full life-cycle assessment of products. Proper assessment will help address "myths" about green purchasing and concerns with potential increased upfront costs.
- Training and equipping procurement staff and departmental liaisons with tools for green purchasing – a relatively new arena for county employees
- Establishing an electronic tracking system that can quickly provide detailed reports regarding specific commodities and quantities purchased. This is a fundamental institutional challenge facing Miami-Dade County government for furthering green purchasing efforts.
- Developing additional indicators that can be used to assess the effectiveness of the County's "Buy Green" guidelines.
- Strengthening the "Buy Green guidelines to switch from voluntary to mandatory green purchasing.

ASSESSMENT DATA & INDICATORS

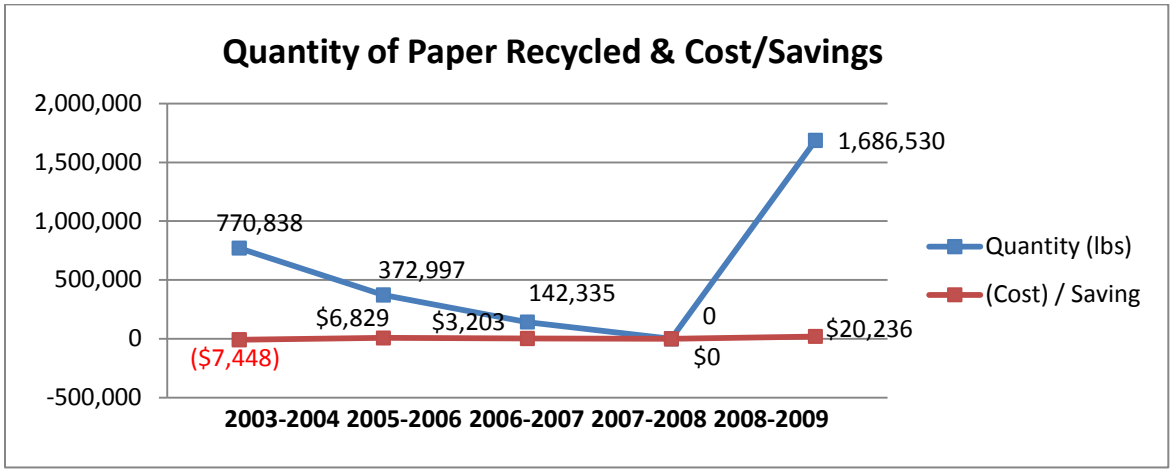
Data and analysis to identify key challenges & establish a sustainability baseline

While the County does not have in-depth historic data to illustrate the County's level of green purchasing, the County's RCC has been tracking some indicators related to green procurement as early as 2003.

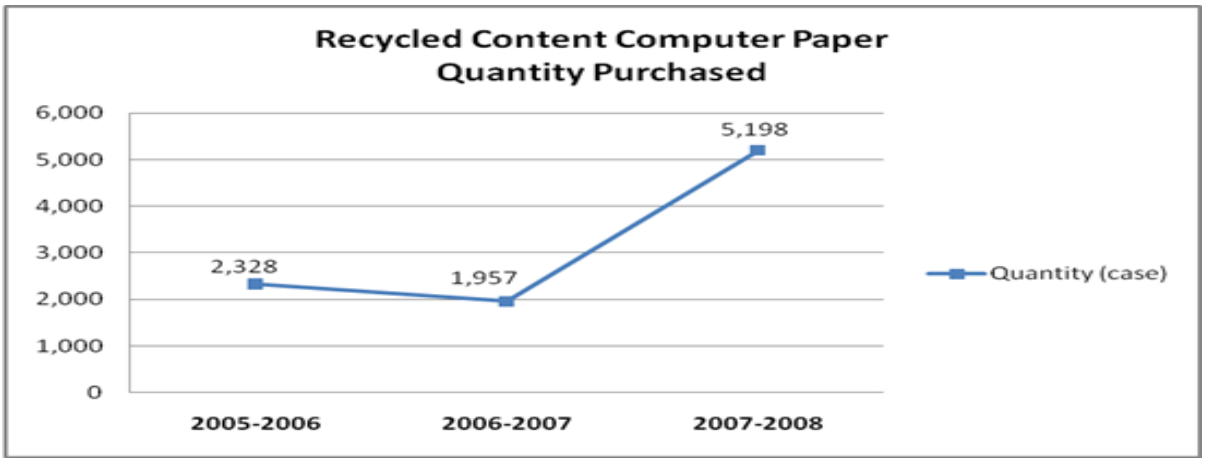
Quantity of Goods Recycled or Purchased with Recycled Content

The RCC creates an annual report summarizing these activities. In order to compile the annual report, the RCC requests departments to provide data related to procurement and recycling. While the RCC has been tracking these indicators since 2003, departments have been inconsistent in submitting the data over the years, making data interpretation difficult. The data collected also reflects contractual disruptions.

The graph below shows pounds of County paper goods that have been recycled. As reflected in the graph, the County began having difficulties with its paper goods recycling vendor in 2004 and the recycling contract was terminated in 2007. A new contract was initiated in 2008 resulting in a significant increase in the amount of paper being recycled and associated savings. Please note that because of the scale used for the graph, it might be difficult to recognize the savings increase from FY 06-07($3,203) to FY08-09 ($20,236).



The graph below shows that purchases of recycled content computer paper have increased moderately over the last few years.



In addition to these existing indicators, the County's Department of Procurement Management (DPM) has recently developed a "Buy Green" supplement to its procurement guidelines, as well as new indicators to help the County track progress in the area of green procurement. In summary, the newly developed indicators are:

- Number of DPM Contracts Issued with Environmentally-Preferred options and criteria and their associated award values
- Number of enrolled vendors reporting that they offer certified green products through Green commodity codes
- Number of contracts awarded using Life Cycle Costing analysis.

Contracts including EPP Criteria or Options

DPM has identified 30 current contracts, or solicitations underway, that include environmentally-preferred criteria or options. Staff is currently tracking these contracts manually. Automation of key identifiers for green products and services to assist with tracking and reporting of these contracts is underway.

Current DPM "Green" Solicitations

Contract No.	Title	Department	Award Date	Contract Value
730-000-09-1	Telephony Equipment and Services (Energy Star)	ETSD	12/16/2008	$7,000,000
250-000-09-1	IT Hardware (Energy Star)	ETSD	1/5/2009	$14,000,000
5204-0/10	2009 Pickup Trucks	GSA	5/7/2009	$996,000
3/11/8550	Janitorial Supplies for MDHA	MDHA	4/2/2008	$437,550
4/13/8593	Janitorial Services for OTV & WASD	W&S	5/22/2008	$302,598
M0692-4/11-2	Janitorial Supplies	Various	7/18/2006	$1,398,506
6763-4/11-2	Janitorial Services For WASD	W&S	6/6/2008	$120,000
4/13/8584	Janitorial Services For GSA & PW	GSA/PW	3/19/2008	$298,980
8469-4/12-1	Janitorial Services For MDPD North Stations	Various	12/10/2008	$236,576
8026-3/11-1	Janitorial Services/ Downtown Complex	GSA	12/8/2008	$4,440,299
6168-3/11-1	Janitorial Services For GSA	GSA	11/21/2008	$200,000
4/13/6371	Janitorial Services For Medical Examiners	GSA	3/28/2008	$312,965
C-2-06-055-BVR	40 Ft Hybrid Buses	MDT	4/7/2009	$7,494,000
FP-7038R/JWW	60 Ft Hybrid Buses	MDT	5/5/52009	$21,585,000
7296-0/14	Scrap Metal Recycling	GSA	1/7/2009	$100,000
E8778-0/09	Janitorial Services For JJC & Metro Annex	GSA	7/29/2008	$51,240
6712-5/15-OTR	Office Supplies	GSA	2/8/2006	$15,000,000
7345-4/13-OTR	Calendars	GSA	6/11/2008	$153,659
7471-3/13-OTR	Envelopes, Blank & Printed	Various	8/29/2008	$500,000
8578-0/23	Landfill Gas Utilization System	Solid Waste	2/3/2009	Revenue Generating
IB8091-0/13	Recycling Services- Toner, Inkjet, Laser Cartridges	Various	5/15/2008	Revenue Generating
7321-4/09-1	Business Cards	Various	2/7/2006	$215,000

RPF 551-1	Janitorial Services for Libraries	Library	10/1/2008	$860,000
RFQ8264	Integrated Pest Management	Various	8/8/2008	$3,726,500
3143-9/18	Gasoline and Diesel Fuel	Various	4/17/2008	$80,060,000
RFP 683	Gasoline and Diesel Fuel	Various		$670,942,500
RFP 545	Countywide Recycling Services	Solid Waste	2/21/2008	$53,130,000
IB7832-3/11-2	Collection & Recycling of Used Oil Filters	Various	12/4/2008	$19,282
1/19/9065	Resilient Hard Surface Flooring	Various	7/31/2009	$2,378,000
RFP 695	Developing Poinciana Industrial Center	GSA		Revenue Generating
RFP 630	Water Theme Park	P&R		Revenue Generating
			Total	**$811,331,282**

Green Commodity Codes

Developed by the National Institute of Governmental Purchasing (NIGP), the County uses the NICP Commodity/Services Code as its coding structure for standardizing purchasing, bringing order and consistency for efficiency and economy. The NIGP Code is used primarily to classify products and services procured by state and local governments.

To date, 26 "Green" codes have been incorporated into DPM's automated purchasing system, ranging from certified janitorial supplies to alternative fuels. Based on these commodity codes, staff will be able to report the number of contracts issued under these codes as well as the award values. Additionally, staff is in the process of developing the capability for determining the number of vendors who use the Green commodity codes to update their vendor profiles.

DPM Green Commodity Codes
(as of September 15, 2009)

Code	Description
405-02	Alternative Fuels (Not Otherwise Classified)
436-24	Detergent-Disinfectant, Phenolic Type, Liquid, Environmentally Certified Products
436-25	Disinfectant, Germicidal, Environmentally Certified Products
486-01	Ammonia and Other Chemicals, Household (Plain or Sudsing), Environmentally Certified Products
486-02	Animal Cage Cleaning Compound, Environmentally Certified Products
486-10	Brooms, Brushes, and Handles, Environmentally Certified Products
486-11	Cleaner and Detergent, Pests and Tablets, Environmentally Certified Products
486-16	Cleaner, Hard Products, General Purposes, Liquid (includes Graffiti Cleaners), Environmentally Certified Products
486-21	Cleaner, Spray, Environmentally Certified Products
486-22	Cleaner, Sewer, Septic Tank, and Waste Pipe, Acid and Caustic Types (Incl. Drain Openers), Environmentally Certified Products
486-25	Cleaner, Tile and Grout, Environmentally Certified Products
486-26	Cleaner, Toilet Bowl, Granular and Liquid, Environmentally Certified Products
486-30	Deodorant Blocks, All Types, Environmentally Certified Products
486-37	Detergent-Disinfectant (Washroom Type), Liquid and Aerosol (See Class 435 for Health Care and 505 for Laundry Type), Environmentally Certified Products
486-54	Floor Polishes and Waxes, Floor Sealer, and Dust Mop Treating Compound, Environmentally Certified Products
486-60	Insecticides and Repellents, Household, Environmentally Certified Products
486-65	Janitorial Equipment and Supplies (Not Otherwise Classified), Environmentally Certified Products
486-74	Oil, Chemical, and Hazardous Material Spill Absorbents, Cleaners, Neutralizers, and Pads

	(Including Microorganisms, Live; Pest
486-85	Soap, Scrubbing Type, Environmentally Certified Products
486-86	Soap, Hand; Bar, Liquid, and Powdered, Environmentally Certified Products
631-33	Lacquer and Shellac, Clear and Colored, Environmentally Certified Products
631-45	Paint and Varnish Removers (Includes Painted Graffiti Removers) (See 485-16 for Other Types of Graffiti Removers)
631-56	Paint, House and Trim, Environmentally Certified Products
631-82	Sealers and Primers, Paint, Environmentally Certified Products
631-84	Stains and Varnishes, Environmentally Certified Products
641-60	Plastic and Styrofoam Products: Cups, Forks, Plastic Coated Dishes, Plastic Food Wrap, Cooking Bags, Sandwich Bags, etc.

Third Party Certification

Often, procurement of goods and services is decentralized within the County, and performed by department procurement liaisons. Analyses that compare net benefits and full life-cycle costs are complex and department procurement liaisons might not have the expertise needed to conduct such assessments and comparisons. One way to ensure procurement of more sustainable goods is to ensure that they are third party certified by a reputable organization. However, purchasing third party certified goods often increases the base price of these goods. In addition, while third party certification can help ensure procurement of sustainable goods, these types of certification programs are not available for all commodities.

Recycled Content of Paper Goods

VS.

No certification | Certified

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Comprehensive Development Master Plan

The County is making it a priority to leverage its purchasing power to influence the market in both price and availability of environmentally-preferred products in the marketplace. In the Comprehensive Development Master Plan (CDMP) states, in part, that "...the County shall provide for the reduction of per capita production of solid waste by encouraging the use of waste reduction technologies and recyclable packaging materials..." and that "...the County shall promote the establishment and expansion of markets for products and materials created from recycled wastes through cooperative State and Federal efforts, County purchasing policies, and by encouraging the purchase of such products by County vendors, clients, and citizens..."

Existing Legislation

State

The State of Florida has also enacted legislation which makes certain green purchasing requirements of the County:

- *State of Florida Statutes 403.7065* – Requires "…any State agency or agency of a political subdivision of the State which is using State funds…to procure products or materials with recycled content when those products or materials are available at reasonable prices."

- *The Energy, Climate Change, and Economic Security Act of 2008* (House Bill 7135) signed into law by Governor Crist created Section 403.7032, Florida Statutes. This establishes a new statewide recycling goal of 75 percent to be achieved by the year 2020. The statute directs the Florida Department of Environmental Protection to develop a program designed to achieve this goal and submit it to the Legislature for approval by January 1, 2010.

Local

In addition, the following Miami-Dade legislation was adopted by the Board:

- *Resolution R-64-01* – Directed the County to study the feasibility of a computer recycling program

- *Resolution R-374-03* – Established a policy for Miami-Dade County favoring waste reduction, environmentally-based promotional activities, and the purchasing of commodities containing recycled or recyclable content

- *Resolution R-702-05* – Established the following items as part of a five-year goal for the Resources Conservation Committee:
    - Increase the percentage of County purchases of office goods containing recycled materials and/or identified as an environmentally preferred product.
    - Increase the rate of participation in recycling by County agencies.
    - Increase the overall percentage of the County's operational waste stream that is eliminated or diverted through recycling and conservation efforts.
    - Reduce operational costs through environmentally-preferable products, services and practices.

- *Life Cycle Costing Procedure (AO 11-3)* - Requires life cycle analysis that considered maintenance, repair, energy costs and other expenditures associated with day-to-day operations for certain commodities

- *Sustainable Buildings Program (AO 8-8)* - Guides the design, construction, renovation and maintenance of County building and requires the County's Department of Procurement Management to include "as directed by the Sustainability Manager or OCI, appropriate language into procurement contracts to ensure compliance with the Sustainable Building Ordinance."

Most recently, the Board adopted Resolution R-1053-09 which directed the County to prepare a "green" procurement preference program for the purchase of environmentally responsible products and services. DPM prepared a "Buy Green" procurement policy, presented to the Board in November 2009, to promote and support the County's commitment to sustainability. The key goals of this policy are to reduce GHG emissions, reduce inefficient/wasteful use of

resources such as electricity, fuel, paper, and water and decrease use of hazardous materials to improve community and environmental health

Other Initiatives

In addition to overall County government goals and initiatives related to greener procurement, individual departments have established their own initiatives. For example, the Department of Environmental Resources Management (DERM) led the way several years ago in switching to digital cameras. A brief non-inclusive list of recent or ongoing initiatives can be found below.

Department	Initiative	Brief Description
General Services Administration	Online Procurement Catalog - Green Upgrade	Revised On-line GSA ordering catalog to flag products with recycled content so that department reps can easily identify for purchasing
Library	Purchase of Recycled Content Paper	Purchasing paper with higher recycled content by using savings realized through reductions in overall quantity of paper purchased.
Multiple Departments	Printer Cartridge Recycling Program	All departments collect and recycle their printer/toner cartridges
Multiple Departments	Scrap Metal and other Recycling	All departments collect and recycle their scrap metal and other commodities.

COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

No relevant feedback was available.

Airports - Government Operations

Assessment Area

Miami-Dade Aviation Department (MDAD) currently operates five airports in Miami-Dade County: Miami International Airport (MIA), Opa-locka Executive Airport (OPF), Kendall-Tamiami Executive Airport (TMB), Homestead General Aviation Airport (X51), and Dade-Collier Training and Transition Airport (TNT). The mission of the Aviation Department is to cost effectively operate airport facilities that are safe, efficient, customer friendly, environmentally responsible and contribute to the economic growth of the community. The Aviation Department must ensure the quick and safe transport of people and goods via multiple methods of transport: aircraft, truck, and passenger vehicles. The internal operations of the airport itself, from aircraft to ground support vehicles, as well as the operations of industrial tenants and companies that transport passengers and cargo, have a great potential for impacting the surrounding natural environment and resources.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Maintaining MIA as one of the community's top economic engines, especially in light of competition with other regional airports
- Maximizing the efficient movement of freight and passengers by minimizing traffic congestion at points of access to the airports and from major trip generators and destinations such as the Port of Miami
- Improving the capacity and efficiency of aircraft mobility in and out of the airports
- Minimizing passenger and commercial vehicle idling time while on airport property, including time to travel to parking areas and pick-up and drop-off areas
- Addressing existing groundwater contamination and preventing additional contamination, in particular the continual inherent risk of jet-fuel spills
- Reducing fuel consumption and associated emissions from auxiliary plane power equipment and other airport fleet and equipment
- Identifying and implementing opportunities for reducing electricity and water consumption and maximizing conservation and efficiency in operations
- Obtaining funding for improvements with sustainability benefits

ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

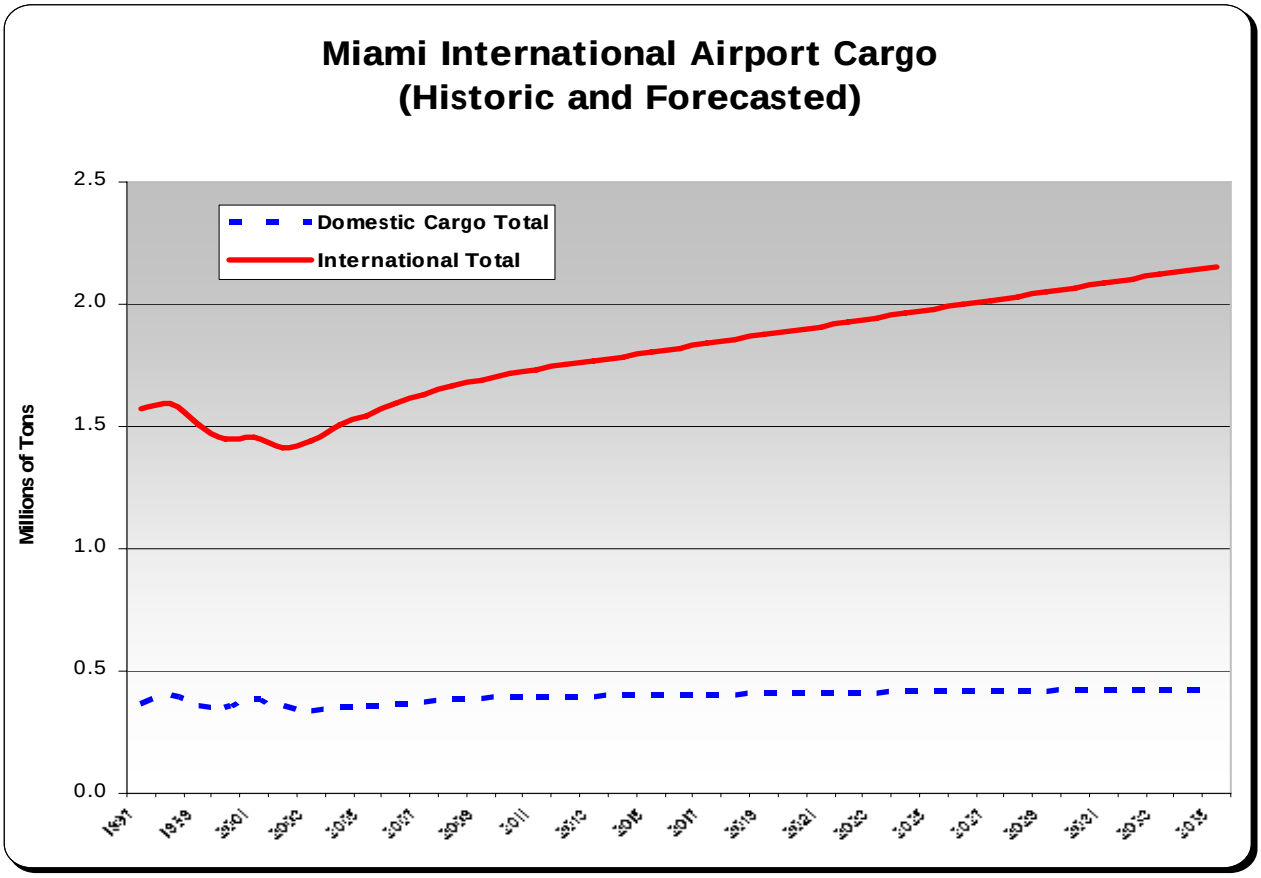
Economic Indicators

The annual economic impact of the MDAD system of airports is over $26.7 billion. The largest of the five airports is MIA, which handled 34.7 million passengers and 2.0 million tons of air cargo in 2008. MIA ranks first in the nation for international freight and 3rd in the nation for international passengers, and 3rd in the nation for total freight and cargo. It is also one of the top 10 airports internationally in terms of handling total freight. MIA and related aviation industries contribute 282,043 jobs directly and indirectly to the local economy. That equates to one out of 4.1 jobs in the County. Below are some graphs illustrating economic indicators associated with Miami-Dade's airport system, related to both cargo and passenger flights.

Economic Impacts of the Miami-Dade County System of Airports

TYPES OF IMPACT	TOTAL IMPACTS	
JOBS	**2006**	**2008**
DIRECT	147,115	152,472
INDUCED	64,602	66,958
INDIRECT	60,659	62,613
TOTAL	**272,376**	**282,043**
PERSONAL INCOME (MILLIONS)		
DIRECT	$3,921.2	$4,066.3
RE-SPENDING/CONSUMPTION	$4,258.8	$4,414.0
INDIRECT	$1,620.4	$1,687.0
TOTAL	**$9,800.4**	**$10,167.3**
BUSINESS REVENUE (MILLIONS)	**$25,560.1**	**$26,746.1**
LOCAL PURCHASES (MILLIONS)	**$2,608.5**	**$2,717.0**
STATE AND LOCAL TAXES (MILLIONS)	**$980.0**	**$1,016.8**
FEDERAL AVIATIONSPECIFIC TAXES (MILLIONS)	**$638.4**	**$654.9**

[http://www.miami-airport.com/pdfdoc/MDAD_Economic_Impact_Brochure2009.pdf]



(Source: Graph from Miami-Dade Freight Plan, 2009)

Comparison Report

12/7/2009

Daily Passengers & Flights

2000		2009	
Sunday, 12/3/00		Sunday, 12/6/09	
Passengers	106702	102159	-4.3%
Flights	1015	812	-20.0%

2008		2009	
Sunday, 12/7/08		Sunday, 12/6/09	
Passengers	100122	102159	2.0%
Flights	772	812	5.2%

Year-To-Date Passengers & Flights

Pre-911		2009	
1/4/01 - 12/3/00		1/1/09 - 12/6/09	
Passengers	32,910,171	31,538,883	-4.2%
Flights	331,495	252,412	-23.9%

2008		2009	
1/3/08 - 12/7/08		1/1/09 - 12/6/09	
Passengers	31,970,796	31,538,883	-1.4%
Flights	262,345	252,412	-3.8%

* These statistics are for commercial passenger flights that operated at Miami International Airport

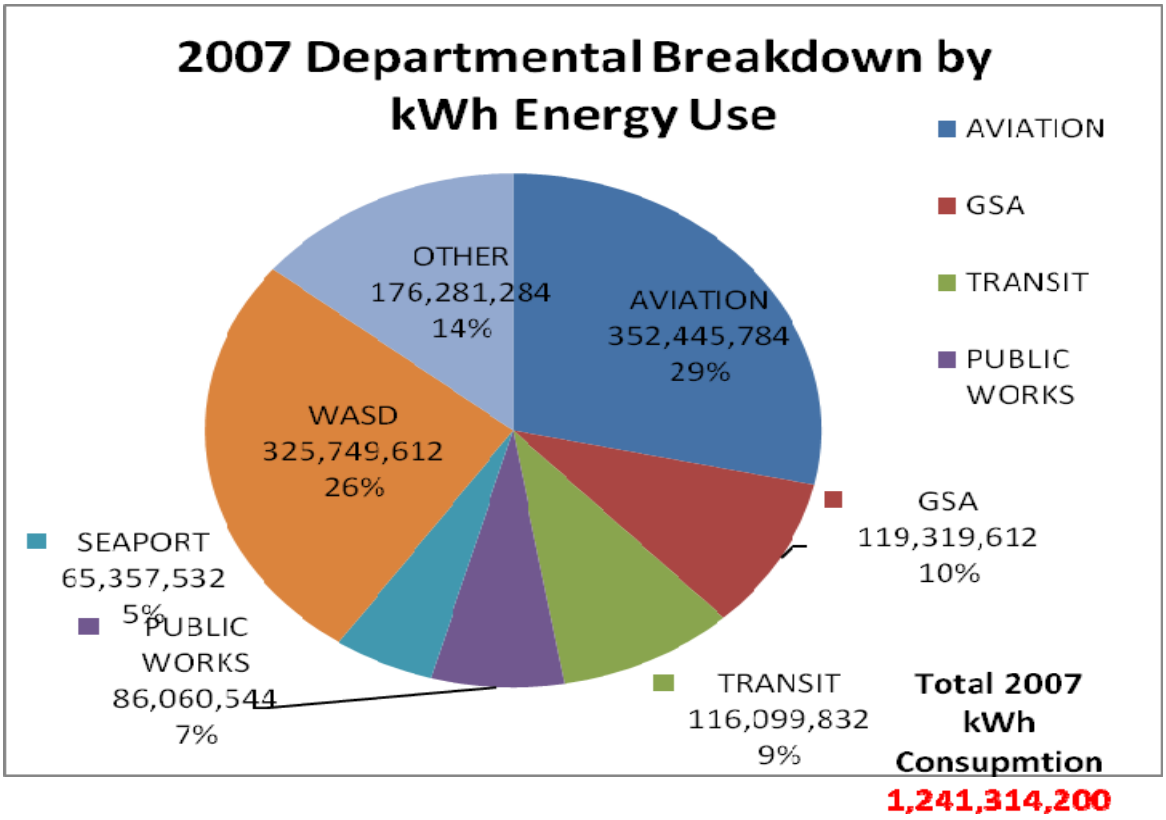
Resource Consumption – Fuel

Currently, the Aviation Department tracks fuel consumption only for internal operations such as vehicles used by County staff to travel within and between airports and equipment like generators. However, the majority of fuel being consumed in association with aviation activities is by private planes, trucks, and cars coming to and from the County's five airports. (MIA alone has approximately 8,700 parking spaces for public use and 7,000 spaces for employees and cargo operators.) See "Existing Efforts" section below for details regarding activities that have helped reduced fuel consumption and associated emissions from external customers.

MDAD Internal Fuel Consumption in Fleet and Equipment	Diesel in Gallons	Unleaded Gasoline in Gallons
2000	178,579.58	241,369.00
2005	143,021.01	290,303.02
2007	263,355.00	235,146.50
2008	287,280.00	232,260.60

Resource Consumption – Electricity

Due to its large facilities, MIA consumes a substantial amount of energy, using approximately 300 million kilowatt-hours of electricity in a year. In 2007, the Aviation Department was the largest user of electricity (29 percent) of any County department. MDAD has pursued several electricity reduction opportunities over the last three years (see "*Existing Efforts*" below). While these electricity reduction initiatives have been very successful, they have been offset by the fact that MIA terminal space has grown by four million square feet during roughly the same period.



Resource Consumption - Water

Water consumption is tracked by the Water and Sewer Department through master meters located at entrance points to MIA. Water use evaluations are being conducted and the recommendations will be used to develop a water use reduction plan by 2011.

MDAD Internal Water Consumption	Million Gallons A Day (MGD)
2007	1.855774
2008	1.851389
2009	2.073859

Annual Fuel Spill Volume

While all fuel spills at County airports are documented and addressed via Airside Spill Reports, this data is not currently being collected in an automated, accessible format that can be used to show trends or demonstrate comparisons from year to year. In the future, the Department of Environmental Resources Management (DERM) and MDAD will track the number of incidents

and volume per each incident in an automated fashion for use as an indicator. This indicator will be used to help evaluate the efficacy of Best Management Practices and International Organization for Standardization (ISO) certification guidelines.

New Violations and Compliance with Environmental Regulations
A report entitled "Violations of Environmental Regulations at Government Facilities and Properties in Miami-Dade County, Florida" is compiled annually by DERM. This report reviews the environmental status of government sites within the County, including county, federal, state and municipal facilities. Only one new case was documented during the current reporting period for MDAD. In terms of assessing sustainability, the number of 'new' violations each year will be tracked as an indicator. Please refer to the "Compliance with Environmental Regulations" section at the end of the Government Operations section of the Assessment Report.

Waste Reduction, Reuse and Recycling
MDAD system of airports has a mature recycling program for the following categories, with associated average yearly volumes/quantities, as follows:

- Paper 500,000 pounds
- Toner Cartridges 1,500 units
- Carpet 5,000 yards
- Fluorescent Lamps 35,000 feet
- Batteries 2,500 pounds
- Used Oil 3,000 gallons
- Used Oil Filters 2,000 pounds
- Coolant/Antifreeze 400 gallons
- Tires 25 tons
- Contaminated Fuel 500,000 gallons
- Cardboard (contract renewed 2009)
- Metal (contract renewed 2009)

Although there is no current year data for quantity of cardboard recycled, this commodity will be specifically tracked in the future as an indicator of MDAD's recycling and pollution prevention initiatives. Additional commodities will also be more closely tracked in the future to allow for year to year comparisons.

Noise Reduction
MDAD has taken a pro-active approach in addressing community concerns about aircraft noise. While the County's system of airports is critical to Miami-Dade's economy, associated aircraft noise can be disturbing and unpleasant. MDAD is continually challenged to reduce and alleviate aircraft noise, where possible, from both operations on the ground and in the air.

MDAD and Federal Aviation Administration (FAA) work together to reduce aircraft-related noise in residential areas by developing operational policies and procedures designed to decrease noise impacts caused by approaching and departing aircraft. MDAD developed compatible land use plans for areas adjacent to all County operated airports. Additionally, MDAD works with airlines to encourage the use of new technology like Stage III aircraft and GPS Area Navigation (RNAV), which are designed to lessen the impact of aircraft noise on neighboring communities.

MDAD receives and document noise complaints related to aircraft. MDAD utilizes a technology system called Aircraft Noise and Operations Monitoring System (ANOMS) to determine noise

impact on residential areas and identify which aircraft generated the noise complaint. The system gathers and processes flight related data, showing flight paths and aircraft altitudes. The trend of complaints has declined over time since the program was implemented and will continue to be monitored (see graph below).

MDAD TOTAL NOISE COMPLAINTS
2000 - 2009 (YTD)

YEAR	# of Complaints
2000	9559
2001	15144
2002	4327
2003	1679
2004	2757
2005	2629
2006	1517
2007	975
2008	1914
2009	2982

The latest aircraft arrival and departure procedural changes approved by the FAA include:

- Reduction of aircraft departures over residential neighborhoods at night
- Reduction of dispersion of low altitude aircraft departure turns during west flow operations
- Reduction of dispersion of aircraft arrivals and departures east of the airport
- Redirection of aircraft over non noise sensitive areas in the vicinity of the barrier islands for both west flow arrivals and east flow departures at MIA
- The FAA, in conjunction with MDAD, also assigns preferential use to MIA's four runways to minimize noise impacts on residential areas

MDAD will continue to work with the FAA to develop procedures to reduce aircraft noise as well as continue to monitor and track complaints and associated flights.

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Comprehensive Development Master Plan

Miami-Dade County's airports are included as a Sub-element in Comprehensive Development Master Plan (CDMP). MDAD will apply sustainable principles in the planning, design, construction, operation and maintenance for all MDAD operated airports, and follow the County's Sustainable Buildings Program which promotes green design, construction and operation of buildings. The Transportation Element, Aviation Sub-element is to ensure the provision of an economic, integrated environment and community-sensitive, and balanced system of air transportation facilities and services to move passengers and cargo effectively and efficiently; accommodate and encourage all types of general aviation activity, including business, commercial, instructional, and personal activity; and enhance the economy and quality of life in the County and the region.

Miami-Dade Freight Plan

The Miami-Dade Freight Transportation Advisory Committee (FTAC), which is the industry's advisory panel to the Metropolitan Planning Organization, establishes a Miami-Dade Freight Plan which is intended to support federal, state and countywide priorities as established in the Long Range Transportation Plan and the future vision for freight movement in the County. One of its primary goals is to promote regional goods movement that are socially and environmentally responsible. MDAD will continue to partner with the FTAC towards sustainable transportation practices. Goals that relate to the Airports are included below and other components of the Freight Plan are expanded on in the Transportation Section of this assessment report.

Below are the broad goals and some policy objectives of the 2009 Freight Plan. Many of the over 40 projects identified in the Freight Plan are likely to positively impact Miami-Dade Airports through improved efficiency of the movement of goods.

- Goal 1: Support economic development by enhancing freight system connectivity.
- Goal 2: Advance strategic freight initiatives that support job creation and retention to enhance the region's long-term competitive position.
- Goal 3: Enhance freight transportation safety and convenience to ensure mobility and access.
- Goal 4: Provide the secure movement of international and domestic goods.
- Goal 5: Address the varied freight improvement needs of area shippers, carriers and distributors at both a regional and corridor level.
- Goal 6: Improve multimodal access in order to enhance freight efficiency throughout the County.
- Goal 7: Promote methods for regional goods movement that are socially and environmentally responsible.
- Goal 8: Educate the public on the importance of freight transportation to the region as well as the needs and issues of shippers, carriers, and other affected stakeholders.
- Goal 9: Give greater priority and attention to freight in the regional planning process.
- Goal 10: Make public investments that help minimize the cost and improve the reliability of goods movement within the County.
- Goal 11: Implement and maintain freight initiatives that provide long-term returns on public investment.

Transportation Initiatives

To address transportation-related challenges, MDAD has undertaken the following initiatives:

- **Fourth Runway -** In 2003, MDAD constructed a fourth runway, thereby increasing MIA's airfield capacity by 25 percent while reducing aircraft delays into and out of the airport. This helped reduce delays in other passenger transportation modes. Increased capacity also minimized aircraft holding above the airport, departure waiting times; and idling of passenger pickup vehicles, resulting in significant air emission reductions.

- **Express Pay Lanes (Pay Pass) -** Express Pay Lanes were opened at the MIA in October 2003 to allow users to pay parking fees with their credit cards. This has resulted in improved customer service and air emission reductions by significantly reducing wait time as well as reducing idling in pay queues. There was an average of 147,898 monthly parking transactions during FY 2002-03. Cashiers handled both cash and credit card transactions and each transaction took an estimated 1 to 1.5 minutes. During FY 2008-09, there was a reduced monthly average of 125,075 parking transactions with the new credit card system at unstaffed lanes, estimated to take 30 seconds per transaction.

During December 2009, Master Card Pay Pass® was added to all 39 garage entry and exit lanes. Users of this system touch their credit cards to readers instead of inserting them into a devise, thus saving time, as well as the wear and tear on the machines**.** Transactions at staffed (with cashier) lane are currently estimated to average 45 seconds (with exceptions for transactions for disabled patrons and other special circumstances).

- **Cell Phone Lot -** A free park and wait area was opened in 2006 to allow customers to park and wait for the arrival of passengers without having to circle around the airport, thereby reducing traffic, idling and air emissions. It is estimated that the number of vehicles at the cell phone lot ranges from three to six at any given time in a 16-hour period. Usage has recently increased as a result of better directional signage and greater construction activities in surrounding areas. The average waiting time is estimated at 20 minutes. There is no signage at the lot recommending or requiring engines to be turned off.

- **MIC-MIA -** Currently, one of MDAD's main capital initiatives is to construct the Miami Intermodal Center (MIC) at MIA by 2012. The MIC will be an intermodal transportation center that links MIA to a new Rental Car Center (MIA-RCC) and the countywide transit system via a Metro Mover. It will provide connectivity between the transportation systems in the Palm Beaches, Fort Lauderdale, Miami, and the Florida Keys, as well as decongest the streets in and around the busy airport for the benefit of South Florida residents and visitors alike.

  The MIA Mover, an automated people mover system, is being constructed in association with the MIC. The Mover has the capacity to transport more than 3,000 passengers per hour between MIA and the MIA-RCC. Once the MIA Mover and the MIA-RCC are in service, rental car shuttles and rental cars will disappear from the airport's arrival deck. More than a half-million shuttle bus trips to off-site rental car companies each year will be eliminated, reducing curbside traffic at the airport's lower level by 20 percent daily. Ultimately, this complex will significantly reduce air emissions and fuel consumption around the MIA area.

- **NW 25th Street Viaduct -** This joint project with the FDOT is intended to provide a multilane freight corridor to avoid traffic congestion, facilitate traffic flow, especially truck movement, and enhance safety along this roadway in order to support the expansion of the West Cargo Area at MIA.

Other Initiatives

- **International Organization for Standardization (ISO) Certification and Pollution Prevention -** The ISO 14001 Certification Process is intended to provide organizations with Environmental Management Systems that comply with international standards to prevent pollution and protect the environment, while striving to achieve continuous improvement in their operations. One of MIA's biggest challenges is to insure that internal departmental operations, as well as tenant and contractor operations, comply with regulations in order to minimize our environmental footprint. MDAD has received ISO 14001 certification for the following MIA sections/units: Fuel, Facility, Civil and Environmental Engineering, Facilities Maintenance, and Commodities Management. ISO has changed the mindset of employees and empowered them to control their environmental impact in both their workplace and at home. MDAD has a permanent commitment to live up to its environmental stewardship in its operations, and ISO's continuous improvement requirement helps drive these efforts.

In addition, internal audits using the MIA Environmental Management System are performed monthly by Internal EMS/Safety Auditors. They check all Maintenance shops, warehouse and offices for environmental compliance and safety violations

- **Recycling -** MDAD maintains an extensive recycling and reuse program which includes items such as fluorescent lights, paper, cardboard, carpet, and lost and found items. MDAD is trying to expand their recycling efforts to the MIA terminal areas with three lines of recycling: paper, plastic and soda cans. The cardboard recycling program will be expanded this year to the Air Side Operations. In 2009, MIA set an internal cardboard recycling goal of 300 tons minimum per year.

- **Environmentally Preferable Purchasing** - MDAD Procurement strongly encourages personnel to consider the selection of Environmentally Preferable Products (EPP) when submitting purchasing requests and supports the green-purchasing guidelines developed by the County's Department of Procurement Management. MDAD has accomplished the following related to its EPP.
    - Purchase Forest Stewardship Council (certified) paper for all MDAD office needs
    - Discontinued purchase of Styrofoam cups
    - Janitorial contractors must abide by MDAD's environmental policies and support MDAD recycling programs
    - One of MIA's janitorial contractors uses only Green Seal certified cleaning products
    - MDAD purchased and installed about 80 Puradyn oil filtration/recycling systems in their vehicular fleet and other motorized equipment units to help reduce oil consumption and used oil disposal, improve engines performance and extend engine life span, reduce the frequency of oil filters replacement, as well as reduce related emissions.
    - Two hydraulic fluid filtration units were purchase for the loading bridges section to reduce consumption of hydraulic fluid and improve performance.
    - Mineral Spirit type parts cleaners, which generate hazardous wastes, were replaced with water-based units, which recycle the solvents/degreasers and significantly reduce the generation of hazardous liquid wastes, as well as emissions. MDAD was then able to change its classification with the State of Florida from Large to Small Quantity Generator of Hazardous Waste.

- **Stormwater and Groundwater Quality Initiatives -** Since 1994, MDAD has actively remediated billions of gallons of groundwater from the County's primary source of drinking water, the Biscayne Aquifer; removed and/or replaced over 200 underground fuel tanks that could pose an environmental threat; and closely monitors and responds to any spill incidents to protect human health and the environment. All employees in MDAD's ISO registered units undergo initial training on the essentials of ISO 14001 followed by annual refresher sessions, which include a review of MDAD's Spill Pollution Control and Countermeasures (SPCC) Plan.

  MDAD has implemented the following measures to ensure that stormwater discharges from MDAD facilities into canals under the jurisdiction of the County and the South Florida Water Management District (SFWMD) comply with the State of Florida Surface Water Standards:
    - Stormwater Pollution Prevention Plans (SWPPP) for Stormwater Discharges Associated with Industrial and Construction Activities. These programs identify

and implement the best management practices (BMP) associated with tenant and construction activities in order to prevent pollutants reaching the canals in the vicinity of MDAD facilities.
  - The installation of Pollution Control Devices such as peripheral grate inlets, grit chambers, oil/water separators and outfall booms and skimmers as integral components of the drainage systems.
  - A Stormwater Sampling and Monitoring Program to protect the quality of the stormwater discharges from MIA into SFWMD Canals have been implemented. *Although monthly sampling is performed actual data was not readily available at the time of this report.*
  - Routine preventive maintenance of MDAD drainage ways.

- **Electricity Reduction -** MDAD has been aggressively pursuing opportunities to reduce energy consumption and related costs, such as re-lamping and retrofitting lighting throughout the terminal and installation of a Thermal Energy Storage System that produces ice during the off-peak consumption period to cool the air during the peak demand period. The estimated savings associated with these measures for 2009 are equivalent to 6,000 tons of CO2 per year.

- **Air Emissions -** In order to reduce CO2 emissions from aircraft operations, MIA has been replacing the diesel powered Ground Support Equipment (GSE) that provide AC and power for aircraft at Concourse H with fixed Ground Power Units (GPU) as alternatives to the Auxiliary Power Unit (APU) and GSEs. The GPU supplies the aircraft with power and pre-conditioned air from airport facilities and, therefore, the CO2 emission is far less than the APU and diesel GSE. These represent an estimated reduction of 131,400 gallons of diesel per year.

- **VOC Air Emissions Reduction Master Plan -** This plan was developed to facilitate the reduction of air emissions by 10 percent from sources operated by MDAD and improve ambient air quality, especially at MIA over a ten year period (2000-2010). Pollution prevention and recycling programs, new procurement policies concerning paints, solvents and diesel fuel, improved spill prevention and reduced fuel losses, discontinuing waste incineration and the removal of two incinerators were among some of the actions undertaken to reach a 15.1 percent reduction (7.2 tons per year) of volatile organic compounds (VOCs) by 2005.

- **Tenant Environmental Compliance Auditing and Assistance Program -** MDAD provides tenants with guidance and assistance to achieve environmental compliance, waste minimization, pollution prevention (P2), and improved environmental management. MDAD, in conjunction with the County's Department of Solid Waste Management is in the process of informing airport tenants about County requirements to recycle a minimum of three items. This initiative should increase recycling levels from the tenants.

- **Soils Reuse -** MDAD negotiated with contractors working on FDOT road projects the reuse of more than 350,000 cubic yards of marginally contaminated soils, which otherwise would have been incinerated or transported to landfills. This protocol not only saved the County over $9 million in transportation and disposal costs; but also resulted in significant reductions in fuel consumption and greenhouse gas (GHG) emissions, when quarry soils were replaced with soils nearby those FDOT projects.

- **Manatee Protection -** MDAD has installed screens and barriers to prevent manatees, an endangered species, from entering MDAD drainage ways, where they often get trapped in the structures and suffocate to death.

- **Canopy Coverage** - Department data suggests the number of trees (canopy cover) at MIA is higher than the standard canopy in Miami-Dade. For example, there are more than 10,000 trees at MIA providing a 45 percent canopy cover on non-airside properties, compared to a County average canopy of 12 to 18 percent. *(Additional information about tree canopy is in the Environment Assessment area.)*

- **Environmental Education** - MIA public website www.miami-airport.com and intranet site offers information for employees, tenants, consultants, contractors and the community on its environmental management system and a variety of environmental compliance issues. Recently MDAD produced a report, available through the website, which summarizes all of MIA's Environmental Achievements.

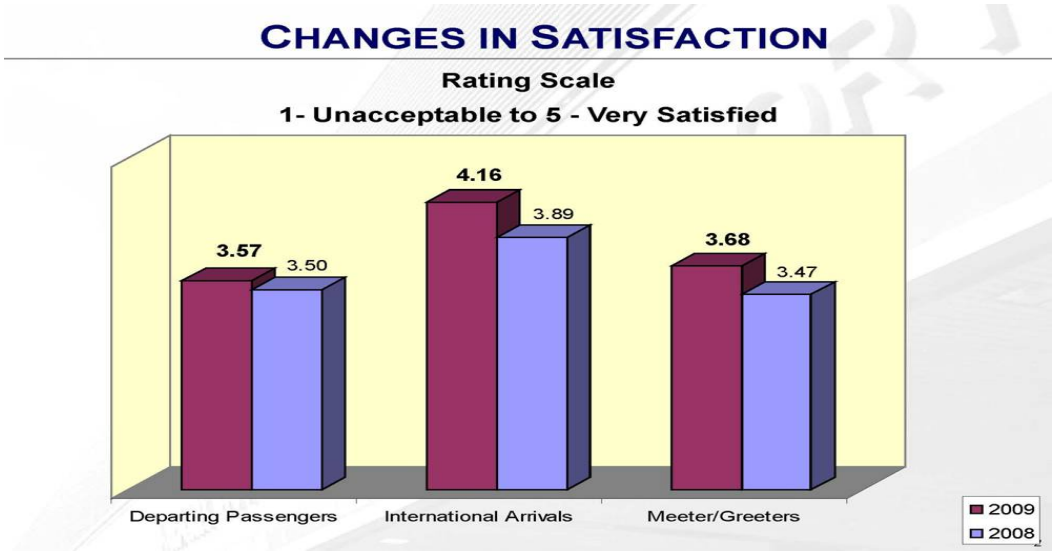
  In order to increase the environmental awareness of their employees, MDAD has developed an internal green newsletter "Working Green at MIA" to inform them about strategies, tips and procedures to improve their environmental footprint at work and elsewhere.

  G.W. Carver Middle School Honors Biology Class in collaboration with Dream in Green actively participated in MDAD environmental activities. These students researched MDAD's environmental foot print and presented proposals to further improve MDAD's airport environment. Future school projects will be encouraged and supported by MDAD.

COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

In 2009, a customer satisfaction survey was conducted by an external consultant (Unison) at MIA. The survey included more than 3,000 airport customers (including departing and international arriving passengers and greeters) and showed improved scores compared to 2008. In order to continue those improvements, the MDAD is partnering with the Greater Miami Convention and Visitors Bureau and the Miami Beach Visitor and Convention Authority to provide mandatory customer service training to all 30,000-plus employees who work at MIA.



Miami-Dade County Resident Satisfaction Survey 2008
See the *Transportation Area* of this report for community feedback on services at MIA.

Seaport - Government Operations

Assessment Area

The Port of Miami (POM) is among America's busiest ports, recognized throughout the world with the dual distinction of being the number one port for cruise passengers and number one for containerized cargo in the State of Florida (12th in the nation). More than four million cruise passengers traveled through the Port of Miami last year and the Port handled approximately 7.5 million tons and over 800,000 Twenty-Foot Equivalent Units (TEUs) of cargo last year. This commerce operation contributes approximately $17 billion annually to the South Florida economy and helps provide direct and indirect employment of 176,000 jobs. Part of the Port's success may be attributed to its geographic location, which places it at the crossroads of major global shipping lanes as well as its close proximity to the popular cruise destinations.

The Seaport Department's core mission is to provide service to cruise passengers, cargo shipping commerce, and other members of the maritime community. The Port operates as a tenant-landlord port with container terminals operated by several private terminal companies. Tenants and ancillary services that transport passengers and goods have a great potential for impacting the surrounding natural environment and resources. Moving people and goods efficiently naturally translates to environmental benefits through a reduction in the consumption of resources and emissions. The following are the key challenges as they relate to sustainable seaport design and operations:

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

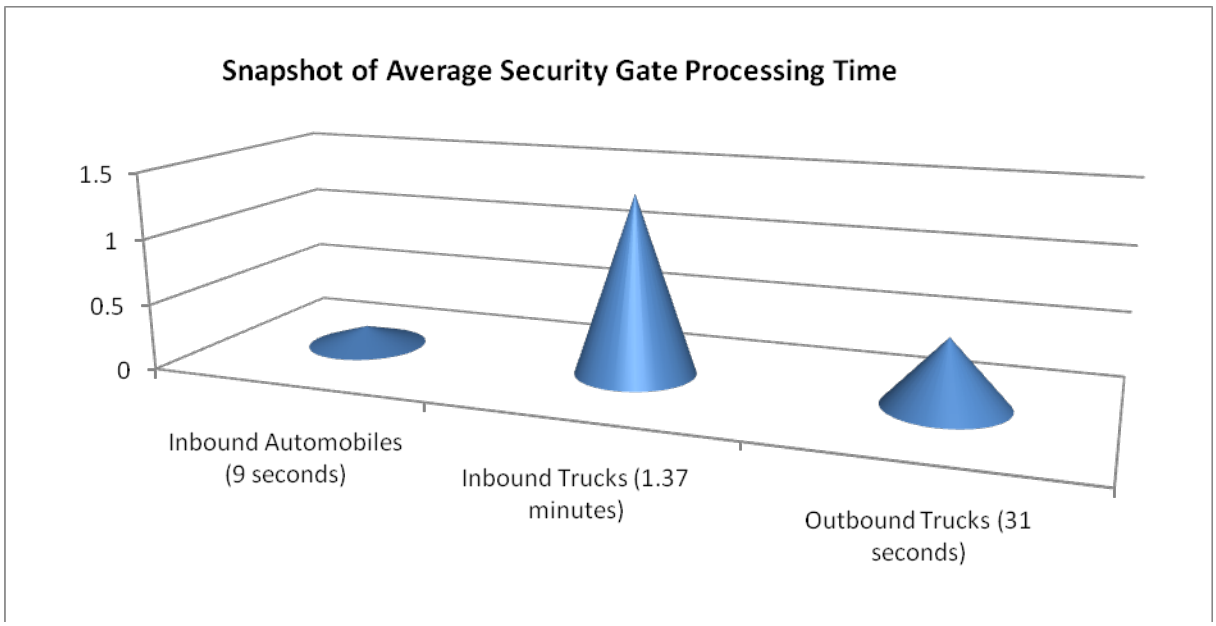
Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Maintaining the POM as the community's second largest economic engine considering economic challenges, competition from neighboring ports, climate change impacts (in particular sea level rise), and the high cost of port security.
- Maximizing the efficient movement of freight and passengers to and from major trip generators and destinations such as Miami International Airport by minimizing vehicular traffic congestion on downtown streets (currently the only point of access to the port). Reducing vehicular traffic will improve regional air quality and enhance transportation safety.
- Maximizing the efficient movement of freight through POM security gates and cargo yards.
- Minimizing passenger and commercial vehicle idling time while on port property, including time to travel to parking and pick-up and drop-off areas.
- Reducing internal and tenant fuel consumption and associated emissions from auxiliary power equipment for port operations.
- Identifying and implementing opportunities for reducing internal and tenant energy and water consumption and maximizing energy efficiency in operations
- Factoring sustainability into long term planning decisions (such as channel/basin expansions) in order to balance the need for cargo ship capacity and safety while minimizing impacts to seagrass beds and coral reefs.
- Working with cruise ship industry to best utilize existing berthing slips to both accommodate business while avoiding or minimizing impacts to marine resources.
- Obtaining grant or other funding to implement projects with high sustainability benefits.

Processing Time

Maintaining efficient and secure flow of trucks to and from the Port's cargo terminal facilities is essential to its viability. Tracking processing time allows the Port to evaluate whether it is operating efficiently and whether initiatives to increase processing efficiency are working. Figure 1 is a snapshot of average security gate processing times in November 2009. Increased efficiency also helps minimize emissions by reducing truck idling time.

Figure 1

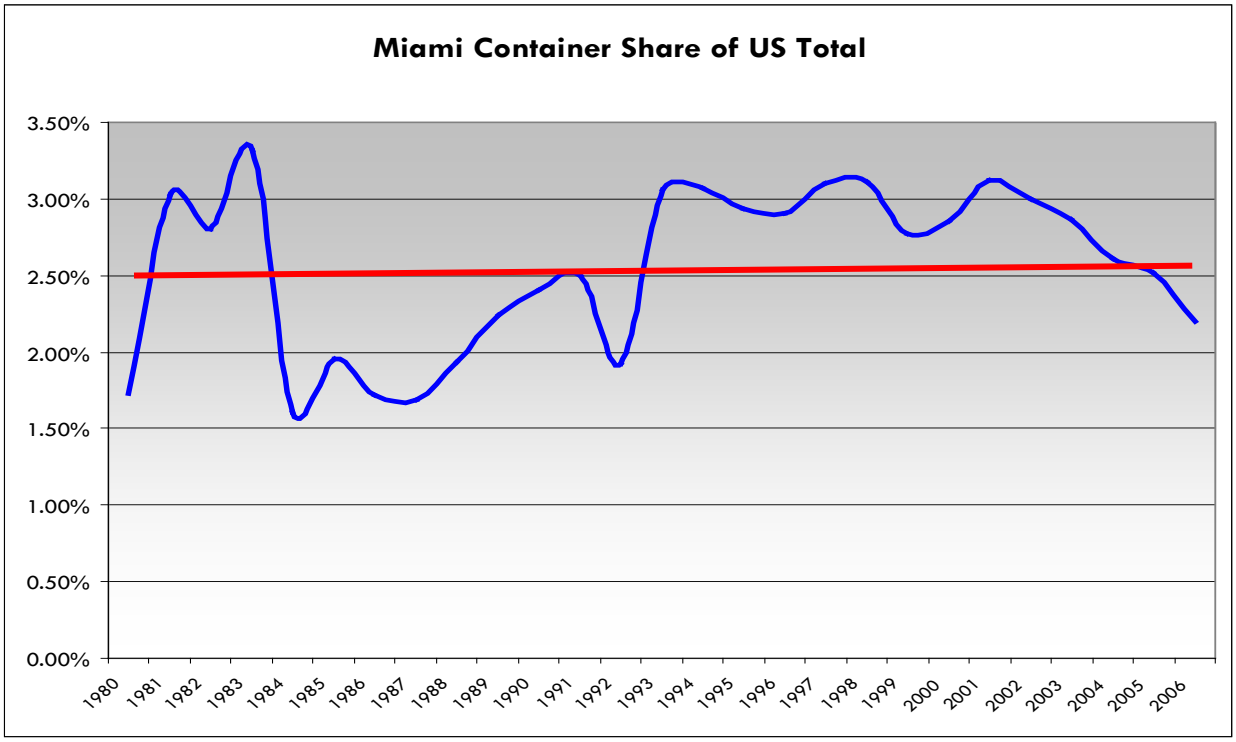


(Source: Miami-Dade Seaport Department)

Cargo and Cruise Statistics

Both cruise passenger numbers and Twenty-Foot Equivalent Units (TEUs) are used to assess level of commercial activity at ports and can therefore be used as indicators. With the Port's cargo sector primarily focusing on containerized cargo, the Port processed approximately 7.5 million tons of cargo in 2008. The industry standard for cargo is measured in TEUs. It is expected that TEUs will rise an average of 1 to 2.5 percent annually by 2035 based on the recent trends and waterborne cargo forecasts from the U.S. Department of Transportation's (DOT) Freight Analysis Framework (Miami-Dade Freight Plan, 2009). Figure 2 shows the Miami container share of the U.S. total.

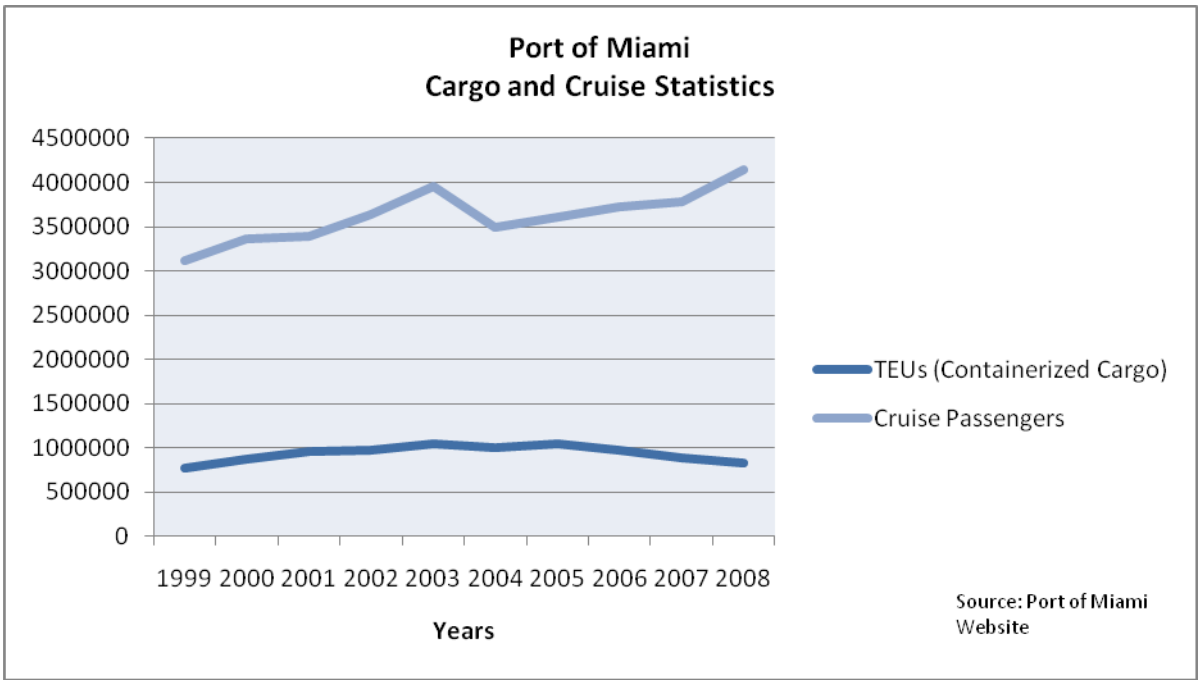
Figure 2



Source: Miami-Dade Freight Plan, 2009. Blue line is actual data; red line is 'smoothed' trend line.

The Port has experienced steady increase of cruise passengers in the past four years as shown below in Figure 3.

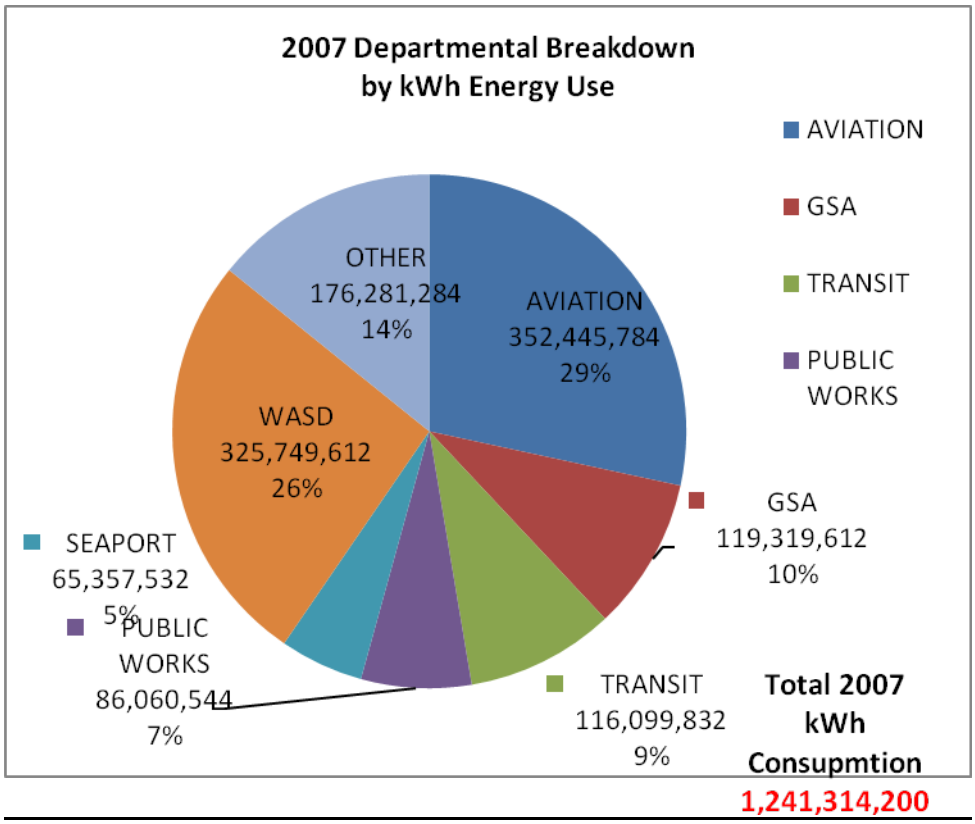
Figure 3



Electricity Consumption

The Seaport Department ranks sixth highest (5.27 percent) for electricity consumption among all County departments, with annual consumption for 2007 at 65,357,532 kWh (Figure 4). This high electricity consumption is related to the fact that the POM is open 24 hours a day, seven days a week for both cargo and cruise operations. Typically cruise operations are concentrated Thursday through Mondays, while cargo operations are underway around the clock (24 hours).

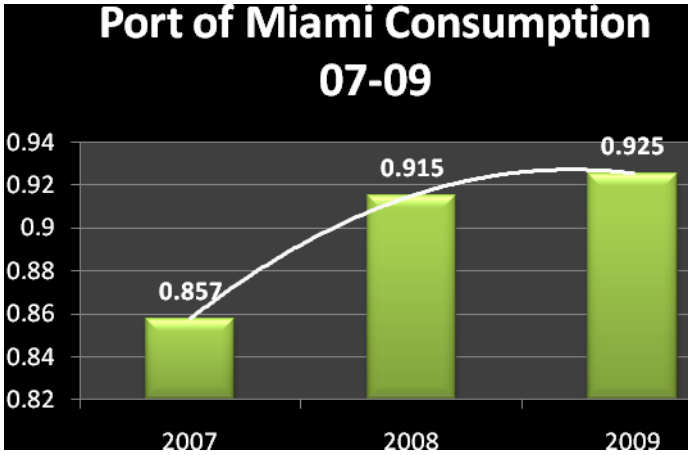
Figure 4



Water Consumption

The port expansion is reflected in its water use, with the addition of terminals D and E at the close of 2007. A water use audit will be performed in 2010 to establish per passenger consumption and identify retrofit needs. Figure 5 illustrates water use consumption.

Figure 5



Millions of Gallons per Day (MGPD)

Environmental Monitoring

Improving access and maneuverability for passenger and cargo ships has shaped the Port since the early 1900s. Historically, there was little documentation or regulation nationwide of activities that had the potential to impact marine resources and therefore there is no accurate way of assessing the extent of past cumulative impacts to these resources. In the 1960s, the Port moved from the downtown Miami mainland to its current location as an island in Biscayne Bay. The base of this new island was reused dredged spoil from the Government Cut dredging projects. In 1970, the National Environmental Policy Act (NEPA) was signed into law and in 1972 the Clean Water Act (CWA) was adopted, requiring the identification and evaluation of impacts to natural resources and a public comment process. In particular, NEPA requires that environmental impact statements (EIS) be prepared to identify environmental impacts and mitigation activities for major federal actions having a significant effect on the environment.

All dredging projects in federal waters are regulated by the United States Army Corps of Engineers (USACE). POM expansion projects that are managed and paid for (sponsored) by the Miami-Dade Seaport Department directly are also governed by local environmental regulations. Although POM expansion projects that are managed and paid for (sponsored) by the USCE are exempt from these local environmental regulations, the County comprehensively reviews these projects and provides recommendations for minimizing impacts and providing mitigation.

Following federal guidelines, past expansion projects performed studies to evaluate different alternatives, associated costs, benefits, and environmental impacts per NEPA and CWA policies. Table 1 below summarizes the harbor improvements for two such projects and the associated mitigation projects completed to offset their associated environmental impacts.

Table 1 - POM 1980 & 1981 Expansion Activities and Associated Mitigation		
Project	Activity	Mitigation Performed
1980 Harbor Improvement Project	Creation of Lummus Island Deepening of South Shipping Channel to -36' Creation of Central Turning Basin Widening of West Turning Basin	Mangrove Habitat Creation – 15 acres Shoreline Stabilization Creation of artificial reefs in Biscayne Bay Seagrass monitoring Creation of inshore artificial reefs Spoil island enhancement
1991 Harbor Improvement Project	Deepening Government Cut to -42' Deepening Fisher Island Turning Basin to -42' Deepening of South Shipping Channel to -42'	Creation of approximately 16 acres of offshore artificial reef Mangrove restoration at Biscayne Bay canals Mangrove restoration at Oleta River State park – 42.5 acres

Source: Miami-Dade County Seaport Department
Mitigation Reimbursement Study
Updated April 1998

Because different entities have managed POM expansion projects, environmental impacts and associated mitigation have been documented and tracked using different methodologies. To better address this lack of data, for both planned projects and projects already completed, historical records should be searched and the data provided at a later date according to Table 2 (below). Data should also be tracked in a similar and consistent manner for future (planned) expansion projects.

Table 2 - POM Expansion - Environmental Impacts & Mitigation					
Project	**Project Activity**	**Projected Impacts (In Acres)**	**Actual Impacts Per Pre and Post Survey (In Acres)**	**Projected Mitigation Per EIS* (In Acres)**	**Final Mitigation Value as Per Permit**
Example Harbor Improvement Project 1					
	Example Activity A – hypothetical island expansion				
Seagrass (direct and indirect impacts)		TBD	TBD	TBD	TBD
High relief coral		TBD	TBD	TBD	TBD
Low relief coral		TBD	TBD	TBD	TBD
	Example Activity B – hypothetical deepening of channel				
Seagrass (direct and indirect impacts)		TBD	TBD	TBD	TBD

High relief coral		TBD	TBD	TBD	TBD
Low relief coral		TBD	TBD	TBD	TBD
	Example Activity C – hypothetical widening of turning basin				
Seagrass (direct and indirect impacts)		TBD	TBD	TBD	TBD
High relief coral		TBD	TBD	TBD	TBD
Low relief coral		TBD	TBD	TBD	TBD

Turbidity

Turbidity is a scientific way of measuring a water body's "muddiness" or "cloudiness." Typically, the cloudier the water, the greater its turbidity. Turbidity is greatly affected by weather events, but can also be increased by human activities such as wastewater discharges, fisheries trawling, boat propeller wash, and re-suspension of sediments caused by dredging. Turbidity is an important indicator because it can disrupt the natural environment and hinder the growth of plants and animals. For this reason, dredging permits typically require turbidity management plans with frequent turbidity monitoring.

New Violations and Compliance with Environmental Regulations

A report entitled "Violations of Environmental Regulations at Government Facilities and Properties in Miami-Dade County, Florida" is compiled annually by DERM. This report reviews the environmental status of government sites within the County, including county, federal, state and municipal facilities. No new cases were documented during the current reporting period for POM. In terms of assessing sustainability, the number of 'new' violations each year will be tracked as an indicator. Please refer to the "Compliance with Environmental Regulations" document the "Government Operations" section of the Assessment Report.

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Comprehensive Development Master Plan

The Seaport Department is included as a sub-element in the Comprehensive Development Master Plan (CDMP). Specific POM goals in the CDMP include:

- The Port of Miami shall endeavor to retain its position as the top-ranking cruise port of the world while expanding its share of the cruise market, and continue to expand its role as one of the leading container ports in the nation.
- In carrying out its day-to-day operations and its long-term expansion program, the Port of Miami shall minimize any detrimental effects on the environment, the community, and supporting infrastructure and shall continue to coordinate its operation and expansion activities with federal, state, and regional agencies, other County departments, neighboring municipalities, and surrounding communities as appropriate.

Specific POM objectives in the CDMP include:

- *Objective PM-4* - The Port shall promote sound environmental practices in its day-to-day operations and long-term maintenance and expansion plans, consistent with the unique role and responsibilities of deep-water port facilities.
    - PM-4A. The Port shall periodically review its environmental practices in response to new information and community issues.
    - PM-4B. The Port shall maintain or obtain, as appropriate, environmental agency approvals for existing and proposed port expansion activities, including extension of existing permits as necessary and preparation of new master expansion

permits to address longer range expansion plans. The Port shall ensure that required mitigation, including, but not limited to, creation of artificial reefs and habitat restoration and enhancement activities in Biscayne Bay, is implemented. The capital projects proposed in this plan element constitute the development program to be undertaken by the Port, with full acknowledgement that each project may proceed only after required environmental and community evaluations are conducted, regulatory and CDMP conformity are determined, and regulatory approvals are obtained.

  - PM-4C. By 2006, the Port shall explore the feasibility of mitigation banking as a long-range option for natural resource planning. The feasibility study should address the beneficial use of suitable dredged materials, the value of integrated ecosystems including submerged habitats, shoreline habitats, and upland areas for mitigation, and ways to integrate public access, as well as recreational and educational opportunities into mitigation areas.
  - PM-4D. By 2006, the Port shall develop a Dredged Materials Management Plan which addresses long-term needs for spoil disposal and beneficial use of dredged material.

- *Objective PM-5* - The Port shall maintain its policy of cooperation with all levels of government and the community in the resolution of environmental issues.
  - PM-5A. The Port shall encourage its users to comply with applicable existing policies designed to minimize particulate emissions from ships in port.
  - PM-5B. The Port shall continue to ensure that the disposal of any spoil not used as fill in its land area is conducted in accordance with permits.
  - PM-5C. The Port shall stabilize all its remaining unconsolidated shorelines and minimize the turbidity associated with maintenance dredging.
- *Objective PM-6* - The Port shall coordinate off-island expansion activities with affected communities.
  - PM-6A. The Port shall conduct the following analysis relative to off-island expansion activities as part of an integrated planning and public participation process: impact analysis on surface transportation linkages, environmental resources, adjacent land uses, and water, wastewater and solid waste facilities.
  - PM-6B. The Port shall integrate expansion activities into the physical, social and economic fabric of the surrounding communities.
  - PM-6C. The Port shall provide public access to the waterfront when appropriate and not in conflict with safety and operation practices. Expansion into parkland shall be consistent with Policy PM-1A.
- *Objective PM-8* - The Port shall coordinate port expansion activities to achieve appropriate land uses, joint uses and joint-venture partnerships.
  - PM-8A. The Port shall work with other agencies and the private sector to maximize the economic benefits to be derived from expanded port operations.
  - PM-8B. The Port shall consider other uses including, but not limited to, commercial, recreational, cultural, hospitality and residential uses accessible to port users, county visitors and residents, in its on- and off-island port developments, so long as these uses are compatible with the primary port use.
  - PM-8C. The Port shall consider multi-use options for all new facilities, including dual purpose parking garages and mixed-use development.
- *Objective PM-9* - The Port shall coordinate landside and waterside transportation issues with pertinent federal, state, county (including adjacent counties) and City agencies to ensure that the Port's requirements are consistent with the abilities of the agencies to provide the services needed to support these activities.
  - PM-9A. Miami-Dade County shall continue to work in partnership with the City of Miami, the Metropolitan Planning Organization (MPO), the Florida Department of Transportation (FDOT), and other affected entities to implement the Miami

Downtown Transportation Master Plan through interagency agreements, amendments to the MPO's Long Range Transportation Plan and Transportation Improvement Program and similar plans and programs of other responsible entities to incorporate recommended provisions, as appropriate.

  - PM-9B. In addition to the Miami Downtown Transportation Plan to be conducted pursuant to policy PM-9A, the Port shall work with other agencies to develop a comprehensive analysis of its transportation requirements for the next 20 years to meet additional projected cruise passenger and cargo transport needs. For cruise transportation needs, the focus will be on more efficient links between port facilities and the airport, and between port facilities and local excursion destinations. For cargo operations, the focus will be on better links between intermodal centers and port facilities, more efficient access between port facilities and the interstate system, and better connections between port facilities and industrial centers.
  - PM-9C. The Port shall work with all applicable agencies to implement the direct port/interstate transportation link and intermodal facilities required to meet the needs of the port and the community.
  - PM-9E. Recognizing that the federal government has merged the tri-county South Florida region into one Metropolitan Statistical Area (MSA) and the state has authorized the creation of the South Florida Regional Transportation Authority (SFRTA), the Port will collaborate with partners who seek synergistic solutions to the region's multimodal transportation constraints. Collaborative activities reflecting the growing importance of regional transportation planning are expected to include implementation of inclusive plans and studies such as the Statewide Intermodal System Plan, Phase III of the Florida Multimodal Trade Corridor Assessment series, and the Intermodal Connectivity in the Atlantic Commerce Corridor Assessment. The port will also support designation of the Atlantic Commerce Corridor as a federal Corridor of National Significance or any similar designation that will help attract critical capital improvement funding to the region.
  - PM-9F. The Port shall assist in implementing the recommendations issued pursuant to policies.
  - PM-9A and PM-9B that will provide improvements to the County's roadway and transit networks that are important to the movement of port-related freight, and cruise passengers.
  - PM-9H. The Port shall work with the City of Miami, other County agencies and the Florida Department of Transportation to identify and improve the key problem intersections and improve access to and from the Port.

- *Objective PM-10* - The Port shall work with County departments and utility providers to ensure that necessary capacity is available to support existing and proposed uses in advance of need.
  - PM-10A. The Port shall implement best management practices, monitoring programs and other measures to improve stormwater quality per its National Pollutant Discharge Elimination System Stormwater Pollution Prevention Plan, dated November 2000.
  - PM-10B. The Port shall complete a Stormwater Management Master Plan by 2006 which shall: identify existing stormwater infrastructure conditions and any potential need for infrastructure improvements that may be required to meet NPDES and State of Florida water quality standards; and, include a schedule for stormwater improvements that may be required. The Port shall propose amendments to the Capital Improvements Element to implement improvements, either through planned development and redevelopment activities or through retrofitting of existing areas.

- PM-10C. By 2006, the Port shall complete construction projects arising from the Consent Agreement with DERM pertaining to extension of sanitary sewer lines into the western half of the Port island facility and elimination of septic tank systems in the same area.
- PM-10D. The Port shall continue to assess the capacity of water lines to determine if additional capacity or water pressure is needed to accommodate future development. The Seaport Department shall schedule necessary improvements to the water system in the Capital Improvements Element.

Miami-Dade Freight Plan

The Miami-Dade Freight Transportation Advisory Committee establishes a Miami-Dade Freight Plan which is intended to support federal, state and countywide priorities as established in the LRTP and the future vision for freight movement in Miami-Dade County.

The Port is primarily served by trucks which must navigate through downtown Miami. The Freight Plan has a goal of promoting regional goods movement that are socially and environmentally responsible. The Plan was developed under the guidance of the Miami-Dade MPO Freight Transportation Advisory Committee (FTAC) which is the industry's advisory panel to the MPO that advises the MPO Board on freight movement and truck traffic needs. Those goals and project recommendations that relate to the Seaport are included below. Components of the Plan are expanded on in the Transportation Section of this Assessment Report.

POM works with Freight Plan partners to towards sustainable transportation practices. While many of the over 40 projects identified in the 2009 Freight Plan are likely to positively impact the POM through improved efficiency of the movement of goods, listed below are the port-specific project recommendations. Priority one recommendations are forwarded for inclusion in the Long Range Transportation Plan.

The goals of 2009 Freight Plan include:

- Goal 1: Support economic development by enhancing freight system connectivity.
- Goal 2: Advance strategic freight initiatives that support job creation and retention to enhance the region's long-term competitive position.
- Goal 3: Enhance freight transportation safety and convenience to ensure mobility and access.
- Goal 4: Provide the secure movement of international and domestic goods.
- Goal 5: Address the varied freight improvement needs of area shippers, carriers and distributors at both a regional and corridor level.
- Goal 6: Improve multimodal access in order to enhance freight efficiency throughout the County.
- Goal 7: Promote methods for regional goods movement that are socially and environmentally responsible.
- Goal 8: Educate the public on the importance of freight transportation to the region as well as the needs and issues of shippers, carriers, and other affected stakeholders.
- Goal 9: Give greater priority and attention to freight in the regional planning process.
- Goal 10: Make public investments that help minimize the cost and improve the reliability of goods movement within the County.
- Goal 11: Implement and maintain freight initiatives that provide long-term returns on public investment.

Examples of policy objectives associated with these goals include:

- Determine a location(s) for truck parking and staging locations closer to origins/destinations to allow drivers to avoid peak traffic periods and comply with Federal Driver Hours of Service regulations.
- Evaluate the feasibility of "24/7" operations at key freight origins and destinations as a potential freight congestion management strategy.
- Identify and evaluate the feasibility and benefit-cost of low-cost congestion management improvements such as improved traffic signal timing.
- Identify intersections with heavy truck traffic that do not meet present design standards. Advance priority intersection improvements in line with updated intersection design standards.
- Implement the Truck Route System for Miami-Dade as a foundation or backbone for defining a Miami-Dade County Core Freight System (all modes) and integrate with current planning and programming activity.
- Implement low cost ITS improvements that provide information to freight carriers that allow them sufficient time to react to changing traffic conditions.
- Periodically review the state of the system in terms of pavement quality and other maintenance related measures that are important to carriers.

Freight Plan Seaport-Related Project Recommendations*

Priority	Project	Details
1	**Downtown/Port Access**	-Construct I-95 NB Slip Ramp on NW 6th St. -Implement NE/NW 5th/6th Sts./Port Blvd. improvements for access between POM and I-95 slip ramp.
		-Improve intersections to accommodate truck movements in existing NW 1st/Miami Ave./NE/NW 5th/6th St corridor
1	**SR 836/I-395/MacArthur Cswy.** (NW 137 Ave. to Proposed Port of Miami Tunnel)	-Elevated express lanes
		-Implementation of E-W Rail Line to reduce passenger traffic
		-836-112 interconnector implementation (part of MIC project)
1	**Port of Miami Infrastructure** (Including all access roads in/through downtown Miami)	-Expand shipping/freight industry hours of operations -Port Tunnel -Expand SB left-turn lane on Biscayne Boulevard for trucks entering the POM
1	**Truck Parking Improvement**	-Provide a location in the area of Okeechobee and the HEFT for long-term truck parking and staging. Area should provide the amenities necessary for drivers to serve Miami-Dade County while meeting their Federal Hours of Service requirements. -Develop truck staging area near NW 36th Street and NW 37th Ave for the Port of Miami River.
1	**Short Sea Shipping Pilot Project**	Conduct a Pilot Project of short sea shipping to evaluate if containers could be transported effectively from the POM to the Port of Miami River using shallow draft vessels to relieve congestion at the POM and reduce truck traffic.
2	**Port of Miami Operations**	PierPass Feasibility Study to examine the impact of implementing congestion mitigation incentives for off-peak operations.

2	**Freight Rail Maintenance and Repair**	Projects associated with line and structure maintenance, including bridge rehabilitation, track and tie replacement, resurfacing, and repairs to signs and signals. Repair FEC Bascule rail bridge into the Port of Miami.
2	**Port of Miami Dredging Phase III**	Complete site preparatory work for dredging project include the strengthening of the South Channel Cargo Wharf bulkhead, purchase two new Post-Panamax cranes, and deepen channel to 50'/52'
3	**Port of Miami-Cargo Yard Freight Accessibility Program**	Site work, access road, paving and drainage, utility work, demolition of existing Shed G in R.O.W. and relocation to a new Warehouse (to be constructed) east of Shed E as part of the freight accessibility program.
3	**Port of Miami-Bulkhead Restoration/Repair**	-Create a new Bulkhead (wharf 155-160) to protect and restore a dilapidated cargo area and maintain existing freight accessibility through: site work, infrastructure improvement, paving and drainage. -Safety project to rehabilitate the bulkhead wall system and pavement of the South Cargo Wharf from approximately berths 165 to 177. Project includes: waterway infrastructure improvement, site work
3	**Port of Miami-Seaboard Marine Cargo Yard Improvements**	Part of the agreement with Seaboard to improve the yard and to support their existing terminal operations at the port. Work to be done in 5 phases including apron and pavement enhancements and drainage improvements in this area. Apron work includes site preparation including excavation, placement of subgrade and lime rock base, and resurfacing to accommodate heavy crane loads.
3	**Port of Miami-Environmental improvements and Equipment Protection**	-Electrification of all gantry cranes for more sustainable operations. Project will increase freight movement efficiency and help reduce noise levels and air pollution. Project also includes cargo yard preparation for the arrival of two new Post-Panamax cranes to increase cargo throughput. -Installation of new canopies at the cargo gates to prevent equipment weathering.

*(Source: *Graph modified from Miami-Dade Freight Plan, 2009)*

Fuel Reduction Initiatives
The Port has embarked on a Gantry Crane Electrification initiative to help reduce fuel consumption. The Port completed Phase 1 of this initiative in 2007 by electrifying five of its nine Gantry cranes. Electrification results in a fuel reduction per crane estimated at 60,000 gallons of diesel per year along with an estimated fuel saving cost of $71,900 per year per crane. In addition, the Port will realize emissions reduction benefits as a result of this initiative as per the graph below. The Port is in the process of implementing Phase 2 of the gantry crane electrification program and is expected to finish by 2011.

Projected Emissions Reductions through Electrification of Gantry Cranes (tons per year)					
Pollutant Unit	**NOx**	**PM**	**HC**	**CO**	**CO2**
Emissions Reductions for 5 Cranes (Phase 1 completed)	111.1	6.54	9.29	41.0	1,990
Total Emissions Reductions for 9 Cranes (4 additional cranes) (Phase 2 pending)	200.0	11.72	3.72	73.8	3,582

Electricity Reduction Initiatives
To reduce electricity consumption, the Seaport has initiated an energy reduction program. In addition to programming the Thermal Energy Storage System to produce ice during the off-peak night consumption period to cool the air during the peak demand period at Cruise Terminals F and G, the Port has installed Energy Star rated chillers and HVAC equipment throughout its facilities. The Port also installed building management systems on all of its terminals and major buildings to help control heating and cooling within its buildings.

Water Reduction Initiatives

The water consumption will be evaluated as part of the county's water use reduction initiative. A water use audit will be conducted in 2010 to identify water use and retrofit needs. An implementation plan will be included in the water use audit evaluation report.

Processing Time Initiatives
In 2007, the POM installed a new state of the art cargo and security gate complex which includes 10 inbound and six outbound lanes for the efficient and secure flow of trucks to and from the Port's cargo terminal facilities. The new cargo gate has decreased the security processing time through its electronic "FastPass" processing system in half – to an average of ninety seconds for inbound trucks. See graph above under "indicators" for a snapshot of average security gate processing times in November 2009.

To ensure efficiency, this "FastPass" Gate Security System includes a "Lane Watcher" program which alerts the security supervisor if the processing time takes three minutes or more. This allows the supervisor to determine if the delays are security or technology (IT) related. If it is IT related, the officer will notify IT staff immediately to investigate and commence repairs, if necessary. Prior to the installation of this security system, trucks were processed manually and processing times were double that of today. Although emissions reduction benefits have not been estimated for the new roads and security gate improvements, the visible decrease of idling vehicles and trucks is noticeable. These changes have allowed the Port to both operate more efficiently and minimize emissions through a reduction of idling time.

Future & On-going Initiatives

One of the Seaport's main capital initiatives, in partnership with FDOT and the City of Miami is the Public Private Partnership (PPP) with the Miami Access Team to construct a tunnel from Watson Island to the Port to create direct interstate access for Port traffic. With the Port's only access through the City's central business district and associated downtown streets, this tunnel will provide pedestrian/bicyclist safety benefits to our community by separating port traffic from the urbanized City, decrease the average ingress and egress travel times by 40 percent, and assist in the reduction of diesel usage and emissions to decrease the region's overall carbon footprint. With freight transportation costs averaging $1 per minute, the mobility benefits of the Port Tunnel result in significant travel cost savings and sustainability.

Other future and on-going initiatives include:

- Incorporating POM objectives into the 2010 CDMP update to apply sustainable principles in the planning, design, construction, operation and maintenance of our facilities, and follow the County's Sustainable Buildings Program which promotes LEED green design, construction and operation of buildings.
- Continuing to reduce energy consumption by retrofitting buildings with energy efficient products such as motion sensor lighting, CRFL lighting, energy Star rated chillers and HVAC equipment. The Port will create and incorporate a "Green Building Committee" into the Capital Development process to ensure that applicable projects are designed to reduce electricity, fuel and water consumption.
- Implement water use consumption reduction practices by retrofitting bathroom and kitchen fixtures with water efficient technologies such as motion sensor faucets, WaterSense rated fixtures and incorporate Florida Friendly principles for landscape irrigated areas.
- Performing a study to determine the feasibility of providing an energy farm, via solar panels on all applicable County-owned facilities at the Port. This system would utilize sustainable measures to create electricity to supply the local power grid to run the Port and potentially sell excess electricity to the utility company.
- Exploring alongside our cargo and cruise tenants the potential use of cold ironing as a means to provide electric power to the ships berthed to enable the vessels to turn off their diesel engines. This initiative has the potential to minimize diesel usage and emissions for the community.
- Creating a Sustainable Committee as part of its Capital Project Development Process. This committee is responsible for overseeing green initiatives during each capital project for construction or major renovation of Port buildings.
- The Port's Procurement Division is promoting the purchase of environmentally preferable products and has commenced tracking of such purchases to show an increase of the Port's green purchasing power.
- The Port's maintenance division continues to promote energy efficiencies through the installation of energy efficient light bulbs, sensor-controlled switches, and low-water usage plumbing fixtures during its operational and maintenance activities.
- The Port continues to offer best management storm water training not only to Seaport staff, but to customers and tenants.

COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

Cruise Passenger Satisfaction

The Port performed a cruise passenger survey between the years 2002 and 2003 to capture both on and off cruise season. Some results are summarized below:

Question	Rating
Mostly likely to cruise again from the Port of Miami	90%
Curbside Staff was helpful and friendly (fair to excellent rating)	97.2%
Able to board the bus easily (fair to excellent rating)	96.7%
The terminals were comfortable	98.2%

Miami-Dade County Resident Satisfaction Survey 2008

See the *Transportation Area* of this report for community feedback on services at the POM.

Compliance with Environmental Regulations

Assessment Area

An annual report entitled "Violations of Environmental Regulations at Government Facilities and Properties in Miami-Dade County, Florida" was created by the Department of Environmental Resources Management (DERM) on recommendation of the Dade County Grand Jury during its 1993 Fall Term. This report is known as the "Government Report," and since its inception in October 1994, this and subsequent Government Reports have reviewed the environmental status of government sites within Miami-Dade County, including county, federal, state and municipal government facilities. An update of the Government Report was recently conducted and reviews the status of environmental cases for the time period of April 2nd, 2008, through March 31st, 2009.

Violations at Miami-Dade Facilities

Table 1 summarizes the status of all cases at County facilities listed by Department. In terms of assessing sustainable practices, the list of 'new' cases compiled each year (Table 2) will be used as an indicator and reviewed each year.

Table 1 - Historic Compliance Summary

Miami-Dade County Department	***Total Cases Listed***	***Cases Continued From 2008***	***New Cases***	***Closed Cases***	***State Cleanup/Cat. B***
Department of Solid Waste Mgmt.	8	*5*	*0*	*1*	*2*
General Services Administration	*12*	*0*	*2*	*0*	*10*
Miami-Dade Aviation	*88*	51	*1*	*3*	*33*
Miami-Dade Housing Authority	7	*4*	*0*	*3*	*0*
Miami-Dade Parks and Recreation	*16*	*9*	*1*	*4*	*2*
Miami-Dade Public Works	*1*	*0*	*0*	*1*	*0*
Miami-Dade Transit	*6*	*3*	*1*	*1*	*1*
Miami-Dade Water & Sewer	*7*	*4*	*0*	*0*	*3*
Community Health of South Dade	*2*	*0*	*0*	*2*	*0*
North County Neighborhood Service Center	*1*	*1*	*0*	*0*	*0*
Miami-Dade Fire Rescue	*4*	*1*	*0*	*3*	*0*
Seaport/Port of Miami	*6*	*2*	*0*	*0*	*4*
Miami-Dade County Corrections	*1*	*0*	*0*	*1*	*0*
Jackson Memorial Hospital	*1*	*0*	*0*	*0*	*1*
MDC Totals	**160**	**80**	***5***	**19**	**56**

Table 2 - New Cases from April 2, 2008 – March 31, 2009

Miami-Dade County Department	Facility	Violation Type	Status
General Services Administration (GSA)	*GSA Property/Former Community Crusade Against Drugs site* NW 37th Av & NW 183rd St (HWR-109)	Contamination in groundwater	Assessment report is past due for this violation documented in 1994. DERM requirements for this violation have not been met in a satisfactory or timely manner. GSA cites lack of funds for assessment/remediation as the cause for non-compliance.
General Services Administration (GSA)	*Community of Landmark* 20600 NW 47th Av (PSO-620)	Section 24-42.2, violation of operating requirements for sanitary sewer collection and transmission systems	Site activities are progressing satisfactorily.
Aviation Department	*Aerotecnic* OPF, 3901 NW 145 St. (IW5-16916)	Failure to obtain operating permit	UCVN issued 03/05/09 for unpermitted activities related to aircraft painting. Affidavit of Non-compliance filed on 06/18/09. Notice of Intended Court Action issued 10/23/09.
Parks & Recreation Department	*Amelia Earhart* 200 W 74 Pl. (HWR-554)	Metals and petroleum contamination from former military use of the site discovered during construction activities.	Environmental assessment and remediation is being conducted by the United States Army Corps of Engineers under the Formerly Used Defense Site program. Site investigation is ongoing and status of work conducted is due within 60 days.
Transit Department	*NE Bus Maintenance* 360 NE 185 St. (UT-0288) (IW-412)	Section 24-42.4, Petroleum and non-petroleum discharges to the sanitary sewer.	Discharge to sanitary sewers from steam bay o/w separator not in compliance. Although MDT instituted DERM required Action Plan to correct discharge violations, current sampling results indicate that violations continue to occur. Follow-up action by the Department is underway.

Source: "Violations of Environmental Regulations at Government Facilities and Properties in Miami-Dade County, Florida", Department of Environmental Resources Management (DERM)

Health

Access and choice are the main drivers in healthy lifestyles and a healthy community. The way a community is designed, its open spaces, paths for biking and walking, and access to healthy foods as well as healthcare facilities, all contribute to overall community health. Reducing the use of cars and shifting to more walking and biking not only positively impact the environment, but also improve health through increased physical activity, avoiding emissions affecting respiratory systems, and reducing traffic-related injuries. Additionally, reducing noise and increasing interaction with natural surroundings is expected to reduce stress and promote overall well-being.

Access to healthier food and making healthier food choices, including eating less processed foods and eating more locally produced fresh foods lowers risk of obesity and other health conditions. There are also environmental benefits of consuming more locally produced foods through the reduction of energy required to produce and move food. Our local economy benefits from a strong local food market. Finally, a sustainable community is one in which all residents have equal access to healthcare services.

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Assessment Area

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Information was collected on key indicators of health outcomes or diseases, as well as access to healthy transportation options and foods, in order to identify links and achieve a better understanding of the challenges our community faces in realizing sustainable health.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Assessing and managing how environmental factors play a key role in our society's overall health.
- Providing and promoting active lifestyles options to our residents such as biking, walking, and access to mass transit. There is a need for collaboration between public health professionals, traffic engineers, and city planners.
- Educating the community on healthy food choices and increase the accessibility of and market for locally grown products.
- Providing charity care with the objective of getting people healthy and self sufficient.
- Addressing uninsured rates in the County.
- Ensuring that the entire community has access to primary care services for health promotion and disease prevention.

ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

A series of indicators is presented to establish the public health baseline in Miami-Dade County. These are followed by data access to quality food and water and bicycling and pedestrian resources. Lastly we analyze the physical and economic accessibility to healthcare services. Feedback in this area is welcomed as we realize that data gaps exist.

Overweight, Obesity, and Physical Activity

The surrounding environment affects our health and physical activity. Communities, homes and workplaces can all influence personal health. Because of this influence, it is important to create communities that make it easy to engage in physical activity and to eat a healthy diet. In Miami-

Dade County, we have the advantage of year round warm weather. This may contribute to better health, but in the summer and fall months heat can be a deterrent to some outside activities. Walkable communities can increase health by providing shady, aesthetic, and safe modes of transportation. Data for Miami-Dade County residents indicates there are health concerns related to weight and physical activity.

Overweight and obesity are both labels for ranges of weight that are greater than what is generally considered healthy for a given height. The terms also identify ranges of weight that have been shown to increase the likelihood of certain diseases and other health problems.

For adults, overweight and obesity ranges are determined by using weight and height to calculate a number called the "body mass index" (BMI). BMI is used because, for most people, it correlates with their amount of body fat. An adult who has a BMI between 25 and 29.9 is considered overweight. An adult who has a BMI of 30 or higher is considered obese. There are certain factors that are factors for overweight and obesity: the caloric balance equation, the environment, and other factors such as genetics. Overweight and obesity result from an energy imbalance. This involves eating too many calories and not getting enough physical activity. Caloric balance is like a scale. To remain in balance and maintain your body weight, the calories consumed (from foods) must be balanced by the calories used (in normal body functions, daily activities, and exercise).

Figure 1 reflects the percent of overweight and obese adults in the county and state for 2007. The county's results are slightly higher in all categories. Figure 2 analyses the physical activity and nutrition of our community. The level of activity is considerably lower compared to the state. Only 29.2 percent of the population meets the recommended physical activity level. Both of these conditions affect negatively the health of our residents.

Figure 1

Overweight & Obesity (2007)	**County**	**State**
Adults who are obese	26.0 %	24.1 %
Adults who are overweight	38.9 %	38.0 %
Adults who are overweight or obese	64.9 %	62.1 %

Figure 2

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

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

Diabetes

Lifestyle changes for prevention research have shown that taking action to manage blood glucose in pre-diabetics can delay or prevent Type 2 diabetes from developing. Modest improvements in weight, a low fat, high fiber diet, and regular physical activity are all aspects of

prudent advice to prevent prediabetes and Type 2 diabetes. Environments that encourage physical activity and healthy food help address this health concern. In Miami-Dade County, 33.5 percent of all adults reported no leisure time physical activity and 64.9% were overweight or obese (2007).

Diabetes is the fifth deadliest disease in the United States, and since 1987 the death rate due to diabetes has increased by 45 percent to 24.6 per 100,000. Death rates due to heart disease, stroke, and cancer have declined. Figure 3 shows that age-adjusted mortality rates from diabetes in 2008 were highest in Miami-Dade County (23.5), greater than the State of Florida (20.6). View results in the following table.

Figure 3

	Average Number of Deaths			Age-Adjusted 3-year Death Rate (per 100,000)		
	2004-06	2005-07	2006-08	2004-06	2005-07	2006-08
State of Florida	5,036	5,137	5,128	21.2	21.1	20.6
Miami-Dade County	613	636	639	23.5	24.0	23.5

In Florida 8.7 percent of the population has been diagnosed with diabetes and 7.6 percent of County residents have been reported (in 2007). In Miami-Dade, 181,425 people have diabetes. There were 2,847 adults admitted to a hospital for diabetes long-term complications (2008). The cost of these admissions was $139 million for services rendered by hospitals. These services averaged $48,947 per admission, excluding associated professional fees and personal convenience items.
(Source: http://www.healthcouncil.org/publications/Diabetes_Snapshot.pdf)

Hypertension
Hypertension is considered a significant health risk factor. In Miami-Dade County 25.3 percent of all persons were diagnosed with hypertension in 2007, an increase of 1.7 percent since 2002, but lower than the state rate of 28.2 percent. Key components of preventing and treating hypertension are healthy lifestyles, ongoing medical care, and following the treatment plan prescribed by a doctor. Obesity is associated with a two to six-fold increase in risk of occurrence of hypertension. Weight loss is a foundation of any lifestyle modification effort designed to decrease blood pressure. Additional lifestyle changes that lower blood pressure include reduced sodium intake, moderation of alcohol intake, adequate potassium consumption and increased physical activity.

There are 73.6 million Americans age 20 and older with hypertension (or approximately one in three adults). Of these, 71.8 percent are aware they have it, 61.4 percent are under current treatment with only 35.1 percent managing it properly. It is estimated that about 25 percent of the U.S. population age 20 and older has prehypertension. In the US, approximately 69 percent of people who have a first heart attack, 77 percent who have a first stroke and 74 percent who have chronic heart failure, have high blood pressure. It is also a risk factor for blindness and kidney disease.

In 2006 high blood pressure was listed as a primary or contributing cause of death for 319,000 Americans. Figure 4 shows that the number and rate of deaths with hypertension as the primary cause in Miami-Dade County have generally been on the rise since 2006. The County rate for 2008 was the same as for the state.

Figure 4

	Average Number of Deaths			Death Rate		
	2006	2007	2008	2006	2007	2008
State of Florida	1826	1712	1833	7.1	6.5	6.8
Miami-Dade County	161	175	192	6.0	6.4	6.8

In 2008, 2,450 adults were admitted to a hospital with a principal diagnosis of hypertension and had no cardiac procedure performed during their stay. The undiscounted cost for services rendered by hospitals associated with these admissions totaled $56,414,945; an average of $23,026 for a single admission.
(Source: http://www.healthcouncil.org/publications/Hypertension_Snapshot.pdf)

Asthma
Asthma is a serious, sometimes life-threatening respiratory disease that affects the quality of life for millions of Americans. Although there is no cure for asthma yet, it can be controlled through medical treatment and management of environmental triggers. There are currently 23 million people in the US with asthma, nearly seven million of whom are under the age of 18.3.

In Florida, 6.2 percent of the adult population has reported having asthma (2007). In 2008 4.6 percent of adults, 4.9 percent of middle school students, and 17.1 percent of high school students in Miami-Dade County have reported having asthma (2008).

Asthma is one of the most common reasons for hospital admission and emergency room care. People with asthma experience well over 100 million days of restricted activity annually and the total annual costs of the disease are estimated at $20 billion nationally. Asthma accounts for approximately 13 million lost school days every year and persists as the most common serious chronic disease in children deaths occur in the US each year.

As shown in Figure 5, approximately 5,000 asthma-related deaths occur in the US each year. Miami-Dade County's death rate from asthma is slightly below that of the state (2008).

Figure 5

	Average Number of Deaths			Age-Adjusted 3-Year Death Rate (per 100,000 persons)		
	2004-06	2005-06	2006-08	2004-06	2005-07	2006-08
Florida	193	191	175	0.9	0.9	0.8
Miami-Dade	21	21	18	0.8	0.8	0.7

In Miami-Dade County the rate of adult asthma admissions per 100,000 adults rose in 2008 after a 7.7 percent fall in 2007 and remains above pre-2003 levels. 3,229 adults were admitted to a hospital with a principal diagnosis of asthma (2008). The cost of these admissions was $90,898,051 for services rendered by hospitals. These services averaged $28,150 per admission, excluding associated professional fees and personal convenience items.

Lifestyle changes for prevention research have that controlling or eliminating exposure to second and third-hand smoke, pet dander (from animals with fur or feathers), indoor mold, cockroach and other pests (parts, secretions and droppings), dust mites, combustion

byproducts (smoke, car fumes, fuel-burning appliance fumes), strong odors (perfume, aerosols, sprays, talcum powder) and outdoor allergens/irritants (pollen, mold, extreme/changing weather) reduces the frequency and severity of asthma attacks. Also the monitoring of lung function for assessment and treatment, implementing environmental control measures to reduce triggers, putting in place comprehensive pharmacological therapy, and patient education result in effective asthma management.

In terms of air quality the topography and meteorological patterns of South Florida help remove harmful air emissions from our community. The indicators reveal that the overall air quality in Miami-Dade falls within the "Good" range of the Environmental Protection Agency's (EPA) National Ambient Air Quality Standards over 80 percent of the days of the year. While this is true, the days when the air quality falls within the Moderate and Unhealthy for Sensitive Groups categories are of concern for the populations more sensitive to air pollution, such as the elderly and very young, and those suffering from respiratory illnesses and diseases.
(Source: http://www.epa.gov/asthma/about.html)
(Source: http://www.healthcouncil.org/publications/Asthma_Snapshot.pdf)

Health Insurance Coverage
Miami-Dade County's rate of uninsured for the population from 18 to 64 years is higher than the state's rate. Most of this population is above the poverty levels which does not entitle them to government programs leaving most coverage to employer-based insurance. Due to increasing high costs, many companies are choosing to provide limited or no insurance. Privately held insurance rates are also following the same trend and preexisting restrictions makes it very difficult for families to purchase them independently.

For reporting purposes, the Census Bureau broadly classifies health insurance coverage as private coverage or government coverage. Private health insurance is a plan provided through an employer or a union or purchased by an individual from a private company. Government health insurance includes such federal programs as Medicare, Medicaid, and military health care; the Children's Health Insurance Program (CHIP); and individual state health plans.* People were considered "insured" if they were covered by any type of health insurance for part or all of the previous calendar year. They were considered "uninsured" if, for the entire year, they were not covered by any type of health insurance.
(Source: http://www.census.gov/prod/2009pubs/p60-236.pdf)

Figure 6

	Florida		**Miami-Dade County, Florida**	
	Estimate	%	Estimate	%
Total:	17,995,843		2,355,454	
Under 18 years:	3,996,332	22.21%	533,384	22.64%
With health insurance coverage	3,295,275	18.31%	422,225	17.93%
No health insurance coverage	701,057	3.90%	111,159	4.72%
18 to 64 years:	10,894,707	60.54%	1,460,631	62.01%
With health insurance coverage	7,906,963	43.94%	925,412	39.29%
No health insurance coverage	2,987,744	16.60%	535,219	22.72%
65 years or over:	3,104,804	17.25%	361,439	15.34%
With health insurance coverage	3,044,429	16.92%	345,196	14.66%
No health insurance coverage	60,375	0.34%	16,243	0.69%

(Source: American Community Survey, 2008)

Access to Healthcare Facilities in terms of Public Transportation:
Accessibility to healthcare is important. One of the goals stated in the County's Transit Development Plan is to improve the accessibility to major health care, recreation, education, employment cultural and social services facilities. Its measure is to have transit service route miles within 1/4 mile of major health facilities, recreation, education, employment, cultural and social services facilities.

Approximately 64 transit service route miles operate within a ¼ mile of major medical facilities while more than 130 transit service miles operate within ¼ mile of all colleges and universities within Miami-Dade County. Figure 7 shows the major hospital and transit bus routes that have stops in close vicinities to these facilities.

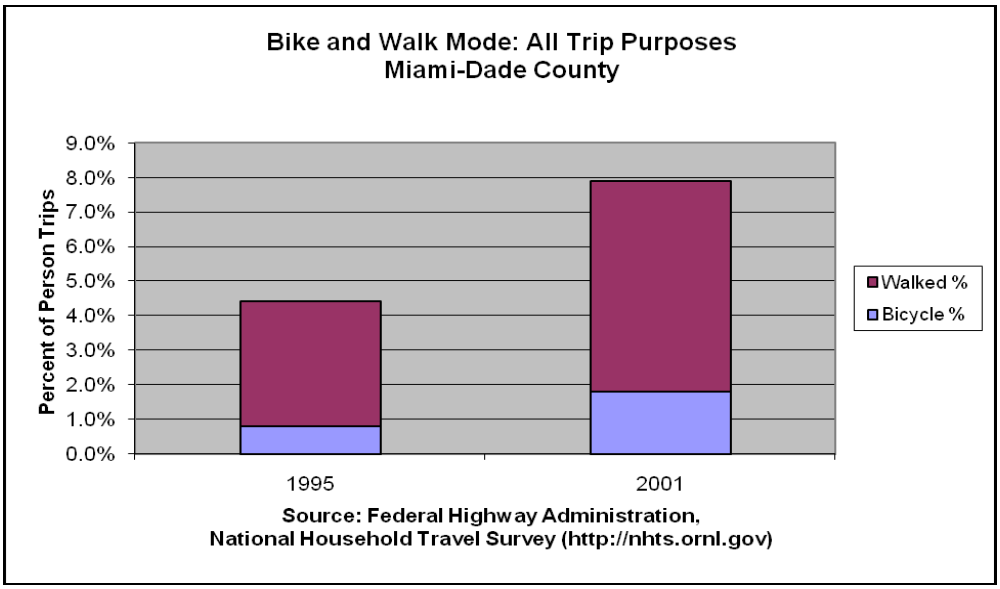
Figure 7

Hospital Name	Routes
Jackson North Medical Center	22,95,246,77,2,42,E
North Shore Medical Center	77,277,33,17
Ryder Trauma Center	12,21,22,32,77,95,M,246,277
Miami Jewish Home & Hospital for the Aged	2,3,9,10,16,54,62,93,202
Jackson Memorial Hospital	12,21,22,32,77,95,M,246,277
University of Miami Hospital	12,21,22,32,95,M,246,17,211
South Florida Evaluation & Treatment Center	M,22,95,246,77,12,21,32,211,277,6
University of Miami Hospital & Clinics	95,77,277,12,211,M,22,246,21,32
Bascom Palmer Eye Institute	95,77,277,12,211,M,22,246,21,32
Department of Veterans Affairs Medical Center	95,12,M,22,246,21,32,17
Mount Sinai Medical Center	M,62,C,J,120,115
Aventura Hospital	95,3,9,99,E
Miami Heart Institute	J,115
Selected Specialty Hospital	95,12,77,211,277,6,7,11,51,207,208
Miami Children's Hospital	56,24,57
Westchester General Hospital	24
West Gables Rehabilitation Hospital	24
Kindred Hospital South Florida - Coral Gables	8
Metropolitan Hospital of Miami	57,7,238
Mercy General Hospital	12,48
Sister Emmanuel Hospital	12,48
Doctors Hospital	48,56,500
South Miami Hospital	57,500,73,37,52,72
Larkin Community Hospital	57,52,500,37,72
Coral Gables Hospital	42,37,24,56
Jackson South Community Hospital	57,52,1,31,34,38,252,287
Baptist Hospital	88104
HealthSouth Rehabilitation Hospital	70
Homestead Hospital	35
Kendall Regional Medical Center	40,240
Palmetto General Hospital	29
Palm Springs General Hospital	54,29,33,73
Hialeah Hospital	54,42,28,L
Southern Winds Hospital	54,33,29

Water Quality
Miami-Dade County's drinking water meets or exceeds all federal and state drinking water standards. This is determined through routine monitoring for contaminants by microbiologists, chemists, and water treatment specialists of more than 100,000 analyses of water samples each year. Water quality samples are collected throughout the county and tested regularly. Samples include untreated and treated water taken at our facilities, sample sites throughout the service areas and at customers' homes. These tests are overseen by various federal, state and local regulatory agencies.

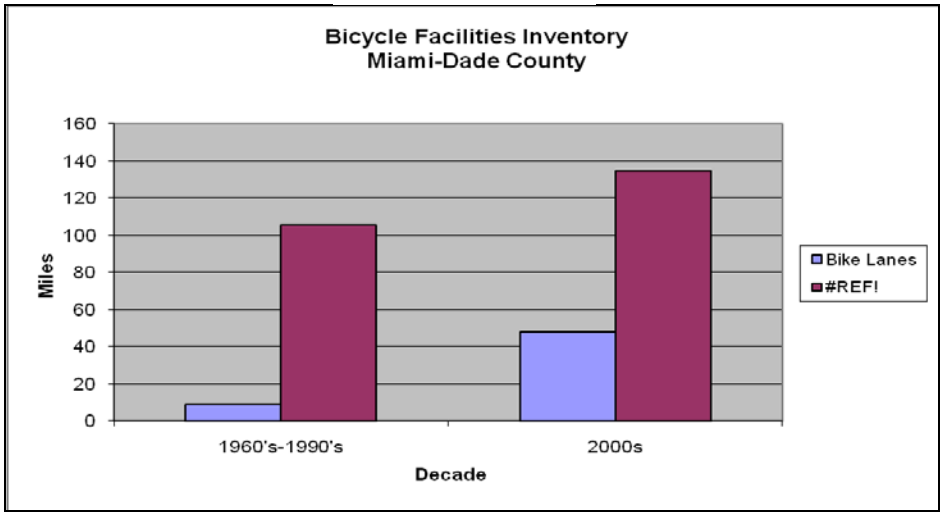
Bicycle and Pedestrian Trips
Figure 8 compares the number of bicycle and walking trips in 1995 and 2001. The graph illustrates an approximate doubling in both modes during this period. This trend can be attributed to the development of new facilities (e.g., Phase 1 of the South Miami-Dade Busway), expansion of Miami-Dade Transit's (MDT) Bike & Ride program, and gas price inflation during that period.

Figure 8



Bicycle Facility (Pathways)
Since 2000 almost 40 miles of bike lanes and 30 miles of paved paths have been built in Miami-Dade County. The increase in facilities mileage is the result of adopted policies, planning, and new funding sources such as the federal Transportation Enhancements Program, the County's Building Better Communities Bond Program and other municipal initiatives. Continued development of an integrated system of bicycle facilities will increase the travel options for residents and visitors.

Figure 9



Walking

Regular physical activity may be correlated to protection from diabetes and cardiovascular disease (Carnethon et al., 2004). Walking, the most common form of physical activity (CDC, 1991) has been associated with reduced weight (Schilling & Linton, 2004), and reduced risk for diabetes and cardiovascular disease (Carnethon et al., 2004). Figure 10 shows an inverse correlation between the percentage of adults that are overweight and the percent of trips that are made on foot. Figure 11 indicates a correlation between obesity and driving time.

Figure 10

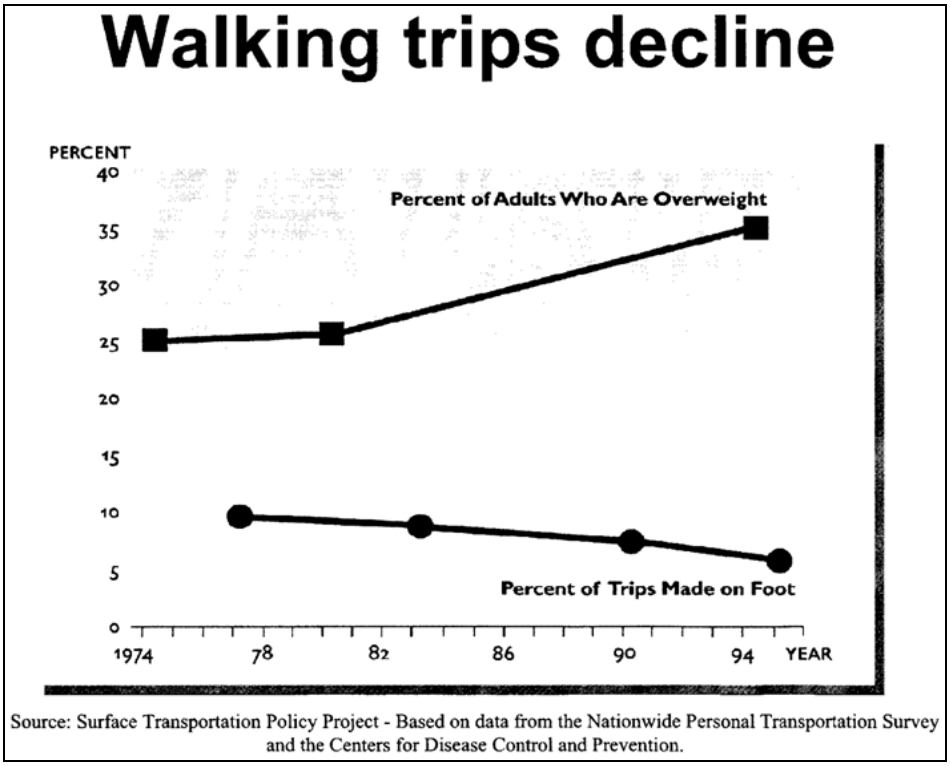
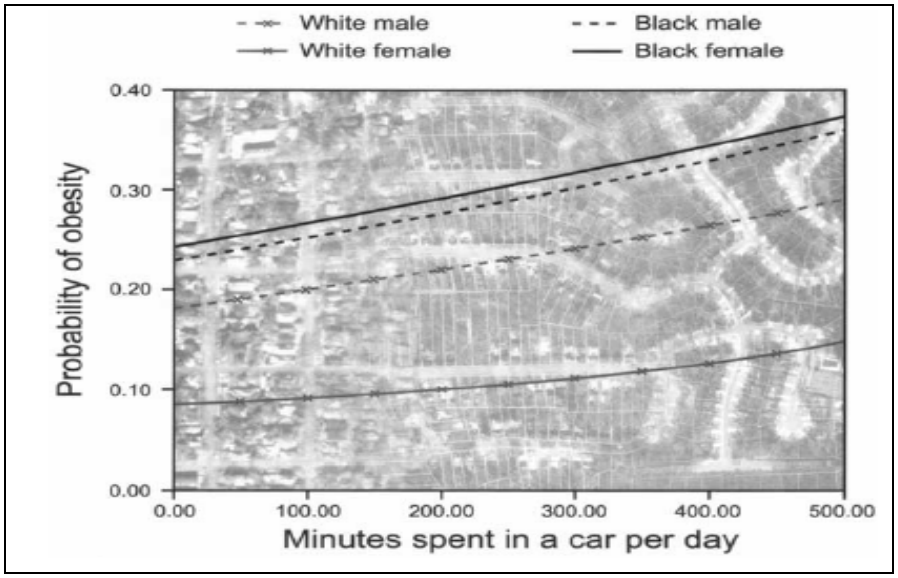


Figure 11



In the face of these health challenges, it is important to focus the development of future built environment (anything built by humans) towards mixed use infrastructure that combines with street connectivity, pedestrian infrastructure, aesthetics, and access to public transportation.

Acre of Green Space per UMSA Residents

As part of the Parks and Recreation Department related Strategic Plan Outcomes to ensure available high quality green space throughout the County, the goal is to meet the local park level service of 2.75 acres per 1000 Unincorporated Municipal Service Area (UMSA) residents. This is an ongoing effort. The present value is 3.71.
(Source: http://www.miamidade.gov/mppa/library/PDFs/businessplans/FY09/Narrative/rec-culture_Parks.pdf)

Food Quality & Access

Access to fresh, wholesome, local foods positively impacts the health of a community. There are two main challenges with food: access to locally grown food and healthier choices.

We are the second largest agricultural producer in the nation. Ninety to 95 percent of our produce is sold outside of Miami-Dade County. This means that we are choosing to purchase food that has traveled long distances. We can reduce our carbon imprint regarding our food significantly by purchasing from our local producers, as well as benefit from fresher foods.

Educating residents about healthier eating choices improves community health. University of Florida Extension's nutrition education programs, which are federally funded, serve low-income adults and children on healthy food purchasing, preparation, and life styles. For every federal dollar spent some $10.64 in long-term health costs and $2.48 are saved in food purchases are realized. These programs are restricted to food stamp eligible residents. Additional programs like this would improve health.

Both price and geographic proximity to grocery stores affects access to healthy and nutritious food. Low-income neighborhoods traditionally have fewer grocery stores and therefore less availability of produce. Data has not been collected at this point to evaluate whether this is an issue in our community. Indicators or considerations used by other communities include the distribution of grocery stores by census tract income; price of market basket in dollars by store

chain and store location; and quality of food available (e.g. nutrient density, freshness, organic) by store chain and location. Using data on grocery store locations and mass transit route and schedule information may be used to calculate travel times from homes to supermarkets to estimate the accessibility of supermarkets for households that rely on transit for shopping trips. The geographical occurrences and pricing of products sold at farmers' markets would be important to understand in this type of analysis. It would also be important to analyze pricing differences in markets in the different areas and neighborhoods of the county. Finally, another consideration would be how these prices compare to those of farmers markets and convenience stores which are generally regarded as more expensive and offering much less variety of healthy products to consumers, especially in terms of fresh produce and lean meat.

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Comprehensive Development Master Plan

The Comprehensive Development Master Plan (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 20 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. As such, it is a framework for use by other programs to be developed to support its long-range planning goals. For each of the master plan elements, there are goals, objectives and policies, measures to be monitored and maps of planned future facilities.

The Community Design and Health component for the CDMP is presently under development.

Social Services Master Plan (SSMP)

The Social Service Master Plan addressing the social services challenge as a whole, rather than in isolated parts - in order to provide the means truly to raise people's quality of life. It gives the Miami-Dade community an overall snapshot of the human services issues and challenges they face, what our goals should be, suggested steps for strategic action, results and outcomes to be reached, and report-card indicators that will help both benchmark along the way and gauge progress made toward the goals. To accomplish this means that services must be integrated, not just to avoid duplication, but to meet human necessities in a comprehensive manner. Identify the linkage between people's needs and assess how best to educate the community, ease access to needed services, and provide those services comprehensively based on individual and neighborhood needs.

The SSMP cover nine service areas. They are as follows:

- Basic Needs - Poverty & Hunger
- Health
- Children Youth & Families
- Elders
- Children & Adults with Disabilities
- Workforce Development for Special Populations
- Criminal Justice
- Immigrants & New Entrants

- Special Needs (Mental Health, Substance Abuse, Homelessness, Victims of Domestic Violence or Sexual Assault)

Its vision is for "residents have access to quality healthcare and lead healthy lives" and the goals are:

- Residents will know how and where to access healthcare services.
- Residents will have equal opportunities for access to comprehensive healthcare services.
- Residents will be knowledgeable and have the capability to make healthy lifestyle choices and effectively manage their health
- Healthcare providers will provide culturally appropriate care to the populations they serve.

The last update of the social services master plan was done in 2008.
(Source: http://www.alliance4hs.org/master_plan.htm)

Miami-Dade County Park and Open Space System Master Plan
Approved by the Board 2008, the Park and Open Space System Master Plan (OSMP) established a vision for a seamless, sustainable parks and open space system to create a new, interconnected framework for growth; one that results in a more livable, sustainable community.

Consisting of existing and proposed parks, public spaces, natural and cultural places, greenways, trails, and streets. The interconnected framework will form the foundation or "The String of Pearls" of the County to accommodate growth while also improving the quality of life for residents. The new framework 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, providing equitable access to parks and open spaces, and providing more opportunities for residents to meet, socialize, and connect with one another.

Safety is a key pillar in the plan. It states in the goals the importance that every resident can safely and comfortably walk, bicycle, or take transit to community parks, recreation centers and special use/ sports facilities.

2003 Strategic Plan
The Strategic Plan provides Miami-Dade County management and employees with blueprint that guides the decision-making towards the future shared priorities of our local government and community. These plan priorities provide the measuring targets needed to determine if Miami-Dade County government is fulfilling its responsibilities, as well as providing for accountability and continuous improvement. The plan consists of seven areas that encompass all the County departments: Economic Development, Health and Human Services, Neighborhood and Unincorporated Area Municipal Services, Public Safety, Recreation and Culture, Transportation, and Enabling Strategies.

The Health and Human Services Safety Strategic Area component's mission statement is "To improve the quality of life and promote maximum independence through the provision of health care, housing, and social and human services to those in need." The goals to achieve it are as follows:

- Eliminate barriers to care improve the future of Miami-Dade County's children and youth
- Promote independent living through early intervention and support services
- Provide adequate, quality, and affordable housing equitably throughout Miami-Dade County

- Ensure high quality standard of care and customer service countywide
- Ensure universal access to timely and accurate service information and community resources
- Develop positive relationships among all groups to promote unity in Miami-Dade County

(Source: http://www.miamidade.gov/stratplan2003/)

Draft Transit Development Plan FY2010 to 2019

The fiscal year (FY) 2010 – 2019 Transit Development Plan (TDP) Major Update is a strategic development and operational guide for public transportation used by Miami- Dade Transit (MDT) for the next 10 year planning horizon. The 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 ten-year implementation plan that provides guidance for future MDT planning. A major update is required every five years and minor updates are required in interim years. There is one goal and objective that contributes to the access to healthcare.

OBJECTIVE	MEASURE
Goal 1: Improve the Quality of Transit Services	
Objective 1.1: Improve the accessibility to Major health care, recreation, education, employment cultural and social services facilities	Transit service route miles within 1/4 mile of major health facilities, recreation, education, employment, cultural and social services facilities.

Bicycle Facilities Plan

An increasing number 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 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.

(Source: http://www.miamidade.gov/mpo/docs/MPO_bike_facilities_plan_2001.pdf)

Pedestrian Plan

An increasing numbers of Miami-Dade County residents and visitors are choosing to walk or bike or all or a portion of their trip. To meet the needs of these travelers, the 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.

The goal of the 2025 Miami-Dade County Pedestrian Facilities Plan is to facilitate the construction of pedestrian improvements at locations that have been determined to address the County's most pressing needs.

(Source: http://www.miamidade.gov/mpo/docs/MPO_ped_plan_2001.pdf)

WALKSAFE Program - University of Miami Miller School of Medicine

Florida has one of the highest numbers of injuries and fatalities due to children being hit by cars. There are various health benefits for children walking to and from school safely on a regular basis. The University of Miami Miller School of Medicine WalkSafeTM program was developed

to improve pediatric pedestrian safety, increase physical activity levels through encouraging children to walk to and from school, and improve the walkability in and around elementary schools.

Multiple agencies have assisted WalkSafe through various phases of development, implementation, and evaluation. WalkSafe utilizes a 5 E Model: The WalksafeTM program is based on a 5 E Model which incorporates education, engineering, enforcement, evaluation, and encouragement.

- Education: a three day curriculum that is taught in the classroom to children in grades K-5. This information is taught yearly at the beginning of October in conjunction with the International Walk to School Day. Using the three main learning modalities (audio, visual, and motor) via formal educational curricula, videos, workbooks, outside simulation activities and art projects, WalkSafe has shown to significantly increase the pedestrian safety knowledge of elementary school children.
- Engineering: in collaboration with organizations such as the Metropolitan Planning Organization and the Department of Public Works, WalkSafe has created a task force team which helps create the safest possible environments for healthy, active living. WalkSafe facilitates the assessment of sites where children have been hit by cars and the documentation of potential engineering modifications that can be made to prevent future accidents. These detailed reports and important community suggestions are presented on a monthly basis at the Community Traffic Safety Team meetings in Miami-Dade County.
- Enforcement: keeping children safe around school zones is of utmost importance to the WalkSafeTM program. WalkSafe's partnerships with the Police Departments and other community organizations assist in ensuring that our communities are safe environments for healthy, active living. These important partnerships also seek to increase community awareness of enforcement within and around school zones.
- Evaluation: is a key factor for all programs in achieving and maintaining a higher level of efficiency. WalkSafe uses various forms of evaluation tools to identify and monitor pedestrian safety and health issues. Data collected from teacher and parent surveys, surveillance of injuries, and behavioral research are a few of the evaluation tools that the WalkSafeTM program utilizes.
- Encouragement: WalkSafe encourages everyone throughout their communities to help advocate children safely engaging in a healthy, active lifestyle. By participating in many outreach efforts, WalkSafe has become a staple in educating and encouraging others to take part in promoting safe walking environments and healthy behaviors.

Since WalkSafe's implementation in 2002, its educational component has been implemented in 223 schools and trained 6,377 teachers. Most notably, the curriculum has reached 143,045 students in 2009 alone.
(Source: http://www.walksafe.us/background.html)
(Source: http://www.enhancements.org/download/TECorner/TECorner_Winter2010.pdf)

Blueprint
Miami-Dade County has undertaken the challenge in meeting our 600,000 uninsured residents' needs. Blueprint is the Office of Countywide Healthcare Planning (OCHP) two-part approach. Part I – the low-cost, comprehensive health insurance product, Miami-Dade Blue, co-designed with Blue Cross and Blue Shield of Florida for those currently uninsured residents (under age 65) and the work force (entities with up to 50 employees); and Part II – OCHP's analysis and management of 4 core efforts: (1) transparency – data at community level, (2) chronic disease management within FQHCs, (3) work force value-added analysis of insurance, and (4) premium assistance program.

(Source: http://www.miamidade.gov/ochp/Miami-Dade-Blue.asp)

Comprehensive Community Needs Assessment of Miami-Dade County

The Comprehensive Community Needs Assessment of Miami-Dade County conducted for Miami-Dade County's Community Action Agency (CAA) is intended to serve as a benchmark by providing a number of indicators which assess socioeconomic conditions in Miami-Dade County. The analysis demonstrates that the county is experiencing demographic and economic shifts which necessitate a closer look at the characteristics of the communities by government agencies, policy makers, and community organizations. The report traces past and present condition of the county's population across several indicators which include demographic characteristics and trends, education, economic development, including employment, income and housing, criminal justice, and public health. The secondary data is supplemented by primary data obtained from a survey with adult low income county residents conducted by the FIU Metropolitan Center, and referred to as the CAA Low-Income Resident Survey from hereon.

The survey results help determine the attitudes and perceptions of a particular segment of county residents towards a variety of issues and in conjunction with the secondary data is intended to improve awareness of population needs and assist CAA in reviewing and improving its programs. Recommendations from this needs assessment include:

- CAA should continue to focus its efforts in the existing targeted areas as they contain large concentrations of low-income families. Some areas, including Perrine, Coconut Grove, and South Beach still contain pockets of poverty despite the overall increase in income as a result of gentrification.
- Community outreach efforts should be expanded to ensure low-income residents are aware of the resources and services available to them. The CAA Advisory Committees can serve as a tool for more community awareness and involvement.
- Programs and services serving low-income residents should focus on perceived areas of need by low-income residents. The Low-Income Resident Survey shows that the most important issues for residents are jobs and crime. Job skills training options and crime prevention, especially targeting juveniles, are of major importance to address the concerns of Miami-Dade residents. In that regard, CAA can expand its job skills training classes and also dedicate resources to keeping children off the streets, including both after-school programs and parental counseling.
- CAA should be proactive in offering services that address emerging needs. Financial counseling, housing assistance, and foreclosure prevention have gained special significance over the last half of 2008 and in that regard CAA can form partnerships with organizations which are already involved in mitigating the effects of the housing crisis. CAA can serve as an organization that assists low-income residents in finding the resources they need, even if CAA is not directly involved in disbursing funding or providing assistance. The same approach can be applied with regard to healthcare services.
- In times of tight budgets and diminished resource availability across government agencies, CAA can continue to be at the forefront of addressing the needs of low-income residents by reaching out to other organizations which share its mission and goals.

(Source:http://www.miamidade.gov/caa/Documents/Needsassessment/CAA%20Comprehensive%20Needs%20Assessment.pdf)

Medicaid Metropass Program

The Medicaid Metropass Program is a joint venture of MDT and the Florida Agency for Health Care Administration (AHCA). The program provides cost-saving transportation to Medicaid recipients who use paratransit service more than six times a month, but are capable of using conventional transportation. Participants receive a monthly Metropass with the co-payment of one dollar. Those exempted from the co-payment status are individuals under 21 years of age,

those who are pregnant and those who are enrolled in a Family Planning or Family Assistance program. Participants must have three or more verifiable Medicaid medical appointments each month to continue in the program. The program began in 1993 and has accounted for an estimated total savings to ACHA of $64.2 million. MDT has collected in excess of $20 million in revenues from the program.

Bike Trails

The Miami-Dade Park and Recreation Department (MDPR) in conjunction with the Public Works Department is developing and improving many bike trails which span across the County. The hope is that building and improving these trails will encourage our population to depend less on cars and public transportation, thereby taking advantage of our beautiful outdoors while getting healthy, fit, and having fun. There are eight trails developed by MDPR throughout Miami-Dade County. They are the Snake Creek Trail, Rickenbacker Trail, Commodore Trail, Old Cutler Trail, Biscayne Trail, Black Creek Trail, Biscayne-Everglades Greenway, and Southern Glades Trail.
(Source: http://www.miamidade.gov/greatparksummit/biketrail_maps.asp)

Miami 21

Miami 21 represents the "Miami of the 21st Century" and entails a holistic approach to land use and urban planning. It will provide a clear vision for the City that will be supported by specific guidelines and regulations so that future generations will reap the benefits of well-balanced neighborhoods and rich quality of life. Miami 21 will take into account all of the integral factors that will make each area within the City a unique, vibrant place to live, learn, work and play. Six elements serve as the lynchpins in the development of the blueprint of Miami: Zoning (Miami 21 Zoning Code), Economic Development, Historic Preservation, Parks and Open Spaces, Arts and Culture, and Transportation.
(Source: http://www.miami21.org/)

City of Miami – Bicycle Initiatives

Miami is committed to becoming a Bicycle Friendly City by 2012. The advancement of bicycle routes and facilities will create a full array of accommodations for cyclists allowing cycling to be an easy alternative to automobile use or for recreational enjoyment of our city. Miami will be a safe place to ride a bicycle creating a more livable and vibrant City for residents and tourists.

- **Miami Bicycle Master Plan**

  This Miami Bicycle Master Plan was developed with the guidance of previous bicycle study efforts locally and nationally. The study also reviewed existing conditions in the City of Miami and gauged public sentiment. This research along with city staff recommendations was used for establishing the citywide bikeway network plan, bicycle parking plan, safety and awareness actions, and evaluation tools to measure future performance of the network and suggest improvements to the existing bicycle infrastructure. The study serves as a guide for the development of the bikeway network and parking over a 20 year period in phases of 2010, 2015, 2020, and 2030.

  The Miami Bicycle Master plan includes more than 280 miles of new or improved bikeways which comprises about 33 percent of the city street network. At present, the City of Miami bikeway network includes 15.91 miles of Bicycle Lanes and Shared Use Paths/ Greenways which is only 1.6 percent of the city street network. Thus, the 2030 plan recommends a comprehensive expansion and diversification of facilities to meet the needs of beginner, intermediate, and expert bicyclists. In total, seven different bikeway types are included. They include: Bicycle Routes, Shared Use Lane Markings (Sharrows), Bicycle Lanes, Shared Use Paths/Greenways, Bicycle Boulevards, Neighborhood Connections, and Scenic View Routes.
  (Source: http://www.miamigov.com/bicycleInitiatives/pages/)

Community Rooted Organic Produce Service (CROPS)
Sponsored by Earth Ethics Institute and Center For Community Involvement, Community Rooted Organic Produce Service (CROPS) goal is to offer the Miami Dade College community fresh, high-quality, primarily locally grown, chemical-free (certified organic), and environmentally responsible food at affordable prices. Making organically grown food more physically and economically accessible will enable people to live healthier lives, thus easing health disparities in our community and reducing the impact of our lifestyles on the Earth by supporting sustainable farming practices and local economies.
(Source: http://www.mdc.edu/environethics/cropsabout.asp)

Earth Ethics Institute (EEI)
Earth Ethics Institute began in 1993 and has been a catalyst for introducing administrators, faculty, staff, and students at Miami Dade College to a new way of thinking called "Earth Literacy." Grounded in the profound implications of the story of the evolution of our 14-billion-year-old universe and the developmental process out of which the Earth and all life emerges, Earth Literacy fosters respect for Earth and life in all its diversity. Earth Ethics Institute provides resources, workshops, and programs for the Miami Dade College community that encourage the integration of the knowledge, values, and skills needed for a sustainable way of life into all practices and disciplines. EEI fosters an awareness of global interdependence, ecological integrity through biological diversity and the natural processes that sustain life.
(Source: http://www.mdc.edu/environethics/aboutEarthEthics.asp)

Community Gardening
Community gardening education is provided by the University of Florida's Institute of Food and Agricultural Sciences. A community garden is a collaborative greenspace in which the participants share in both the maintenance and the rewards.

There are two community vegetable gardens in Miami-Dade County. The first is the Miami Beach Victory Garden located in 226 Collins Ave, Miami Beach. The garden has 20 plots and it's under the care of the Parks and Recreation Department of City of Miami Beach, but it is managed by a core of community volunteers. The second is the community garden at Liberty Square, Liberty Square Housing Development, 65th Street NW at 14th Avenue, Miami. The garden is made up of more than 40 plots.
(Source: http://miami-dade.ifas.ufl.edu/lawn_and_garden/communitygarden.shtml)

Grass root efforts have also been made locally. This type of initiative creates a specific challenge for Land Use: it needs to provide for sustainable urban agricultural practices inside the UDB.

Farmers' Market
As part of an effort of the Economic Sustainability Department of the City of Coral Gables, the city has been hosting a Farmers Market for the past fifteen years. This year it began on January 16 and will run through March 27 on Saturdays from 8:00 AM to 1:00 PM.
(Source: http://www.coralgables.com/CGWeb/dep_dev_farmersmarket.aspx)

The Market Company, a local business, has been involved in the production of farmers' markets throughout Miami Dade and Broward County since 1995. Their locations are:

- The Jackson Memorial Foundation Green Market @ Alamo Park: 1611 NW 12th Ave inside the JMH Campus. Thursdays from 9 AM to 4 PM.
- The Aventura Mall Farmers' Market: Aventura Mall. Saturdays 10:00 AM to 9:30 PM and Sundays 12:00 PM- 8:00 PM, every first and third weekend.

- Las Olas Outdoor Gourmet Market: 1201 E Las Olas Boulevard, Ft. Lauderdale. Sunday 9:00 AM to 2:00 PM.
- Lincoln Road Farmers' Market and Organic Market: Lincoln Road, Miami Beach. Sunday from 9:00 AM to 6:30 PM.
- Normandy Village Marketplace: 900 Block of 71st Street at the Normandy Isle Fountain, along the Rue Vendome, North Beach. Saturday from 9:00 AM to 5:00 PM.
- The Pinecrest Gardens Green Market: Pinecrest Gardens (old Parrot Jungle). Sundays from 9 AM to 2 PM
- The Collins Park Sunday Market: 22nd Street and Collins Avenue, Miami Beach. Sunday from 9 AM to 6 PM.
- Upper East Side Green Market: 5556 NE 4th Court, Miami. Saturday from 9:00 AM to 4:00 PM.

(Source: http://www.themarketcompany.org/home.html)

Fertile Earth Foundation

FEF was created to educate, inspire, and spark change in the community and to initiate a dialogue between the community, businesses and municipalities. FEF orchestrates unique and stimulating events that showcase specific topics relating to how individuals, corporations and communities can lessen their footprint on Earth.

Mission:

- Raise environmental awareness in the local community through intriguingly innovative events, workshops, lectures and parties, reaching the section of the population that does not normally hear the message
- Support environmentally-focused research, from food composting to algae- to-biofuel generation

Current Projects:

- Fertile Roots Miami— Sponsored by the City of Miami, this project is a collaboration of organizations working together to help hotels & restaurants compost food waste, create soil amendment for urban gardening projects and create jobs and income by selling local produce back to the restaurants, thus closing the local food and waste production loop.
- Urban Gardening Project in Coconut Grove – local garden for residents in Coconut Grove.
- Green Roofs Project in Coconut Grove – we're working on creating the first hurricane-resistant raised bed garden systems to pass hurricane code in South Florida. Our goal is to help our community conserve energy and grow food locally through the proliferation of green roofs.

(Source: http://www.fertileearth.org/about)

Roots in the City, Inc

Roots in the City, Inc. was founded by author and academic Marvin Dunn, Ph.D. in 1994. It is a nonprofit, community-based organization located in the Overtown neighborhood in the shadow of downtown Miami. It focuses on community development, creating jobs, and beautifying Miami's inner city. he organization has established several community gardens and tree nurseries in Overtown.

The main botanical garden sits across from the Overtown Youth Center on Northwest 14 Street and Northwest Third Avenue. Drivers headed to Miami Beach on I-395 can catch a glimpse of the lush garden beautifying this small strip of Overtown.

The vegetable garden is located across the street from the historic Mt. Zion Baptist Church on the northeast corner of Northwest Ninth Street and Northwest Third Avenue. The two-acre lot features collard greens, citrus trees and papayas. The fertile garden yields fruits and vegetables throughout the year and supplies locals with a healthy supply of greens often missing from their diet. Freshly grown produce from the garden is offered free to the community through giveaway programs to schools, community agencies and homeless shelters. Produce is also sold in markets and local stores.

Funding for Roots in the City comes primarily from the City of Miami's Community Redevelopment Agency, which supports the organization's Landscape and Horticultural Training Institute for inner-city residents. The organization has received funding from Miami-Dade County Community Image Advisory Board (CIAB) for the beautification of I-95 through Overtown and from the Dade Community Foundation.
(Source: http://www.rootsinthecity.net/Home_Page.html)

COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

Living Healthy, Living Longer Miami-Dade County Survey

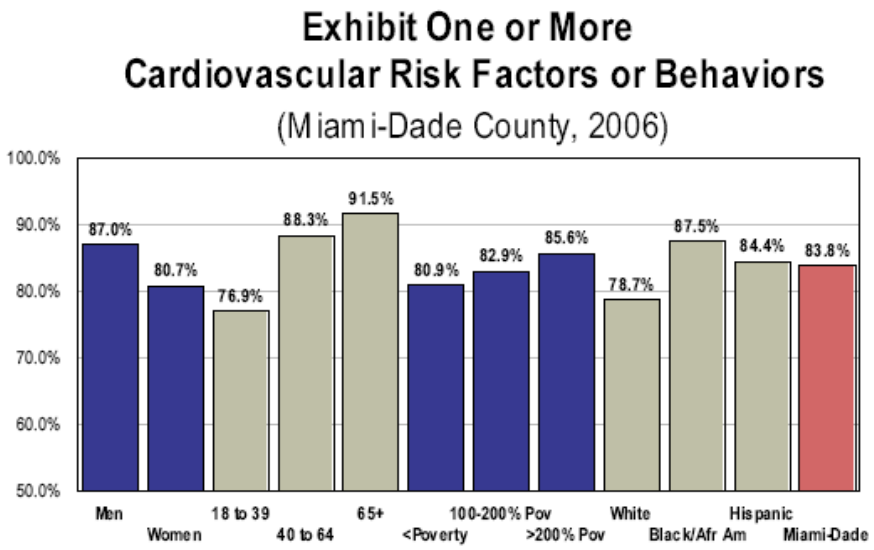
The Community Health Survey is a systematic, data-driven approach to determining the health status, behaviors and needs of residents in a defined geographical region. Subsequently, this information may be used to formulate strategies to improve community health and wellness.

A Community Health Survey provides information to consider when developing effective interventions so that communities may identify issues of greatest concern and decide to commit resources to those areas, thereby making the greatest possible impact on community health status. This survey will serve as a tool toward reaching three basic goals:

- To improve residents' health status, increase their life spans, and elevate their overall quality of life. A healthy community is not only one where its residents suffer little from physical and mental illness, but also one where its residents enjoy a high quality of life.
- To reduce the health disparities among residents. By gathering demographic information along with health status and behavior data, it will be possible to identify population segments that are most at-risk for various diseases and injuries. Intervention plans aimed at targeting these individuals may then be developed to combat some of the socio-economic factors which have historically had a negative impact on residents' health.
- To increase accessibility to preventive services for all community residents. More accessible preventive services will prove beneficial in accomplishing the first goal (improving health status, increasing life spans, and elevating the quality of life), as well as lowering the costs associated with caring for late-stage diseases resulting from a lack of preventive care.

The following represents an overview of findings from the 2006 PRC Community Health Survey: Living Healthy, Living Longer in Miami-Dade County, Florida. Overarching findings include:

- Geographically, where discernible differences were noted in health indicators between South Miami-Dade County and the rest of the county, South Miami-Dade County typically fared less favorably.
- While health and quality of life are good for most Miami-Dade County residents, low-income residents and communities of color often bear the greater burden of health risk and disease.

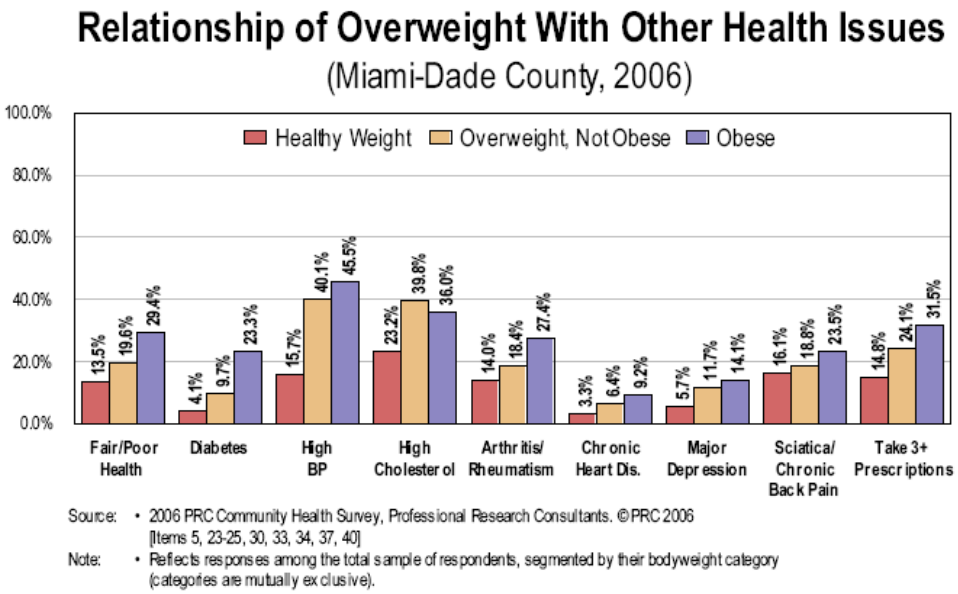


Source: • 2006 PRC Community Health Survey, Professional Research Consultants. ©PRC 2006 [Item 139]

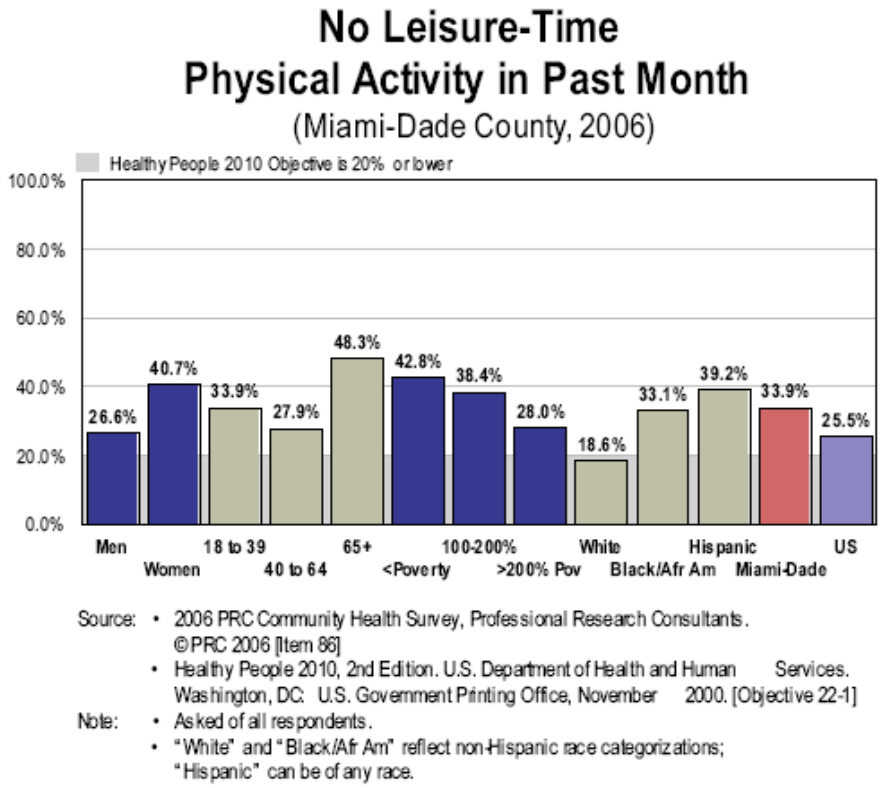
Note: • Includes respondents reporting any of the following: overweight, cigarette smoking, high blood pressure, high cholesterol, or physical inactivity.
• "White" and "Black/Afr Am" reflect non-Hispanic race categorizations; "Hispanic" can be of any race.

Other key findings from survey respondents include:

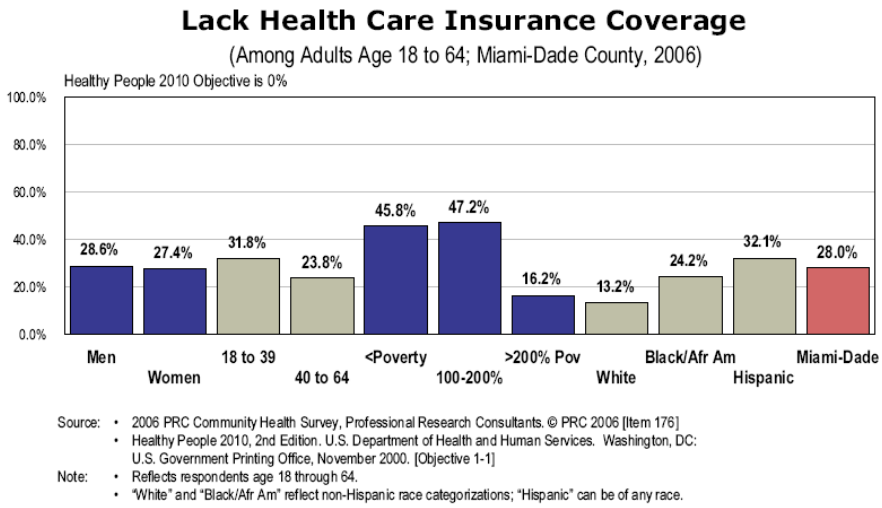
- Health Status: While most residents enjoy good physical health, one out of five says their health status is only "fair" or "poor."
- Asthma prevalence in Miami-Dade County is quite high, affecting an estimated 286,300 adults and 71,600 children.
- While the overall prevalence of diabetes is comparable to the national prevalence, the disease affects approximately 208,700 county residents and is especially high among adults aged 40+, those living below the federal poverty level, Hispanics, and Blacks. Just over one-third of Miami-Dade County adults get the recommended five servings of fruits and vegetables per day.
- An estimated 570,700 adults do not have a specific source of ongoing medical care.
- As found nationally, nearly two-thirds of Miami-Dade County adults are overweight or obese; this proportion is even higher among the Black/African American and Hispanic populations as illustrated in the following graph.



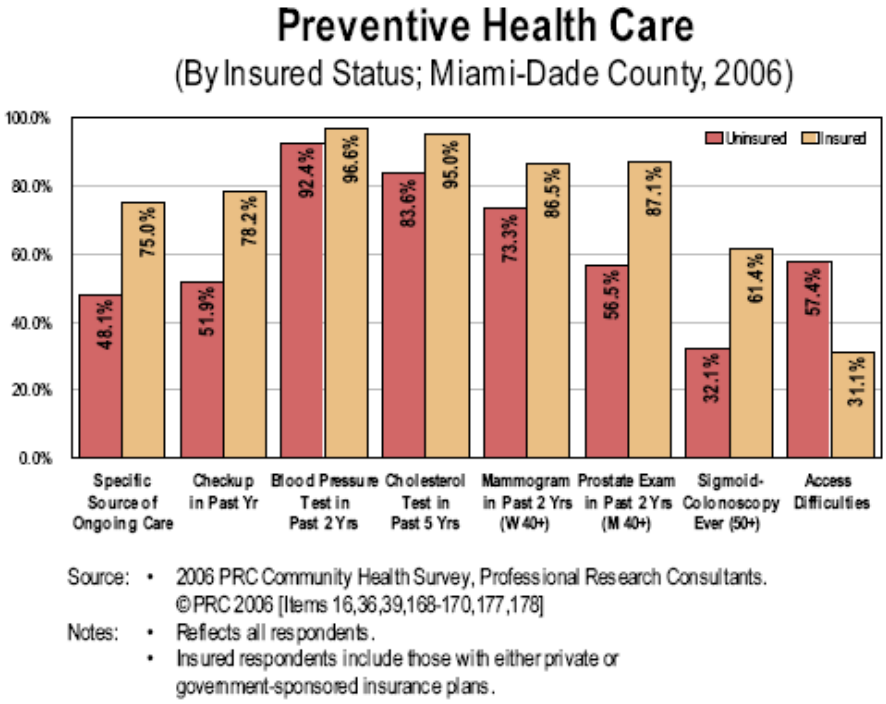
- According to the data in the following table, Miami-Dade County adults are much less physically active than Americans overall.



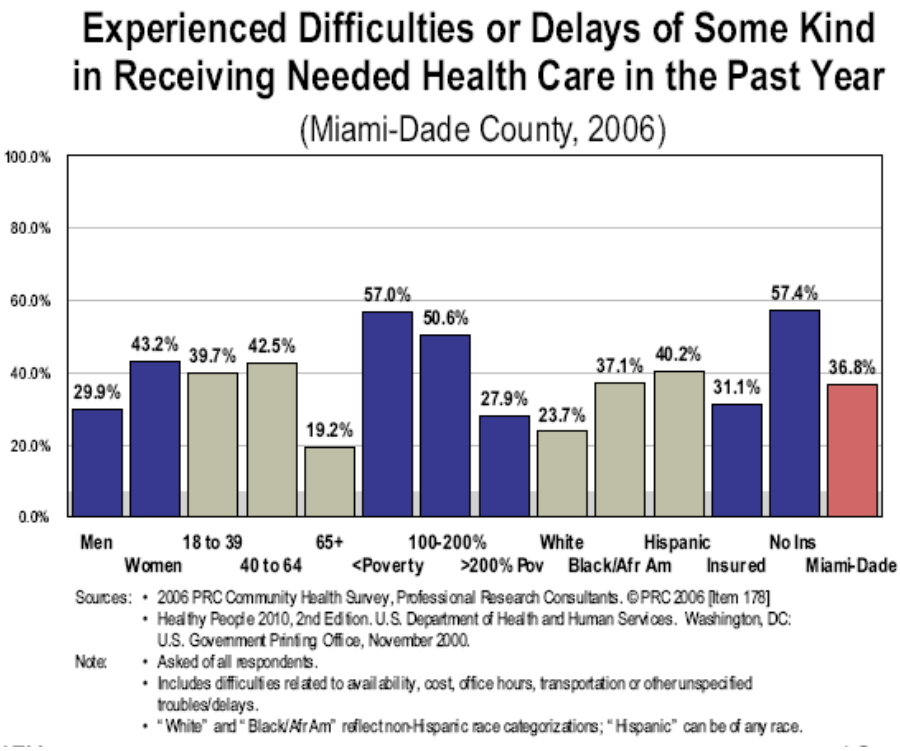
- With regards to access to healthcare services the uninsured, as well as low-income residents and communities of color, face limited access to the county's public and private health care delivery systems due to cost, as well as a variety of other barriers.



- Miami-Dade County's uninsured rate is significantly higher than the national average.



- Nearly three-quarters of a million people in Miami-Dade County (679,600 adults and 63,900 children) experienced some type of difficulty or delay in accessing healthcare services over the past year. Barriers to access are not limited to financial qualifiers, but also touch on issues of finding a provider, inconvenient hours of service, and lack of transportation.



(Source: http://www.healthcouncil.org/documents/Living_Healthy_Living_Longer.pdf)

Housing

In a sustainable community housing is affordable, energy efficient and is in relative proximity to transportation options, employment centers, schools and services. For purposes of this assessment report supply and demand, housing affordability, and the age and conditions of buildings are the dimensions reviewed.

Housing

Assessment Area

In a sustainable community housing is affordable, energy efficient and is in relative proximity to transportation options, employment centers, schools and services. For purposes of this assessment report supply and demand, housing affordability and the age and conditions of buildings are the dimensions reviewed.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Meeting the current demand for housing affordability and the longer-term projected demand for housing.
- Providing education that residential and commercial energy and water efficiency retrofits provide financial personal and collective benefits. Short term investments provide long term financial savings and contribute to community greenhouse gas reductions.
- Housing affordability issues currently exacerbated by high unemployment and foreclosures.
- Integrating green construction into affordable housing to reduce recurring housing costs within the affordable housing maximum purchase price set by Miami-Dade County.
- Attracting residents to housing in urban centers rather than suburban areas.
- Developing and funding effective mechanisms to facilitate and finance energy efficiency retrofits for existing buildings.

ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

Housing Affordability

According to the Office of the County Manager's 2006 report "Affordable Housing in Miami-Dade County: Review of the Data, Policies, and Initiatives," affordable housing demand is expected to increase. The projected demand for housing units with allowance for vacancy is 10,609 units per year through the year 2015, and 11,018 per year during the 2015-2025.

The US Department and Housing and Urban Development (US HUD) defines housing affordability as the capacity of households to pay for housing while also meeting other basic needs and, specifically, the relationship between household incomes and prevailing housing prices and rents. While moderate rent or cost burden is considered housing costs between 31 and 50 percent of reported income, "affordability" policy think tanks suggest households should spend no more than 30 percent of their income on housing costs[1].

This definition does not consider that upper income and smaller households are able to afford spending far above 30 percent of their incomes on housing, and have sufficient income left over to satisfy other basic needs; whereas low income households that even pay only 10 percent of

[1] http://www.huduser.org/publications/affhsg/worstcase/appendixb.html

their incomes on housing costs may be forced to forgo essential medical care and healthy food (The Brookings Institution, 2002). Figures 1 and 2 illustrate that in Miami-Dade County, extremely low- and low-income households are substantially cost-burdened, meaning they pay significantly more than 30 percent of their income on housing cost. Reducing costs through the more efficient utilization of energy would help, but will require upfront, deferred, or full subsidy funding through government grants.

Housing Affordability in Miami- Dade County for Owner and Renter Occupied Housing

Figure 1: **Owner Occupied**

Income Range	Total	Cost Burden	% Burdened
Less than $20,000	31,359	31,112	99.21%
$20,000 to $34,999	44,739	43,161	96.47%
$35,000 to $49,999	44,539	38,190	85.75%
$50,000 to $74,999	74,145	49,815	67.19%
$75,000 or more	150,827	44,762	29.68%
Total :	345,609	207,040	59.91%

Source: Miami-Dade County Planning & Zoning Economic Development Coordination Division.
Data Source: U.S. Census Bureau, 2008 American Community Survey.

Figure 2: **Owner Occupied**

Income Range	Total	Cost Burden	% Burdened
Less than $20,000	112,803	101,446	89.93%
$20,000 to $34,999	66,067	59,122	89.49%
$35,000 to $49,999	48,693	29,149	59.86%
$50,000 to $74,999	43,622	12,909	29.59%
$75,000 or more	39,804	2,922	7.34%
Total	310,989	205,548	66.09%

Source: Miami-Dade County Planning & Zoning Economic Development Coordination Division.
Data Source: U.S. Census Bureau, 2008 American Community Survey.

Funding Sources for Affordable Housing and Green Building

Housing affordability is a challenge in and of itself, and green construction has traditionally been perceived as adding to this cost. As the green construction industry has expanded, these costs have decreased. The County supports green construction for affordable housing through existing competitive processes. Some projects have been constructed with green components but this data is not currently tracked. Miami-Dade County uses local and federal funds to support the construction of affordable housing developments and homeowner mortgage assistance. The County's Department of Housing and Community Development's (DHCD) Annual Action Plan, includes federal Home Investment Partnership (HOME) funds, portions of the Community Development Block Grant (CDBG), Documentary Surtax (Surtax) and State Housing Initiative Partnership (SHIP) funds for affordable housing.

A review of the rules governing affordable housing subsidy programs reveals difficulties with sustainable affordable housing efforts. The Housing Finance Authority (HFA) of Miami-Dade County, however, has worked with a partnership of Sustainable Affordable Housing pioneers to

produce two LEED Certified Homes. The purchase price of a home under SHIP, Surtax, HOME or CDBG would limit participation in any of these existing homeownership programs.

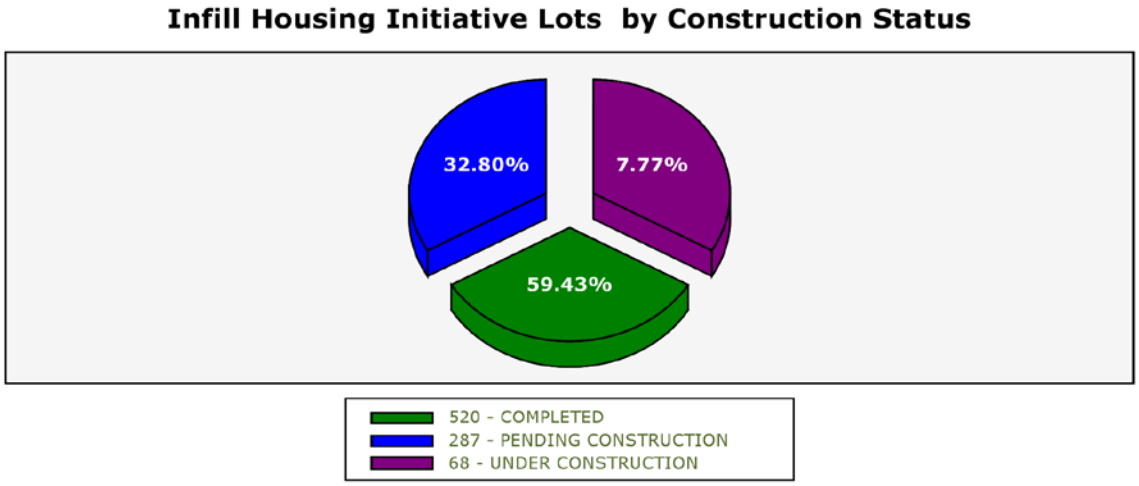
In June of 2009, a partnership was announced between the US HUD, the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Transportation (DOT) to help improve access to affordable housing, more transportation options, and lower transportation costs while protecting the environment in communities nationwide to increase sustainability. As the partnership develops, it will enhance the affordability/sustainability connection in Miami-Dade County.

The Miami-Dade Public Housing Agency (MDPHA) administers two major federally-subsidized programs: the public housing program and Section 8. Currently, the County administers approximately 9,265 public housing (annual contribution contract) units. That figure will adjust in future years with the completion of Phase 2 of the HOPE VI revitalization project, which will add a total of 354 units and 177 of those will be public housing (ACC-equivalent) units. In addition, the County's Building Better Communities General Obligation Bond (GOB) Program, will use $32.3 million in program proceeds to demolish an existing 94 public housing units, and build 296 new units at existing public housing developments. With respect to the Section 8 program, as November 2009, 13,283 families in Miami-Dade were being assisted under the Section 8 Housing Choice Voucher Program. Approximately, an additional 2,865 families were being assisted under other Section 8 programs.

Infill

Ordinance 01-47 established the Infill Housing Initiative to increase the availability of affordable homes for low and moderate income persons, redevelop urban neighborhoods by eliminating the blight of vacant lots and dilapidated or abandoned properties, and payment of ad valorum properties. Infill also addresses sustainability by redeveloping existing areas where transportation and service are more readily available. Figure 3 shows the completion status of these projects.

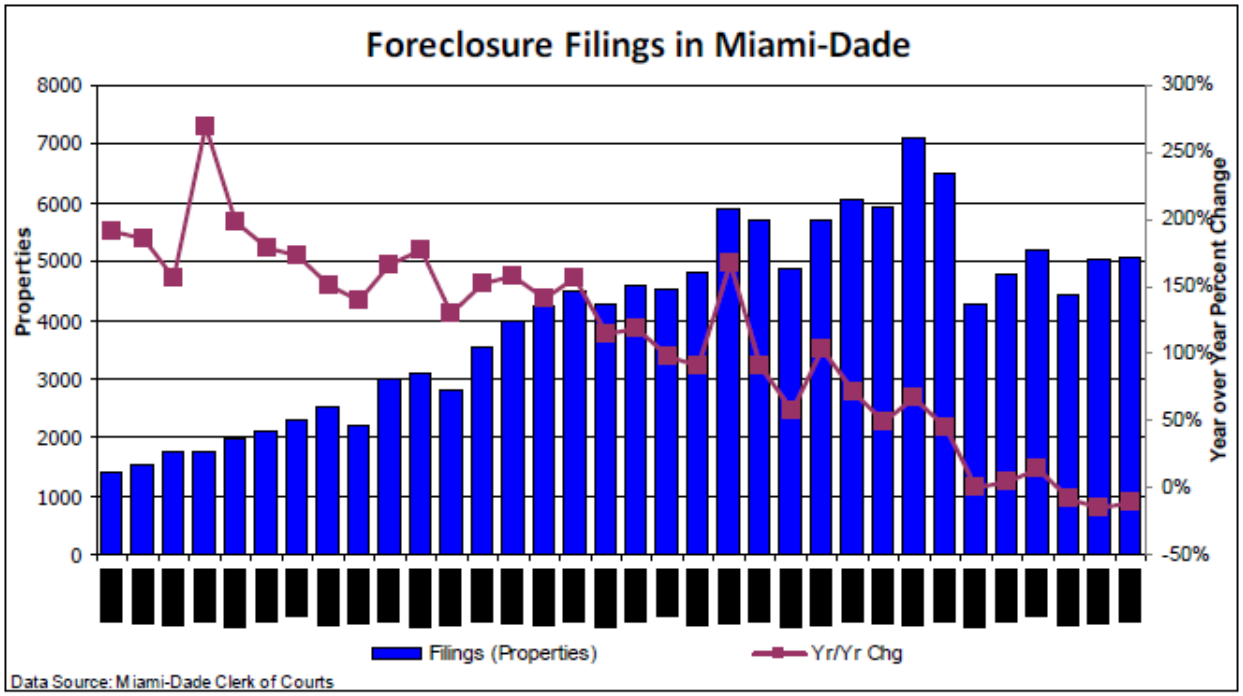
Figure 3



Foreclosure Rate

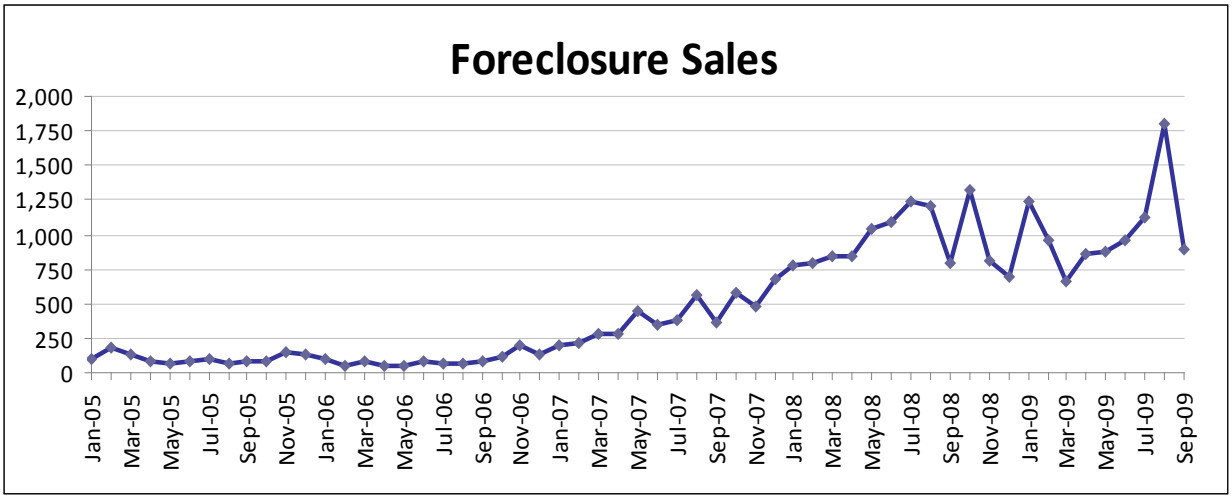
Miami-Dade County, like many of the nation's fastest growing areas, faces a significant foreclosure rate. The County has averaged 800 to 850 actual foreclosures monthly in 2009, a rate that has not changed much from 2008. The rate is small in contrast to the number of foreclosure filings, as many of those do not end up in foreclosure, but is significant compared other US metropolitan areas and is a clear indicator that many homeowners cannot afford to keep their homes whether it is their primary residence or secondary home. The states of California, Nevada, and Florida have been the most affected. Figure 4 shows foreclosure filings. A foreclosure filing is the first action taken by a lender when a homeowner falls behind. After that the homeowner may catch up or modify the mortgage and the bank will never actually take ownership of the property.

Figure 4



The final step in the foreclosure process is the sale – when the lender actually takes ownership of the property from the defaulted homeowner. Figure 5 shows the actual foreclosure sales.

Figure 5



Housing Supply and Demand

The projection of housing demand may seem counterintuitive given the foreclosure rate and occupancy rate. County and state planners still expect the county population to grow in comparison the state due to immigration, but projections do not account for variable growth scenarios. The Demographics Assessment Area details the projected population growth which is tied to the housing demand projection. Figure 6 shows the projected depletion for single-family and multi-family structures for 2009 to 2025 in Miami-Dade County.

Figure 6: Housing Demand Projection

	Structure Type		
	Single-Family	**Multifamily**	**Both Types**
Capacity in 2009	42,687	89,960	132,647
Demand 2009-2010	5,467	6,798	12,265
Capacity in 2010	31,753	76,364	108,117
Demand 2010-2015	5,672	6,411	12,083
Capacity in 2015	3,393	44,309	47,702
Demand 2015-2020	5,699	6,395	12,094
Capacity in 2020	0	12,334	0
Demand 2020-2025	5,617	6,618	12,235
Capacity in 2025	0	0	0
Depletion Year	2015	2021	2018

Source: Planning and Zoning Department

Occupancy Rates

Overall, occupancy was 86 percent in Miami-Dade County in 2007. The state of the local economy can cause the rate of vacancy to rise if unemployment grows and families chose to share residencies to reduce their household costs. Figure 7 shows the quantity and percentage of housing units that are occupied or vacant by owners or renters.

Figure 7: Housing Occupancy

Total Housing Units	971,199	
Occupied housing units	833,199	86%
Owner-occupied	501,722	60%
Renter-occupied	331,477	40%
Vacant housing units	138,409	14%
Homeowner vacancy rate	3.8%	
Rental vacancy rate	7.9%	

Source: 2007 American Community Survey

Urban Center Occupancy

A recent study reports that 62 percent of residential units completed in downtown Miami since 2003 are occupied and the closing rate is accelerating. The study suggests that heightened demand for urban living has contributed to the upward trend which will continue. The study, entitled “Population and Demographic Profile: Downtown Development Authority District and Adjacent Areas in Influence” was prepared for the Miami Downtown Development Authority by Goodkin Consulting.

Age of Buildings

The quantity and age of buildings is considered in the sustainability assessment to ascertain the opportunity for efficiency retrofits. In Miami-Dade County, the greatest number of buildings, in terms of quantity of structures, are residential single family homes. Single family homes exceed multifamily when considering units as well. Figures 8, 9 and 10 below present the quantity and average age of buildings and a comparison of residential units.

Figure 8: Age of Housing Stock

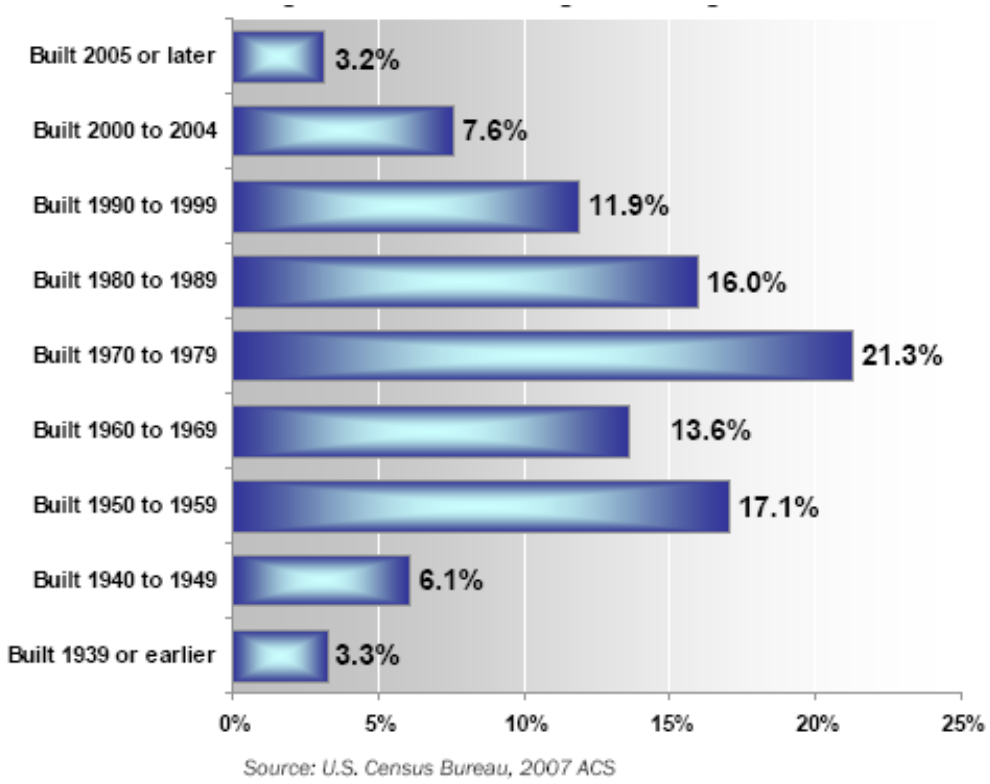
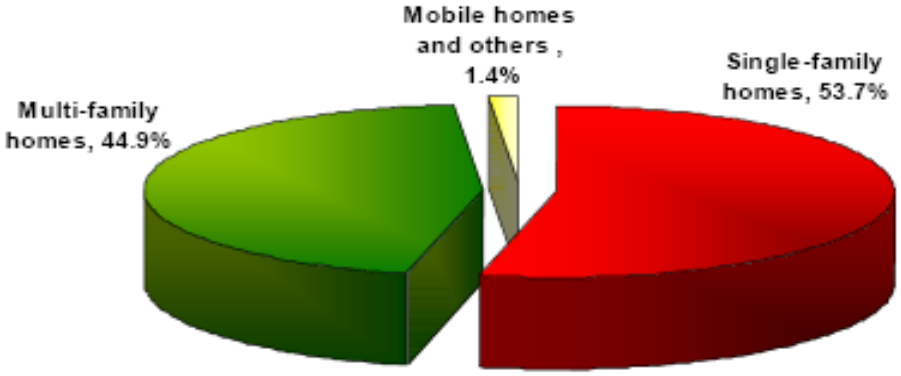


Figure 9: Housing Units by Structure Type 2007



Source: Miami-Dade Community Action Agency Comprehensive Needs Assessment 2008

Figure 10: Building Types and Age

Building Type	Number	% of Total Buildings	Average Year Built	Average Age
Residential (Single Family)	314,442	82%	1965	44
Condo Buildings	6,043	2%	1983	26
Multi-Family	35,131	9%	1957	52
Commercial	15,054	4%	1965	44
Industrial	7,519	2%	1973	36
Agricultural	2,792	1%	1977	32
Institutional	2,244	1%	1962	47
Government	2,205	1%	1970	39
Total	**385,430**	**100%**		

Source: Property Appraiser Department

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Comprehensive Development Master Plan

The CDMP Housing Element provides general policies which guide Miami-Dade County's affordable housing development initiatives. It includes three goals and their associated objectives:

Goal 1: Ensure the provision of affordable housing that will meet the spatial and economic necessities of all current and future Miami-Dade County residents, regardless of household type or income.

- *Objective HO-1:* Promote housing choice for all Miami-Dade County citizens regardless of race, ethnicity, age, sex, family composition, disability or sexual orientation such that residential segregation indices are reduced to a value of 50 or less. Policies: HO-1A, HO-1B, HO-1C
- *Objective HO-2:* Designate by the year 2025 sufficient land (+/-25,000 acres) to accommodate sites at varying densities for a variety of housing including manufactured homes, with special attention directed to affordable units for extremely low, very low, low, and moderate income households, including workforce housing. Policies: HO-2A, HO-2B, HO-2C, HO-2D, HO-2E
- *Objective HO-3:* Assist the private sector in providing affordable housing products in sufficient numbers for existing and future residents throughout the County by the year 2025, approximately 294,000 units), with an appropriate percentage (about 42 percent) of new housing available to extremely low, very low, low and moderate-income households, including workforce housing. Policies: HO-3A, HO-3B, HO-3C, HO-3D, HO-3E, HO-3G
- *Objective HO-4:* Develop ways to broadly communicate accurate information about public and private affordable housing development, especially extremely low, very low, low, moderate-income, and workforce housing, throughout the County. Policies: HO-4A, HO-4B

Goal 2: Throughout Miami-Dade County identify and provide affordable housing opportunities from within the existing housing stock and ensure its efficient use through rehabilitation and renovation, and facilitate adaptive conversion of nonresidential structures

to housing use for extremely low, very low, low, and moderate-income households, including workforce housing.

- *Objective HO-5:* Reduce the number of substandard housing units in the County by encouraging the rehabilitation or conservation of the existing housing stock, including historic structures, and provide that an increased number of extremely low, very low, low and moderate-income, and workforce units comes from housing rehabilitation and adaptive re-use of nonresidential structures. Policies: HO-5A, HO-5B, HO-5C, HO-5D, HO-5E
- *Objective HO-6:* Increase affordable housing opportunities for extremely low, very low, low, and moderate-income households, including workforce housing options, within reasonable proximity to places of employment, mass transit and necessary public services in existing urbanized areas. Policies: HO-6A, HO-6B, HO-6C, HO-6D

Goal 3: All variations of affordable housing products in Miami-Dade County should be provided through the most economically feasible alternatives.

- *Objective HO-7:* Bring about housing design and development alternatives that are aesthetically pleasing, encourage energy efficiency and enhance the overall health, safety and general welfare of County residents. Policies: HO-7A, HO-7B, HO-7C, HO-7D, HO-7E, HO-7F
- *Objective HO-8:* Maintain the stock of suitable rural housing available to farm workers, as well as special housing for migrant farm workers. Policy: HO-8A.
- *Objective HO-9:* Provide for the special housing needs of the County's elderly, disabled, homeless, orphaned children, families in need, persons with AIDS and others in need of specialized housing assistance. Policies: HO-9A, HO-9B, HO-9C
- *Objective HO-10:* Continue governmental assistance to persons and families displaced and relocated by public projects and encourage private-sector assistance in relocating people displaced by private projects. Policies: HO-10A, HO-10B, HO-10C

Consolidated Master Plan

Miami-Dade County is required to submit a Consolidated Plan to US HUD as a pre-requisite for receiving entitlement grant funds for affordable housing. The Consolidated Plan, which is administered by DHCD, provides an assessment of the housing and non-housing needs of the low and moderate income population in Miami-Dade County, and includes a five-year strategic plan for addressing those needs. An Action Plan, as detailed further in this section, has to be created for each of the five calendar years covered by the Consolidated Plan.

The current Consolidate Plan covers the five-year period from January 1, 2008 through December 31, 2012. The following are the entitlement grant programs included in the Consolidated Plan: the Community Development Block Grant (CDBG), the Home Investment Partnerships (HOME), and the Emergency Shelter Grant (ESG).

Annually, the Action Plan lists the activities to be undertaken, the geographic distribution of activities, homeless and special needs activities, and other actions taken to address the goals and objectives of the Consolidated Plan. In addition, the Action Plan is updated on an ongoing basis as funds are reprogrammed throughout the program year. Under the 2010 Annual Action Plan approved by the Board of County Commissioners in November 2009, $11.092 million in CDBG, HOME, and SHIP funds were allocated to fund high priority housing needs and provide support services, such as housing for low- and low- to moderate-income families, the homeless, and Tenant Based Rental Assistance (TBRA). These programs and activities directly serve the needs of populations with highest incidences of poverty identified in the FY 2008-2012 Consolidated Plan, which focuses on updating priorities identified by the Neighborhood Revitalization Strategies.

Local Housing Assistance Plan (LHAP)
The LHAP is the County's three-year plan that is required by the State of Florida in order to accept and utilize the State Housing Initiative Partnership (SHIP) revenues in Miami-Dade County for affordable housing. The current plan expires in FY 2010. SHIP dollars are one of the most flexible funds available for housing. Staff is encouraged to develop strategies and activities that will meet the SHIP guidelines and encourage sustainability for the local housing market place.

Homeless Trust
The Homeless Trust serves as the Miami Dade County's administrating department for Federal homeless funding under the McKinney Act. On an annual basis the Homeless Trust prepares a consolidated application and administers contracts for housing and services which includes: permanent supportive housing (affordable housing with supportive services), transitional housing, and an array of supportive services including behavioral and primary healthcare, drug and alcohol treatment, legal services, homeless outreach, employment services and housing placement.

The funding and program priorities established by the Homeless Trust each year are part of the County's consolidated plan administered by Housing Community Development (HCD). In addition, a unique food and beverage tax provides $14 million per year with 85% of the funding going to local homeless programs and 15% going to domestic violence shelters. These local funds are utilized to provided housing and services Housing and Urban Development (HUD) does not fund, or to leverage the Federal dollars. Local services include but are not limited to emergency shelter provided in our full service Homeless Assistance Centers, homeless prevention services, identification assistance, housing placement services to individuals exiting institution facilities.

As part of an amendment to the Consolidated Plan, the Homeless Trust also was selected by HUD as the administering department for the American Recovery and Reinvestment Act Homeless Prevention and Rapid Re-Housing Program (HPRP). The HPRP provides short and medium term rental assistance to households who but for this assistance would be homeless.

The Homeless Trust is developing 50 acres of surplus military land (formerly the Homestead Air Force Base), as 145 units of permanent supportive housing for formerly homeless families, an organic nursery, and farmer's market, which shall serve as a microenterprise for the residents. The project will obtain LEED Silver Certification.

The Homeless Trust successfully advocated for the Florida Housing Finance Authority to set aside affordable housing funds for 30 percent of their units to be made available to households at 30 percent of the Area Median Income. This initiative, known as the 30:30 campaign, targets affordable rental units developed with Low Income Housing Tax Credits, at households at the lowest economic levels.
(Source: Miami-Dade County Homeless Trust)

Housing Master Plan
The County's Community Affordable Housing Strategies Alliance (CAHSA) committee, comprised of over 30 top housing professions, is currently studying the issue of affordability. Under the development of the Master Housing Plan, the strategy is to maximize and effectively apply public and private sector resources toward producing and maintaining affordable housing that addresses community need, access, proximity, cost, and stability. Although it addresses more than the focus of this report, it is significant in that the 'sustainability" should be incorporated into the report and if directed, become a priority.

Public Housing Agency Five-Year Plan
The Public Housing Agency (PHA) Plan is a comprehensive guide to public housing agency policies, programs, operations, and strategies for meeting local housing needs and goals. There are two parts to the PHA Plan: the Five-Year Plan, which each PHA submits to US HUD once every 5th PHA fiscal year, and the Annual Plan, which is submitted to US HUD every year. The last Annual Plan approved on June 2, 2009, includes the strategies for managing the federally subsidized Public Housing and Section 8 programs.

The Five-Year and Annual Plans, which are approved by US HUD, are MDPHA's plans that drive Miami-Dade County's federally subsidized housing programs and their ability to meet the need for housing in the Miami-Dade County entitlement jurisdiction. The Five-Year and Annual Plan does not include the activities of other using programs administered by other Public Housing Authorities within Miami-Dade County (i.e. Hialeah Housing Authority, Housing Authority for the City of Miami Beach, and Homestead Housing Authority). The management of the day-to-day operations of the Section 8 Housing Choice Voucher Program have been outsourced to a private contractor, Florida Quadel, for an initial two-year period. MDPHA staff monitors the performance of Florida Quadel on a monthly basis.

Weatherization & Energy Programs
The Miami-Dade Community Action Agency (CAA), Energy Programs Division receives funding from the U.S, Department of Energy through the State of Florida's Department of Community Affairs (DCA) for the Weatherization Assistance Program (WAP) and Weatherization Assistance /Low Income Home Energy Assistance Program (WAP/LIHEAP). The program reduces energy costs for low-income and senior homeowners by increasing the energy efficiency of their homes. In the last two years, the programs provided some or all of the following energy-efficiency services to nearly 200 homes: caulking and weather-stripping, attic insulation, door and window repair or replacement, cooling system up-grade (replacement) or tune-up, refrigerator replacement with Energy Star rated units, water heater replacement and pipe insulation, and water saving devices such as Aerators showerheads and faucets (kitchen and bathrooms).

As a result of the American Recovery and Reinvestment Act (ARRA), DCA encourages the program providers to work diligently in order to be able to weatherize nearly five times the previous number of homes weatherized for 2008. In FY 2007-2008, 75 homes were weatherized; therefore the projected increase anticipated by DCA will be approximately 400 homes per year. Weatherization Assistance Program ARRA funding, which is estimated at $6.2 million as of mid-December 2009 and does not include WAP/LIHEAP funds, will be for a three year period (2009–2012) and the goal is to weatherize seven hundred-fifty (750) homes throughout Miami-Dade County.

The MDPHA, along with the General Services Administration (GSA), is in the process of developing an RFP for an agency-wide Energy Performance Contract consistent with Guaranteed Energy, Water and Wastewater Performance Savings Contract Act. This would include an initial evaluation, via an investment grade technical energy audit, of existing facilities which would determine the scope of work. This would be followed by subsequent implementation which would include design, installation, modification, monitoring and operational training of existing and new equipment, which will reduce energy and water consumption associated with operation of facilities. With a portion of the $19.3 million granted to MDPHA under ARRA for the rehabilitation of existing public housing units, MDPHA is replacing roofs for existing high rise buildings with insulation and reflective surfaces in coordination with FPL for energy efficient rebates.

Existing Legislation
Local
The following list includes some of the Board's adopted legislation related housing availability and affordability.

- *Resolution R-1416-08*: Directs the County to use best efforts to identify up to 850 public housing (ACC equivalent) units within the expanded HOPE VI Target Area for low-income families and elderly persons.
- *Resolution R-1292-09*: Directing the County to determine the feasibility of utilizing housing constructed through the County's infill initiative program as temporary rental housing and requiring a report. 11/4/09
- *Ordinance 01-47*: Established the Infill Housing Initiative to increase the availability of affordable homes from low and moderate income persons, redevelop urban neighborhoods by eliminating the blight of vacant lots and dilapidated or abandoned properties and payment of ad valorum properties.

Other Initiatives

- Under the Building Better Communities General Obligation Bond program, $132 million is dedicated for affordable housing.
- The Miami-Dade County Housing Finance Authority recently approved a Green Mortgage designed to support an increase in affordable green homes.
- To help with the foreclosure issue, US HUD allocated $62.207 million to Miami-Dade County, out of a total of $3.92 billion in grants to states and units of local government, under Title III of the Housing and Economic Recovery Act of 2008, referred to as the Neighborhood Stabilization Program (NSP), to address problems associated with concentrations of foreclosed, vacant, and abandoned homes.
- Earlier this year, HUD and DOT announced an unprecedented agreement to implement joint housing and transportation initiatives. With EPA joining the partnership, the three agencies will work together to ensure that these housing and transportation goals are met while simultaneously protecting the environment, promoting equitable development, and helping to address the challenges of climate change. This partnership may translate to sustainability in Miami-Dade County.
- Under the Capital Fund Recovery Competition (CFRC) grant under the American Recovery Reinvestment Act, the County was awarded $16,643,865 that would allow for the completion of all 354 mixed-income units (including 177 public housing units) envisioned under Phase II of the Scott/Carver HOPE VI Revitalization Plan. All new construction will comply with the 2003 International Energy Code or successor codes and the USHUD-adopted Model Energy Code issued by the Council of American Building Officials. The proposed plan calls for the use of Energy Star labeled products throughout - HVAC equipment, ceiling fans, washers, dishwashers, refrigerators, and water heaters (if available). Developer will strive to meet the Enterprise Green Community status developed by Enterprise Communities with United States Green Building Council and other "green" organizations and is the same criteria that is included in the 2008 HOPE VI Act. Furthermore, the Developer will use best efforts to achieve a LEED Silver rating in accordance with the U.S. Green Building Council rating system for Homes and Neighborhood Development. The Developer is currently incorporating green features into its design.

COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

The Department of Housing and Community Development provides federal, state, and local funding support to more than 100 organizations. These organizations administer programs that produce suitable living environments, economic opportunities, and housing for low or moderate income persons that reside in Miami-Dade County. The allocation of the funding requires an active community outreach program. The outreach program is defined below and any or all of these listed provide a good forum for outreach, however formal feedback data is not tracked.

- Program Development Workshops: From December through April, there will be at least three program development workshops that the Department will conduct with its funded agencies for the proper implementation of projects in 2010.
- Community Advisory Committee Meetings: Conducted by the department's planning staff, these meetings will occur throughout eight Neighborhood Revitalization Service Areas throughout the County at least once each month. The meetings involve not only local community leaders but also members of the public and clientele of our projects.
- Technical Assistance Sessions: Program managers will meet at least monthly with the staffs of their assigned agencies throughout the first quarter of 2010, when the agencies are initiating their programs for the 2010 fiscal year.

Land Use

Miami-Dade County encompasses nearly 2,000 square miles of land, including 500 square miles of urban development, bounded 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 ten to 20 year span. The CDMP provides a framework for "sustainable development" by providing land capacity to meet projected needs, preserving wetlands and agricultural areas, and protecting (drinkable) water well fields. This section illustrates the many challenges in implementing these broad parameters within land use planning and zoning activities, functional planning and programming of infrastructure and services.

Land Use

Assessment Area

Miami-Dade County encompasses nearly 2,000 square miles of land, including 500 square miles of urban development, bounded 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 ten to 20 year span. The CDMP provides a framework for "sustainable development" by providing land capacity to meet projected needs, preserving wetlands and agricultural areas, and protecting (drinkable) water well fields.

In general, the CDMP calls for the establishment of a more compact and efficient urban form within the County's Urban Development Boundary (UDB). More specifically, Objective 1 of 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; thus, recognizing the need to effectively link neighborhoods, urban centers, employment centers and other major destinations.

As illustrated in this section, there are challenges in implementing these broad parameters within land use planning and zoning activities, functional planning and programming of infrastructure and services.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Planning outside the UBD including addressing sub-urbanization of agricultural lands (the current practice of five-acre zoning outside the UDB is affecting the agricultural community and economy as a whole).
- Differing opinions and interests from time to time regarding the movement of the UDB, including re-evaluating the urban expansion areas (UEAs).
- Planning and prioritizing infrastructure and services consistent with the CDMP, for example ensuring water and sewer infrastructure availability in redevelopment and infill areas that would result more sustainable, walkable communities.
- Allowing residents to work, shop, and play near their homes by redefining neighborhoods and the Guidelines of Urban Form in the CDMP to align with compact, urban form policies.
- Connecting population and employment centers with effective transportation linkages.
- Improving coordination and review by County agencies to increase the effectiveness and implementation of adopted policies, for example processing roadway and public infrastructure projects to achieve goals established in the Open Space Master Plan, achieving a network of tree-lined boulevards, parkways and shaded bikeways and trails.
- Establishing urban, pedestrian-friendly, multi-modal roads.
- Incorporating sustainability considerations into the Long Range Transportation Planning process.
- Addressing the affects annexations and incorporations have on planning and sustainability in the absence of a coordinated regional or County approach.
- Lack of a coordinated planning and zoning approach due to thirty-five separate

municipal codes and comprehensive plans.

- Providing for sustainable, urban agricultural practices such as community gardens inside the UDB.
- Implementing the Park and Open Space System Master Plan (OSMP) goal to allow for every resident in the County to be able to walk, within five minutes, to a central neighborhood park or civic space.

ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

This section provides some of the most relevant land use data related to the key sustainability challenges. However, not all the relevant information affecting land uses in the assessment is found in this assessment area, some data such as population, population density and vehicles miles traveled (VMT) can be found in other assessment areas such as transportation and demographics.

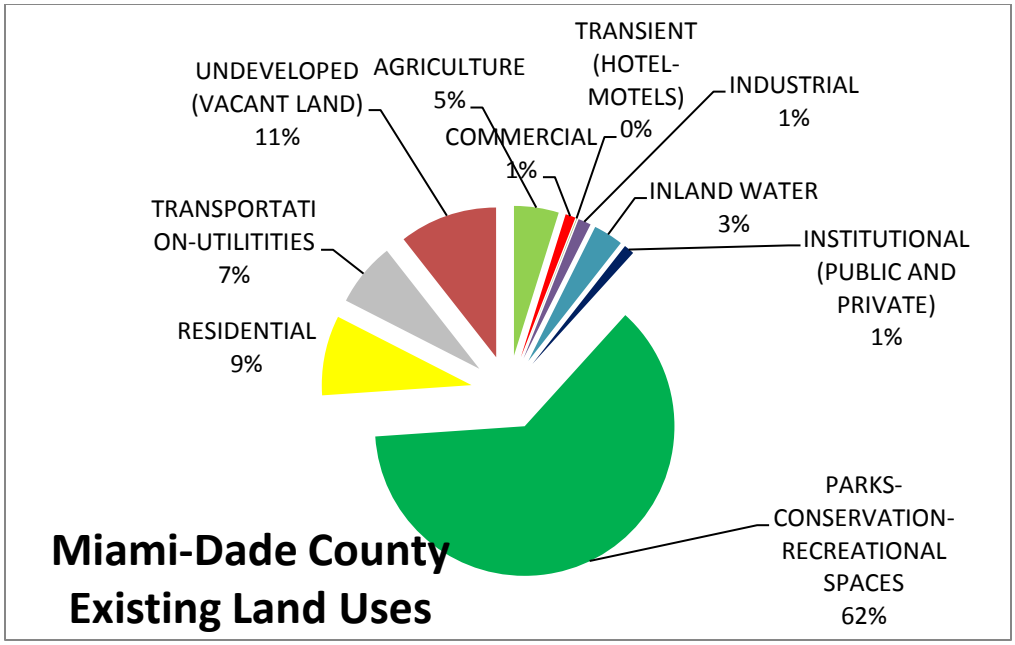
Land Consumption Rates

Existing Land Use: Table 1 and the accompanying figure show the County's current inventory of land area by use. Approximately 60 percent of the County land area is park land or conservation uses and only nine percent of the total County lands are in residential use.

TABLE 1
Existing Land Uses – Miami-Dade County

	COUNTYWIDE		
DESCRIPTION	**TOTAL ACRES**	**TOTAL SQM**	**%**
AGRICULTURE	61474.1	96.1	4.8
COMMERCIAL	13975.9	21.8	1.1
TRANSIENT (HOTEL-MOTELS)	724.7	1.1	0.1
INDUSTRIAL	17515.4	27.4	1.4
INLAND WATER	40963.9	64.0	3.2
INSTITUTIONAL (PUBLIC AND PRIVATE)	14287.4	22.3	1.1
PARKS-CONSERVATION-RECREATIONAL SPACES	790647.7	1235.4	62.2
RESIDENTIAL	109442.4	171.0	8.6
TRANSPORTATION-UTILITITIES	87598.6	136.9	6.9
UNDEVELOPED (VACANT LAND)	134608.0	210.3	10.6
TOTAL	**1271238.0**	**1986.3**	**100.0**

(Source: Department of Planning and Zoning, Planning Research Section, July 2009)



Residential Land: As shown in Table 2 below, the annual average demand for residential units within the UDB is expected to be approximately 12,000 units (combined single and multi-family units). It also shows that the demand is higher for multifamily residential units. Based on this data and the amount of vacant land designated residential in the County, it is projected that the depletion year for single-family residential units is 2015 and the depletion year for multi-family residential units is 2021. The combined depletion year is 2018. Given the fact that these projections are based solely on vacant residential land, the current inventory surplus of vacant residential units may slow down the residential vacant land absorption rates. Further analysis on this matter will be completed through the ongoing CDMP's Evaluation and Appraisal Report (EAR).

TABLE 2
Residential Land Capacity/Demand Analysis, 2009 to 2025: Countywide

Analysis Done Separately For Each Type,
i.e. No Shifting of Demand Between Single & Multi-Family Type

	Structure Type		
	Single-Family	Multifamily	Both Types
Capacity in 2009	42,687	89,960	132,647
Demand 2009-2010	5,467	6,798	12,265
Capacity in 2010	31,753	76,364	108,117
Demand 2010-2015	5,672	6,411	12,083
Capacity in 2015	3,393	44,309	47,702
Demand 2015-2020	5,699	6,395	12,094
Capacity in 2020	0	12,334	0
Demand 2020-2025	5,617	6,618	12,235
Capacity in 2025	0	0	0
Depletion Year	2015	2021	2018

Note: Residential capacity is expressed in terms of housing units.
Housing demand is an annual average figure based on population projections.
(Source: Department of Planning and Zoning, Planning Research Section, July 2009)

Table 2 also shows that with time, our housing mix will change to higher density, as we deplete the vacant, single-family land.

Commercial Land: Table 3 shows the projected annual absorption rate of commercial land within the UDB is 127.1 acres between 2008 and 2025. At this rate, the projected depletion year of the commercially designated land is 2031. As expected, this is mostly land within the UDB.

TABLE 3
Commercial Land Supply - Countywide

Acres of Vacant Commercial Land in 2009	2,775.4
Acres of Land in Commercial Use in 2009	13,767.5
Average Yearly Acreage of Absorption from 2008 to 2025	127.1
Projected Year of Depletion	2031
Commercial Acres per Thousand Persons in 2015	6.1
Commercial Acres per Thousand Persons in 2025	5.4

(Source: Department of Planning and Zoning, Planning Research Section, July 2009)

In essence, Table 3 shows that there is plenty of commercial land to be developed in the County; however, the location of these lands and the transportation linkages available may become a challenge.

Industrial Land: As shown in Table 4 below, the projected annual absorption rate of industrial land within the UDB is 116.95 acres between 2008 and 2025. At this rate, the projected depletion year of the industrially designated land is 2041. As expected, this is mostly land within the UDB.

TABLE 4
Industrial Land Supply - Countywide

Acres of Vacant Industrial Land in 2009	3,761.2
Acres of Land in Industrial Use in 2009	11,866.3
Average Yearly Acreage of Absorption from 2008 to 2025	116.95
Projected Year of Depletion	2041

Source: Department of Planning and Zoning, Planning Research Section, July 2009

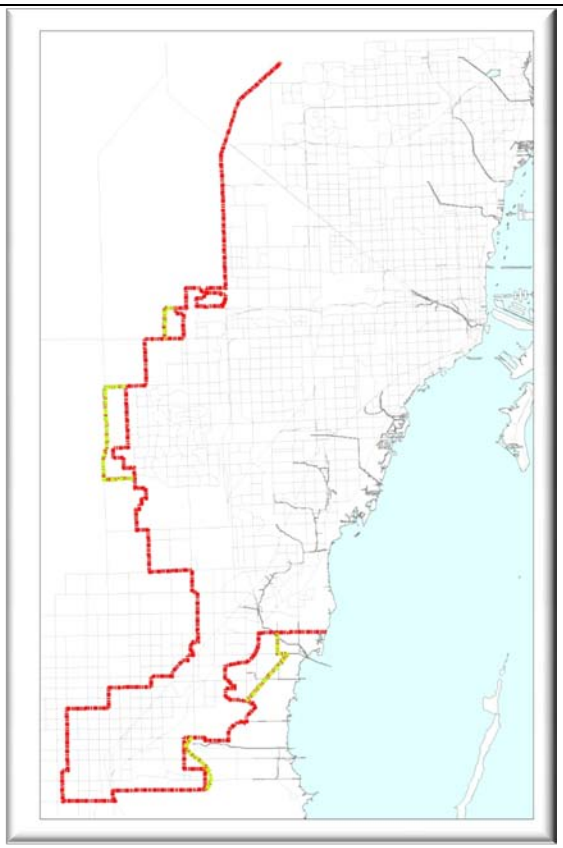
As it is the case with commercial land, Table 4 shows that there is a surplus of industrial land to be developed in the County; however, the location of these lands and the transportation linkages available may become a challenge.

Urban Development Boundary

The Land Use Plan Map of the CDMP includes the Urban Development Boundary with the purpose of distinguishing "the area where urban development may occur through the year 2015 from areas where it should not." In essence, the UDB line separates urban from rural areas and provides for urbanization only within the boundary.

The CDMP also includes the 2025 Urban Expansion Area (UEA) boundary. The UEA is comprised of that area located between the 2015 UDB and the 2025 UEA boundary. In essence, the UEA is the area where current projections indicate that further urban development beyond the 2015 UDB is likely to be warranted sometime between the year 2015 and 2025. However, not until these areas are brought within the year 2015 UDB through the CDMP amendment process, can they be used for urbanization purposes.

The proximity of areas currently designated as within the UEA to the Homestead Air Reserve Base and to other environmentally sensitive areas, among other issues, warrants a re-evaluation of the current UEA boundary.



The CDMP's 2015 UDB (Red) and 2025 UEA (Yellow) Boundary Lines

Environmental Protection Agency Smart Growth Assistance:
In 2008, the County was selected by the Environmental Protection Agency (EPA) as a recipient of the agency's smart growth implementation assistance in order to conduct a study on the UDB. Specifically, the EPA has appointed a panel of experts to conduct a policy analysis on the UDB. This panel of experts held a series of public meetings in October 2009, and a final report is expected in early 2010. A draft workshop report was released by the panel on January 8, 2010 and is currently being reviewed. The EPA technical assistance study is expected to:

- Analyze the UDB as it relates to adopted plans and policies.
- Compare the UDB to growth boundaries in other metropolitan areas and its effectiveness in contrast to other boundaries in use.
- Evaluate the effectiveness of the UDB in adequately supporting other smart growth policies already in place and, if warranted, make the appropriate criteria or policy recommendations.
- Evaluate the UDB amendment process and, if warranted, develop alternative criteria or policy recommendations.

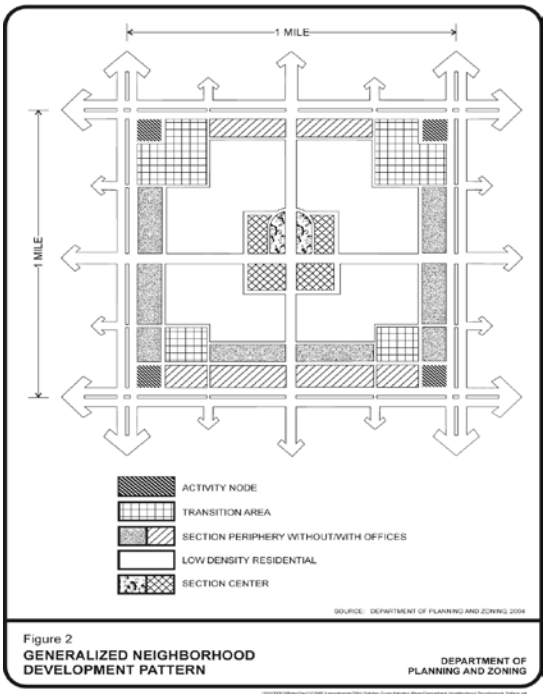
Inside the UDB

Inside the UDB, the CDMP calls for the establishment of compact and efficient urban form. As stated in the introduction, the CDMP directs urban growth in a pattern that emphasizes, among other things, concentration and intensification of development around centers of activity (urban centers) and the renewal and rehabilitation of blighted areas. In essence, the CDMP calls for an

increased reliance in infill development and redevelopment. As shown below, this re-urbanization strategy has been the main objective of County efforts, including the development of urban center zoning districts, since 1999. This experience has been challenging as the County begins to transition from a predominantly suburban form to an urban one. The experience has also evidenced need for adequate planning and prioritization of the County's infrastructure and services (from potable water and sewer to transit).

In addition, the CDMP provides guidelines to urban form. These guidelines establish a generalized pattern for location of different uses, their intensity and density, and the interconnecting network of vehicular and pedestrian movement. However, this concept as diagrammed in the CDMP remains suburban in nature, thus requiring re-evaluation in order for it to further the goals, objectives and policies of the Master Plan. The same is also required of the CDMP's definition of neighborhoods.

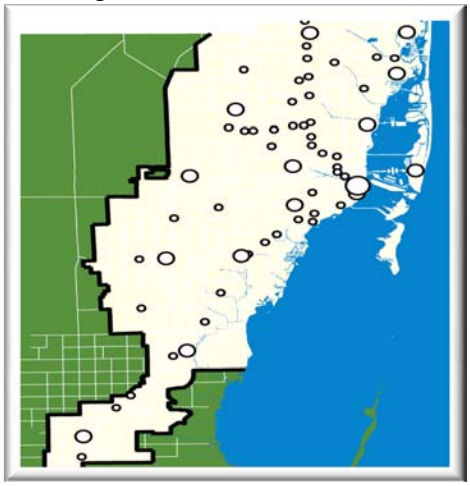
CDMP's Guidelines of Urban Form



Urban Centers and Mixed-Use Corridors:
Transit-oriented developments (TODs) incorporate sustainable principles regarding land use, housing, transportation and energy conservation. The CDMP's Urban Centers and Mixed-Use Corridors policies represent the County's approach to implement transit-oriented development. The Land Use Plan Map of the CDMP establishes a network of urban centers and mixed-use corridors aimed at guiding the County's urban growth to areas well served or planned to be served by multimodal transportation facilities. In order to implement this policy, the Department of Planning and Zoning (DPZ) conducts charrettes and prepares small area plans and implementing urban centers/urban area zoning districts. Since 1999, the Board has adopted eight ordinances establishing urban center zoning districts, including:

- The Downtown Kendall Urban Center District
- The Naranja Community Urban Center District
- The Goulds Community Urban Center District
- The Princeton Community Urban Center District
- The Perrine Community Urban Center District
- The Cutler Ridge Metropolitan Urban Center District
- Ojus Urban Area District
- Leisure City Community Urban Center District

Urban Centers utilize land more efficiently by allowing mixed uses, higher-density and more intense development around existing and future transit stations.



Except for the Leisure City area, all the areas corresponding to these urban centers have already been rezoned. In addition, DPZ is currently working on implementing zoning districts for the Model City/Brownsville and the North Central areas. Regarding mixed-use corridors, DPZ is currently working on the following:

- The Bird Road Charrette which encompasses the Bird Road corridor between the Palmetto Expressway and the Homestead Extension of the Turnpike.
- The corridors of NW 79th Street, NW 7th Avenue and NW 27th Avenue in the North Central area.
- The development of free-standing mixed-use zoning districts in the zoning code to implement the CDMP language regarding activity nodes and mixed-use corridors along the County's major roadways and their intersections.

From Planning to Implementation - Downtown Kendall Urban Center

The CDMP designates 66 urban centers (regional, metropolitan and community) in the County of which 27 are located in unincorporated Miami-Dade. The unincorporated urban centers include 23 community urban centers (CUCs) and four metropolitan urban centers (MUCs). There are four CUCs with urban center zoning districts in effect now (Perrine, Goulds, Princeton, and Naranja), one CUC is pending rezoning (Leisure City), and two MUCs in effect (Downtown Kendall and Cutler Ridge, which shares an MUC with Cutler Bay). The Ojus urban area zoning district covers the unincorporated area of the third MUC, the Aventura MUC. A total of 19 urban centers in unincorporated Miami-Dade have yet to be planned and implementing regulations proposed.

Indicators in this area could be number of urban center area plans completed and zoning districts implemented, site plans approved and building permits within the urban centers.

Urban Sprawl and Outside the UDB

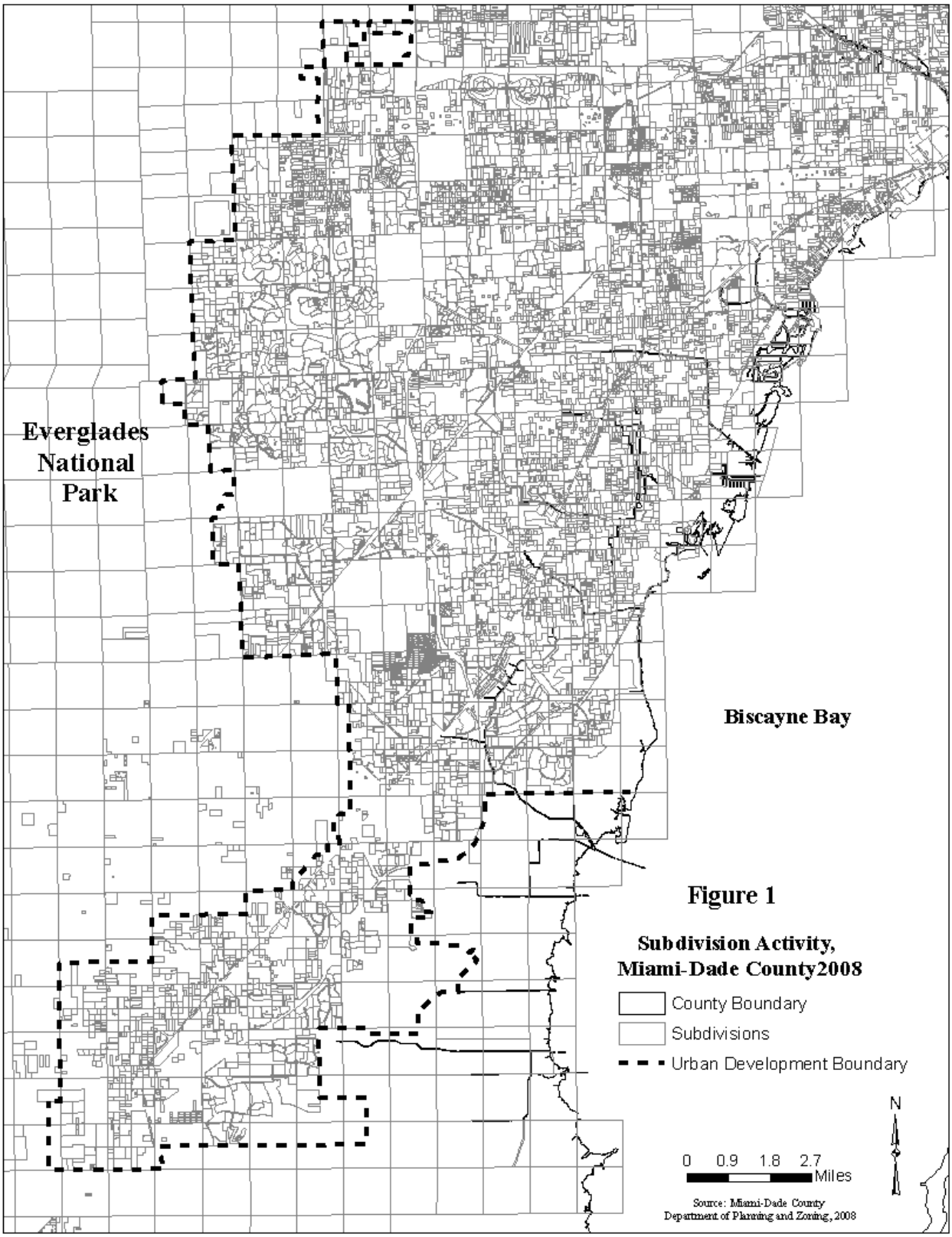
In order to determine the pattern of development countywide and measure the level of sprawl or scattered non-contiguous development, data from the County's Geographic Information System (GIS) database, which contain all subdivision boundaries countywide was retrieved and mapped. The figure below shows the pattern of growth and development countywide, indicating how the UDB has contained growth and development within the boundary line; thereby, slowing urban sprawl. Although, the population density within the UDB has increased, rural residential development is occurring outside the UDB. The latter is mostly in the form of five-acre residential lots allowed by the CDMP in the areas designated as Agricultural and Open Land in the Future Land Use Plan Map.

The proliferation of these five-acre parcels outside the UDB has been identified as an issue of major significance during the EAR process. This suburbanization of the agricultural area may affect runoff and water quality to the detriment of the County's watershed and may also threaten the viability of the agricultural economy outside the UDB.

With roughly 67,000 acres of agricultural land in active use outside the UDB, the dwindling supply of agricultural land has become an urgent issue to the County.

All of these issues also evidence the need for additional planning efforts outside the UDB.

Western Miami-Dade County – The UDB at Work


Everglades
National
Park
Biscayne Bay
Figure 1
Subdivision Activity,
Miami-Dade County2008
County Boundary
Subdivisions
Urban Development Boundary
N
0 0.9 1.8 2.7
Miles
Source: Miami-Dade County
Department of Planning and Zoning, 2008

Annexations and Incorporations

As shown in Tables 5 and 6 below, since 1993 there have been 23 annexations and eight incorporations approved.

TABLE 5 Annexations Approved Since 1993		
Municipality	**Date Adopted**	**Acres**
City of Homestead	(Adopted March 7, 1995)	Parcel No. 1 = 10.1 Parcel No. 2 = 52.6
City of Homestead	January 16, 1996	Parcel No. 3 = 1,641.4
City of Coral Gables	February 16, 1996	63.6
Florida City	May 7, 1996	Area A = 200 Area B = 280
City of Coral Gables	May 7, 1996	215.5
City of Coral Gables	June 18, 1996	347.4
City of Coral Gables	July 18, 1996	386
City of Homestead	July 24, 2001	479
City of Coral Gables	May 7, 2002	21
Town of Medley	May 21, 2002	487.5
Florida City	September 12, 2002	11.81
Coral Gables' Kings Bay	April 8, 2003	68.7
North Miami (Home Depot)	July 8, 2003	11.8
Medley	July 8, 2003	N/A
City of Hialeah	October 21, 2003	1,890.4
City of Hialeah Gardens	April 13, 2004	748.9
City of Florida City	June 7, 2005	1,727.7
City of Florida City	December 18, 2007	19.6
City of Homestead	February 19, 2008	233.6
City of North Miami	June 3, 2008	2.6
City of Florida City	October 7, 2008	34.2
Miami Shores Village	Dec 2, 2008	23.7
City of Homestead	February 17, 2009	39.8
	Total:	**8996.91 Acres**

TABLE 6 Incorporations Approved Since 1993		
unicipality	**Date Adopted**	**Acres**
Aventura	May 02, 1995	1,918.57
Pinecrest	November 21, 1995	4,816.67
Sunny Isles Beach	June 16, 1997 Election on Charter	644.33
City of Miami Lakes	Sept. 19, 2000	4,248.31
Palmetto Bay	July 9, 2002	5,471.30
Miami Gardens	May 13, 2003	12,430.64
Doral	June 24, 2003	9,805.58
Cutler Bay	November 9, 2005	6546.07
	Total:	**45,881.47 Acres**

Parks & Open Spaces

The recreation and open spaces in Miami-Dade include federal parks and preserves, state parks, water conservation areas, county parks and municipal parks. As of June 2009, there are 815 recreational facilities and open space areas in the County of which 22 are under federal and state jurisdiction, 260 are under County jurisdiction and 533 are under municipal jurisdiction.

The Miami-Dade Park and Recreation Department (MDPR) provides recreation and parkland, facilities and services to the County in two primary ways. First, the MDPR provides local recreation open space for Unincorporated Municipal Service Area (UMSA) residents. Second, the County provides countywide recreation open space for both UMSA residents and residents of the 35 municipal areas.

As shown in Table 7, MDPR operates and maintains a system of 12,669 acres of parkland (countywide and local parks), as well as County-owned Environmentally Endangered Lands (EEL) that are adjacent or contiguous to MDPR properties and managed as County parks. Of the 12,669 acres, 2,800 acres are part of the EEL program.

TABLE 7
Countywide Recreation & Open Space Areas

	Miami-Dade County		Municipal		State/ Federal		Total	
	Sites	Acres	Sites	Acres	Sites	Acres	Sites	Acres
TOTAL	260	12,669	533	4,045	22	1,017,828	815	1,034,542

(Source: MDPR Parks Property Management Information System, June 2009)

MDPR countywide parks are large and diverse and include such areas as beaches, natural area preserves, historic sites, and unique places such as Miami Metrozoo. Local parks are commonly smaller and in the form of neighborhood, community and district properties. At present, MDPR offers 87 countywide parks and 173 local parks. Within these two general categories, County parks are further classified based on their primary function, size, and degree of facility/program development. The characteristics of the various classes of parks are summarized in Table 8.

Table 8
Recreation Open Space Classifications
Type of Recreation Open Space

Criteria	Countywide					Local			
	Metropolitan	Natural Area Preserves	Greenways	Special Activity	District	Single-Purpose	Community	Neighbor-hood	Mini Park
Primary Orientation	Resource	Resource	Resource	Resource	User	User	User	User	User
Staff Available	Yes	Varies	No	Yes	Yes	Yes	Yes	No	No
Programs Available	Varies	Varies	No	Yes	Yes	Yes	Yes	No	No
Acres	Varies	Varies	Varies	Varies	200+	Varies	20-100	1-10	1/2
Service Area	Countywide	County-wide	County-wide	County-wide	5 Miles	3 Miles	3.5 Miles	1 Mile	.5 Mile

Source: (1) Miami-Dade Park and Recreation Department 2009
(2) Miami-Dade Park and Recreation Areas – Summary of Park Classifications, July 2006

Countywide Parks
Countywide parks support the recreational needs of incorporated and unincorporated area residents and tourists that can only be accommodated within larger, resource-based parks. They serve large populations and draw users from great distances. Countywide parks provided by the County include Metropolitan Parks, Natural Area Preserves, Special Activity Areas, District and/or Greenways.

Local Parks
Local parks are the County's functional equivalent of municipal parks and are designed to fulfill the specific recreational needs of unincorporated area residents. There are 173 local County parks totaling 1,467 acres that include Community, Single Purpose, Neighborhood, and Mini-Parks. There are an additional 444 local parks totaling 2,362 acres of parkland in municipalities. Local parks have smaller service populations than countywide parks, drawing users principally from surrounding residential neighborhoods and communities.

Table 9 below summarizes local parkland by park class, and differentiates between the total number of County-owned park acres and acres for other government agencies.

Table 9
Local Park Land Inventory Summary

Park Class	Miami-Dade Sites	Miami-Dade Acres	Other Govt. Sites	Other Govt. Acres	Total Sites	Total Acres
Single Purpose	11	113	31	280	42	393
Community	50	883	141	1,624	191	2,507
Neighborhood	78	444	91	372	169	816
Mini-Parks	34	27	181	86	215	113
TOTAL	173	1,467	444	2,362	617	3,829

Source: Inventory of Local Recreation Open Spaces, MDPR, 2009 Parks Property Management Information System Database

Level of Service Standards
The County has adopted a Level of Service Standards (LOS) standard of 2.75 acres of local recreation open space per 1,000 unincorporated area residents. Local recreation open spaces include:

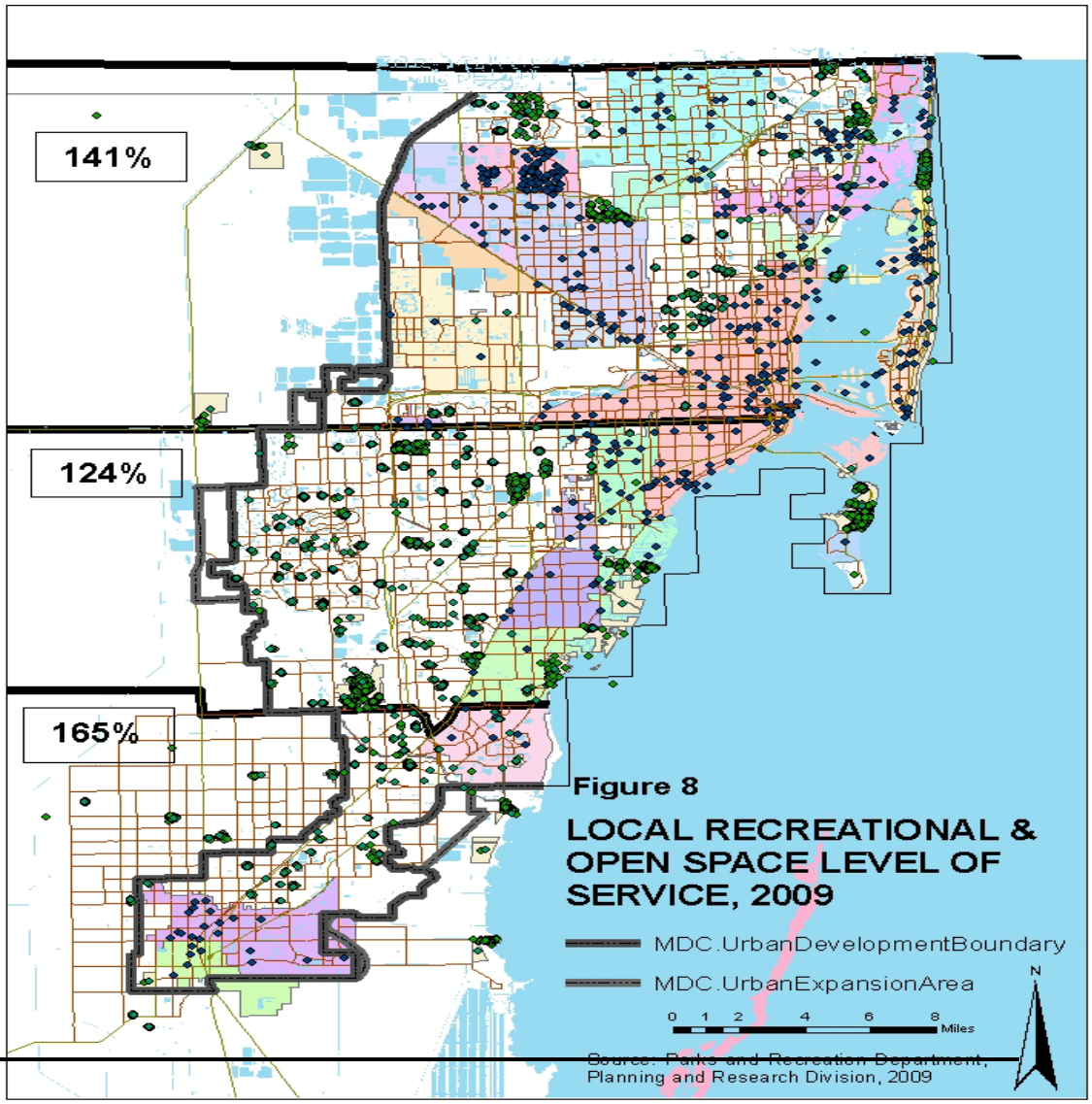
- County provided mini, neighborhood, community, and single-purpose parks
- Portions of County-provided countywide parks that function and are designated as local parks in the implementation of the Miami-Dade Service Concurrency Management Program
- Portions of public school and public college playfields
- 50 percent of the recreation open space provided at private developments in the unincorporated area

As of June 2009, there were 4,169 acres of local recreation open space, including 3,152 acres of local and designated portions of countywide parks, 753 acres of public school and public college playfields, and 264 acres of privately provided open space (See Table 4 below).

As required by Chapter 163, Florida Statutes, and the Miami-Dade Service Concurrency Management Program, MDPR calculates the LOS provided in each of the County's three Park Benefit Districts (PBDs) shown in Figure 8. Table 10 below also summarizes the LOS conditions by PBDs as of June 2009.

Table 10 Local Recreation Open Space Level of Service, 2009								
Park Benefit District	Unincorporated Population (1) Plus Permitted Development	Standard @2.75 Acres Per 1000 Residents	Public Park Acres (2)	School Acres (3)	Private Open Space Acres (4)	Total Recreation Open Space Acreage	Surplus (Deficit) Acres	Percent of Standard (%)
1	363,905	1000.74	1005.65	299.82	110	1,415.47	414.96	141.44
2	619,408	1,703.37	1,619.43	356.3	137	2,112.73	409.36	124.03
3	141,256	388.45	526.78	96.62	17	640.4	251.95	164.86
TOTAL	1,124,569	3,092.56	3,151.86	752.74	264	4,168.60	1,076.04	134.79

Sources: Department of Planning and Zoning, June 2009
MDPR, Planning and Research Division, June 2009
Miami-Dade County School Board, Site Planning Department 11/28/08
Private Open Space is one-half of total private acres. Derived from LUMA code 517 1/9/07



Through the ongoing CDMP's Evaluation and Appraisal Report process, MDPR proposes to revise the level of service criteria in order to reflect the Park and Open Space System Master Plan (See "*Existing Efforts*"). The amendment proposed as a new policy to the Recreation and Open Space Element, requires that the County develop Level of Service (LOS) standards for parks and recreational open spaces that are that are intended to encourage equitable access to local (neighborhood) parks and open space as well as area-wide recreational activities for all County residents.

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Comprehensive Development Master Plan

The Comprehensive Development Master Plan (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. As such, it is a framework for use by other programs to be developed to support its long-range planning goals. For each of the master plan elements, there are goals, objectives and policies, measures to be monitored and maps of planned future facilities.

The CDMP establishes a growth policy that encourages development:

- At a rate commensurate with projected population and economic growth.
- In a contiguous pattern centered around a network of high-intensity urban centers well-connected by multi-modal intra-urban transportation facilities.
- In locations which optimize efficiency in public service delivery and conservation of valuable natural resources.

CDMP Goals, Objectives & Policies Supporting Urban Centers & Mixed-Use Strategy

Provide the best possible distribution of land use and services to meet the physical, social, cultural and economic needs of the present and future populations in a timely and efficient manner that will maintain or improve the quality of the natural and man-made environment and amenities and preserve the County's agricultural lands. The objectives include:

- *Objective LU-1:* 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. Policies: LU-1A.
- *Objective LU-7:* Miami-Dade County shall require all new development and redevelopment in existing and planned transit corridors and urban centers to be planned and designed to promote transit-oriented development (TOD), and transit use, which mixes residential, retail, office, open space and public uses in a pedestrian-friendly environment that promotes the use of rapid transit services. Policies: LU-7A, LU-7B, LU-7C, LU-7D, LU-7E, LU-7F, LU-7G, and LU-7I.
- *Objective LU-9:* Miami-Dade County shall continue to maintain, update and enhance the Code of Miami-Dade County, administrative regulations and procedures, and special area planning program to ensure that future land use and development in Miami-Dade County is consistent with the CDMP, and to promote better planned neighborhoods and

communities and well designed buildings. Policies: LU-9D, LU-9F, LU-9G, LU-9I, LU-9R, and LU-9U.

- *Objective LU-10:* Energy efficient development shall be accomplished through metropolitan land use patterns, site planning, landscaping, building design, and development of multimodal transportation systems. Policies: LU-10A.

In addition to the objectives and policies in the Land Use Element, the following policies in the Transportation and Housing Elements apply, TE-1F, TE-2C, TE-2G, TE-3B, MT-2A, MT-2B, MT-4A, HO-4B, HO-6A, HO-6C, HO-7A.

Miami-Dade County Park and Open Space System Master Plan

Approved by the Board 2008, the Park and Open Space System Master Plan (OSMP) established a vision for a seamless, sustainable parks and open space system to create a new, interconnected framework for growth; one that results in a more livable, sustainable community.

Consisting of existing and proposed parks, public spaces, natural and cultural places, greenways, trails and streets, the interconnected framework will form the foundation or "The String of Pearls" of the County to accommodate growth while also improving the quality of life for residents. The new framework 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, providing equitable access to parks and open spaces, and providing more opportunities for residents to meet, socialize and connect with one another.

The OSMP's guiding principles (listed below) create an interconnected parks and open space system that is vital to the ecological, social and economic functions of Miami-Dade County.

- *Equity* – Every resident should be able to enjoy the same quality of public facilities and services regardless of income, age, race, ability or geographic location.
- *Access* – Every resident should be able to safely and comfortably walk, bicycle, drive and/or ride transit from their home to work, school, parks, shopping, and community facilities.
- *Beauty* – Every public space, including streets, parks, plaza, and civic buildings, should be designed to be as aesthetically pleasing as possible, and to compliment the natural and cultural landscape.
- *Multiple Benefits* – Every single public action should generate multiple public benefits to maximize taxpayer dollars.
- *Seamlessness* – Every element of the County, including neighborhoods, parks, natural areas, streets, civic centers and commercial areas, should be connected without regard to jurisdiction.
- *Sustainability* – Every action and improvement of the Parks and Open Space System, including facilities, programs, operations and management, should contribute to the economic, social, and environmental prosperity of the County.

The OSMP's guiding principles, as well as the vision for a seamless, sustainable parks and open space system, are proposed for incorporation as a new objective and related policies of the Recreation and Open Space Element as part of the April 2009 Cycle of Amendments to the CDMP. Implementation of the OSMP through the policies of the Recreation and Open Space Element, the CDMP, and the County's Sustainability Plan is necessary to meet the present and future recreational needs for all residents and visitors.

As the OSMP is implemented, it is important to provide an accounting of baseline conditions. As identified through the proposed amendments to the CDMP, the classification system of parks will need to be updated with the emphasis on equitable access criteria. The overall typologies in the OSMP are Neighborhood (At-Will Activities) (Programmed Activities) and Regional (At-

Will Activities) (Programmed Activities) and consideration should be given to including greenways and heritage parks. The current provision of parks and open space is based on a sub-urban development context primarily automobile dependent and assumes the availability of large tracts of land for parks development. This model will not work in a County that is experiencing much of its growth through redevelopment and increased density. The new model for parks acknowledges that the need for parks varies widely across the County depending on the development context and the demographics and lifestyles of a particular area. With understanding the following existing conditions is provided as our baseline condition assessment.

OSMP goals include**:**

- Every resident in the County can walk (within five minutes) to a central neighborhood park or civic space for picnics, special events, informal play and socialization.
- Every resident can safely and comfortably walk, bicycle, or take transit to community parks, recreation centers and special use/sports facilities.
- A balance of active and passive recreation opportunities are available to all residents.
- The County Parks Department works with State and Federal Agencies, every municipality and the School District to provide public access to schools, parks, and recreation areas.
- Public access is provided to lakes, beaches, forests and other major natural areas. The County's significant cultural and historical sites are protected, maintained, and promoted.
- Conservation areas and critical habitats are protected from over-use and negative impacts.
- 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 are transformed into tree-lined boulevards and parkways that define the County's urban form.
- Transit is provided to parks and civic sites.
- Public art, signage and cultural/historical exhibits are integrated into park and public realm infrastructure projects to "tell the County's story" and to create a sense of pride and place.
- Park improvements are used to create a sense of place for neighborhood stabilization and/or redevelopment.
- Parks are designed to reduce energy and water consumption, and to serve as models for sustainable development County-wide.
- Parks are designed to be flexible in order to accommodate ever-changing recreation trends and demographics.
- Residents of surrounding neighborhoods are engaged in the planning, design and stewardship of each park.

Miami-Dade County Aesthetics Master Plan (AMP)

Community aesthetics is a critical component of a vibrant, economically viable and sustainable metropolitan area. In Miami-Dade, we rely heavily on tourism as a primary economic engine. Furthermore, residents gauge their quality of life in the County with indicators that correspond to the aesthetic value of their neighborhoods and commercial areas they frequent. For this reason, community design of high aesthetic quality is directly tied to a community's socio-economic health.

To address the community aesthetics, in 2006 the Board directed the County Manager under the authority of Resolution No. R-108-06 to "develop a County Aesthetics Master Plan that addresses landscaping and landscape maintenance of all public roadways and County facilities..." The Community Image Advisory Board (CIAB) commissioned the development of the AMP that would provide design recommendations, guidelines, and standards for County Corridors, Gateways and Facilities. The CIAB reviewed other recent countywide community

planning documents such as the Open Space Plan, the Street Tree Master Plan, the Urban Design Manual, the Landscaping Manual, and the Typical Roadway Section & Zoned ROW Update Study in order to develop the overall goals and objectives for including community design with current planning efforts.

The AMP provides guidelines for the design and appearance of the County transportation corridors, gateways, and key public facilities by providing examples of specific architectural, hardscape and landscape elements. The plan establishes clear objectives and standards for improving the appearance of the County's entrance gateways, the corridors which channel vehicular, pedestrian and marine traffic, and public facilities including public transportation centers, buildings, and parks.

Implementation of the AMP will include the development of a Community Design Element currently being drafted, that would be presented as an amendment to the CDMP. Also, a web-based portal would be created to serve as a clearing house for design standards, specifications, and municipal codes that restrict design. This portal would be promoted and accessible to the Architecture and Engineering industry as well as the general public.

- **Goal**: To articulate the principles and standards for establishing a practical, sustainable beautification and greening process for County Corridors, Gateways and Facilities.
- **Vision:** 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.

COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

The following major issues were identified during public workshops held in August 2009 for the 2010 Evaluation and Appraisal Report of the CDMP:

Growth Management

- Evaluate if sufficient capacity is contained within the UDB to accommodate future land use needs
- Establish new planning horizon timeframes
- Evaluate the current delineation of the Urban Expansion Areas (UEA)
- Discuss related topics such as the retention of agricultural land
- Protection of natural resources
- Address redevelopment and infill potential
- Address Comprehensive Everglades Restoration Plan impacts
- Address annexation/incorporation trends
- Perform the EAR required Community-wide Assessment (population growth, land supply and demand, etc.)

Transportation/Mobility

- Address the transportation component of HB 697 (Energy)
- Discuss how the County can more effectively achieve pedestrian friendly and walkable communities
- Promote park connectivity on a countywide basis
- Explore concepts such as mobility fee zones to help supplement existing transportation facilities and services
- Evaluate potential incentives for transit oriented development

Local Business & Industry

Local businesses and industries that drive Miami-Dade's economy have the ability to contribute to a more sustainable community through the choices they make in the procurement of raw materials and supplies, in how they operate their businesses, and/or in the goods and services they produce.

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.

This emerging trend 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.

Local Business & Industry

Assessment Area

The local businesses and industries that drive Miami-Dade's economy have the ability to contribute to a more sustainable community through the choices they make in the procurement of raw materials and supplies, in how they operate their businesses, and/or in the goods and services they produce. 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. This emerging trend 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 and has become increasingly mainstream over time, with companies around the world implementing "green practices," corporate social responsibility programs and sustainability initiatives. To understand the current and potential role of Miami-Dade's local businesses and industries in the emerging "green" economy, it is important to look at the business community's current practices, products, and services they provide, how we currently steer and direct economic development activity, and what new opportunities the marketplace exist for improving the sustainability of commerce.

An efficient model to consider as we evaluate the role of Miami-Dade's economy is nature and its complex ecosystems. In ecosystems, nothing is wasted; matter is recycled over and over and productivity is consistent over time, notwithstanding any major external perturbations. More and more, waste recovery and the waste=food philosophy is becoming part of the industrial and manufacturing culture. How can we facilitate this in our local economy; integrating "zero-waste" principles to the benefit of our community as well?

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Taking advantage of the "green" movement by improving our capacity for innovation and competitiveness in today's market.
- Lessening the shock of future economic downturns and recessions.
- Transforming existing industries to be "greener" while contributing to a more sustainable economy.
- Growing, attracting and/or retaining emerging "green" or sustainable industries
  - Evaluating the green industrial and business growth opportunities as part of our economic development investment decision-making.
  - Integrating a sustainable industry focus into the array of economic development incentive programs currently available.
  - Raising awareness and participation in the County's *Targeted Jobs Incentive Fund (TJIF)* which provides financial incentives for select industries, including Solar Thermal and Photovoltaic Manufacturing, Installation and Repair Companies, wishing to relocate or expand within the County.
    Raising awareness and participation in the County's Expedited Review and Approval of Permits for "Green" Buildings program.
  - Increasing the market penetration of the energy-efficiency and renewable energy industries and having a properly trained construction contractor workforce for energy-efficiency retrofitting of existing buildings.

- Improving access to and availability of training opportunities for jobs in the green economy
- Promoting local business and industry

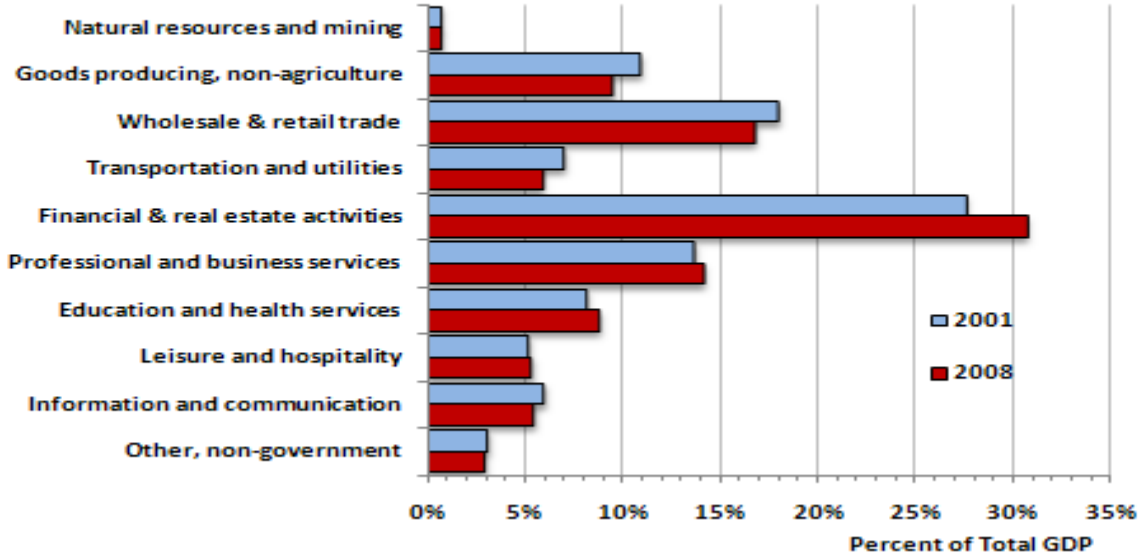
ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

Local Business & Industry Representation in the Economy

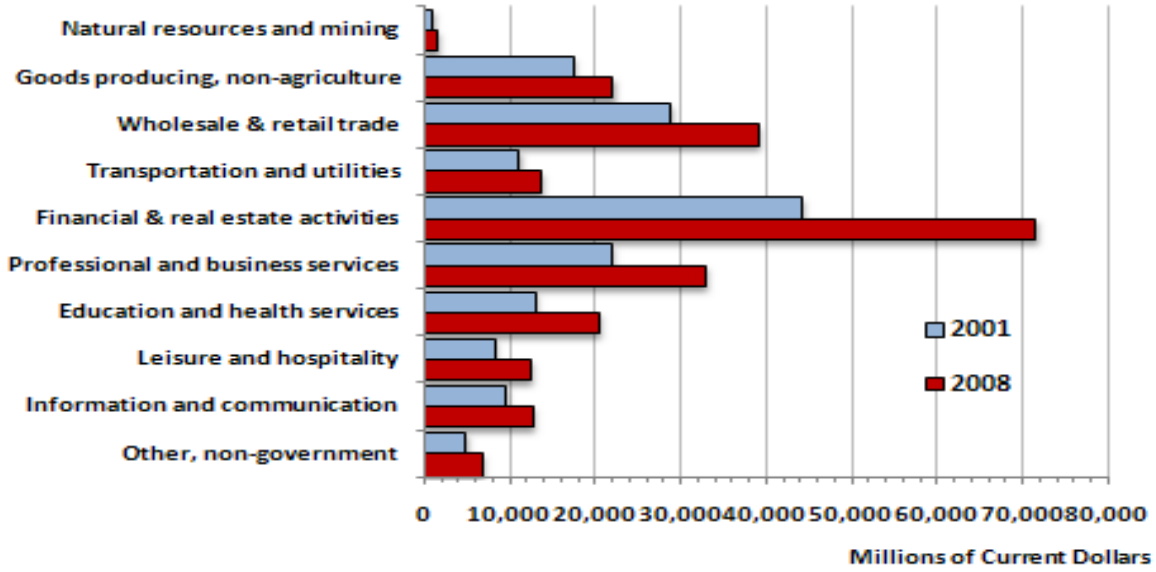
The Miami-Ft. Lauderdale-Pompano Metropolitan Statistical Area (Miami MSA) is comprised of the Miami-Dade, Broward and Palm Beach counties. The total Gross Domestic Product (GDP) of the Miami MSA reached $261.3 billion in 2008, rising by 22.5 percent between 2001 and 2008 after adjusting for price inflation. GDP on a per capita basis grew at an inflation-adjusted annual rate of 2.1 percent between 2001 and 2008.

Figure 1 Miami-Fort Lauderdale-Pompano Private Sector GDP as a Percent of the Total, by Industry Sector: 2001 & 2008



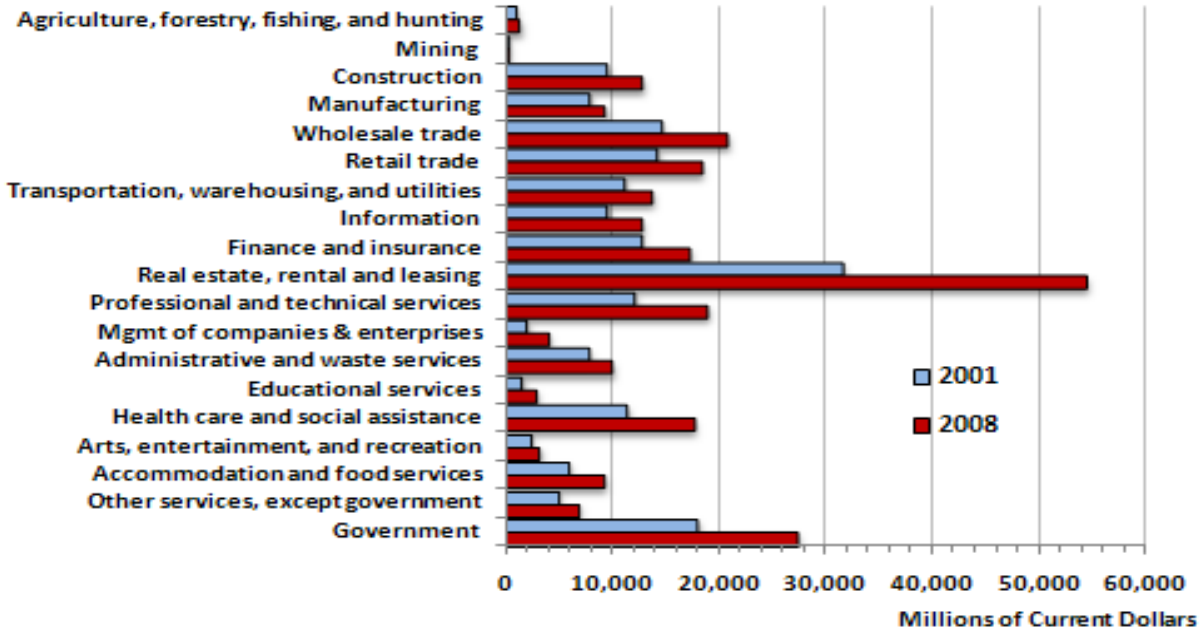
Private sector industries generate 90 percent of the GDP in the Miami MSA, and accounted for 95 percent of the economic growth experienced from 2001 to 2008. The Miami MSA is a mature economy and economic output is heavily oriented towards the private sector provision of services, with 80 percent of GDP in 2008 originating in private sector establishments. Nine percent of GDP originates in private sector goods producing industries (construction 5 percent, manufacturing 3.5 percent, and agriculture 0.5 percent), while the remaining balance originated in government services (See Figures 1 and 2). The distribution of GDP between private services, private goods production and government services is not expected to change significantly over the next decade.

Figure 2 Miami-Fort Lauderdale-Pompano Private Sector GDP by Industry Sector: 2001 & 2008



At a greater level of disaggregation, the private sectors accounting for the largest shares of GDP include: real estate, rental and leasing (20.8 percent); wholesale trade (8 percent); professional and technical services (7.8 percent); retail trade (7 percent); and healthcare and social assistance (6.7 percent). (See Figure 3)

Figure 3 Miami-Fort Lauderdale-Pompano GDP by Industry: 2001 & 2008



Local Economic Hubs

Efficient and safe movement of goods benefits business and the general public. Miami-Dade has three large commercial hubs for transportation of goods or passengers, Miami International Airport (MIA), the Port of Miami (POM), and the Miami River Port. Because MIA and POM are both managed by Miami-Dade County, more detailed descriptions of their services and operations are provided in the Government Operations area of this assessment. The Miami River is the fifth largest port in the State of Florida, providing shipping links to the shallow draft ports of the Caribbean and, Central and South America. The Miami River's navigation and commercial shipping directly handle millions of tons of cargo each year and thousands of direct and indirect jobs. Foreign trade exports account for over 75 percent of the total commerce, according to a 2007 economic analysis conducted by Florida Atlantic University. Miami River cargo transshipment is estimated at $4 billion per year. At the same time that the Port of the Miami River it is a vital part of the economy, it has many sustainability-related challenges such as dredging and water quality issues that impact marine resources. Because the Miami-River is a working river, there are also risks of industrial contamination, as demonstrated by the fact that two of its tributaries, Wagner Creek and the Seybold Canal, were deemed the most polluted bodies of water in Florida.

(Sources: http://www.miamirivercommission.org/PDF/EconomicAnalysisoftheMiami%20River42808.pdf) & Miami River Commission Annual Report 2008.)

Green Industries & Jobs

To understand the extent of economic activity that Miami-Dade businesses and industries are contributing to sustainability, first we have to agree on how to measure what makes up a sustainable economy. One place to start is with the federal government's emphasis on "green" jobs and utilizing their evolving measurement standards to assess our current and potential sustainable economic activity.

The US Bureau of Labor Statistics (BLS) recently embarked on an effort to "produce objective and reliable information on the number of green jobs, how that number changes over time, and the characteristics of these jobs and the workers in them." The intent is to assist "policymakers and the public to better understand green jobs and make informed decisions." To achieve this, BLS has begun the process of:

1. Defining those economic activities related to renewable energy, energy efficiency, and protecting the environment,
2. Identifying green job categories as jobs involved in the production of green products and services, jobs involved in "greening" of production processes and jobs in the supply chain to production of green products and services, and
3. Establishing a protocol for measuring green jobs and the change in number over time according to a survey of establishments of industries in the North American Industrial Classification System Codes (NAICS codes) that have green products or services.

For Miami-Dade this translates into the identification of "green" industries in our County and the total number of companies within these which provides the upper bound for the extent that these industry groups as whole could embrace sustainability. Table 1 provides a summary of these industries.

Table 1: 4 Digit NAICS "Green" Private Sector Establishments and Employment – MDC

Private Sector Industries that Most Likely Contain Establishments and Employment that are "Green" - Miami-Dade

NAICS	Industry Title	Number of Establishments	Avg Monthly Employment	Total Quarterly Wages	Avg Weekly Wage
1111	Oilseed and grain farming (1)	4	NA	NA	NA
2211	Power generation and supply (2)	35	NA	NA	NA
2361	Residential building construction	1,309	4,885	$65,567,566	$1,032
2362	Nonresidential building construction	360	3,989	$64,635,690	$1,247
2381	Building foundation and exterior contractors	793	4,776	$37,640,562	$606
2382	Building equipment contractors	1,496	12,064	$125,131,279	$798
2383	Building finishing contractors	1,254	3,873	$30,974,026	$615
3241	Petroleum and coal products manufacturing (3)	9	1,039	$11,740,617	$869
3251	Basic chemical manufacturing (4)	7	171	$2,603,197	$1,169
3351	Electric lighting equipment manufacturing	18	568	$3,993,225	$541
3359	Other electrical equipment and component mfg. (5)	21	NA	NA	NA
3363	Motor vehicle parts manufacturing	23	575	$7,815,767	$1,045
5413	Architectural and engineering services	1,206	9,281	$133,974,582	$1,110
5414	Specialized design services	758	1,787	$18,923,094	$814
5417	Scientific research and development services	123	808	$13,322,791	$1,268
5622	Waste treatment and disposal (6)	6	378	$5,425,603	$1,105
5629	Remediation and other waste services	44	394	$3,324,414	$649
		7,466	44,588	$525,072,413	$757

Total Private Sector - All Industries:	84,398	$8,675,550,743
% of the Total Establishments that are in "Green Industries":	**8.8%**	**6.1%**

Data Source: BLS Quarterly Census of Employment and Wages (QCEW), 1st Quarter 2009
Industries identified based on work from City of Los Angeles, Michigan and Washington State.

Notes: (1) May include grains and other products for use in bio-fuels., (2) May include solar tidal, wind and other., (3) Petroleum products for use in producing blended bio-fuels., (4) Production of Bio-diesel., (5) Production of Fuel Cells and batteries., (6) Waste to energy conversion.

Agriculture

The Miami-Dade agricultural industry has an estimated economic impact of $2.7 billion according to the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS), based on 2007 United States Department of Agriculture (USDA) data indicating direct sales value of $661 million. Approximately 90-95 percent of all agricultural products grown within the county are exported to other parts of the state, nation, and internationally, depending on season, commodity, etc. As the second largest agriculture producing county by value, the local industry far surpasses the ability of the local marketing of any commodity currently grown. While acreage has been reduced by conversion to other uses, the industry continues to produce high value products. As a major port of entry for international agricultural products, 44 percent of all fresh produce enters the Port of Miami and/or Miami International Airport (MIA), according to the USDA.

The above assessment of the current local industry does not take into account potential bio-fuel crops opportunities in the short term, or second or third generation technologies that may make bio-fuel production from non-food crops, or off-season value added cropping.

In combination with climate change, land conservation issues, the community's increasing interest in introducing small scale agriculture into the urbanized parts of the County and bio-energy potential, the sustainability of agriculture from an economic, environmental, and social perspective would seem a natural meeting point for the long-term goals of reducing greenhouse gases (GHG), maintaining aquifer recharge and open spaces and improving the resiliency of our

local/regional economy. Of all Miami-Dade industries, agriculture represents an industry that is most directly dependent on the natural world for its productivity and thus represents a significant opportunity to mimic natural processes in an "agro-ecosystem."

The recent emergence of viable urban composting programs in a select few municipalities across the nation is one example of a move towards improving the sustainability of agriculture at the local level and integrating a *waste=food* sustainable business/industry principle that mimics the natural world. An important next step is to understand Miami-Dade's current agricultural system, not just in terms of economic value as currently measured, but also its environmental footprint, and impacts on quality of life and local economic development. There currently exists a data gap of indicators that will help illustrate the broader impact and opportunity around agriculture and sustainable communities. Feedback in this area is welcomed.

Tourism/Hospitality & Related Industries

Tourism and hospitality, both highly visible industries in Miami-Dade and the region, are characterized by the temporary lodging provided to visitors, and the recreational and other activities or infrastructure that these visitors are attracted to. Through the State of Florida's Green Lodging Certification Program, as well as the Governor's requirement that all state employees have to stay in certified Green Lodges while traveling within the state, there has been an increase in the number of hotels seeking and achieving Green Lodge certification. As of December 2009, there are 40 hotels in Miami-Dade designated as "Green Lodges".[1]

Separate from this effort, large global/national hotel chains have implemented their own green lodging practices as part of their corporate social responsibility/sustainability programs. This initial uptake in the implementation of green operational practices within this industry can have long-term impacts on how services are delivered, from the food served and recreational activities offered to visitors, and complementary industries.

Two complementary industries that have also exhibited significant growth over the past 20 years are the eco-tourism and agri-toursm industries. These industries promote the visitation of and recreational opportunities associated with natural ecosystems and agro-ecosystems in their pristine or relatively pristine state thereby increasing the economic value of these land uses/ natural systems relative to competing medium to high-economic value land uses. National, state and local governments and private organizations, including land trusts and conservancies and specialized conservation efforts like botanical gardens, play a significant role in maintaining the significant and vital natural ecosystems or natural areas that make up our County and region and attract tourists to our region. Through potential linkages between the growing sustainability movement with the lodging industries and existing eco- and agri-tourism opportunities, the participation in ecotourism activities and the market demand for such activities could increase. We have identified as a data gap the history of visitation (both from out of the region and within) to key recognizable natural or other destinations: National, state and local parks (County ecotourism programs), Botanical Gardens, etc. Potential future indicators could go beyond just visitation numbers to include the number and dollar value of eco-tours associated with hotels and resorts.

[1] Source: http://www.dep.state.fl.us/greenlodging/lodges.htm

Building Design, Construction and Real Estate

There has been a growth and expansion in green building design and construction as a result of the nationwide grassroots green building movement and use of green building rating systems (U.S. Green Building Council - Leadership in Energy and Environmental Design, Green Globes, Florida Green Building Coalition rating systems, etc.). The following data gaps have been identified: (1) the current capacity of the workforce in this sector and (2) what resources, programs and initiatives are needed to improve the ability of our workforce including planners, real estate brokers and professionals, architects, engineers, construction trades and building and facility managers to be able to plan, design, construct and operate and continuously improve the buildings and infrastructure that make up the built environment. Potential future indicators include:

- Number and type of green building permits filed with building departments across Miami-Dade County and municipalities
- Percentage of companies within each of these built environment industries that have worked on certified green building (or other equivalent) projects
- Projects and types and number of training opportunities available across these range of built environment industries

The indicators listed above are not all inclusive and do not paint the entire picture of how this industry is a component of a sustainable community. Feedback in this area is welcomed as data gaps exist.

Energy Services

The nationwide interest in energy independence, decreased reliance on fossil fuels that contribute to climate change and the federal and state government's funding of programs that encourage energy efficiency and use of renewable energy are driving the growth of energy auditing, management and retrofit industries in the electricity arena and biofuel harvesting and processing and refining in the fuels arena.

- *Energy Services Companies (ESCO)*
  The County and other municipalities across the state currently take advantage of an established State of Florida Energy Performance Contract. With performance contracting, vendors assigned work guarantee that the equipment procured and installed will achieve the promised energy savings. Thus, each project assigned to an Energy Services Company (ESCO) in the pool is backed by a guarantee from that ESCO that project savings will be sufficient to cover the customer's debt service or lease payments. Should projected savings (in energy and maintenance expense) fall short of the amount needed to cover the debt, the ESCO pays the difference (*See Government Operations, Electricity Section for more information on this program.)*

The ESCO program works well and could be further utilized in government, but we must get the industry to enable the same type of retrofit capabilities in other sectors including the residential, small and large commercial building sectors. For example, the payback periods for retrofit initiatives often are not comfortable for private sector building owners who may only be holding onto a property for a number of years.

In the residential and small commercial sector, there are a variety of innovative programs emerging across the nation at the municipal level to enable the financing of energy efficiency and renewable energy retrofits for these sectors. This type of innovation is critical for the growth in energy service companies and small businesses as well as local green jobs.

- *Weatherization Programs*
  The Community Action Agency (CAA) provides home weatherization assistance, through a partnership with the U.S. Department of Energy and the Florida Department of Community Affairs. This program is a multi-faceted program with enormous benefits by helping low-income families conserve energy and save money. It creates and supports many "green" collar jobs that are vital to the economy and future. Furthermore, it serves as a critical element of the "green jobs" initiative. CAA's goal is to mandate that weatherization contractors (vendors) make every effort to employ no less than 50 percent of their weatherization crew from local community base organizations such as the South Florida Workforce Agency. Projections reflect an increase in staff from nine to 27 which reflects an estimated 300 percent increase from FY 08-09 staff levels.

- *Alternative Energy Manufacturers*
  From a production and manufacturing perspective there has been increasing marketplace interest across the region from renewable energy systems manufacturers and biofuel harvesting, collection and production industries. We have identified as a data gap an inventory of both the attempts and success of these industries to start-up operations in the County and the larger region and their share of the regional economic output. Potential future indicators for the energy service industries and marketplace include:
  - Tracking of investments in energy efficiency: federal tax deductions for energy star/efficient appliances
  - Number of permits filed for energy service industries based on available North American Industry Classification System codes (NAICS)
  - Number of retail/service firms that provide energy services based on available NAICS codes
  - Types and number of training opportunities available within the spectrum of alternative energy and energy-efficiency service industries

These indicators are not all inclusive and do not paint the entire picture of how this industry is a component of a sustainable community. We welcome feedback in this area as we realize that there are data gaps.

Recycling

While recycling is a popular, recognized, and growing green practice, the industries that collect, process and create new raw materials or products from materials that otherwise would be treated as waste at the end of their life-cycles are less understood. Both the increasing demand for recycling and recycled products, the increasing popularity of the "cradle-to-cradle" industrial design philosophy, and the concept of "zero waste" are impetus and resources to examine and grow processing and recycled product industries.[2] Potential future indicators for this industry include:

- List of existing recycling firms and complementary industries (e.g. processers, haulers)
- Number and type of permits for industrial recycling operations filed
- Volume of materials collected for recycling (tons or other quantity measures)

[2] William McDonough and Michael Braungart describe the "Cradle-to-Cradle" industrial design philosophy in their 2002 "Cradle-to-Cradle" publication.

These indicators are not all inclusive and do not paint the entire picture of how this industry is a component of a sustainable community. We welcome feedback in this area as we realize that there are data gaps. *(See the Solid Waste & Recycling Area of this report for information on recycling rates and the Climate Change Area of this report for information on the significant reduction in greenhouse gas emissions achieved through recycling.)*

Other Relevant Industries
A data gap of has been identified for information related to other potential industries we want to describe and analyze through the sustainability lens in this assessment area. What other economic sectors should be described and analyzed through the sustainability lens?

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Existing Legislation - Local

- *Ordinance 05-91: MDC Targeted Jobs Incentive Fund*
  In the interest of promoting a healthy economy, stimulating economic development and eliminating distressed economic conditions, the County adopted an ordinance that provided the following incentives based on the number of new jobs created and the amount of countywide ad valorem property taxes, excluding debt service, and countywide portion of sales taxes paid per annual amounts addressed in the approved application/agreement:
  - Up to $1,500 bonus for companies that operate their businesses out of buildings or facilities that qualify as "green construction" and/or that incorporates alternative energy systems. Specially, a company can receive a bonus of up to $1,000 if the Company operates its business out of a building or facility which qualifies as "green construction" and is certified through the Leadership in Energy and Environmental Design (LEED) Green Building Rating System by the Florida Green Building Council or by the U.S. Green Building Council; and an additional bonus of up to $500 if the Company operates its business in a building or facility which incorporates solar, thermal, photovoltaic, fuel cell, and/or co-generating energy generation. The alternative energy systems, with the exception of solar thermal, must be grid interconnected to the local utility to qualify.
  - Up to $1,500 bonus, if the company is in the business of Solar Thermal and Photovoltaic (PV) Manufacturing, Installation and Repair.

- *R-05-0971: Expedited Review and Approval of Building Permit Applications for Green Buildings*

- *R-747-09: Sign Local Government Green Jobs Pledge*
  In order to provide new opportunities to employ residents in growing industries that reduce our dependence on fossil fuels, cut greenhouse gases, eliminate toxins and protect our natural environment, the County adopted a Resolution directing the signing of a Local Government Green Jobs Pledge.

Sustainable Buildings Ordinance & the Built Environment Industry
Miami-Dade County's requirement for its owned, operated and financed building projects to meet specific green building certification levels is driving local architects, engineers, construction professionals and green product suppliers to provide the necessary resources for the successful design, construction and operation of buildings that exhibit enhanced site/land

development management, energy, water efficiency, indoor air quality and materials and resource management performance.

Some Miami-Dade municipalities have introduced green building ordinances for their own capital improvement processes and/or the larger community that are mirroring the impact on industry that the County has experienced with its own ordinance. We have identified as a data gap an inventory of municipal green building resolutions and ordinances.

Miami-Dade County Water Efficiency Standards & Water/Wastewater Fixture Industry
Miami-Dade County's recently adopted water efficiency standards will drive the local demand for more water and energy efficient water/wastewater fixtures and appliances in our homes and businesses.

MDC Renewable + Alternative Energy Product Approval Incentives Program (unfunded)
The County's Building Code Compliance Office (BCCO) is interested in funding a renewable/alternative energy product approval rebate program. Such a program would attract more product manufactures to the County and which would help accelerate the adoption and use of these emerging technologies locally.

Improved Permitting Efficiency for Renewable Energy Installations
Over the past year, the BCCO has spearheaded an ongoing effort to evaluate and resolve code obstacles associated with renewable energy installations which involves the leadership of the Miami-Dade County Board of Review and Appeals and engagement of renewable energy (solar PV and solar thermal) manufacturers, contractors, decision makers and stakeholders.

Redlands Raised Initiative
The local branding initiative, *Redland Raised*, was created by the County's Agricultural Manager, in conjunction with local farmers and the Florida Department of Agriculture and Consumer Services, to promote a "buy local" program throughout the County and state. The brand is in line with the State's *Fresh from Florida* brand, of which the majority of local growers and packers are members. The Miami-Dade *Redland Raised* buy local program will enhance the competitiveness and economic sustainability of crops grown in Miami-Dade by:

(1) Marketing and promotion of the *Redland Raised, Fresh from Florida* brand – through the development of a wide range of marketing materials that will be used by producers, packer and retail outlets;
(2) Increased consumption – through a countywide advertising campaign to raise the public awareness of the benefits of buying local.
(3) Increasing child and adult nutrition knowledge – through the development and production of an official *Redland Raised* cookbook showcasing locally grown specialty crops.

The project is important to Miami-Dade's agricultural community, with the resulting impacts of the program being:

- Establishing a sustainable buy local brand and program
- Assist local growers with marketing and promotion
- Providing fresher products to consumers
- Increase sales and consumption of locally grown crops
- Lowering carbon footprint on the environment
- Increasing consumer awareness, education, and expectations

- Raising the profile and importance of local growers of specialty crops to all types of consumers

Through a partnership with Publix supermarkets established in late 2009, more than 1,000 stores will feature locally-grown produce under the "Redlands Raised" banner.

Miami-Dade County Cooperative Extension

Miami-Dade County Cooperative Extension, as part of UF/IFAS and the Consumer Services Department, provides non-formal educational opportunities and training, technical assistance, publications, electronic-based resources, and consultations to a wide variety of clientele within the county. Since the Extension is university affiliated organization, information is research-based and objective without regulatory implications. These educational activities include:

- *The Agriculture Best Management Practices (BMPs) Program:* This BMP program is part of the non-point source pollution prevention efforts within the state. Numerous BMP manuals have been created and adopted by the above agencies and IFAS/Extension has been integral in providing training and consultation with these efforts for voluntary compliance by providing workshops on what the BMPs are and how they can be attained. Some on-site assessments have been conducted to review the check lists of practices a grower is currently carryout and/or what modifications in the operation may be implemented. As Miami-Dade agriculture is a highly diverse industry, several manuals are utilized. Row crops/Vegetables, Container Nurseries, Aquaculture, Equine, and currently under development Tropical Fruit crops manuals are utilized by growers. Growers upon review and assessment, submit a "Notice of Intent" to comply with the stated BMPs to the state. Monitoring and regulatory aspects are carried out by Florida Department of Agriculture and Consumer Services (FDACS) and/or Florida Department of Environmental Protection (FDEP). In addition, production innovations, Integrated Pest Management methods and updates on new and threatening pests and diseases to the industry are delivered in various methods described above.

- *BMPs for the Environmental Horticulture or Landscape Maintenance Industry:* A BMP manual has been developed for the Environmental Horticultural and Landscape Maintenance "Green Industries" as well. In addition, a recent state law (373.62(1) FS) went into effect on urban commercial fertilizer application and mandatory completion of training is required for all applicators. This training is offered by the Extension in English and Spanish as it has been designated the training entity, and Extension staff must be certified to provide the training. Programs are available to private industry, public agencies and organizations at all levels of government, supporting community sustainability initiatives.

- *General Agricultural and Landscaping Sustainable Practices:* The Extension, working with the FDEP and FDACS, will keep agricultural producers and landscapers up to date with current Best Management Practices for specific industries as a means of optimizing pesticide and fertilizer use and minimizing environmental impacts. Enforcement of state laws regarding pesticide purchase and use is the purview of the FDACS. The Extension is designated as the local training and testing organization for licenses issued under Chapters 388, 482 (Limited Certification licenses only) and 487, Florida Statutes. In addition, the Extension is responsible for keeping the agricultural community and other non-residential fumigant users up to date with current federal and state requirements for safe use of these products.

Beyond sustainable practices, Extension conducts updates on business and financial management, market development, new crops and technologies, disaster preparedness and recovery, bio-security and many other topics on a periodic and timely basis.

Greater Miami Chamber of Commerce "Green" Focus

The Greater Miami Chamber is an activist chamber that seeks solutions to the problems that vex businesses and creates solutions when answers cannot be found. The Chamber is committed to improving the economic vitality of the community, with a keen eye on quality of life issues and social justice for all residents. To carry out this mission, the Chamber serves as the voice of business enterprise and involves the private sector in community leadership. The Chamber's "green" focus includes:

- *Natural Resources Committee:* The Natural Resources Committee of the Chamber encourages dialogue among local member businesses, partners and invited industry leaders to catalyze the increased adoption of sustainable business practices in Miami-Dade County
- *Sustainable Best Practices Award:* A natural evolution of the Chamber's Green Industry focus is the leadership of the Chamber in launching the first Miami-Dade Sustainable Best Practices Award program in 2009. There were over 91 entries representing manufacturing, professional services, hospitality/tourism, green building, retail, government and other sectors of our economy.

Eco-Chamber

Miami-Dade County is the home of the recently founded Global Eco-Chamber. The Chamber is "dedicated to helping organizations create and implement sustainable business practices while counseling them on how to make sound and profitable business decisions…" The six initiatives of the Chamber include (from mission page of website):

- Help companies and governments take additional eco-friendly steps while improving their budget through analysis and tracking tools.
- Help those who are already green or taking steps in the right direction to thrive through business development and marketing tools.
- Work to ensure governments are creating legislation that is good for environment while still supporting jobs and businesses.
- Help to build and support the next generation of environmental leaders through free student programs
- Share best practices across the globe between industries and governments to, helping progress to be more rapid and readily adopted.
- Unify fragmented eco industries to create a louder, more powerful voice for advancement.

COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

No feedback is available at this time.

Public Safety

Sustainable communities are pedestrian friendly and provide dense mixed use with various transportation options to employment centers and a variety of services. A cross cutting issue for each of these components is safety. While vehicles are an important transportation option in such a geographically large county, transit, walking and biking are low-cost alternatives.

Additional benefits from reducing vehicle use and improving vehicular safety range from reducing congestion, emissions, and accidents to increasing resident health. However, to take transit, bike, or walk, residents must feel safe. This assessment area includes data on crimes in jurisdictions, public safety transit statistics, vehicle safety, bicycle safety, and pedestrian safety, as well as information on other related plans and initiatives in an effort to assess possible barriers.

Public Safety

Assessment Area

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The data at this point suggests the following challenges stated below.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Educating the public about safe behaviors to reduce current incidents and crime levels related to transit, vehicles, pedestrians, and cyclists.
- Providing more safe and practical options for pedestrians (sidewalks) and cyclists (paths).

ASSESSMENT DATA & INDICATORS

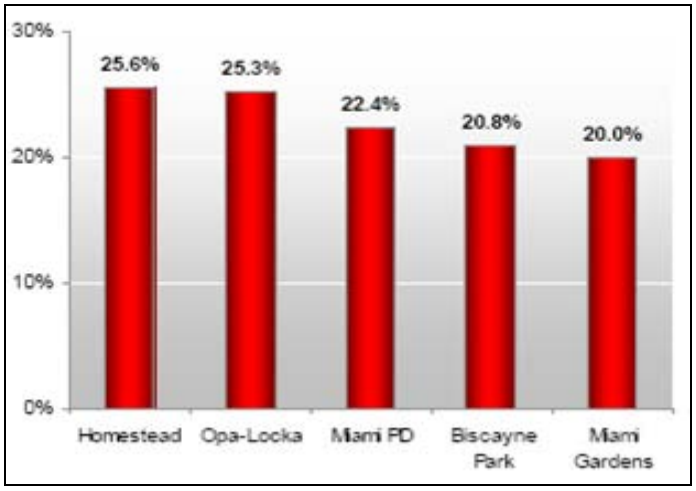
Data and analysis to identify key challenges & establish a sustainability baseline

The series of indicators below help establish a public safety baseline in Miami-Dade County. They include crimes in jurisdictions, incidents in our public transportation system, vehicle safety, bike safety, and pedestrian safety.

Crimes by Jurisdictions

An analysis of 2007 crime data by jurisdiction shows that despite the overall decline in crime rates over time in Miami-Dade County, some jurisdictions experience crime rates that are disproportionately higher. Figure 1 below shows arrests by jurisdiction. These arrests may not be residents of that jurisdiction; however it may be an indicator of the desirability of the area for living and raising a family. The highest crime rates have been reported in three of the lowest incomes cities of the county – Medley, Florida City and Opa-Locka. In addition, there are nine other jurisdictions with reported arrests above the average 69 per 1,000 population figure for the county.

Figure 1: Cities with High Violent Crime Rates, 2007



The majority of arrests (85 percent) were for nonviolent crimes including burglary, larceny and motor-vehicle theft. However, in some jurisdictions arrests for violent offenses constitute a very large percentage of total crimes in that area. Arrests for violent crimes in some cities are well above the County's average of 15.3 percent. Bal Harbor, Key Biscayne and Aventura are the cities with the lowest percentage of violent crime arrests and conversely with the highest percentage of non-violent crimes.

Figure 2: Miami-Dade County Crime Statistics 2007

County	Murder	Rape	Robbery	Aggravated Assault	Burglary	Larceny	Motor Vehicle Theft	Arrests per 1,000 Population
Medley PD	0	1	6	13	111	253	37	372
Florida City PD	0	4	96	161	280	962	73	169
Opa-Locka PD	12	7	285	242	745	595	276	141
Miami Beach PD	4	58	448	562	1,354	5,607	844	95
Doral PD	0	8	30	98	353	2,313	279	89
Miami Gardens PD	24	61	686	1,134	1,668	4,904	1,034	87
North Miami PD	9	30	391	353	857	2,748	488	81
South Miami PD	0	0	29	47	110	569	61	77
Miami Shores PD	0	1	39	25	212	430	62	74
Miami PD	78	57	2,537	3,447	4,829	12,478	3,876	69
N. Miami Beach PD	0	28	225	212	677	1,478	137	67
Aventura PD	0	2	49	26	114	1,711	63	65
Miami-Dade PD	84	353	2,679	5,498	9,737	35,866	6,880	56
Miami-Dade County	**228**	**725**	**8,872**	**13,915**	**26,713**	**87,420**	**17,177**	63

Source: Florida Department of Law Enforcement, Florida Statistical Analysis Center, Uniform Crime Reports Program (UCR), 2007.

While arrests are an indicator of crime activity, general crime statistics help define safety issues. Figure 2 shows a comparison of crime statistics in different jurisdictions over the last two years, as well as shows that change varies by location and type of crime. Violent crimes increased in these cities Opa-Locka, North Miami Beach and Coral Gables, and decreased in Homestead, Surfside and South Miami. Property crimes which account for the overall increase in crimes

climbed in double digit numbers in many cities, including Virginia Gardens, Pinecrest, and Surfside, while decreasing in Biscayne Park and Homestead.
(Source: Miami-Dade County Community Action Agency 2007 Comprehensive Needs Assessment)

Public Transportation

Public transportation is monitored for criminal or terrorist activity by the Miami-Dade Transit (MDT) working closely with local law enforcement and the United States Department of Homeland Security, Transportation Security Administration (TSA). This includes Metrobus, Metrorail and Metromover routes. Public safety programs include:

- MDT buses have safety doors installed on all bus operator compartments, as well a camera system for operator safety.
- Police officers monitor rail and bus routes for the safety of the traveling public.
- MDT conducts integrity tests on buses with the cooperation of the Miami-Dade Police Department (MDPD).
- Periodically plain clothes officers board buses, ride the routes, and check for bus operator awareness.
- Plain clothes police details from the MDPD Police Operations Bureau, Kendall District and Cutler Ridge District, monitor bus activity along the MDT Couth Dade Busway in South Miami-Dade County, as well as incidents in surrounding areas.
- The MDT coordinates with other law enforcement jurisdictions that buses travel through for additional assistance when needed. In cooperation with the Transit Security Administration and local law enforcement, Visual Intermodal Prevention & Response (VIPR) events are conducted at Metrorail/Metromover stations and Bus Terminals throughout the year.

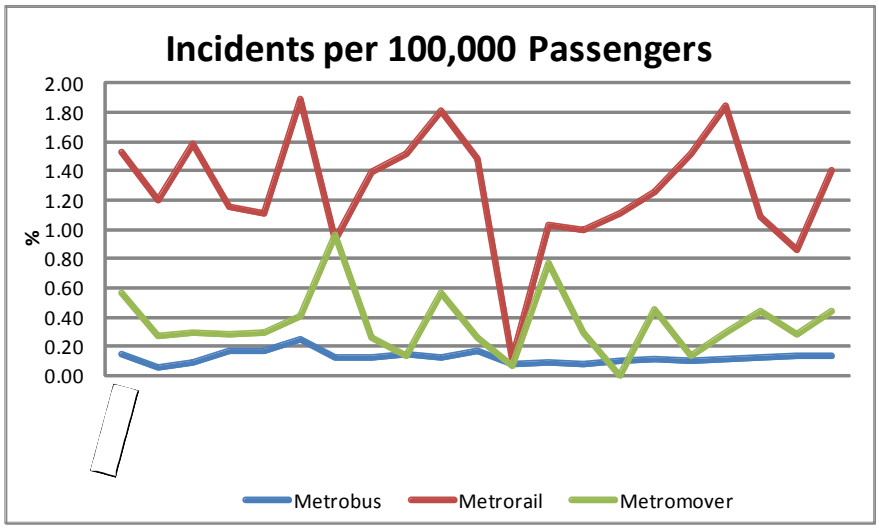
The occurrence of incidents and crimes on public transportation should be considered within the context of ridership. From January to August 2009:

- Metrorail had 12 million riders, averaging 1.5 million per month,
- Metrobus had 50.3 million riders, averaging 6.3 million per month, and
- Metromover had 5.4 million riders, averaging 0.7 million per month.

Public safety indicators for the Miami Dade Transit system are tracked as the number of incidents per 100,000 passengers. These incidents can be any type of occurrence that is security related. Figure 3 segments the overall incident rates for Metrobus, Metrorail, and Metromover from December of 2007 to August 2009.

- On Metrobus 34 percent of incidents were due to vandalism (primarily objects thrown to glass of buses), 12.5 percent were due to assault to operators (physical and verbal), and the third largest group be inter-passenger fights (physical and verbal).
- For Metrorail the top three incidents were battery (which include assailant versus MDT security officers), theft of patron property, and strong armed robbery.
- For Metromover the main incident was battery (which include assailant versus MDT security officers).

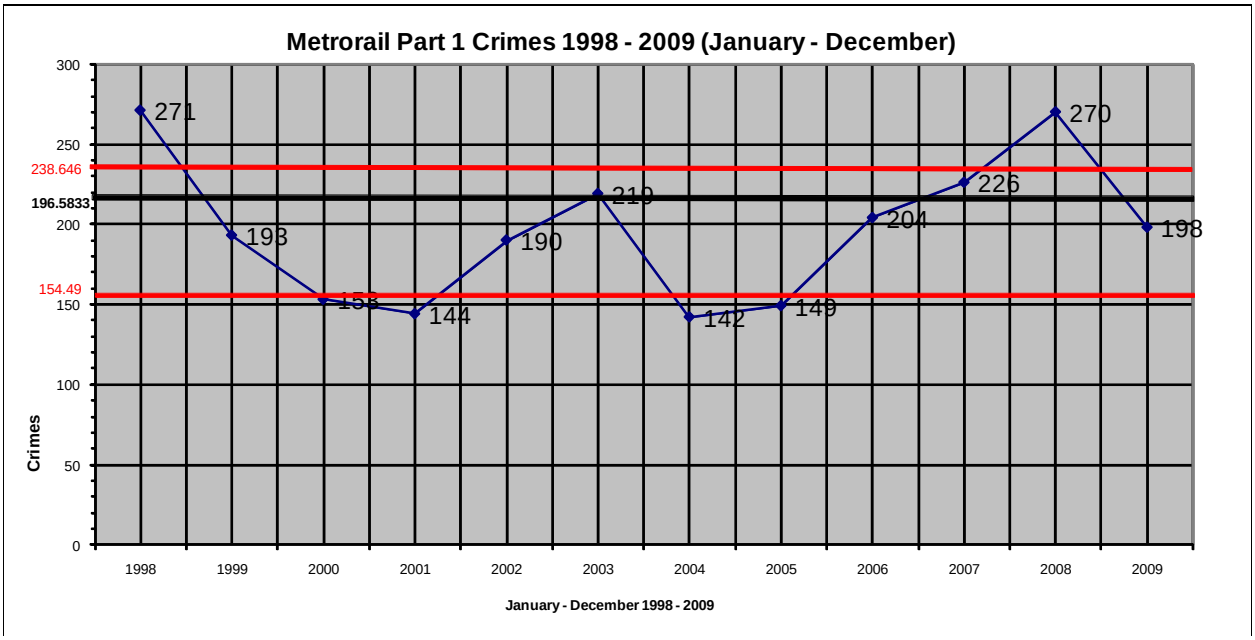
Figure 3: Incidents per 100,000 Passengers by Transportation Mode



Source: Miami Dade Transit

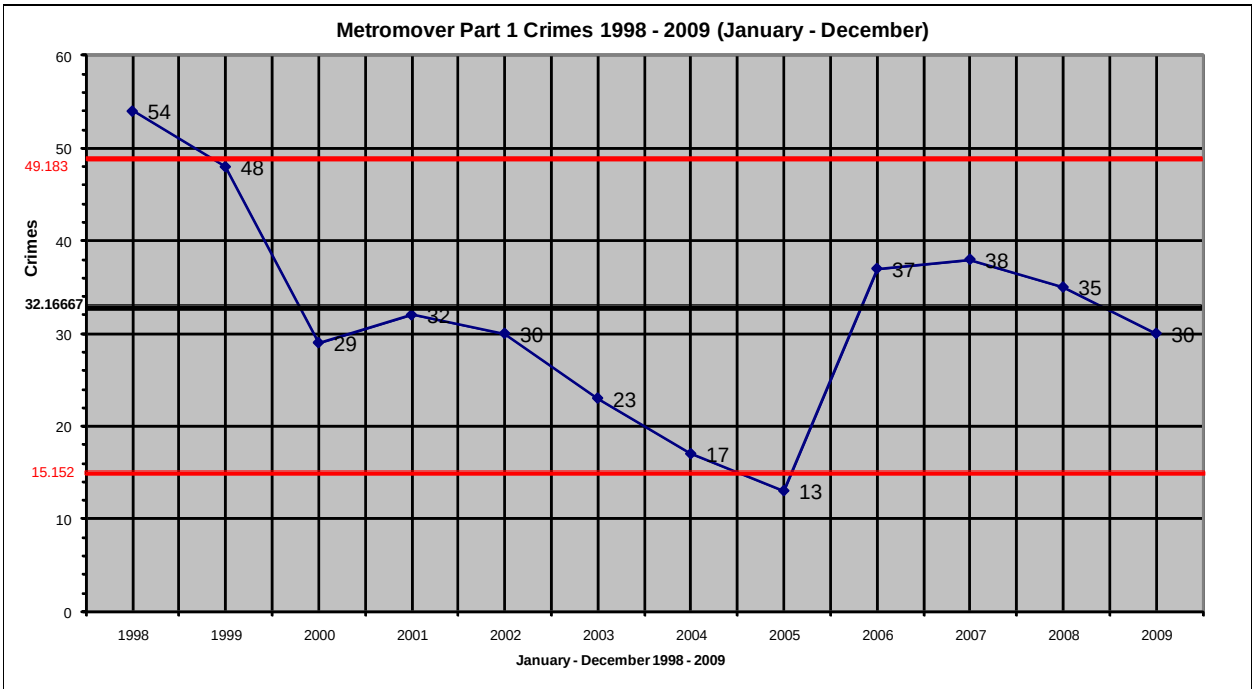
Another critical indicator for the Transit system is the number of Part 1 Crimes which are the more likely to be reported to the police and to occur with sufficient frequency to provide an adequate basis for comparison. These crimes fall into the following categories: Murder, Forcible Sex Offenses, Robberies, Aggravated Assaults, Burglaries, Larcenies, and Motor Vehicle Thefts. Figure 4 and Figure 5 are Part 1 Crimes in Metrorail and Metromover respectively. The data available for 2009 includes only January to October 2009 time period. November and December 2009 data are not yet available (figures are projected for the two remaining months).

Figure 4: Metrorail Part 1 Crimes



Source: Miami Dade Transit

Figure 5: Metromover Part 1 Crimes

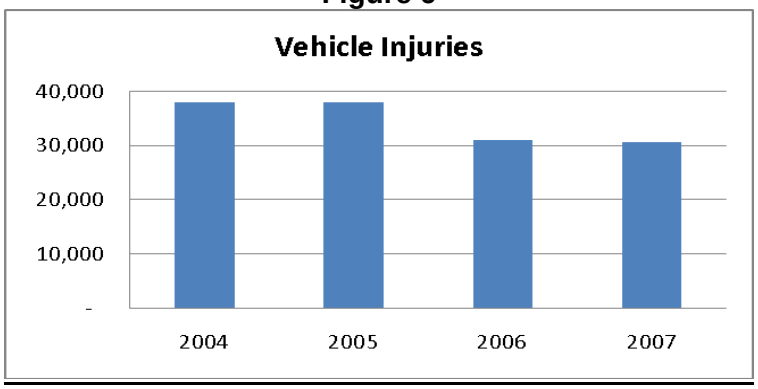


Source: Miami Dade Transit

Vehicle Safety

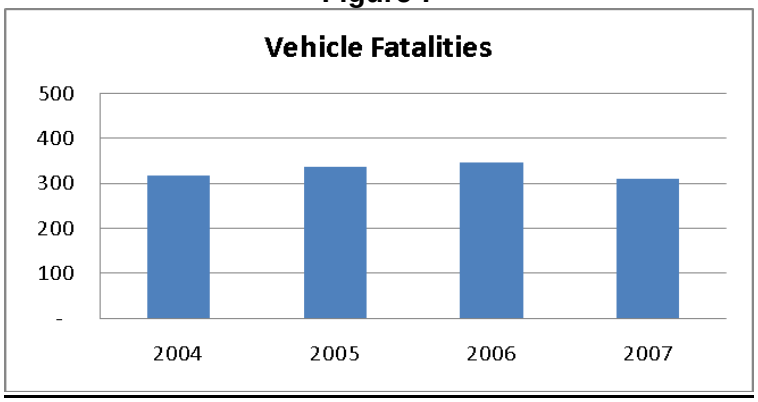
Vehicles are the primary mode of transportation. Figures 6 and 7 show vehicle injuries and vehicle fatalities. Overall vehicle injuries have decrease. Fatalities increased from 2004 to 2006, and decreased in 2007. Education and enforcement of traffic laws impact these results.

Figure 6



(Source: Alliance for Human Services Miami-Dade County Human Services Progress Report for 2008)

Figure 7



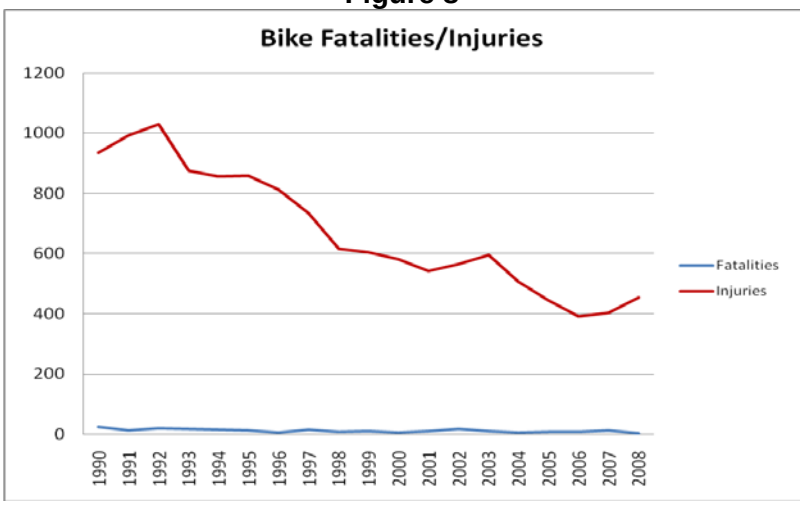
(Source: Alliance for Human Services, Miami-Dade County Human Services Progress Report for 2008)

Bike Safety

The bicycle is a legal roadway vehicle in all fifty states. Bicycling is a healthy, inexpensive, and emission-free means of transportation. It is not a widely utilized mode in Miami-Dade County; however efforts are being made to increase this.

The Metropolitan Planning Organization (MPO) monitors both bike and pedestrian fatalities and injuries. Crashes involving bicyclists and pedestrians are considerable. They account for 40 percent of the traffic fatalities in Miami-Dade County each year. Figure 8 shows bike fatalities and injures.

Figure 8



(Source: Prepared by Miami-Dade MPO from the Department of Highway Safety and Motor Vehicles' "Traffic Crash Statistics Report 2008.")

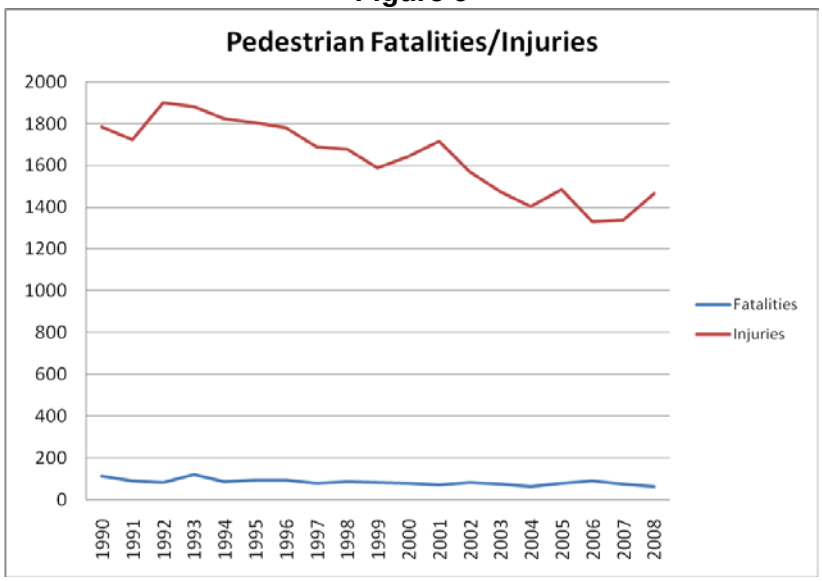
Pedestrian Safety

As part of the Department of Environmental Health Seal of Walkability, Pedestrian Safety is one of the evidence-based criteria for the identification of Florida's most walkable communities. The program is a combined effort of the University of Miami's Department of Epidemiology and Public Health and the Florida State Department of Environmental Health with approval from the Surgeon General. The rational is that a safe, walkable community will have a low rate of pedestrian injuries and fatalities (IOM 2005; Smith et al., 2008) and that incidents are more likely to occur in areas with high traffic volume, along the sides of roads, or where pedestrian

crossings occur at mid-block. This may be related to a lack of crosswalks, signals, large block sizes, or high speed traffic. (Ewing et. al., 2003; Beck et al., 2007).

A pedestrian safety indicator is calculated by dividing the number of pedestrian injuries or fatalities in the submission area population divided by the total number of residents in the submission area. The 2008 Pedestrian Fatality Safety and Pedestrian Injuries Safety was 0.065 percent and 0.003 percent respectively. Figure 9 shows the pedestrian injuries and fatalities. Efforts are being made to make neighborhoods that have the largest numbers of incidents safer (*view "Existing Efforts" section*).

Figure 9



(Source: Miami-Dade MPO from the Department of Highway Safety and Motor Vehicles' "Traffic Crash Statistics Report 2008")

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Long Range Transportation Plan 2035

The purpose of the Miami-Dade 2035 Long Range Transportation Plan (LRTP) was to develop a plan for a multimodal transportation system that complied with state and federal requirements, optimized the movement of people and goods, and met the goals and objectives adopted by the Miami-Dade Metropolitan Planning Organization (MPO) Governing Board. The LRTP Steering Committee developed eight primary goals for the Miami-Dade County transportation system. For each goal, a number of more specific objectives were identified.

The goals and objectives 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 following goals, but is not an implementation plan for achieving these comprehensive goals and objectives. The following goals relate specifically to the safety of our public transportation system.

Goals / Objectives	Measure
Goal 2: Increase the Safety of the Transportation System for Motorized and Non-motorized Users	
Objective 2.1: Improve safety on facilities and in operations	Level of investment in safety projects
Objective 2.2: Reduce roadway and multi-modal crashes	Number of accidents
Objective 2.3: Increase safety at transit stops and intermodal stations and connections	Does MDT address safety at transit stops and stations as part of the operation of its system?
Goal 3: Increase the Security of the Transportation System for Motorized and Non-motorized Users	
Objective 3.1: Enhance the capacity of evacuation corridors	Total lane miles within evacuation travel corridors
Objective 3.2: Improve transportation security for facilities and in operations	Does the plan address security as part of the operation of its system?
Objective 3.3: Ensure transportation options are available during emergency evacuations for the elderly and persons with disabilities	Transit service route miles within 0.5 miles of TAZs with a high proportion of elderly population
Objective 3.4: Ensure security at ports, airports, and major intermodal centers/terminals	Do airports, seaports and intermodal centers address security as part of the operation of their facilities?

Draft Transit Development Plan FY2010 to 2019

The fiscal year (FY) 2010 – 2019 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. The following objectives and measures are the ones that relate specifically to the safety in our public transportation system.

OBJECTIVE		MEASURE
Goal 2: Improve Customer Convenience, Comfort and Safety on Transit Service and within Facilities		
2.1	Improve safety on vehicle service operations	• Level of investment in safety projects/Audit of System Safety Program Plan
2.2	Reduce roadway and multi-modal crashes	• Number of accidents involving transit vehicles, Number of accidents/incidents per 100,000 miles
2.3	Enhance outreach opportunities to educate the community on transportation issues and highlight transit service benefits such as service reliability, passenger cost savings, and environmental benefits	• Develop speaker's bureau to inform public about transit benefits • Work with MPO, Transportation Management Organizations, major employers to promote transit service • Recruit community leaders to advise on promoting transit service
2.4	Maintain convenient, clean, safe transit passenger facilities and vehicles	• Reduction of passenger complaints regarding safety and cleanliness of vehicles and facilities • Completion of bi-annual safety and inspection audits of Metrorail and Metromover stations • Number of safety related accidents and incidences on-board and in stations/transit facilities

Goal 3: Increase the Security of Transit Vehicles and Facilities		
3.1	Ensure transit vehicles and facilities provide a secure environment for customers	• Percent of functioning video cameras • Security personnel capabilities • Ensure 100 percent compliance with security contract • Reduction of security related incidents
3.2	Increase security at transit stops and intermodal stations and connections	• Number of criminal incidents on-board transit and in stations/transit facilities

Miami-Dade County Park and Open Space System Master Plan
Approved by the Board in 2008, the Park and Open Space System Master Plan (OSMP) established a vision for a seamless, sustainable parks, and open space system to create a new, interconnected framework for growth; one that results in a more livable, sustainable community.

Consisting of existing and proposed parks, public spaces, natural and cultural places, greenways, trails and streets, the interconnected framework will form the foundation or "The String of Pearls" of the County to accommodate growth while also improving the quality of life for residents. The new framework 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, providing equitable access to parks and open spaces, and providing more opportunities for residents to meet, socialize, and connect with one another.

Safety is a key pillar in the plan. It states in the goals the importance that every resident can safely and comfortably walk, bicycle, or take transit to community parks, recreation centers, and special use/ sports facilities.

Bicycle Facilities Plan and the Pedestrian Plan
The Bicycle Facilities Plan and the Pedestrian Plan were developed by the MPO to increase the number of Miami-Dade County residents and visitors that walk or bike for all or a portion of their trip. The plan seeks to enhance bicycling facilities and achieve a higher percentage of non-motorized trips by focusing improvements in areas of greatest need.

Other Initiatives

Transit Watch: "Let's Count on Each Other for a Safe Ride"
Transit Watch is a safety program designed to include the participation of transit riders and the public to be the "eyes and ears" of MDT. They request users to report an suspicious package or strange activity in, on, or near a bus, a Metrorail or Metromover train, a bus stop, a rail station, or any transit property to the bus operator, station security officer, or any transit official as quickly as possible.

Safe Routes to School (SRTS)
The Public Works Department (PWD) has had a program to build safe routes to school since the 1970s. The scope of SRTS has been expanded to include education in addition to infrastructure with the creation of the federal SRTS funding program. Federal grants and transportation Enhancement Program funding from the MPO now assist Miami Dade County Public Schools provide the WalkSafe education program and participate in International Walk to School Day.

Community Traffic Safety Teams (CTST)
The MPO participates in the Community Traffic Safety Team Program, an inter-agency team approach to reducing the number of traffic crashes, injuries, and fatalities. The MPO hosts monthly countywide CTST meetings where representatives from traffic engineering, planning, and law enforcement come together to coordinate their traffic safety programs. The School Board CTST is a spin-off of the countywide team and deals only with school traffic issues and coordinates the Safe Routes to School program. Meetings are held at the School Board Administration Building.

Bike Trails
The Miami-Dade Park and Recreation Department (MDPR), in conjunction with PWD, is developing and improving many bike trails which span across the County. It is expected that building and improving these trails will encourage residents to depend less on cars and public transportation, and encourage health, fitness, and having fun.

There are eight trails developed by MDPR throughout Miami Dade County. They are the Snake Creek Trail, Rickenbacker Trail, Commodore Trail, Old Cutler Trail, Biscayne Trail, Black Creek Trail, Biscayne-Everglades Greenway, and Southern Glades Trail.

2010 Transit Miami Collision Database
Transit Miami, a local blog, has introduced an application that helps track and identify unsafe intersections and roadways for pedestrians and cyclists. The 2010 Greater Miami Collision Database provides the locations where cyclists and pedestrians have been struck-by vehicles over the past year.

The database is a collaborative process and they request that readers submit (movemiami@gmail.com) information concerning any collision between a car and a pedestrian or cyclist.
(Source: http://fwix.com/miami/share/cf40bf73f9/2010_transit_miami_collision_database)

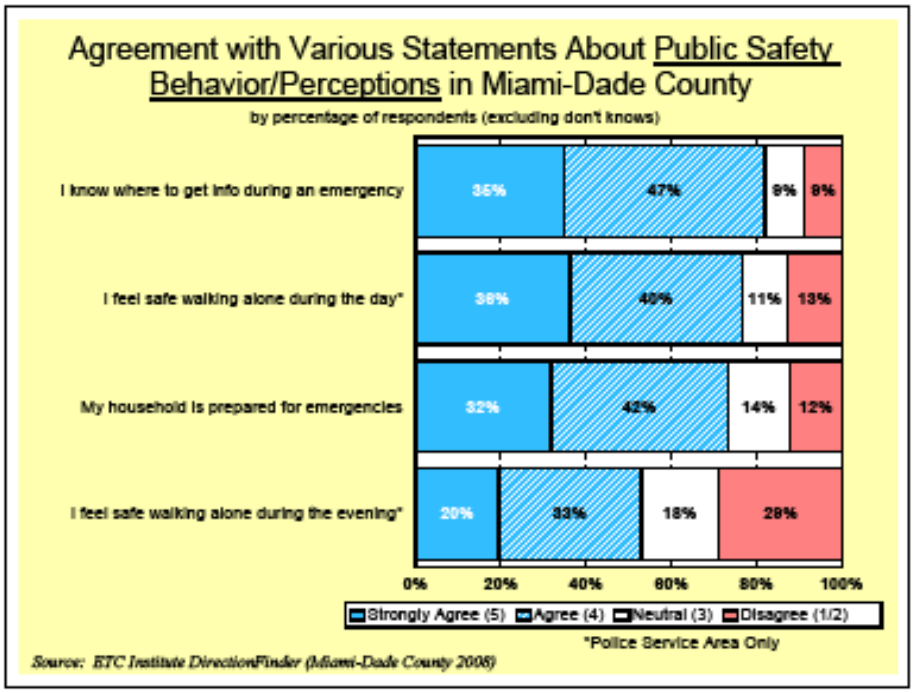
COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

CAA Low-Income Resident Survey
In the Community Action Agency (CAA) Low-Income Resident Survey, the most important issue affecting the quality of life in neighborhoods was crime and drugs (20 percent), followed by jobs (10 percent). A significant number viewed safety and crime as major problems (39 percent). Respondents agreed that domestic violence (20 percent) and sexual assault (17 percent) are major problems. In some neighborhoods crime and drugs were more important than in others. For example, at least 50 percent of people surveyed in the Liberty City – Edison area consider crime a major issue. Only a quarter of respondents in Perrine and Goulds indicate the same.

Miami-Dade County Resident Satisfaction Survey
During the fall of 2008, ETC Institute administered a Resident Satisfaction Survey for Miami-Dade County to assess resident satisfaction with the delivery of major county services and to help determine priorities for the community as part of the County's ongoing planning process. Of the 20,000 households that received surveys, 5,522 were completed (a 27 percent response rate). The survey was administered in English, Spanish and Creole.

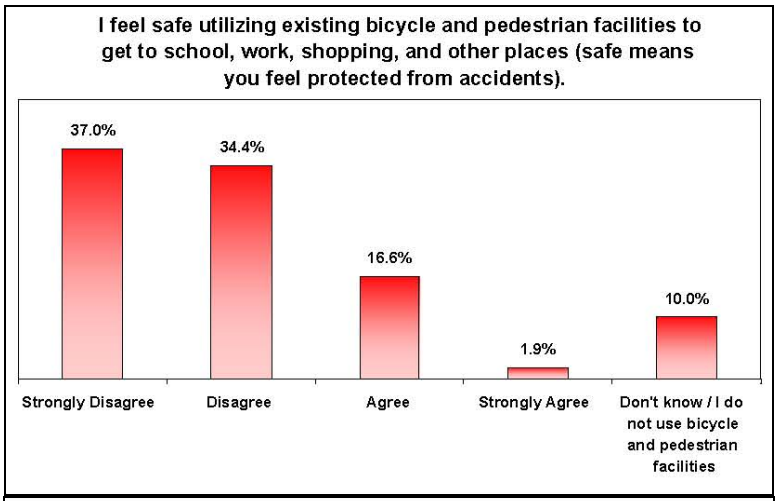
The police and public safety ratings were assessed based on the areas where the County is responsible for providing police services. The highest levels of satisfaction with public safety services in the County's police and fire service areas based upon the combined percentage of "very satisfied" and "satisfied" responses among residents who had an opinion were: the quality of fire services (84 percent), the quality of local emergency/ambulance services (82 percent) and the County's emergency preparedness services (69 percent). Residents were least satisfied with the enforcement of local traffic laws (46 percent).

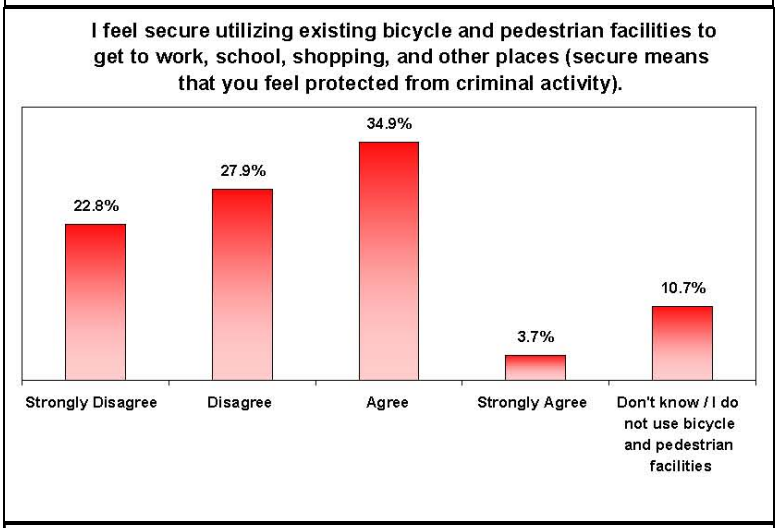


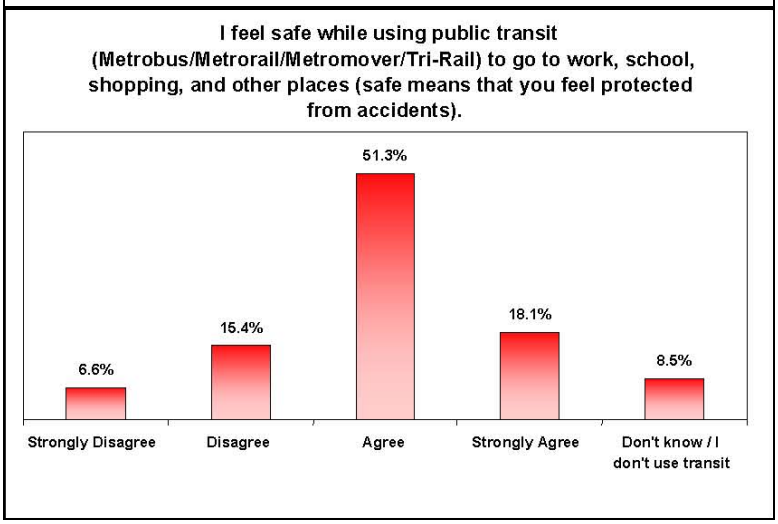
2035 Miami-Dade County Long Range Transportation Plan
Public Involvement Survey – October 2008

Public feedback was collected through both an online survey and the use of the Option Finder Technology during public involvement sessions held throughout the County. A total of 417 responses were collected through the online survey, while a total of 294 responses were collected during public involvement sessions. The following are the results of the public safety-related questions:

This section of the survey asked respondents to rate their agreement with statements relating to the ease, safety, and security of different forms of transportation. The statement about feeling safe utilizing existing bicycle and pedestrian facilities received the lowest average rating (1.8), meaning that more respondents were in disagreement with that statement than the other statements.


I feel safe utilizing existing bicycle and pedestrian facilities to get to school, work, shopping, and other places (safe means you feel protected from accidents).
37.0%
34.4%
16.6%
1.9%
10.0%
Strongly Disagree
Disagree
Agree
Strongly Agree
Don't know / I do not use bicycle and pedestrian facilities


I feel secure utilizing existing bicycle and pedestrian facilities to get to work, school, shopping, and other places (secure means that you feel protected from criminal activity).
22.8%
27.9%
34.9%
3.7%
10.7%
Strongly Disagree
Disagree
Agree
Strongly Agree
Don't know / I do not use bicycle and pedestrian facilities


I feel safe while using public transit (Metrobus/Metrorail/Metromover/Tri-Rail) to go to work, school, shopping, and other places (safe means that you feel protected from accidents).
6.6%
15.4%
51.3%
18.1%
8.5%
Strongly Disagree
Disagree
Agree
Strongly Agree
Don't know / I don't use transit

Schools

Miami-Dade County is home to a wide variety of educational institutions that include private and public schools, as well as colleges and universities.

For schools to thrive in the 21st Century they must be sustainable along many dimensions: financial, demographic, programmatic, environmental, and global.

Schools can work toward environmental sustainability by becoming more “green,” reducing school and personal carbon footprints, promoting a commitment to life-long environmental responsibility, and incorporating environmental education into the curriculum. Schools systems and institutions of higher learning are integral components of a sustainable tomorrow.

Schools

Assessment Area

For schools to thrive in the 21st Century they must be sustainable along many dimensions: financial, demographic, programmatic, environmental, and global. Schools can work toward environmental sustainability by becoming more "green," reducing school and personal carbon footprints, promoting a commitment to life-long environmental responsibility, and incorporating environmental education into the curriculum. Schools systems and institutions of higher learning are integral components of a sustainable tomorrow.

Miami-Dade County is home to a wide variety of educational institutions that include private and public schools as well as colleges and universities. Miami-Dade County Public Schools (M-DCPS) is the largest school district in Florida and the 4th largest in the United States with a diverse enrollment of more than 340,000 students from over 100 countries in 392 schools, that include elementary, middle, senior high schools and alternative, specialized and vocational centers.

In terms of higher education, Miami-Dade College (MDC) is the largest and most diverse college in the nation with eight campuses and over 170,000 students from across the world. Florida International University (FIU) has more than 39,000 students, over 1,000 full-time faculty, 7,000+ employees, and 135,000 alumni. FIU is one of the 25 largest universities in the nation, based on enrollment. Both are public institutions. University of Miami (UM) is amongst the 12 private institutions in and around Miami. It is a research university with more than 15,000 students from around the world.

For purposes of this assessment report County staff has gathered information on existing efforts as well as data for the following indicators from M-DCPS: educational attainment, quality of schools, infrastructure, school bus age, and water consumption. These are not all inclusive and do not paint the entire picture of how schools are a component of a sustainable community.

While the report does not yet include assessment data or indicators of local colleges and universities, several initiatives are highlighted under "*Existing Efforts*." We welcome feedback in this area as we realize that there are data gaps.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Educating our children, and indirectly their families, to live and behave in a more sustainable manner.
- Ensure comprehensive early childhood education as an investment that results in long-term academic success and positive social outcomes for youth.
- Developing and promoting robust curriculum at the schools, colleges and universities to produce a pool of talent that can participate in new and emerging technologies and "green" industries or jobs.
- Positioning our educational institutions to participate in and benefit from research and trends in new and emerging alternative energy, design, construction, and sustainable approaches in general.
- Designing, constructing and operating school facilities that are energy and water efficient, procure and dispose of materials and resources sustainably, maintain high standards of indoor air quality utilize sustainable landscaping and site selection techniques and where possible integrate these practices into educational objectives and curriculum.
- Reducing exposure of drivers, children, staff, and community residents to diesel exhaust from school bus fleet operations.
- Increasing mixed uses of buildings and the school's relationship in the neighborhood. For

example, connecting schools with libraries, parks, pools and other safe and healthy locations.

- Building schools to encourage urban development rather than suburban sprawl.

ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

Educational Attainment

The educational attainment rate for the 25 and older population of Miami-Dade County as of 2007 is illustrated in the table below. The high school graduation rate for people 25 years and over nationwide is 85 percent and 85.2 percent statewide compared to 77 percent in Miami-Dade County. *(See the Demographics & Our Economy Section of this report for more detailed information on educational attainment.)*

Educational Attainment	2008 Estimate	2007 Estimate	2007 - 2008 % Change
Population 25 Years and Over	1,623,937	1,606,447	1.1%
Less than 9th Grade	206,693	197,612	4.6%
9th to 12th Grade, no diploma	161,145	172,882	-6.8%
High school graduate (includes equivalency)	430,136	454,300	-5.3%
Some college, no degree	245,169	228,564	7.3%
Associate's degree	129,563	133,192	-2.7%
Bachelor's degree	286,615	271,735	5.5%
Graduate or professional degree	164,616	148,162	11.1%

(Source: Miami-Dade County Planning & Zoning Economic Development Coordination Division)
(Data Source: Selected Demographic Characteristics for Miami-Dade County from the American Community Survey.)

Quality of Public Schools

The Department of Education of the State of Florida grades each public educational institution individually or as whole for a district. The Dade School District grades are as follows:

Year	Grade
2008-2009	B
2007-2008	B
2006-2007	C
2005-2006	B
2004-2005	B
2003-2004	C

The criteria utilized to calculate the grade is based on overall achievements in the areas of reading, math, writing, science as well as gains made. The results in these areas for 2008 – 2009 are:

2008 - 2009	
District Number: 13 & District Name: DADE	
% Meeting High Standards in Reading	62%
% Meeting High Standards in Math	69%
% Meeting High Standards in Writing	88%
% Meeting High Standards in Science	40%
% Making Reading Gains	63%
% Making Math Gains	69%
% of Lowest 25% Making Learning Gains in Reading	63%
% of Lowest 25% Making Learning Gains in Math	67%
Points Earned (Sum of Previous 8 Columns)	521%
Percent Tested	99%

(Source: http://schoolgrades.fldoe.org/)

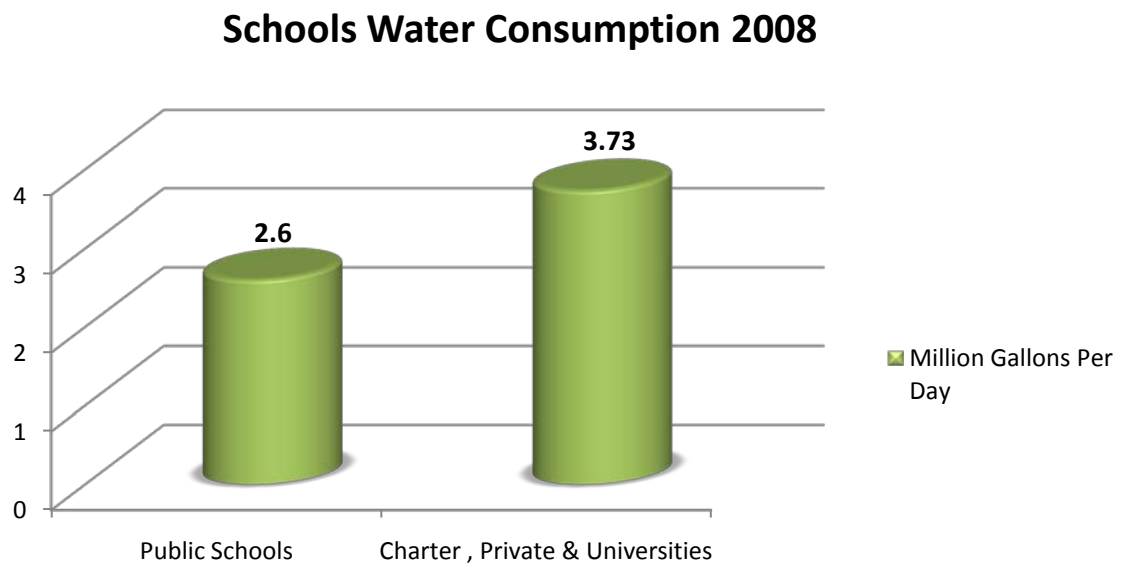
Infrastructure

M-DCPS includes 381 facilities. There are 338 school facilities and 43 administrative facilities. This consists of 3,092 buildings that take over 34,695,365 square feet of area. The weighted average age of the buildings for the Miami Dade School District is from 1979. The breakdown by the nine districts is reflected in the chart below. Despite new construction, about 50 percent of the building inventory is 40 years or older, and about 34 percent is 50 years or older. In terms of energy efficiency challenges, many of these older schools were designed to maximize cross-ventilation with walls of jalousie type windows that may not be airtight and allow for warming through the filtration of natural light.

	Schools	Admin	Buildings	Area (GSF)	Year
District 1	45	2	409	3,259,825	1971
District 2	59	17	499	6,470,037	1975
District 3	20	1	174	2,135,127	1978
District 4	36	1	276	4,095,196	1983
District 5	26	5	234	2,606,012	1983
District 6	32	4	298	3,142,778	1969
District 7	33	4	274	3,928,741	1992
District 8	37	5	399	4,072,016	1977
District 9	50	4	529	4,985,633	1979
Total	**338**	**43**	**3,092**	**34,695,365**	**1979**

(Source: Miami-Dade County Public Schools.)
(Data Source: 2008-2013 Educational Plant Survey.)

Water Use
The County developed a plan for reducing water consumption at public schools as part of the Water Use Efficiency Plan adopted by the Board of Miami-Dade County Commissioners in 2006. As part of this effort, school water consumption for those schools located within the Miami-Dade Water and Sewer service area is tracked, and the County will collaborate with the school system on the development of a consumption reduction plan. Similarly, the District is developing a program for future implementation. The education sector is a large water user with consumption exceeding 6 million gallons a day (MGD). The chart below includes consumption at all facilities classified as schools, including public and private schools as well as universities.



Bus Fleet
There are 1,469 school buses (607 purchased in 2007) in M-DCPS. The average age of the buses is 6.5 years. According to a grant application filed in 2006, the typical replacement life of the fleet's buses is approximately 12 years. From a community wide perspective it is important to note that these buses are expected to remain in operation for at least an additional ten years after being sold by the District. This durability of diesel engines coupled with the fact that buses manufactured today are approximately 98 percent cleaner, highlights the importance of addressing emissions from existing diesel fleets. See the "*Existing Efforts*" Section for information on initiatives associated with this indicator.
(Source: Miami Dade School Board and Project R.I.D.E. Reducing In Cabin Diesel Exposure EPA Grant Application)

As mentioned previously, County staff has gathered the following indicators for public schools: educational attainment, quality of schools, infrastructure, school bus age, and water consumption. These are not all inclusive and there are data gaps in:

- Energy (Electrical and Fuel) Use
- Indoor Air Quality
- Private School Indicators and Existing Efforts
- Indicators for Colleges and Universities

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Comprehensive Development Master Plan

The Educational Element is the 10th component of the Comprehensive Development Master Plan (CDMP). It states the development, operation, and maintenance of a system of public education by M-DCPS in cooperation with the County and other appropriate governmental agencies which strive to improve the quality and quantity of public educational facilities available to the citizens of Miami-Dade County.
(Source: http://www.miamidade.gov/planzone/cdmp/plan/CDMPEducationalElement10.pdf).

Although this component covers the planning process it would be advisable to show strength in the sustainability related matter. There is an opportunity to make use of the countywide sustainability plan to provide direction and initiative to this element.

Human Services – Child Development Services

Miami Dade County's Child Development Services assists parents and families needing financially assisted child care (School Readiness and Voluntary Pre-Kindergarten) for children from infancy to 9 years of age. Services include eligibility determination and placement of children through a network of licensed child care facilities throughout Miami-Dade County. Other services include resource and referral information on child related services, developmental screening and assessment services to identify children at-risk for developmental delays, inclusion training and technical assistance for child care teachers and providers, school readiness and Voluntary Pre-Kindergarten (VPK) providers payments. Programs included:

- Child Care Financial Assistance: provides child care financial assistance to parents with low-income. The County's function is to determine the eligibility of children and their families.
- Resource and Referral: maintains a database of all legally operating child care programs and serves children from birth to age thirteen.
- Selecting Child Care Centers: provides a list of child care facilities sorted by zip code, child age groups, child care cost, accredited center or all centers. This information can be accessed by using the online child care lookup.
- Voluntary Prekindergarten (VPK): is a free program that belongs to the Voluntary Prekindergarten Education Program. The required conditions are that you live in state of Florida and that your child turns 4 years of age by September first. The Coounty is responsible for registering parents and refunding the cost of program to the approved vendors.
- Inclusion and Assessment: provides developmental screening of children from ages 0 to 5 as well as work with the parents and schools to address the delay issues that will bring the child up to their recommended level.

(Source: http://www.miamidade.gov/dhs/children.asp)

TERRA Environmental Research Institute

This high school opened in August of 2009. It is an eco-friendly prototype for schools and a green laboratory for students. It accommodates 1,864 student work stations with a total of 178,000 square feet. A specialized green curriculum includes Environmental Research & Field Studies, Biomedical Research, and Robotics & Engineering Technology for the school. TERRA is the District's first school to go through the United States Green Building Council for Leadership in Energy and Environment Design (LEED) certification process - projected to achieve a Gold LEED designation.
(Source: http://greenschool.dadeschools.net/index.htm)

Green Education Program

The Superintendent's Eco-awareness Access Platform is developing a Green Education Program that imbeds age and grade appropriate 'green' concepts in curriculum and will

implement them systemically. They are also establishing and implementing a curriculum at the high school level that teaches 'green building' principles and practices and prepares high school students for the Associate Level LEED exam which is currently under formulation in collaboration with the US Green Building Council (USGBC).
(Source: "2009 Elected Officials Joint Workshop Session" presentation)

M-DCPS Energy Conservation
In the area of energy conservation, the M-DCPS has committed to reducing its overall carbon footprint and has specifically committed to achieving incremental yearly reductions in greenhouse gas emissions. The goal for the 2009-10 school year is to reduce 100 million KWH which represents a 15 percent reduction from the 2008-09 baseline. The estimated savings associated with this reduction is approximately $9 million and an emissions reduction in CO2 equivalents of about 72,000 metric tons. A monitoring mechanism has been deployed in all sites which delivers monthly progress reports. This data could be used as a future indicator of energy conservation in the public school system.

Efforts to achieve the energy conservation goals include a commitment to 'zero waste' principles, participation in the Environment Protection Agency's (EPA) Energy Star Portfolio Management System, and the adoption of green building practices. Green building practices are being adopted for existing and future schools. Future major renovation projects for existing buildings and large building system replacement projects will incorporate 'green' elements, materials and practices, as well as to incorporate 'green' practices and materials in routine maintenance protocols. New school facilities, including replacements, will be designed and built to achieve at a minimum certification at the Silver level by the Leadership in Energy and Environmental Design (LEED) Green Building Rating System™. Silver LEED certification. encourages and accelerates global adoption of sustainable green building and development practices through the creation and implementation of universally understood and accepted tools and performance criteria. LEED is a third-party certification program and the nationally accepted benchmark for the design, construction and operation of high performance green buildings. LEED gives building owners and operators the tools they need to have an immediate and measurable impact on their buildings' performance. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.
(Source: "2009 Elected Officials Joint Workshop Session" presentation)

M-DCPS Bus Fleet
The District completed the following diesel retrofit projects:

- $21,000 In-Kind Project with Miami-Dade County Department of Environmental Resources Management (DERM) to retrofit three school buses with clean diesel technologies resulting in an estimated overall reduction in diesel emissions of 40 percent (2005).
- $171,000 EPA Clean School Bus USA Grant to retrofit 110 school buses with clean diesel technologies resulting in an estimated overall reduction in diesel emissions of 40 percent.

Dream in Green
Dream in Green is a non-profit organization whose mission is to develop and implement programs that promote energy conservation and efficiency, environmental sustainability, and the use of renewable energy. They build partnerships with schools, local governments, and businesses for the purpose of reducing greenhouse gas emissions, waste, and reliance on fossil fuels. Their programs emphasize education and behavior change.

The Green Schools Challenge involves students and staff directly in designing and implementing environmental and energy solutions at their schools. Local schools reduce their

overall carbon footprint while promoting environmental sustainability. Activities are often student-led and usually promote low and no cost conservation as part of the overall plan to reduce the school's carbon footprint.

Since the launch of the Green Schools Challenge in August 2006, Dream in Green has expanded the program from three to 44 schools in Miami-Dade, the nation's 4th largest public school district. Each of the pioneering schools is taking concrete steps to lower its electricity consumption, recycling and carbon footprint. The collective efforts of the participating schools saved (from September 2008 to March 2009) over $414,000 in energy costs, which translates to approximately 9,800,000 kWh of electricity. M-DCPS schools also recycled over 375,000 pounds of paper, plastic, and aluminum, mitigating over 14,000,000 pounds of carbon dioxide.
(Source: http://www.dreamingreen.org/index.php & http://www.greenometer.org)

Florida International University

- **Climate Action Plan – September 15, 2009**
  Florida International University's (FIU) Climate Action Plan, dated September 15, 2009, outlines greenhouse gas emissions of FIU, as well as the University's plan to reduce its environmental impact. It takes into consideration findings from the FIU Greenhouse Gas Inventory Summary Report submitted in 2008 by the FIU Presidents Climate Commitment Task Force.

  The Climate Action Plan will guide FIU into a more sustainable future through education, research, and mitigation strategies. The report found that achieving reductions are economically feasible, and require the dedication of the entire FIU community. Reductions will be achieved through mitigation strategies in the areas of transportation, building and energy, solid waste, and offsets. Other notable areas include sustainable efforts, and student sustainability initiatives. *Specific indicators will be included into this assessment at a later date.*

- **FIU Facilities Management**
  FIU's Facilities Management Department is the center for quality service and performance excellence in the development of the University's physical environment. It is their mission to provide for the physical development and growth of the university community, and is committed to providing quality, sustainable facilities, and diligent oversight of all aspects of the physical environment. Recycling and waste reduction strategies at FIU include, but are not limited to: the recycling program, energy reduction, water consumption reduction, purchasing recycled materials, and the LEED program which will cause all future construction to be green. *Data and indicators will be provided at a later date.*
  (Source: http://facilities.fiu.edu)

- **FIU Green – Sustainable Green Living Program**
  Florida International University's (FIU) Sustainable Green Living Program is run by the multidisciplinary student organization, FIU Emerging Green Builders, with a coalition of students and young professionals from engineering, construction management, architecture, business and others, to promote the integration of technology, entrepreneurship, economic and political leadership into the green building movement. Its vision is to provide a unique educational and outreach opportunity to FIU students and professionals to enhance their education and training through involvement in real-world sustainable green building projects. Its mission is to create a cohort of emerging green building leaders and to develop opportunities for networking through the United States Green Building Council (USGBC) and other green building organizations to generate momentum for the green building industry.
  (Source: www.fiugreen.org)

FIU began offering a course this fall for a professional certification in sustainable construction. This interdisciplinary Professional Certificate provides both traditional students and practicing professionals with a unique learning experience that enhances their design and management capabilities in the emerging field of sustainable building design and construction. The program focuses on an integrated system approach to apply basic engineering science/architectural principles to practical applications through interdisciplinary teamwork.
(Source: web.eng.fiu.edu/~green/sc/Program.html)

Miami Dade College – Strategic Plan 2004-2010
The Strategic Plan is the active blueprint, guiding the efforts of the College for the past years. Under the forth strategic theme "Serving the Community" a strategic goal was created to address sustainability in their plan. It was defined as "Promote environmental sustainability within the College, student body, and broader community". The recommended actions identified are the following:

- Establish policies and procedures that encourage environmental sustainability
- Provide campus-based programs/events that educate about sustainability
- Increase the number of courses addressing environmental sustainability in relation to the specific discipline (credit and non-credit)
- Denote on course schedule the course with an environmental sustainability component
- Implement MDC Energy Conservation Program
- Revise MDC Facilities Management design & construction standards for new construction/remodeling/renovation of facilities to include sustainability requirement
- Seek financial support for "Greening" Across the Curriculum

The One Year Milestone of these actions are the following:

- Establishment of Green teams at 6 of the 8 campuses
- Paper recycling college wide
- Paper and beverage container recycling during Book Fair
- Development of the College-wide energy conservation policy
- Upgrade lighting/AC control systems & automatic/motion sensor lighting controls in offices (measure = % of systems/controls updated)
- Increase partnership initiatives with FPL to reduce consumption & engage Energy Service Company (ESCO) services for college-wide energy audit to explore further energy conservation measures
- Grants Proposals funded (added 12/2008)
- A variety of courses through Community Education Departments including the Environmental Center and the Green Urban Living Center.

The Strategic Plan is presently under revision for the development of the 2010 – 1015 update.
(Source: http://www.mdc.edu/main/news/president/2010/strategicplan10-15.asp)

Miami Dade College - Earth Ethics Institute
Earth Ethics Institute (EEI) opened its doors, as the Environmental Ethics Institute, in 1993 and has been a catalyst for introducing administrators, faculty, staff, and students at Miami Dade College (MDC) to a new way of thinking called "Earth Literacy." Grounded in the profound implications of the story of the evolution of our 14-billion-year-old universe and the developmental process out of which the Earth and all life emerges, Earth Literacy fosters respect for Earth and life in all its diversity. EEI provides resources, workshops, and programs for the MDC community that encourages the integration of the knowledge, values, and skills needed for a sustainable way of life in all practices and disciplines. EEI fosters an awareness of global interdependence, ecological integrity through biological diversity, and the natural processes that sustain life.

Several MDC programs or initiatives include:

- *Green Studies Workshops:* EEI offers a series of professional development workshops for MDC faculty interested in infusing ecological concepts and a cosmological context into the course objectives of their disciplines. Dozens of MDC faculty have participated in EEI workshops, featuring topics such as Greening the Curriculum, Biophilia, Culture and Cosmology, Technology and Sustainability, and Ethics.
- The integration of a green perspective into many faculty lesson plans.
- Encouraging the purchase of green products.
- Providing a series of Photovoltaic Workshops to educate the community.
- *Organic Gardens:* Since 2004 EEI has been partnering with Miami Dade County Public School teachers and Three Sisters Organic Farm to establish organic vegetable gardens within the schools, to be used as outdoor, experiential learning centers. In this context teachers and students can explore a wide range of subjects while fulfilling the Florida Sunshine State Standards. Students learn to take ownership and responsibility for their plants, write poems about the garden, measure, chart and compare growth of the plants, and learn about nutrition, food preparation and self care. In addition, lessons about ecology, companion plants, composting and decomposers present an opportunity for developing a deep understanding of the interconnectedness of all living things and the importance of diversity.

(Source: www.mdc.edu/environethics/index.asp)

On October 26, 2009, Dr. Padron appointed a College-Wide Environmental Sustainability Steering Committee. Chaired by Dr. Gina Cortes-Suarez, president of MDC InterAmerican Campus, the committee will serve as an advocacy group for environmental sustainability at the College. Activities will include but are not limited to: facilities related sustainability efforts, college and community awareness, recycling, resource development coordination, career preparation, curriculum development, etc.

The current MDC Strategic Plan, which expires 2010, includes environmental sustainability, and drafts of the new plan are putting a stronger emphasis on sustainability in the future. Also MDC Learning Outcomes include a specific outcome that all departments and disciplines are addressing. All MDC graduates are being assessed on Learning Outcome #10 that states "Describe how natural systems function and recognize the impact of humans on the environment."

University of Miami – Green U

Through its teaching and research endeavors, as well as the operations of its overall enterprise, the University of Miami (UM) is committed to the safeguarding of the environment. Innovative programs in schools and colleges, interdisciplinary centers and institutes, and events and activities throughout the University address issues involving a wide spectrum of environmental concerns. In 2005, the University launched Green U, a program coordinated by the Office of Environmental Health and Safety aimed at making UM a community leader in the acquisition of environmentally responsible products and the practice of ecologically sound maintenance and operations procedures.

Through its Green U initiative, the University of Miami established a university-wide goal to be a community leader in becoming more sustainable, a goal that requires active participation of the entire University community. Green U includes numerous conservation and energy efficiency initiatives, recycling initiatives and certification initiatives, and certified products. The University is also the home to the first high-rise in South Florida - residential or commercial - that was designed and built for energy efficiency and sustainability. The new Clinical Research Institute is home to clinical trials and other medical research at the UM Miller School of Medicine. The Biomedical Research Institute currently under construction will be LEED certified.

In 2006, student leaders founded Sustainable U to educate faculty, staff and students at UM about the benefits of engaging in activities on campus that sustain, rather than deplete, the environment. Student have implemented Recycle Canes, a comprehensive recycling program on the Coral Gables campus, got hybrid vehicle owners a 50 percent discount on parking passes and work closely with university administration to plan and implement future sustainable efforts. *(Source: www.miami.edu/greenu)*

Talloires Declaration

Originally composed in 1990 at an international conference in Talloires, France, this is the first official statement made by university administrators of a commitment to environmental sustainability in higher education. The Talloires Declaration (TD) is a ten-point action plan for incorporating sustainability and environmental literacy in teaching, research, operations and outreach at colleges and universities. It has been signed by over 350 university presidents and chancellors in over 40 countries.

The Association of University Leaders for a Sustainable Future (ULSF) serves as the Secretariat for signatories of the Talloires Declaration. Its mission is to support sustainability as a critical focus of teaching, research, operations, and outreach at colleges and universities worldwide through publications, research, and assessment.

Several local colleges and universities have signed the Talloires Declaration, and as members they can develop their own course of action with the goal of achieving greater environmental sustainability and awareness on campus.
(Source: http://www.ulsf.org/index.html)

COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

No feedback is available at this time.

Solid Waste & Recycling

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 including human health, the environment, land use, and economic development. Waste materials originate from a variety of sources including industrial, agricultural, commercial and domestic activities.

In Miami-Dade, 3,769,683 tons of waste were managed by both the public and private sectors through landfilling, incineration, and recycling practices in 2008. This area provides information on countywide waste quantities, facility capacities, treatment strategies including recycling composition and rates, and the air pollution and greenhouse gas (GHG) emissions associated with the various strategies.

Solid Waste & Recycling

Assessment Area

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 including human health, the environment, land use, and economic development. Waste materials originate from a variety of sources including industrial, agricultural, commercial and domestic activities. In Miami-Dade, 3,769,683 tons of waste were managed by both the public and private sectors through landfilling, incineration, and recycling practices in 2008. This area provides information on countywide waste quantities, facility capacities, treatment strategies including recycling composition and rates, and the air pollution and greenhouse gas (GHG) emissions associated with the various strategies.

The County's Department of Solid Waste Management (DSWM) handles a large portion of solid waste collection. The geographic area where DSWM provides garbage and trash collections services is known as the Waste Collection Service Area (WCSA) and consists of the unincorporated part of the County, as well as nine municipalities that contract with DSWM for these services. In addition to waste pickup services, DSWM also operates 13 Trash and Recycling (T&R) drop off centers in the WCSA. DSWM also provides recycling services in the County's unincorporated area and to 11 municipalities through interlocal agreements. All other municipalities provide garbage and trash collection and recycling services to their residents.

The County contains two operating landfills (one that accepts trash and one that accepts trash and garbage), three regional transfer stations, and two closed landfills, all of which are managed by DSWM. Private landfills in the County include a landfill that accepts both trash and garbage within the municipality of Medley and two landfills that accept only construction and demolition type materials. The County also has two home chemical collection centers, both managed by DSWM.

While DSWM does not provide garbage, trash, and recyclable services to all areas of the County, it does have countywide responsibility for the regulation of waste collection, transportation of waste, and recycling activities, as well as any enforcement connected to these activities. DSWM also manages an agreement for the operation of the Resources Recovery facility (including onsite ashfill), one of the largest waste-to-energy facilities in the world.

There are challenges associated with garbage, trash, and recycling in the County, as outlined below.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- The dwindling capacity of county landfills.
- An aging and antiquated system.
- Planning for the appropriate location of future facilities considering population changes and shifts due to land-use strategies changes and climate change impacts.
- The expiration of major disposal agreements with municipalities and private entities in 2015 and the expiration of the waste-to-energy facility operating contract in 2023 (with options to renew).
- An existing business model based on more tons of garbage in, more money in the system.

- The new statewide recycling goal of 75 percent (House Bill 7135) to be achieved by the year 2020.
- Disposal tonnage is significantly impacted by the economy and hurricane activity.
- Alternative disposal methods for the best use of organic waste, such as composting, will be explored in the Solid Waste Master Planning process.

ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

Indicators presented in this area include the amount of waste each person contributes to the waste system, a breakdown of the amount of waste distributed to each facility, the amount of waste treated by various strategies, and ultimately the impact of waste on the capacities of our waste facilities. Also considered in this area are the air pollution and greenhouse gas (GHG) emissions associated with the different waste management strategies of landfilling, incineration, and recycling.

The waste per person ratio and its percentage of change since 2003 is shown in Table 1. The waste per person ratio decreased in 2003 and 2004 but climbed in 2005 and 2006 before the 2007 decrease. The 2005 and 2006 increase was caused by the waste generated by the two storms that impacted the County in 2005. More recently, the current state of the economy has had an impact on the disposal environment. Consumers are buying less and therefore disposing of less material. The reduction in tonnages has not only been felt in Miami-Dade but it has had an affect on the entire waste industry nationwide.

Table 1

Waste per Person and Percent Change in Waste per Person
(Annual Tonnage - Wastestream / Population)
(FDEP Report / calendar year / gross tons)

	2003	2004	2005	2006	2007	2008
Waste/person	1.79	1.73	1.88	2.08	1.86	1.61
% Change in waste/person	-0.5%	-3.5%	8.7%	10.6%	-10.6%	-13.44%

**Note 2008 data published by FDEP*

Tables 2 a and b shows that the overall amount of waste collected by both the public and private sectors was less in 2008 than in 2003, with an increase in the amount recycled and a decrease in the amount incinerated and landfilled. While this is true, the amount of waste managed by each method has remained proportionally consistent over those years; 20 percent recycled, 20 percent incinerated, and 60 percent landfilled. Presently the County has a goal to meet a recycling rate of 30 percent, which includes all recycling including yard trash and mulching.

Table 2a

Amount of Waste Managed through Recycling, Incineration and Landfilling by Public and Private Sector (FDEP Report / calendar year / gross tons)

	2003	2004	2005	2006	2007	2008
Recycling	746,991	709,215	775,022	918,696	823,229	775,181
Incineration	843,475	725,368	692,434	669,410	636,387	750,893

Landfilling	2,402,737	2,452,867	2,893,917	3,290,231	2,930,608	2,243,609
Total	3,993,203	3,887,450	4,361,373	4,878,337	4,390,224	3,769,683

Table 2b

Percentage: Amount of Waste Managed through Recycling, Incineration and Landfilling by Public and Private Sector (FDEP Report / calendar year / gross tons)

	2003	2004	2005	2006	2007	2008
Recycling	19%	18%	18%	19%	19%	21%
Incineration	21%	19%	16%	14%	14%	20%
Landfilling	60%	63%	66%	67%	67%	59%
Total	100%	100%	100%	100%	100%	100%

Table 3 below shows the amount of waste managed by the County's DSWM, versus the previous consideration of waste managed by both public and private facilities. The Resource Recovery facility handles the largest amount of waste in the County.

Table 3

Annual Amount of Waste Disposed or Processed at each County Disposal Facility (Tons)

	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008
South Dade Landfill	429,150	503,846	740,783	873,997	537,675	486,491
North Dade Landfill	315,522	317,758	344,439	582,782	254,285	203,310
Resources Recovery - Incinerated	582,394	495,023	495,477	533,633	534,934	570,064
Resource Recovery - Ashfill	144,100	148,769	140,800	158,057	164,439	173,854
Total	1,471,166	1,465,396	1,721,499	2,148,469	1,491,333	1,433,719

The County's available landfill capacity has steadily decreased from 7,275,674 tons in 2003 to 4,935,010 tons in 2008, a 32 percent reduction over that time period. Table 4 below shows estimates of the year by which each facility is expected to reach capacity. North Dade Landfill is the first facility expected to reach capacity sometime between 2012 and 2014. The Department has a capital project underway that will extend the capacity of the South Dade Landfill and other projects under consideration that may extend capacity at all facilities.

Table 4

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

Table 5 shows the recycling rates for various material types for the entire County which includes the County's recycling program, other governments and private recycling.

Table 5
Waste Products Collected and Recycled (Tons) by Material Type

Materials	2000	2001	2002	2003	2004	2005	2006	2007	2008
Aluminum cans	7%	11%	42%	17%	6%	6%	4%	7%	6%
C&D debris	45%	13%	9%	13%	6%	9%	13%	9%	11%
Corrugated paper	38%	36%	26%	31%	31%	36%	29%	34%	30%
Ferrous metals	47%	51%	42%	28%	53%	43%	54%	51%	56%
Food	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glass	21%	19%	30%	23%	12%	20%	17%	18%	10%
Miscellaneous	16%	14%	17%	14%	6%	5%	5%	5%	6%
Newspaper	32%	27%	22%	25%	21%	21%	28%	24%	17%
Non-ferrous metals	21%	36%	30%	51%	32%	42%	41%	41%	44%
Office paper	3%	8%	5%	5%	3%	4%	2%	6%	7%
Other paper	5%	4%	5%	6%	3%	4%	5%	6%	8%
Other plastics	0%	0%	0%	0%	0%	0%	0%	1%	1%
Plastic bottles	17%	21%	18%	10%	10%	10%	15%	17%	7%
Process fuel	100%	0%	100%	100%	100%	100%	100%	100%	100%
Steel cans	35%	39%	3%	4%	2%	12%	2%	2%	68%
Textiles	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tires	31%	38%	34%	33%	22%	11%	7%	54%	69%
White goods	100%	100%	100%	100%	100%	100%	100%	100%	100%
Yard trash	4%	8%	8%	7%	7%	19%	23%	14%	14%
County Totals	**25%**	**20%**	**18%**	**19%**	**18%**	**18%**	**19%**	**19%**	**21%**

In 2008, the County transitioned from the dual stream recycling program in June, to the single stream recycling program, which began in July 2008 and was fully implemented by January 30, 2009. Table 6 shows that since the implementation of the Single Stream recycling program, the annual tons collected through the curbside recycle program increased by 88 percent in reference to the previous year.

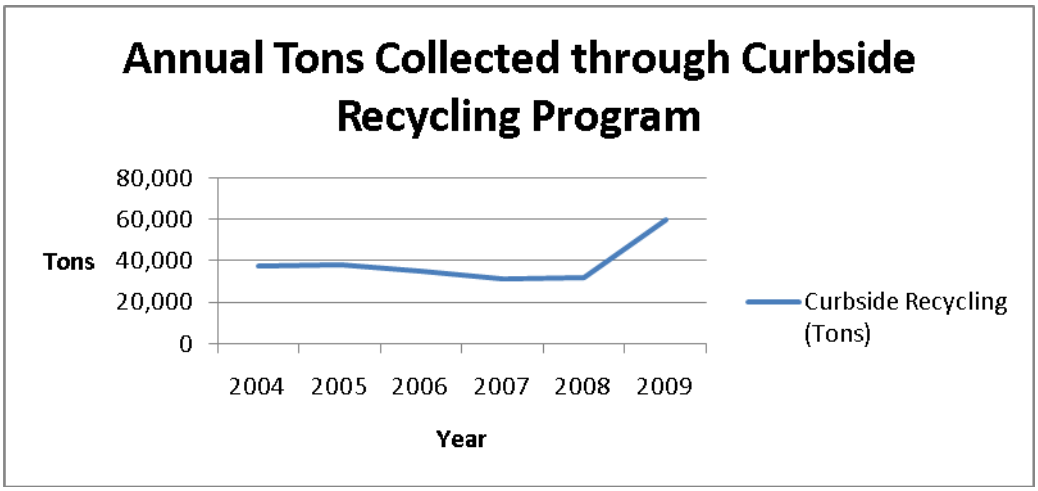


Table 6
Annual Tons Collected through Curbside Recycling Program
(Tons)

FY2004	FY2005	FY2006	FY2007	FY 2008	FY2009
37,651	37,878	34,751	31,229	31,778	59,616

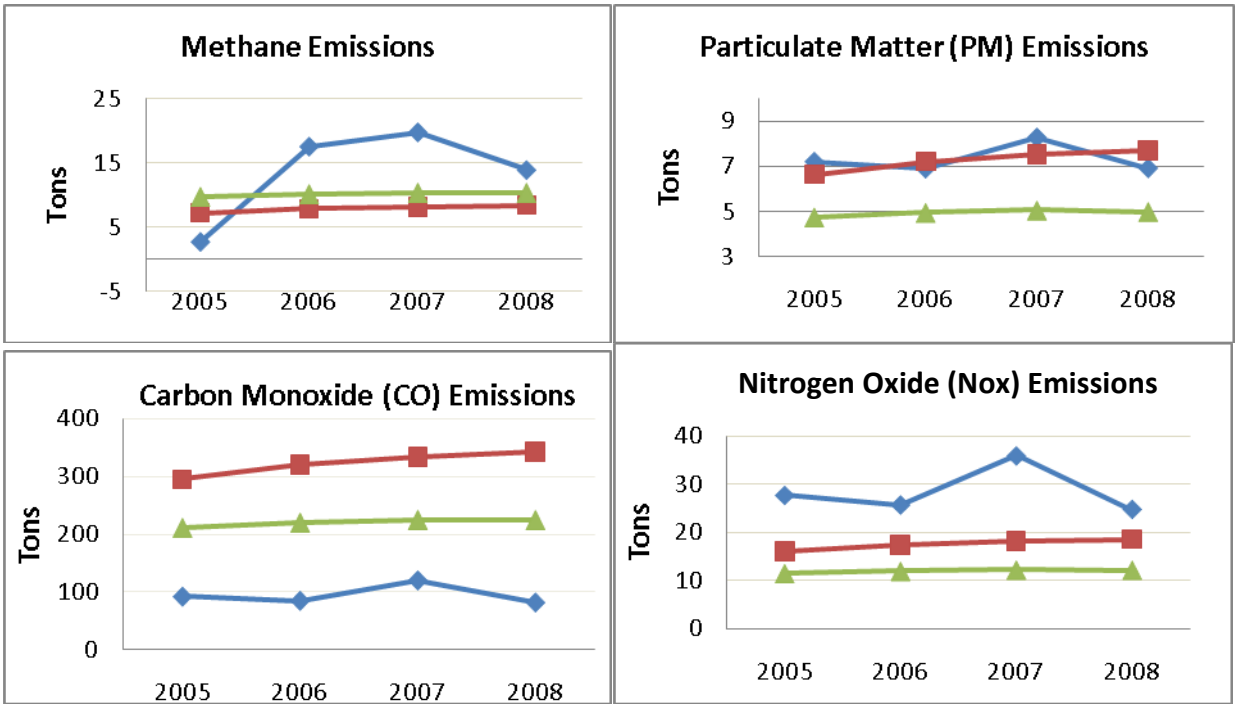
In addition to the incineration of garbage to generate electricity, the Resources Recovery facility produces RTI Biomass fuel that is sold outside of Miami-Dade County. Table 7 shows the amount of waste used to produce fuel has decreased from 179,484 tons in 2004 to 100,285 tons in 2008. The decrease in fuel production is due to the lack of availability of feedstock and mechanical difficulties at the facility.

Table 7
Waste to RTI Biomass Fuel Sold Outside Miami Dade County
(Tons)

	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008
RTI Biomass Fuel	143,251	179,484	178,290	97,042	108,128	100,285

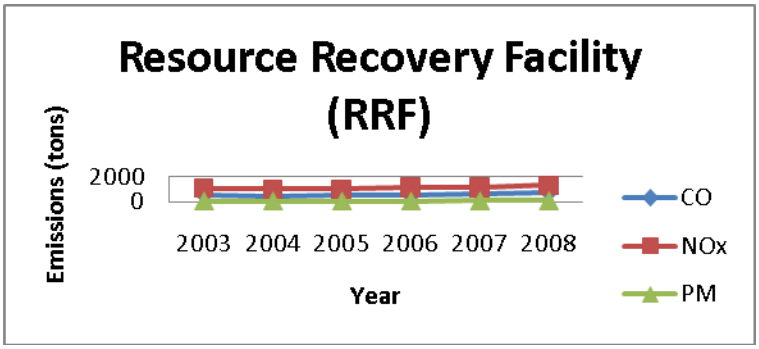
Air Pollution Emissions Associated with Incineration, Landfilling and Recycling

The charts below show emissions of the the four largest pollutants from the three major landfills in the County. Methane emissions are produced from the breakdown of organic matter in the landfill. All three landfills have gas collection systems which collects some of the methane gas, which is burned by a flare. The CO, NOx and PM emissions are by-products of the methane combustion. The spike in emissions between 2005 and 2007 is most likely a result of additional materials being landfilled due to debris from the 2005 hurricanes.



Blue – **Waste Management Landfill**
Red – **South Dade Landfill**
Green – **North Dade Landfill**

The chart below shows emissions from the Miami-Dade County Resource Recovery facility. This is the largest solid waste handling facility in the county. The waste however is not landfilled but is used as fuel to generate electricity. The CO, NOX and PM emissions are by-products of combustion of the waste. The majority of PM emissions are captured through pollution control devices. While the NOX and CO emissions are higher than those from landfilling and flaring, combustion of waste produces electricity, diverts waste from landfills and prevents the production of methane gas from the degenaration of waste.



Greenhouse Gas Emissions Reductions from Recycling
Emissions not illustrated above are those avoided all-together through recycling. By diverting waste, recycling realizes significant emissions reductions through avoidance of methane gas production from landfills. As a result of County's original GHG mitigation efforts from 1990 to 2005, over 34 million tons of equivalent CO2 GHG's were reduced or avoided. Approximately 76 percent, or 26 million tons, of these avoided GHG emissions were due to recycling.

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Comprehensive Development Master Plan
The Comprehensive Development Master Plan's (CDMP) Solid Waste Sub-Element contains one goal, six objectives and 25 policies. The goal is to "Provide an integrated solid waste management system in conformity with federal, State and County law which promotes the public health, sanitation, environmental protection, operational efficiency, beneficial land use and growth patterns and is funded through fair and equitable means."

The CDMP policies call for, among other things:

- The continued development and management of a single consolidated solid waste system and shall discourage the establishment of disposal facilities not integrated in the system. (SW-5B)
- Miami-Dade County shall reduce the amount of waste requiring disposal through reliance on recycling programs or other alternative solid waste management strategies. (SW-4B)
- The County shall promote the establishment and expansion of markets for products and materials created from recycled wastes through cooperative state and federal efforts, County purchasing policies, and by encouraging the purchase of such products by County vendors, clients and citizens. (SW-4C)
- The County shall provide for the reduction of per capita production of solid waste by encouraging the use of waste reduction technologies and recyclable packaging materials, to the extent possible. (SW-4D)
- The County shall minimize the amount of yard trash disposed of in landfills through the development of alternative means that include encouraging, among other innovative programs, diversion or composting of biodegradable materials other than yard waste. (SW-4E)

Miami-Dade Solid Waste Master Plan
In addition to the goals, objectives, and policies listed in the CDMP's Solid Waste Sub-Element, DSWM is currently undertaking a master planning process that will meet the waste reduction, collection, recycling, transfer and disposal needs for Miami-Dade County for the next 50 years. The goal of this Plan is to identify and develop activities, programs, facilities, and technologies that will provide sustainability, resource conservation, source reduction, recycling, and diversion, disposal and collection options and ensure public health and environmental protection for the next generation of County residents.

The development of the plan began in June 2009 and will be completed in 36 months. Completion of the first phase is expected in 13 months. It will specifically focus on:

- Provide System Financial Stability
- Minimize Operating Costs
- Conserve Landfill Capacity
- Provide Higher Level of Customer Service
- Develop Public/Private Disposal Partnerships
- Regional Capacity for Long-Term Needs

The Plan will inventory, evaluate and assess the existing solid waste management system including, but not limited to the facilities, operations, contracts/agreements, financial state, regulatory environment, etc. and define long-range goals for the future solid waste management system in general terms regarding technologies, cost, customer convenience, environmental impacts, county-municipal relations, risk, etc.

The goals and priorities are to be developed through an open and public consensus building process involving the community, county government, municipalities, haulers, regulators and various stakeholders. It will identify and prioritize system needs in general terms as defined by the gap between the existing system and the long-term goals. It will develop corresponding criteria for evaluation of waste management alternatives. Based on the recommendations of this Plan, DSWM may amend the policies detailed in the CDMP to reflect future growth and development of DSWM.

Existing Legislation
There are federal and state legislative items that may affect DSWM operations as it relates to recycling and renewable/clean energy. The Energy, Climate Change, and Economic Security Act of 2008 (House Bill 7135) signed into law by Governor Crist created Section 403.7032, Florida Statutes. This establishes a new statewide recycling goal of 75 percent to be achieved by the year 2020. The statute directs the Florida Department of Environmental Protection (FDEP) to develop a program designed to achieve this goal and submit it to the Legislature for approval by January 1, 2010. DSWM's contribution towards the goal includes solid waste material converted to energy (i.e., waste to energy plant) and residential curbside recycling collection. Additionally, the DSWM is seeking the inclusion of landfill gas energy projects as part of meeting the recycling goal. DSWM is expanding its enforcement of the commercial recycling ordinance, which will increase overall recycling tonnage. The combination of the waste-to-energy plant, residential curbside recycling, and landfill to gas energy projects will help the DSWM contribute to reaching the state wide goal.

A comprehensive legislative item regarding Renewable Energy reflects the DSWM's ongoing efforts to both preserve waste-to-energy's inclusion in applicable definitions of "renewable

energy" and "green energy" and to provide incentives and other support for the production of such renewable energy.

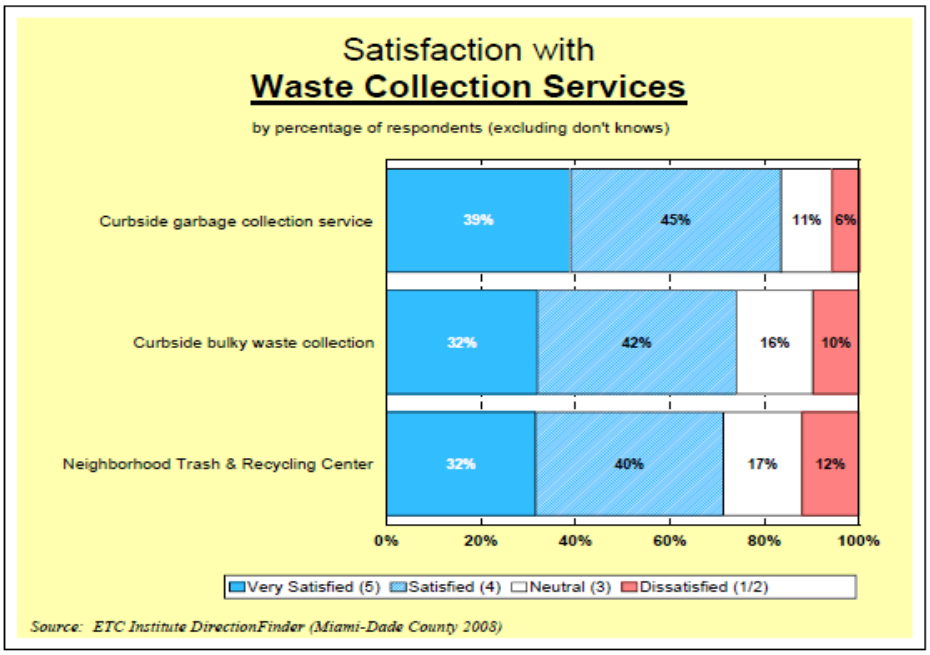
Additionally, there are two air emission standards established by the United States Environmental Protection Agency/Florida Department of Environmental Protection (USEPA/FDEP) that may be modified and therefore, could affect DSWM facilities in the foreseeable future, (Mercury and Greenhouse gases). They both include Carbon Dioxide, Methane and Nitrous Oxide. The FDEP has expressed that Mercury from the Waste-to Energy plant may require continuous emissions monitors which is equipment that analyzes stack emissions continuously on a real time basis. Currently, the stack emissions are monitored once yearly. Effective January 1, 2010, landfills and the waste-to-energy plant must keep an inventory of Greenhouse gas emissions. Data collected through the inventory will most likely be used as a basis for limiting (capping) Greenhouse gases from solid waste facilities. Facilities emitting over a certain established threshold(s) will have to offset the Greenhouse gases by buying credits and/or paying a fee. The American Clean Energy and Security Act (Federal Legislation - HR 2454), proposes a cap-and–trade system which is projected to begin in 2012.

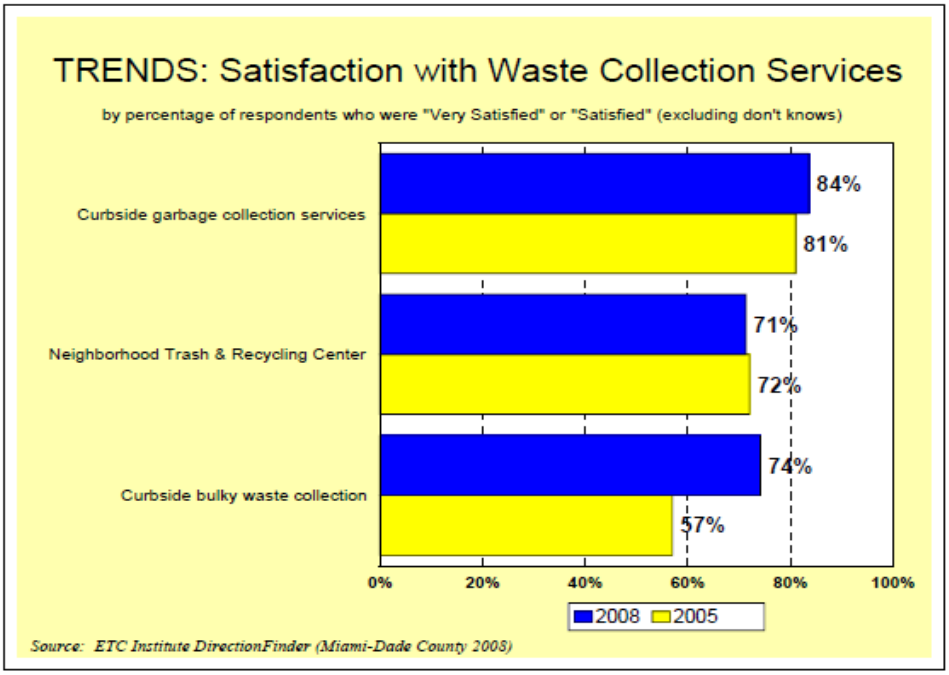
COMMUNITY FEEDBACK

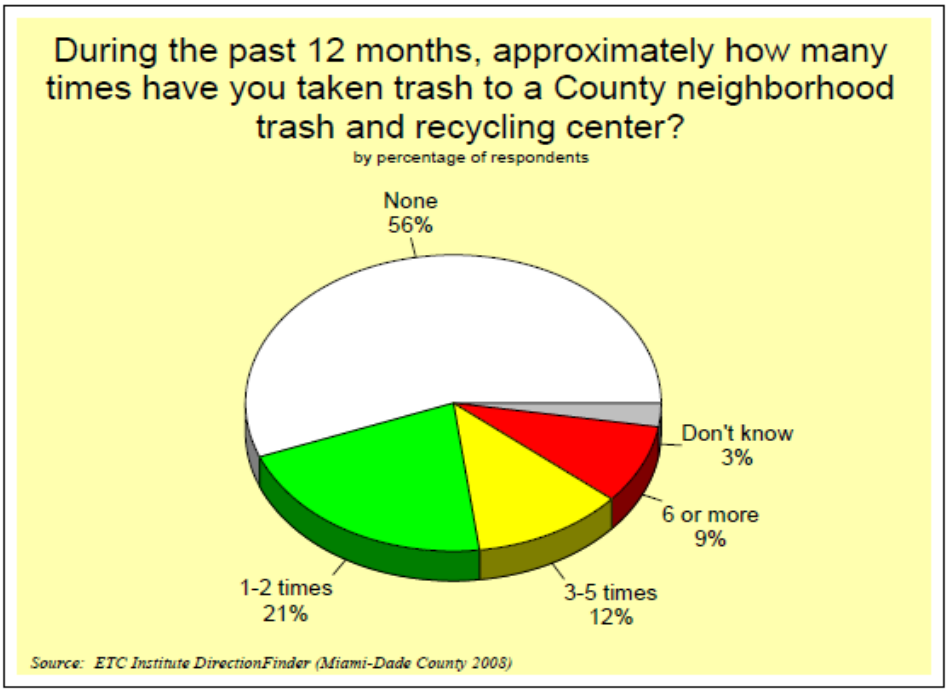
Feedback & results gathered though the planning process or surveys

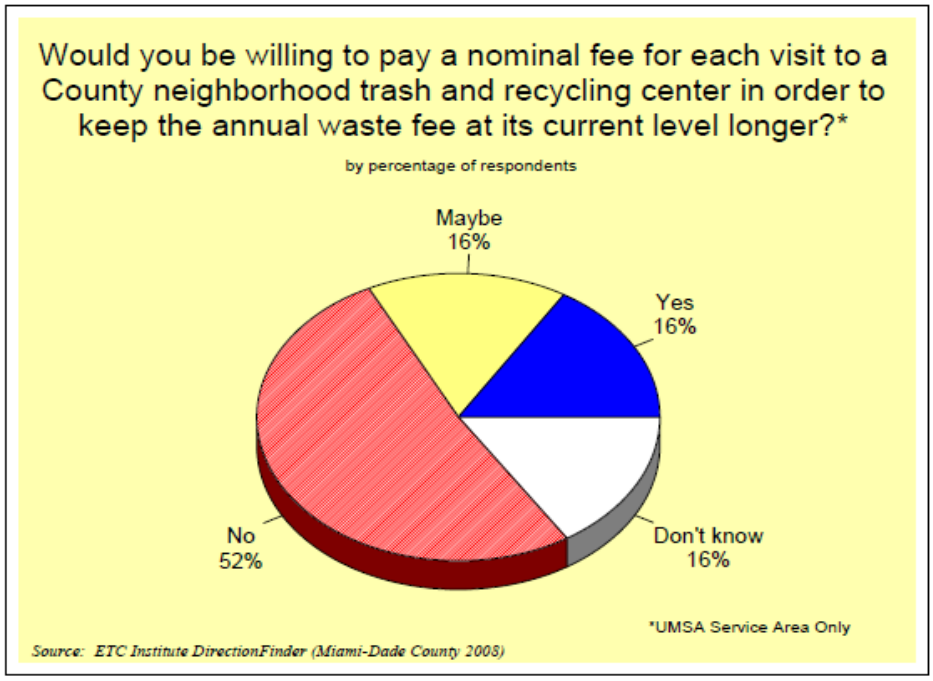
During the fall of 2008, ETC Institute administered a Resident Satisfaction Survey for Miami-Dade County to assess resident satisfaction with the delivery of major county services and to help determine priorities for the community as part of the County's ongoing planning process. Of the 20,000 households that received surveys, 5,522 were completed (a 27 percent response rate). The survey was administered in English, Spanish, and Creole.

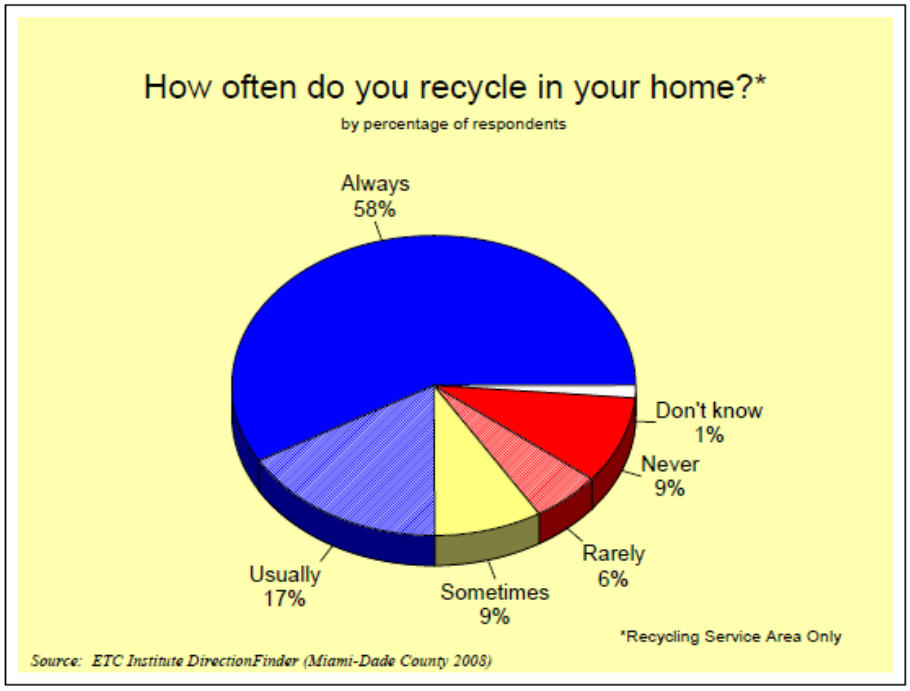
Below are the results related to resident satisfaction with waste collection services and recycling.

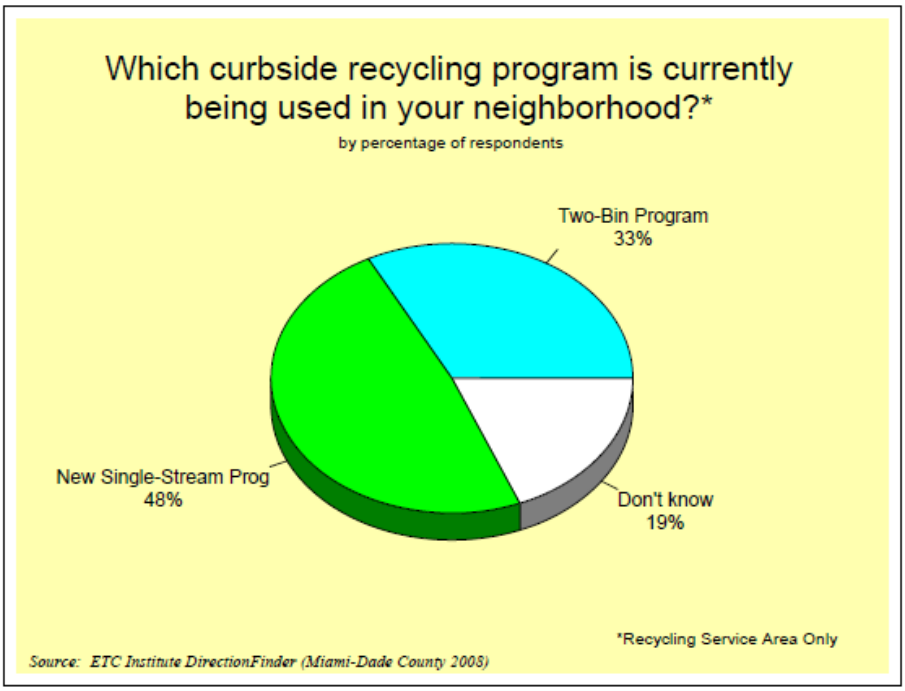


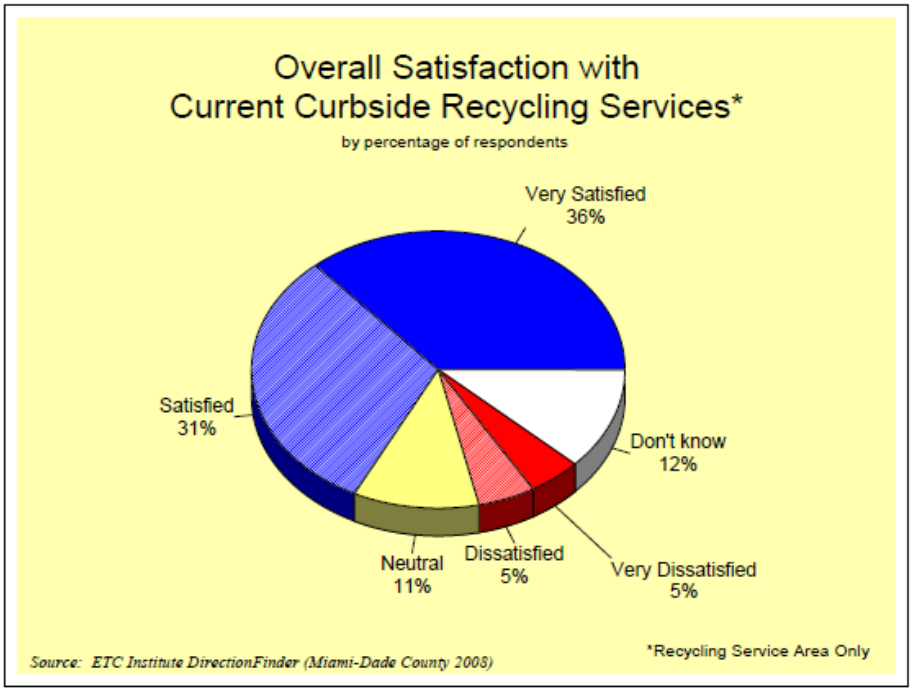

TRENDS: Satisfaction with Waste Collection Services
by percentage of respondents who were "Very Satisfied" or "Satisfied" (excluding don't knows)
Curbside garbage collection services
84%
81%
Neighborhood Trash & Recycling Center
71%
72%
Curbside bulky waste collection
74%
57%
0%
20%
40%
60%
80%
100%
2008
2005
Source: ETC Institute DirectionFinder (Miami-Dade County 2008)


During the past 12 months, approximately how many times have you taken trash to a County neighborhood trash and recycling center?
by percentage of respondents
None
56%
Don't know
3%
6 or more
9%
3-5 times
12%
1-2 times
21%
Source: ETC Institute DirectionFinder (Miami-Dade County 2008)


Would you be willing to pay a nominal fee for each visit to a County neighborhood trash and recycling center in order to keep the annual waste fee at its current level longer?*
by percentage of respondents
Maybe 16%
Yes 16%
Don't know 16%
No 52%
*UMSA Service Area Only
Source: ETC Institute DirectionFinder (Miami-Dade County 2008)


How often do you recycle in your home?*
by percentage of respondents
Always 58%
Don't know 1%
Never 9%
Rarely 6%
Sometimes 9%
Usually 17%
*Recycling Service Area Only
Source: ETC Institute DirectionFinder (Miami-Dade County 2008)


Which curbside recycling program is currently being used in your neighborhood?*
by percentage of respondents
Two-Bin Program 33%
New Single-Stream Prog 48%
Don't know 19%
*Recycling Service Area Only
Source: ETC Institute DirectionFinder (Miami-Dade County 2008)


Overall Satisfaction with Current Curbside Recycling Services*
by percentage of respondents
Very Satisfied 36%
Satisfied 31%
Don't know 12%
Neutral 11%
Dissatisfied 5%
Very Dissatisfied 5%
*Recycling Service Area Only
Source: ETC Institute DirectionFinder (Miami-Dade County 2008)

Transportation

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, bikeability and walkability has been identified by many public surveys as indicators residents use to assess the quality of life within a community. Because personal 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. Therefore, land use practices, roadway design, the diversity of transportation choices, and the delivery of public transportation services, all play a part in the sustainability and performance of our transportation network, with the ultimate goal to move people in the fewest number of vehicles with the greatest fuel efficiency, in the quickest manner.

Transportation

Assessment Area

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, bikeability and walkability has been identified by many public surveys as indicators residents use to assess the quality of life within a community. Because personal 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. Therefore, land use practices, roadway design, the diversity of transportation choices, and the delivery of public transportation services all play a part in the sustainability and performance of our transportation network, with the ultimate goal to move people in the fewest number of vehicles with the greatest fuel efficiency, in the quickest manner.

It is important to understand that one 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 influence the purchase of more efficient vehicles for both government and residential 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. Specifically, the four plans considered in this report are the 2035 Long Range Transportation Plan (LRTP), the Draft Transit Development Plan FY2010 to 2019 (TDP), the 2009 Freight Plan, and the Transportation and Land Use Elements of the Comprehensive Development Master Plan (CDMP). A brief description of these plans is provided in table below.

Name of Plan	Responsible Entity	Aligns with	Brief Description
Comprehensive Development Master Plan (CDMP)	Miami-Dade County – Planning and Zoning Department	Other plans listed below are supposed to align with the CDMP	It sets 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.
2035 Long Range Transportation Plan (LRTP)	Metropolitan Planning Organization–established via interlocal agreement by County and Florida Department of Transportation which follows rules and regulations established by the US Department of Transportation	CDMP	Guides transportation investments in Miami-Dade County. Because there is only a limited amount of funding available for transportation the LRTP is used to prioritize funding allocated to transportation projects for all modes (roadways, public transportation, non-motorized transportation, etc.)
Draft Transit Development Plan FY2010 to 2019 (TDP)	Miami-Dade County – Transit Department	LRTP	It is a strategic development and operational guide for public transportation used by Miami- Dade Transit for the next 10 year planning horizon.
2009 Freight Plan (Freight Plan)	Metropolitan Planning Organization	LRTP	The Miami-Dade Freight Plan has a goal of promoting regional goods movement that are socially and environmentally responsible.

The Transportation area of this report brings information from the various plans together in one place, identifies links, and presents key challenges that plan originators face when trying to put into action (implement) objectives that were designed to meet identified transportation needs of the county.

The challenges identified below are the result of a review of existing plans as well as discussions with the GreenPrint Interdepartmental Team, and are organized into categories/themes for clearer presentation, with overarching challenges listed first. The challenges in this section are very specific relative to other assessment areas due to the many facets of transportation including policy, planning, design, and service, as well as the stakeholders at the federal, regional, state and local levels.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES *Main challenges identified through collaborative stakeholder analysis of assessment data & indicators*	
Overarching	• Addressing conflicting policies, different levels of project reviews and compartmentalized reviews by individual departments. • Integrating sustainability into the development review and approval process, including the prioritization and selection of highway projects. • Promoting a true multi-modal balance by strengthening policy and financial commitment for transit, walking, and bicycling while dimishing the emphasis on maintaining or expanding roadway capacity. • Shifting funding to better support transit and non motorized modes, since current federal transportation funding formulas favor road expansion and construction.
Transportation Practices Related to Land-Use	• Increasing the demand for living in the urban core and designated urban centers. • Increasing transit-supportive, multi-family, and mixed-use developments. • Identifying and expanding alternative ways to address development and service costs associated with infill development and re-urbanization. The rate of infill development and re-urbanization is impeded by the cost of providing necessary infrastructure and services such as additional roadway capacity and utilities, such as water and sewer.
Highways	• Improving connectivity as a means to ease congestion. • Establishing urban-style roadway cross sections, that provide for the various modes of transportation within existing rights-of-way; Prioritizing rights-of-way users. • Establishing alternate ways to handle persistent traffic congestion.
Freight Movement	• Improving connectivity between intermodal facilities such as rail terminals/yards, deep water ports, river terminals, etc. • Reducing gaps and bottlenecks in freight corridors. • Relieving competition for roadway space between commercial cargo trucks and passenger cars during peak traffic periods, and minimizing delay in freight movement, while also taking into consideration bicycle and pedestrian needs. • Obtaining funding to implement the projects identified in the Freight Plan that achieve the highest sustainability benefits.
Transit & Alternate Modes	• Increasing transit ridership. • Changing the mindset of the community with regards to riding transit. • Facilitating development of additional priority transit corridors using

	propensity to ride public transportation as a key determinant. • Strengthening the County's policies regarding transit-supportive development near transit stations and corridors. • Expanding special use lanes for transit. • Preserving exclusive bus rapid transit corridors for intended purpose of serving as an alternative to the personal automobile. • Expanding Park and Ride facilities. • Providing safe, convenient, and comfortable transportation routes for bicyclists and pedestrians. • Increasing connectivity between pedestrian, bike, transit, and road facilities

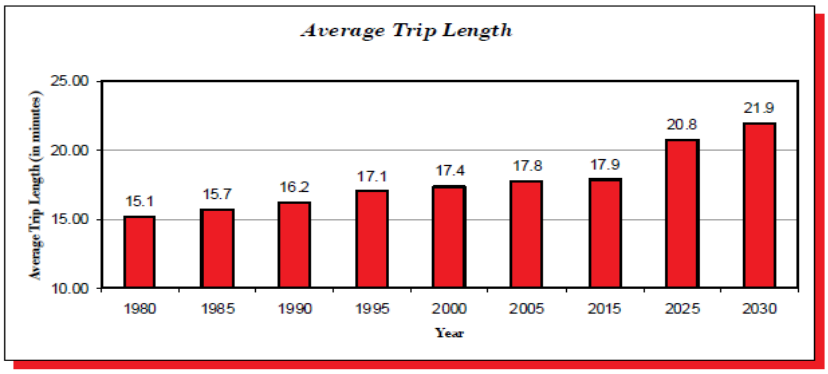
ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

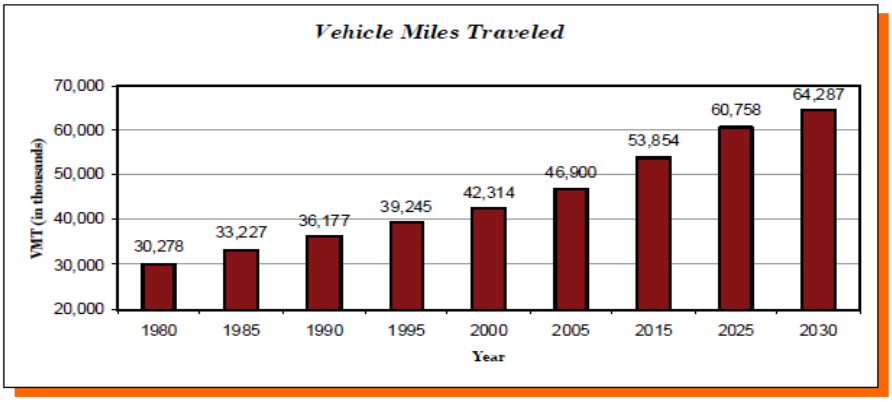
TRAFFIC

The following data trends are collected and reported by the Metropolitan Planning Organization (MPO) as a part of the development of the Long Range Transportation Plan. The information that follows is intended to provide a perspective on the condition of the current transportation network.

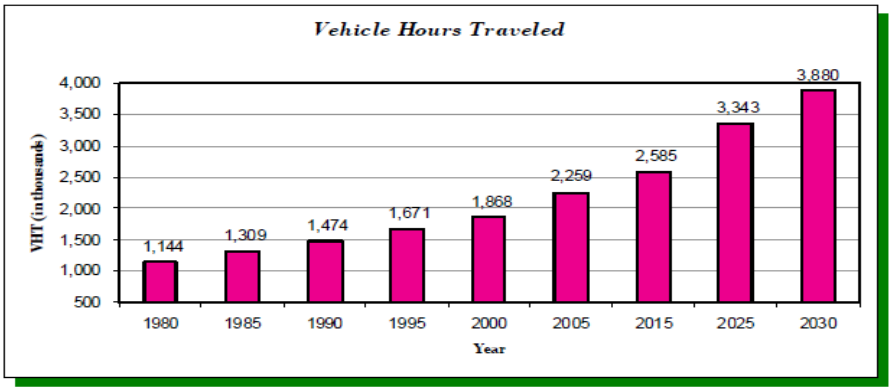
Average Trip Length (ATL) – One of the measures used by transportation planners and engineers to assess the demand on our roadways is the ATL, which represents the average duration of trips that people make on a typical weekday. This includes the one-way duration of trips made to go to work, the store, the gym, etc. **The ATL between 1980 and 2007 has increased from 15 minutes to almost 18 minutes, and is projected to further increase to almost 22 minutes by the year 2030.** The graph below shows the ATL for nine target years, from 1980 and projecting out to 2030.



Vehicle Miles Traveled (VMT) –VMT represents the total number of miles traveled by everyone in Miami-Dade County on a typical weekday. The 2007 countywide VMT of 48.3 million miles is calculated by multiplying the 2007 (County) average of 19.7 daily miles, by the number of travelers in the County on a typical weekday. **The growth in VMT between 1980 and 2007 was 60 percent,** a trend that is expected to continue, as shown below for nine target years, from 1980 and projecting out to 2030.

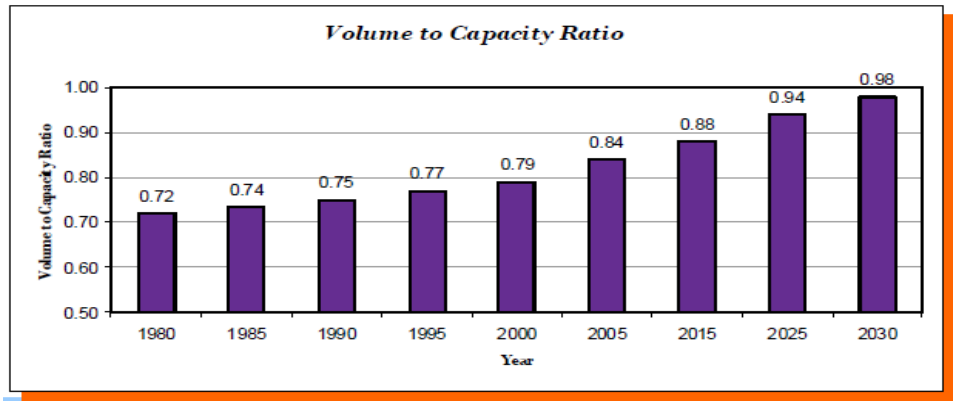


Vehicle Hours Traveled (VHT) – VHT represents the total number of hours of travel by everyone in Miami-Dade County on a typical weekday. The 2007 (County) average of 57 minutes, multiplied by the number of travelers in the County on a typical weekday, equals the 2007 countywide VHT of 2.3 million hours. **The growth in VHT between 1980 and 2007 was more than 100 percent,** a trend that is expected to continue, as shown in the chart below for nine target years, from 1980 and projecting out to 2030.



A challenge related to VHT is the need for Transportation Demand Strategies (TDM) that include public transportation and non-motorized transportation, such as walking and biking. Currently, subsidies are very limited and are only offered for transit riders and park-and-ride lots. The key to reducing VHTs will be to provide realistic and attractive travel options to driving, and therefore the list of TDM strategies should be broadened in order to encourage people not to drive.

Volume to Capacity Ratio (V/C) – V/C represents the total number of vehicles traveling on a particular roadway, and is usually measured on an hourly or daily basis. It is calculated by dividing the volume of traffic by the carrying capacity of that roadway. For example, if the volume is equal to the capacity, the ratio is 1.0 and that means that the road is gridlocked. The 2007 countywide average V/C is 0.85; meaning 85 percent of the capacity of the County's roadways is being utilized. The growth in V/C between 1980 and 2007 was 18 percent, a trend that is expected to continue, as shown below for nine target years, from 1980 and projecting out to 2030.



Additional indicators related to traffic are in the process of being developed through the County's Long Range Transportation Plan, within its Cost Feasible Assessment and its Climate Change Emissions Calculations Guidelines.

Cost Feasible Plan

Because there is only a limited amount of funding available for transportation improvements in Miami-Dade County during the LRTP projection period, the LRTPs Cost Feasible Plan divides funding among the different transportation modes (e.g. highway, public transportation, non-motorized transport). The total revenues and costs included in the 2035 Plan analysis and the funding split (highway vs. transit) was not available at this time of this draft report. It is expected that the information will become available within the public comment period and therefore incorporated into the final version of this document. Once this information is available, it can be used as an indicator to assess which modes and types of projects are receiving funding prioritization.

Climate Change Emission Calculation Guidelines

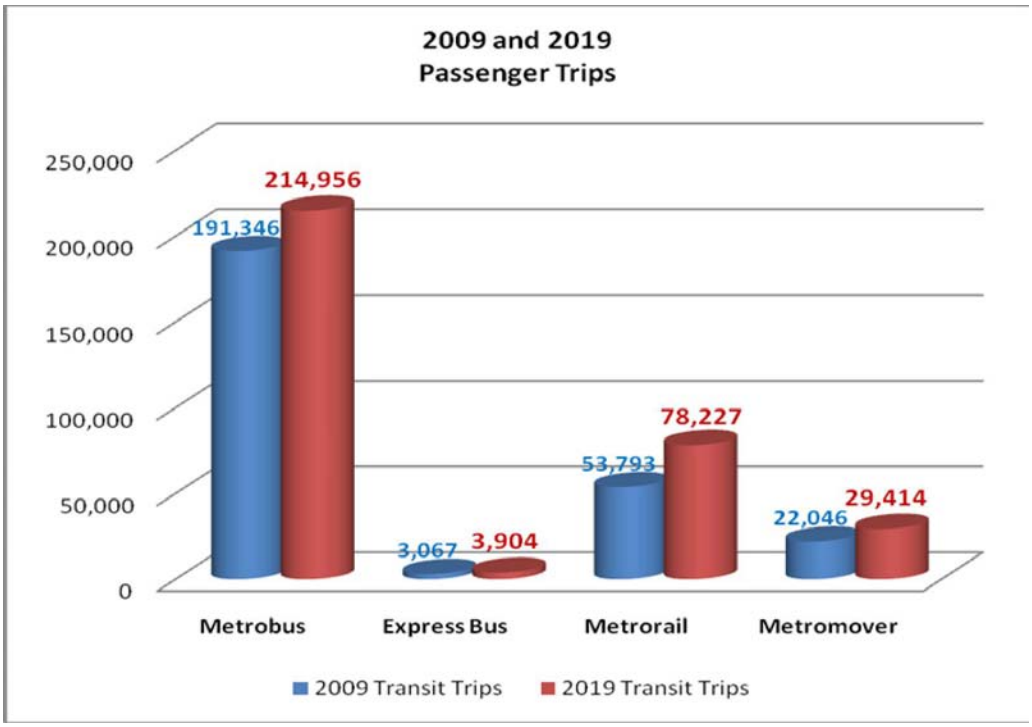
The LRTP's Cost Feasible Plan (LRTP) considers the following objectives when prioritizing projects for funding: (1) projects that mitigate the air quality impacts of transportation facilities, services, and operations; (2) projects that reduce fossil fuels use; and (3) projects that promote the use of alternative vehicle technologies. Projects under consideration will be assessed relative to the three objectives by estimating GHG and other pollutant emissions. The model output results will also include VMTs, travel volumes, congestion (levels of service), and travel times. The results of this analysis were not finalized at the time of this report, but will be used as a future indicator of the sustainability of projects contained in the LRTP. Once this information is available, they can be used as indicators to assess whether sustainability factors are playing a key role in determining funding prioritization.

PUBLIC TRANSPORTATION

Miami-Dade Transit (MDT) operates four transit modes: bus (Metrobus), heavy rail (Metrorail), automated guideway (Metromover), and demand-response service for residents with special needs (Special Transportation Services). While there are privately owned and operated jitneys and a small number of circulator bus systems run by municipalities, these services are limited in geographic scope and number of riders. Therefore the indicators included below relate to the public transportation options provided by Miami-Dade County. The following are measures set forth in the Draft Transit Development Plan to allow for the evaluation of future performance and for continued improvement of its system. The measures that relate most closely to sustainabile transit services, that is, goals that promote the most efficient use and expansion of public

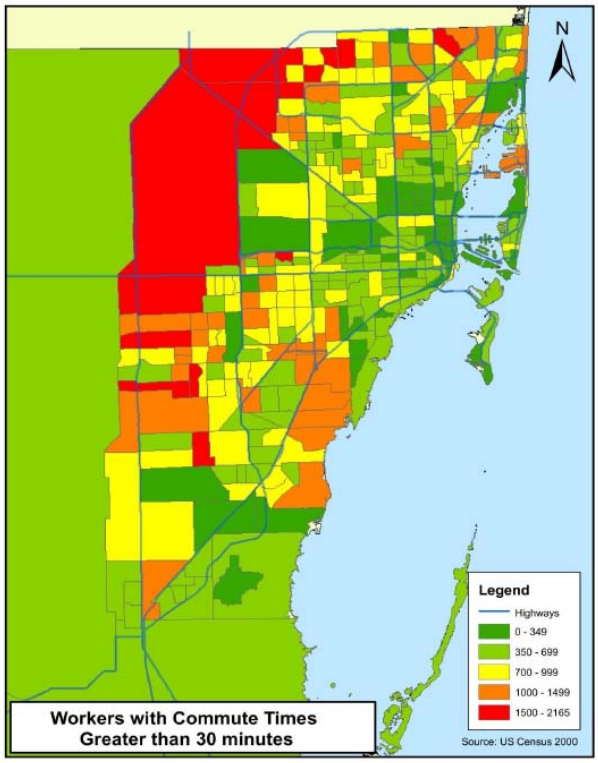
transportation, and those that support sustainable development such as infill and increasing ridership of mass transit are included here.

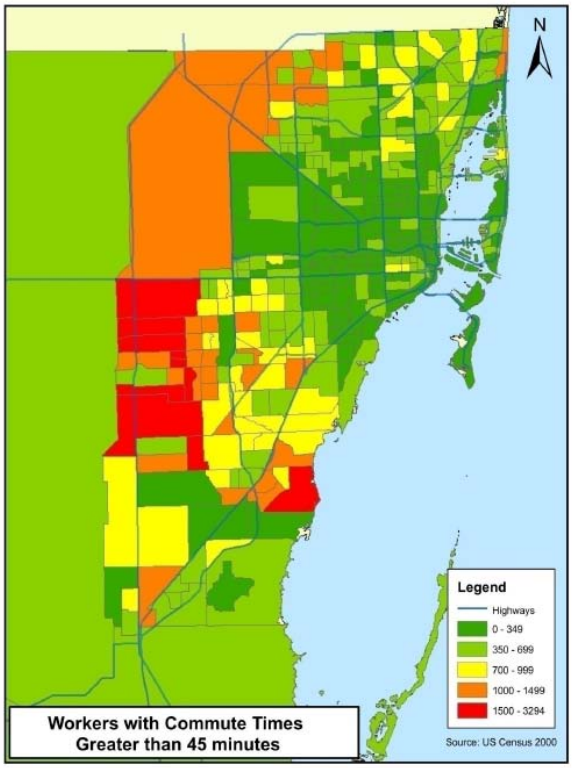
Increased Ridership
Between 2009 and 2019, a 23 percent increase in the total number of transit trips is projected. MDT will be able to further improve upon existing ridership through the provision of efficient transit service that improves transit travel time and on-time performance.



Transit service route miles within 1/4 mile of major health facilities, recreation, education, employment, cultural and social services facilities.
Approximately 64 transit service route miles operate within a ¼ mile of major medical facilities while more than 130 transit service miles operate within ¼ mile of all colleges and universities within Miami-Dade County. In the future ,this measure will also evaluate recreation, employment, cultural and social service facilities.

Travel Time to Work
Travel times commuting back and forth to work are steadily increasing throughout the South Florida region. A majority of residents living in western regions of the county reported travel times between 30 to 45 minutes. This reveals that residents are spending longer amounts of time commuting in traffic to reach places of employment each work day. The figures below illustrate commute time to work increases significantly for residents living in the outer western regions.





Transit service route miles within 1/4 mile of MIA and Port of Miami

Facility	Transit Service Route Miles within 1/4 mile
Miami International Airport	70.0
Port of Miami	17.5

Source: Miami-Dade GIS, 2009

Six Metrobus routes connect directly to Miami International Airport (MIA) terminals, in addition to the Tri-Rail commuter rail service which stops nearby. The Seaport Connection bus connects the Port of Miami to downtown Miami and to Metrobus and Metrorail systems. While the indicator above provides general information on access, other indicators need to be examined to gauge ridership and commute times. The construction of the Miami Intermodal Center (MIC), the MIC-Earlington Heights extension of Metrorail, and MIA Mover will greatly enhance transit service to the airport terminal. Please see the "*Existing Efforts"* below for more information on the MIA Mover.

Transit Service Route Miles Within ¼ mile of Urban Infill Area

	Transit Service Route Miles within 1/4 mile
Urban Infill Area (UIA) Boundary	1,418

Source: Miami-Dade GIS, 2009

The transit service route miles operated by MDT within the Urban Infill Area are more than 1,400 miles. Most of the transit system operates in the urban infill area, and there are few significant areas of the infill area where transit service is not available. In many of these areas,

development still has not fully occupied the area; The TDP will begin measuring service hours on routes serving the Urban Infill Area for future TDP updates.

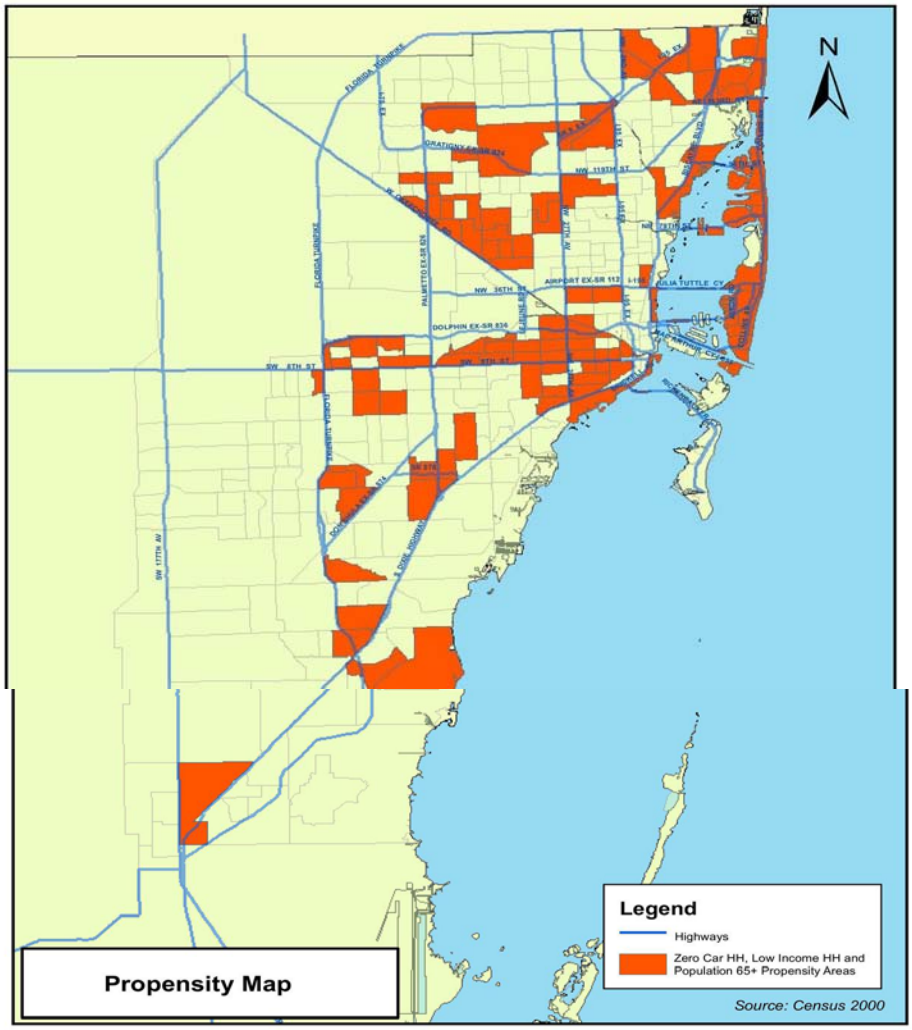
Transit Propensity

A transit propensity analysis was performed for the TDP Major Update based upon the latest available Census 2000 data. The transit propensity analysis takes into account various demographic characteristics of geographic areas of Miami-Dade and uses this information to identify those areas that have the strongest propensity for transit use. The transit propensity analysis prepared for the MDT TDP Major Update took into account three demographic characteristics:

- Percentage of Population Age 65 or Over
- Percentage of Low Income Households (household income <$10,000)
- Percentage of Zero Car Households

All of these household characteristics are considered an important transit market, so places with a high concentration of these three characteristics can be considered to be locations where improvements to transit service are likely to yield the greatest return in terms of transit ridership. The following is a map showing concentrations for areas with these three characteristics:

Transit Propensity Map



(Source: Draft Transit Development Plan FY2010 to 2019)

The transit propensity map shows a strong concentration of areas for high transit ridership potential areas west of downtown and mid-County, with a number of pockets north and south and along the coast. These areas generally correspond to those areas where MDT is providing higher level transit service or has plans to expand its service offerings.

Total Unfunded Needs, FY2010-2019 (YOE millions)
The table below serves as an indicator of the funding for transit service improvement needs as identified by the Miami-Dade Transit Department. 28.8 million dollars in unfunded needs for transit service improvements is projected for FY2010.

Service Improvement Category	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total Unfunded Needs FY10-19
Bus Improvements (Operating)	$ 8.0	$ 11.4	$ 15.7	$ 21.3	$ 22.0	$ 22.8	$ 23.6	$ 25.0	$ 25.9	$ 26.8	$ 202.6
Bus Improvements (Capital)	$ 20.8	$ 2.0	$ 4.9	$ 8.8	$ -	$ -	$ -	$ 2.7	$ 0.9	$ -	$ 40.0
Priority Corridors (Capital)	$ -	$ 106.9	$ 44.8	$ 29.4	$ 80.3	$ 64.5	$ 41.3	$ 110.6	$ 172.6	$ 121.9	$ 772.4
CIP Projects (Capital)	$ -	$ -	$ 5.7	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5.7
TOTAL UNFUNDED NEEDS	**$ 28.8**	**$ 120.3**	**$ 71.1**	**$ 59.5**	**$ 102.3**	**$ 87.3**	**$ 64.9**	**$ 138.2**	**$ 199.5**	**$ 148.8**	**$ 1,020.6**

(Source: Draft Transit Development Plan FY2010 to 2019)

Promote transportation improvements that are consistent with adopted comprehensive development master plans
The above is a measure established in the Draft TDP to assess meeting its goal to preserve the environment and promote energy conservation. While there is currently no method in place to measure the successful implementation of this objective, it is included here as an important future indicator.

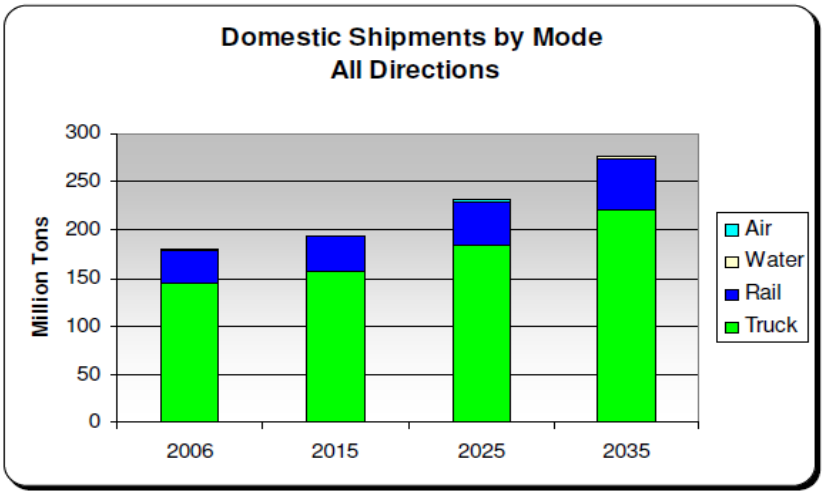
FREIGHT MOVEMENT

The performance of the freight network is critical to the County's mobility and economic competitiveness. Efficient and safe movement of goods benefits business and the general public. Miami-Dade has three large commercial hubs for transportation of goods or passengers, MIA, POM, and the Port of the Miami River.

Because MIA and POM are both managed by the County, more detailed descriptions of their services and operations are provided in the *Government Operations* portion of this report. The Miami River Port is the fifth largest port in the State of Florida and its navigation and commercial shipping facilities directly handle millions of tons of cargo each year. Therefore, the Miami River Port, along with MIA and POM, are a key part of the County's cargo-related transportation network.

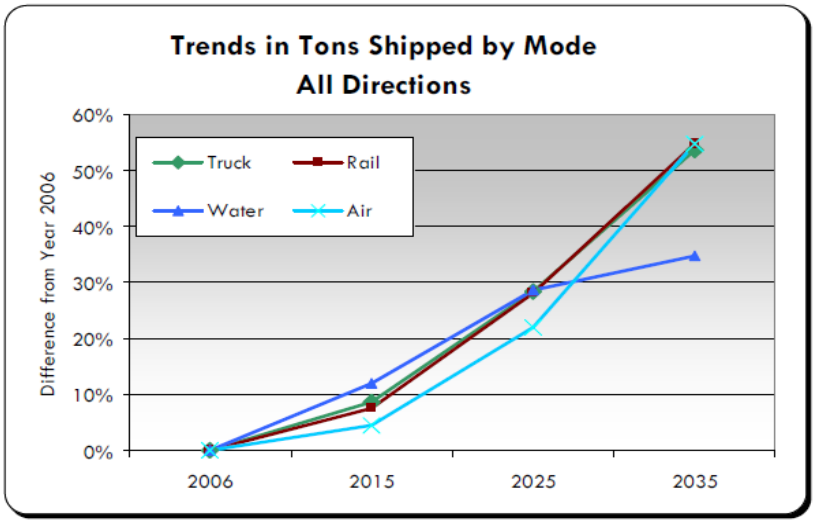
The Miami-Dade Freight Plan examines freight mobility needs, identifies goals and policy objectives, and recommends projects and policies to achieve these goals and objectives. The Freight Plan is ultimately incorporated into the County's Long Range Transportation Plan to ensure that local freight-related improvements are consistent with the broader regional transportation plan. The following graphs illustrate that domestic shipments are expected to jump nearly 50 percent by 2035 for cargo both into and out of the county. The total number of goods shipped from Miami-Dade is slightly above those received, making the County a net exporter and providing a trade surplus.

Domestic Shipments by Mode



(Source: Figure ES-1 from Miami-Dade County Freight Plan, March 2009)

Trends in Tons by Modes



(Source: Figure ES-2 from Miami-Dade County Freight Plan, March 2009)

The 2009 Freight Plan identified performance areas to track during plan implementation. Once data is collected for these indicators, they will be incorporated into updates to the GreenPrint Assessment Report. Future indicators to be considered are:

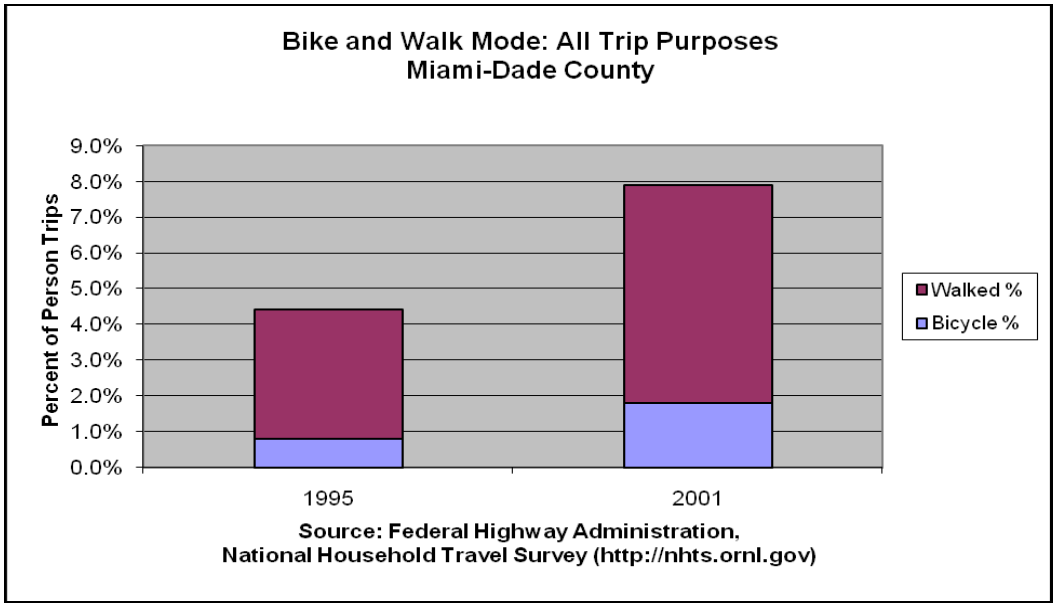
- Freight mobility: Access and Volume/Capacity ratios on key freight corridors
- Freight facilities: Availability of truck parking in relation to demand
- Other measures: System delays

ALTERNATE MODES

Bicycle & Pedestrian Trips

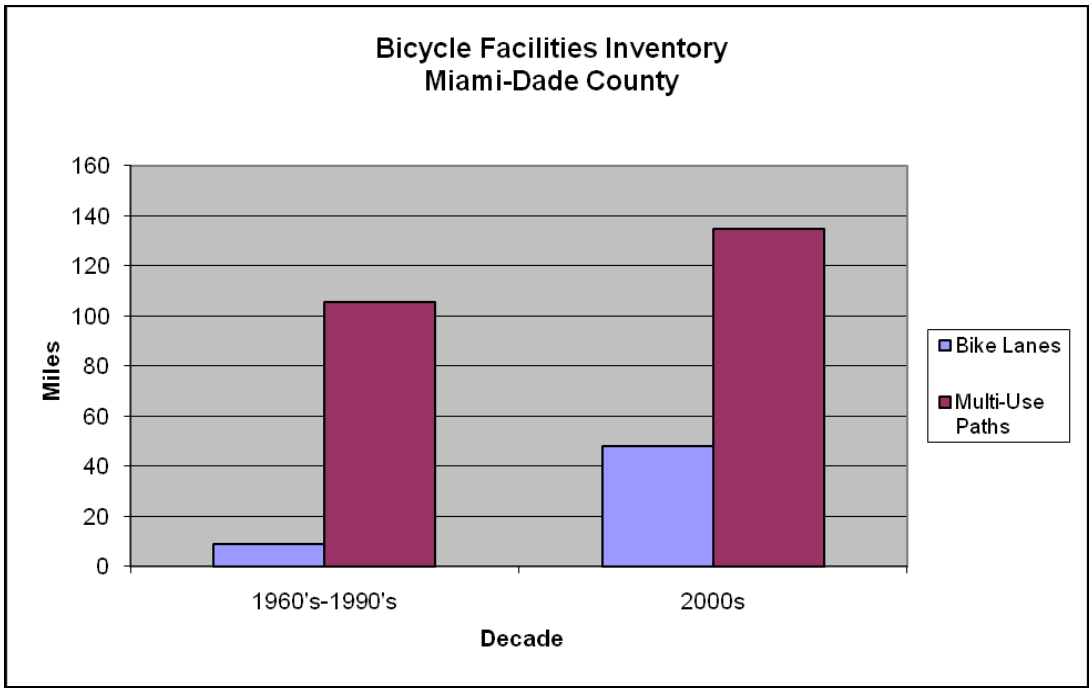
The following table compares the number of bicycle and walking trips in 1995 and 2001. The graph illustrates an approximate doubling in both modes during this period. This trend can be attributed to the development of new facilities (e.g., Phase 1 of the South Miami-Dade Busway),

expansion of Miami-Dade Transit's Bike & Ride program, and gas price increases during that period.



Bicycle Facility (Pathways)

Since 2000 almost 40 miles of bike lanes and 30 miles of paved paths have been built in the County. The increase in facilities mileage is the result of adopted policies, planning, and new funding sources such as the federal Transportation Enhancements Program, the County's Building Better Communities Bond Program and other municipal initiatives. Continued development of an integrated system of bicycle facilities will increase travel options for residents and visitors.



Competing Policies Identified in the Transit Development Plan

MDT performed an evaluation of the Land Use and Transportation elements of the Comprehensive Development Master Plan (CDMP) as part of the update to the TDP. This review was performed to determine whether policies of these CDMP elements were supportive or hindered the provision of MDT transit services. The results of this evaluation are summarized here to demonstrate the challenge in implementing policies and objectives that compete for both funding and prioritization in their implementation. These observations illustrate the complex interconnections between land use and transportation.

Land Use Element

The objectives and policies in the Land Use Element clearly recognize the importance of multi-modal transportation and the role that land development should play in creating a well-integrated relationship between transit and the land uses it serves. Three policy amendments to the Land Use Element are suggested to further enhance its support for transit. Each of these proposed policy amendment are described below.

- **Evaluate policies that may discourage mixed-use development** - Objective LU-4 addresses the issue of incompatible land uses, with a focus on protecting residential neighborhoods. These policies could discourage mixed use and transit-oriented development. The TDP proposes modifying the objective to acknowledge that in some cases, different uses should be mixed with careful consideration of their characteristics and application of sound urban design principles to ensure compatibility.
- **Develop a stronger policy regarding inappropriate land uses and development design near transit** - Policy LU-7E states that land uses "not conducive to public transit" should not be permitted within a ¼ mile of rail rapid transit stations. The TDP suggests amending the policy in the following ways:
  - Make the prohibition mandatory – at least for uses that are clearly incompatible in all conceivable circumstances.
  - Indicate where a specific list of prohibited uses can be found in the County's land use ordinance. In addition to use,
  - Consider the physical form of development when determining land uses, including which land uses are incompatible with transit. For example, a car dealership is not necessarily incompatible with creating a good pedestrian/transit environment if it has store front windows near the street with parking behind or within the building.
  - Expand the policy to apply to more than "rail rapid transit stations" by including urban centers and important transit corridors.
- **View major streets (section line roads) as potential community focal points rather than neighborhood boundaries.** - The "Residential Communities" section of the Land Use Element notes that the section line roads should form the physical boundaries of neighborhoods. This section also states that along major streets, pedestrians should be accommodated by sheltering sidewalks from passing traffic with landscaping on the street edge. Even when done well, this tends to create an isolated, noisy, and uninviting pedestrian environment situated between busy, high-speed streets and parking lots. The TDP suggests that people will only walk in these environments when they are forced to do so, not because they want to and adds that thinking of such streets as boundaries may also have the unintended consequence of creating few pedestrian and bicycle linkages across these major roadway barriers. The TDP suggests considering using design treatments along major streets, and especially along important transit corridors, to allow them to become attractive and active community centers rather than neighborhood barriers.

It also suggests that traffic calming, mixed land uses, pleasant and convenient pedestrian/bike access. Good urban design can transform vehicle throughways into multi-modal corridors.

Transportation Element

The TDP review acknowledges that objectives and policies in the Transportation Element recognize the importance of multi-modal transportation. However, it suggests the emphasis of the general Transportation Element objectives and policies and the Traffic Circulation Sub-element is biased toward accommodating automobiles over other transportation modes. The evaluation recommends three types of future amendments to address these issues:

- **De-emphasize the focus on level of service (LOS) for automobiles** - Objective TC-1 states that "It is desirable that all roadways in Miami-Dade County operate a level of service (LOS) C or better." Supporting Policy TC-1H states that "…Miami-Dade County will give highest priority to the funding of necessary capacity improvements to roadways on the Florida Intrastate Highway System…" Objective TC-3 states "The County's transportation system will emphasize safe and efficient management of traffic flow." Supporting Policies TC-3A and B focus on auto-related system treatments and correcting high accident locations. The TDP states that similar aggressive policy statements are absent regarding pedestrian and bicycle system safety and performance, connectivity, and convenience issues. The Mass Transit Sub-element Objective MT-1 and supporting policies suggest appropriate levels of transit service, and Objective MT-3 indicates that a "sound funding base" should be provided. However, the TDP interprets this policy language as suggesting that compared to automobile travel, transit and non-motorized modes are lower priorities and recommends the County should consider promoting a true multi-modal balance by strengthening its policy and financial commitment for transit, walking, and bicycling while diminishing the emphasis on maintaining or expanding roadway capacity.
- **Consider Transportation Demand Strategies (TDM) that include transit & non-motorized transportation** - Objective TC-1F lists a number of possible TDM strategies to reduce overall peak-hour demand and use of single occupant vehicles. The analysis revealed that of the strategies, offering a subsidy for transit riders and park-and-ride lots are the only transit-related alternatives and that there are no walking or bicycling strategies. The TDP suggests the county consider broadening the list of TDM strategies to encourage people not to drive.The key will be to provide realistic and attractive travel options to driving.
- **Provide a clearer and more detailed vision regarding pedestrian and bicycle system improvements that complement transit** - The TDP states that successful transit depends upon people having easy access to it and that walking and bicycling are the two common and most efficient ways to reach transit. It explains that Objective MT-8 and the supporting policies begin to address this by noting the importance of pedestrian walkways, comfortable pedestrian environment, and bicycle lockers and racks. The TDP suggests that the Transportation Element does not clearly address what accommodations should be made to provide pedestrians and bicyclists with safe, convenient, and comfortable access between transit and surrounding development and suggests the county consider broadening the objectives and policies to cover:
    - Safe and convenient pedestrian and bicycle networks, especially within urban centers and transit corridors.

- A planned countywide non-motorized network featuring a fine-grained system that is comparable to the level of attention given to vehicular modes.
- Access strategies for the major county centers that would promote transit use along with walking and bicycling. There is no discussion about how access should be provided by transit, walking, or bicycling to the Major Existing Traffic Generators and Attractors 2025.

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Goals from three of the County's major plans that deal with transportation issues are listed below. Because there are so many initiatives related to transportation in Miami-Dade County, only a few initiatives have been listed below the goals to provide a sense of the diversity of these initiatives.

Comprehensive Development Master Plan

The CDMP Transportation Element provides general policies which guide Miami-Dade County's. It includes three goals and their associated objectives:

Goal 1- Develop and maintain an integrated multimodal transportation system in Miami-Dade County to move people and goods in a manner consistent with overall countywide land use and environmental protection goals.

- *Objective TE-1:* Miami-Dade County will provide an integrated multimodal transportation system for the circulation of motorized and non-motorized traffic by enhancing the Comprehensive Development Master Plan and its transportation plans and implementing programs to provide competitive surface transportation mode choice, local surface mode connections at strategic locations, and modal linkages between the airport, seaport, rail and other intercity and local transportation facilities. These plans and programs shall seek to ensure that, among other objectives, between 2004 and 2010 Miami-Dade Transit boardings will increase at a rate equal to or greater than the rate of resident population growth during this period.
- *Objective TE-2:* In furtherance of pedestrianism as a mode of transportation encouraged in the planned urban area, by 2008 Miami-Dade County shall enhance its transportation plans, programs and development regulations as necessary to accommodate the safe and convenient movement of pedestrians and non-motorized vehicles, in addition to automobiles and other motorized vehicles.
- *Objective TE-3:* As provided in the policies herein under, Miami-Dade County shall cooperate with the MPO for the Miami Urbanized Area to enhance Miami area planning procedures, methodologies and analytical tools to improve analysis of relationships between transportation facility plans and programs, and local land use plans, development standards and implementing programs.

Goal 2 - Develop, operate and maintain a safe, efficient and economical traffic circulation system in Miami-Dade County that provides ease of mobility to all people and for all goods, is consistent with desired land use patterns, conserves energy, and protects the natural environment.

- *Objective TC-1:* It is desirable that all roadways in Miami-Dade County operate at level of service (LOS) C or better. By the year 2010 no roadways in Miami-Dade County should operate at a level of service lower than the base level of service standard contained herein.

- *Objective TC-2:* Rights-of-way and corridors needed for existing and future transportation facilities will be designated and reserved.
- *Objective TC-3:* The County's transportation system will emphasize safe and efficient management of traffic flow.
- *Objective TC-4:* The Traffic Circulation Sub-element will continue to be coordinated with the goals, objectives and policies of the Land Use Element, including the land uses, Urban Development Boundary and Urban Expansion Area designated on the Land Use Plan map, and with the goals, objectives and policies of all other Elements of the CDMP.
- *Objective TC-5:* The traffic circulation system will protect community and neighborhood integrity.
- *Objective TC-6:* Plan and develop a transportation system that preserves environmentally sensitive areas, conserves energy and natural resources and promotes community aesthetic values.
- *Objective TC-7:* Miami-Dade County's Traffic Circulation Sub-element, and the plans and programs of the State, region and local jurisdictions, will continue to be coordinated.

Goal 3 - Maintain, operate and develop a mass transit system in Miami-Dade County that provides efficient, convenient, accessible, and affordable service to all residents and tourists.

- *Objective MT-1:* By the year 2007*, the mass transit system shall operate at a level of service no lower than the standard contained herein.
- *Objective MT-2:* Coordinate the provision of efficient transit service and facilities with the location and intensity of designated future land use patterns as identified on the Land Use Plan Map, and the goal, objectives and policies of the Land Use Element.
- *Objective MT-3:* Provide a sound funding base utilizing public and private sources that will assure maintenance of existing service operations and timely implementation of the needed transportation improvement projects and services.
- *Objective MT-4:* Provide convenient, accessible and affordable mass transit services and facilities.
- *Objective MT-5:* Provide equitable transportation services to all groups in the metropolitan population, including the special transportation needs of the elderly, persons with disabilities, low income and other transit dependent persons.
- *Objective MT-6:* Continue to coordinate Miami-Dade County's Mass Transit Sub-element, and the plans and programs of the State, region and local jurisdictions.
- *Objective MT-7:* Initiate, by 2007*, protection strategies for Mass Transit rights-of-way and exclusive transit corridors.
- *Objective MT-8:* Encourage ease of transfer between mass transit and all other modes, where it improves the functioning of the transportation network.

Long Range Transportation Plan 2035

The purpose of the Miami-Dade 2035 Long Range Transportation Plan (LRTP) was to develop a plan for a multimodal transportation system that complied with state and federal requirements, optimized the movement of people and goods, and met 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. For each goal, a number of more specific objectives were identified.

**Excerpt from the October 2006 Edition of the "Adopted Components Comprehensive Development Master Plan for Miami-Dade County, Florida"*

The following goals and objectives 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 following goals, but is not an implementation plan for achieving these comprehensive goals and objectives.

Goals / Objectives	Measure
Goal 1: Improve Transportation System and Travel	
Objective 1.1: Improve accessibility to major health care, recreation, education, employment and cultural facilities	Highway lane & centerline miles within 1 miles of major health facilities, recreation, education, employment and cultural facilities
	Transit service route miles within 0.5 miles of major health care facilities, recreation, education, employment and cultural facilities
Objective 1.2: Enhance mobility for people and freight	Average travel time (all purposes)
	Number of daily passengers on public transit
Objective 1.3: Reduce Congestion	Hours of delay
Objective 1.4: Maximize multimodal travel options and provide travel choices	Transit service route miles and HOV/HOT lane miles
Objective 1.5: Fill transit service gaps	Service coverage in transit supportive areas (see TCQSM)
Objective 1.6: Promote transit reliability	Total hours of delay on highway facilities with transit service
Objective 1.7: Improve transportation facilities' and services' regional connectivity	Highway lane & centerline miles in corridors of regional significance
	Transit service route miles in corridors of regional significance
	Number of park-n-ride/multimodal facilities
Objective 1.8: Include provisions for non-motorized modes in new projects and in reconstructions	Does the plan consider non-motorized infrastructure in highway and transit improvements?
	Percentage Increase in number/mileage of non-motorized facilities
Objective 1.9: Promote new non-motorized (bicycle, pedestrian, greenways) projects	Does the plan consider new non-motorized facilities?
	Percentage increase in number/mileage of non-motorized facilities
Objective 1.10: Increase reverse commute opportunities for disadvantaged communities	Transit service route miles from cities and central areas in the AM Peak period
Objective 1.11: Promote transportation improvements that provide for the needs of the elderly and disabled	Average highway and transit travel time to/from TAZs with a high proportion of elderly population
Objective 1.12: Improve transit services that provide access to educational facilities	Transit service route miles within 0.5 miles of educational facilities
Goal 4: Support Economic Vitality	
Objective 4.1: Increase access to employment and sites	Average HBW travel time
Objective 4.2: Enhance tourist travel and access opportunities	Highway lane & centerline miles within 1 miles of tourist attractions

	Transit service route miles within 0.5 miles of tourist attractions
Objective 4.3: Increase and improve passenger and good access to airports and seaports	Highway lane & centerline miles within 1 miles of MIA, Opa Locka, HGAA, and Port of Miami
	Transit service route miles within 0.5 miles of MIA, Opa Locka, HGAA, and Port of Miami
	Number of transit patrons going to/from the airports and seaport
Objective 4.4: Augment multimodal access to major activity centers	Highway lane & centerline miles within 1 miles of major activity centers
	Transit service route miles within 0.5 miles of major activity centers
Objective 4.5: Enhance the efficient movement of freight and goods	Does the plan consider freight-specific infrastructure improvements/programs?
Objective 4.6: Implement projects that support economic development and redevelopment areas	Highway lane & centerline miles within 1 miles of redevelopment areas
	Transit service route miles within 0.5 miles of redevelopment areas
Goal 5: Protect and Preserve the Environment and Quality of Life and Promote Energy Conservation	
Objective 5.1: Minimize and mitigate air and water quality impacts of transportation facilities, services, and operations	Tons per day of emissions (NOx, CO, VOC)
	Surface coverage of transportation system on acres of wetlands
Objective 5.2: Reduce fossil fuels use	VMT
	Non fossil fuel burning daily transit service route miles
Objective 5.3: Promote projects that support urban infill and densification	Highway lane & centerline miles within the Urban Infill Area
	Transit service route miles within the Urban Infill Area
Objective 5.4: Minimize adverse impacts to established neighborhoods	Does the plan minimize impacts to established neighborhoods?
Objective 5.5: Promote transportation improvements that are consistent with adopted comprehensive development master plans	Is the plan consistent with adopted comprehensive development master plans?
Objective 5.6: Prioritize funding to favor intra-urban (within UDB) improvements	Ratio of lane & highway centerline miles inside/outside UDB boundaries
	Ratio of transit service route miles inside/outside UDB boundaries
Objective 5.7: Promote the use of alternative vehicle technologies	Does the plan promote the use of alternative vehicle technologies?
Objective 5.8: Apply transportation and land use planning techniques, such as transit-oriented development, that support intermodal connections and coordination	Does the plan's socioeconomic data projections/allocations encourage TOD and other transit-supportive land uses?
Goal 6: Enhance the Integration and Connectivity of the Transportation System, Across and Between Modes, for People and Freight	
Objective 6.1: Improve connectivity to Strategic Intermodal System (SIS) and intermodal facilities	Highway centerline miles on SIS connectors
Objective 6.2: Provide multi-modal options consistent with the local government comprehensive plan	Is the plan consistent with adopted comprehensive development master plans?
Objective 6.3: Facilitate connections between transportation modes	Does the plan address multimodal connections?

Objective 6.4: Improve goods movement by enhanced intermodal access and other infrastructure that serve major freight origins and destinations in Miami-Dade County	Highway lane miles within 1 miles of major freight origins and destinations
Objective 6.5: Improve freight movement operations and reliability by promoting expedient and cooperative practices across all modes	Does the freight component of the plan address multimodal freight improvements?
Goal 7: Optimize Sound Investment Strategies for System Improvement and Management/Operation	
Objective 7.1: Optimize benefits of capital expenditures	Capital expenditure/travel time savings benefit ratio
Objective 7.2: Optimize operations and maintenance expenses	O&M expenditure/travel time savings benefit ratio
Objective 7.3: Optimize applications of People's Transportation Plan funding	PTP expenditure/travel time savings benefit ratio
Objective 7.4: Maximize use of private sector funding sources	Number of private sector funded projects
	Dollar amount of private sector funding (as a proportion of total cost of plan)
Objective 7.5: Maximize use of State and Federal funding sources	Percent of State and Federal funding sources
	Dollar amount of State and Federal funding (as a proportion of total cost of plan)
Objective 7.6: Promote local improvement projects within the systems improvement context	Number of improvements on local facilities (non-State Highway System)
Goal 8: Maximize and Preserve the Existing Transportation System	
Objective 8.1: Continue to examine the provision and utilization of special-use lanes on the existing system	Lane miles of special use/managed lanes
Objective 8.2: Identify and implement the best available technologies and innovations to improve the reliability and efficiency of the transportation system	Does the plan consider the latest technologies and innovations in transportation improvements?
Objective 8.3: Identify and reserve corridors and right-of-way (on roadways, railways, and waterways) for future transportation facilities and services	Does the plan consider right-of-way acquisition as a phase that can be planned independently?
Objective 8.4: Expand the use of Transportation Demand Management (TDM) strategies	Does the plan make use of TDM strategies?

Note: Goals 3 & 4 addressing the Increase the Safety and Security of the Transportation System for Motorized and Non-motorized Users were removed. Please see the Public Safety Area of this report for a discussion of how these goals contribute to a sustainable community.

Draft Transit Development Plan FY2010 to 2019

The fiscal year (FY) 2010 – 2019 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.

OBJECTIVE		MEASURE
Goal 1: Improve the Quality of Transit Services		
1.1	Improve accessibility to major health care, recreation, education, employment, cultural and social services facilities	▲ Transit service route miles within 1/4 mile of major health facilities, recreation, education, employment, cultural and social services facilities
1.2	Enhance mobility for people through improved transit connectivity	• Average travel time, transfer time
1.3	Improve transit level of service on major roadway corridors and between major origins and destinations	• Headway and service span, average transit time savings
1.4	Maximize service reliability and efficiency	▲ On time performance, frequency of service
1.5	Maximize multimodal travel options and provide travel choices	• Transit service route miles by transit mode (Metrorail, Metromover, Express and Local Bus)
1.6	Fill transit service coverage gaps	• Service coverage in transit supportive areas completed in a regional level
1.7	Promote transit reliability	• Increase in ridership
1.8	Improve transportation facilities' and services' regional connectivity	• Transit service route miles in corridors of regional significance ▲ Number and location of shelters, stations, transit centers relative to service standards
1.9	Include provisions for non-motorized modes in new projects and in reconstructions	• Non-motorized infrastructure on transit improvements
1.10	Increase reverse commute opportunities for disadvantaged communities	• Transit service routes miles from urban centers to suburban employment areas in the AM Peak period
1.11	Promote transportation improvements that provide for the needs of the elderly and disabled	• Average transit travel time to/from TAZs with a high proportion of elderly and disabled population
1.12	Improve transit services that provide access to educational facilities	• Transit service route miles within 1/4 mile of educational facilities
Goal 2: Improve Customer Convenience, Comfort and Safety on Transit Service and within Facilities		

2.1	Improve safety on vehicle service operations	• Level of investment in safety projects/Audit of System Safety Program Plan.
2.2	Reduce roadway and multi-modal crashes	• Number of accidents involving transit vehicles, Number of accidents/incidents per 100,000 miles
2.3	Enhance outreach opportunities to educate the community on transportation issues and highlight transit service benefits such as service reliability, passenger cost savings, and environmental benefits	• Develop speaker's bureau to inform public about transit benefits • Work with MPO, Transportation Management Organizations, major employers to promote transit service • Recruit community leaders to advise on promoting transit service
2.4	Maintain convenient, clean, safe transit passenger facilities and vehicles	• Reduction of passenger complaints regarding safety and cleanliness of vehicles and facilities • Completion of bi-annual safety and inspection audits of Metrorail and Metromover stations • Number of safety related accidents and incidences on-board and in stations/transit facilities

Table 6-1: TDP Major Update Goals, Objectives and Measures (continued)

OBJECTIVE		MEASURE
Goal 3: Increase the Security of Transit Vehicles and Facilities		
3.1	Ensure transit vehicles and facilities provide a secure environment for customers	• Percent of functioning video cameras • Security personnel capabilities • Ensure 100 percent compliance with security contract • Reduction of security related incidents
3.2	Increase security at transit stops and intermodal stations and connections	• Number of criminal incidents on-board transit and in stations/transit facilities
Goal 4: Support Economic Vitality		
4.1	Provide transit access to urban centers at a minimum of 30-minutes during the peak	• Transit service within 1/4 mile of urban centers as identified by MDT • Average home base to work (HBW) travel times on transit route providing access to urban centers
4.2	Enhance major tourist travel and access opportunities within the Urban Growth Boundary	• Transit service route miles within 1/4 mile of tourist attractions
4.3	Increase and improve transit access to Miami International Airport and the Port of Miami	• Transit service route miles within 1/4 mile of MIA and Port of Miami • Service hours on transit routes operating within 1/4 mile of MIA and Port of Miami
4.4	Implement projects that support economic development and redevelopment areas	• Transit service route miles within 1/4 mile of redevelopment areas • Service hours on routes operating within 1/4 mile of redevelopment areas
4.5	Apply transportation and land use planning techniques, such as transit-oriented development (TOD), that	• Promote modification of permitted land use to encourage mixed-use and TOD • Encourage use of transit overlay districts to simplify

OBJECTIVE		MEASURE
	support intermodal connections and coordination	implementation of transit-friendly land use in areas of high transit service or around transit station facilities
Goal 5:–Preserve the Environment and Promote Energy Conservation		
5.1	Minimize and mitigate air quality impacts of transportation facilities, services, and operations	• Tons per day of emissions (Nox, CO, VOC) generated by the region's transportation system
5.2	Reduce fossil fuels consumption through the consideration of alternative fuel vehicle technology	• Number of gallons of bio-diesel fuel consumed • Ratio of bio-diesel to standard clean diesel fuel consumed • Number of hybrid technology buses in MDT fleet. • Average miles per gallon of bus fleet
5.3	Promote transit service projects that support urban infill and densification	• Transit service route miles within the Urban Infill Area • Service hours on routes serving the Urban Infill Area
5.4	Minimize adverse impacts to established neighborhoods	• Minimize impacts to established neighborhoods
5.5	Promote transportation improvements that are consistent with adopted comprehensive development master plans	• Consistent with adopted comprehensive development master plans
Goal 6: Enhance the Integration and Connectivity of the Transportation System, Across and Between Modes and Transit Providers, for People and Freight		
6.1	Provide multi-modal options consistent with the local government	• Consistency with adopted comprehensive development master plans
6.2	Facilitate connections between transportation modes	• Multimodal connections (bus-rail, transit-taxi etc.) • On-time performance • Transfer time • Transfer policies
6.3	Ensure transportation options are available during emergency evacuations for the elderly and persons with disabilities	• Transit service route miles within 1/4 mile of TAZs with a high proportion (20% or higher) of elderly and the disabled population
6.4	Increase coordination between regional and local transportation providers	• Provide better Multimodal connections: Tri-Rail-bus, bus-rail, municipal services-MDT, transit-taxi, jitney etc.
Goal 7: Optimize Sound Investment Strategies for System Improvement and Management/Operation		
7.1	Optimize benefits of capital expenditures	• Capital expenditure
7.2	Optimize operations and maintenance expenses	• Decrease cost per revenue mile • Decrease cost per revenue hour
7.3	Optimize applications of People's Transportation Plan funding	• PTP expenditure • Consistency of PTP funding being used with commitments made in PTP
7.4	Identify Public, Private Partnership opportunities	• Number of private sector funded transit projects • Dollar amount of private sector funding

OBJECTIVE		MEASURE
		• Ratio of public to private sector funding for operating funds and capital improvements
7.5	Align MDT priorities and deliverables with available funding and resources	• Availability of additional funding from new sources tied to specific projects or programs • Projects completed within budget and on-time
Goal 8: Maximize and Preserve the Existing Transportation System		
8.1	Continue to examine the provision and utilization of special-use lanes on the existing system for transit use	• Lane miles of special use/managed lanes used by transit services. • Dollar amount of planned right-of-way acquisition for transit facilities
8.2	Identify and implement the best available technologies and innovations to improve the reliability and efficiency of the transportation system	• Operation of new technologies and innovations in transportation improvements
8.3	Upgrade and maintain existing transit infrastructure and facilities in a state of good repair	• Capital expenditure on existing transit infrastructure is in line with identified needs (IRP)
8.4	Maintain the operational functionality of transit vehicles to maximize reliability	• Number/percentage of missed pullouts, failures • Adherence to preventative maintenance programs • Mean distance between service disruptions on Metrorail, metromover and bus

Freight Plan

The Miami-Dade Freight Plan has a goal of promoting regional goods movement that are socially and environmentally responsible. The Plan was developed under the guidance of the Miami-Dade MPO Freight Transportation Advisory Committee (FTAC) which is the industry's advisory panel to the Metropolitan Planning Organization. The goals of the 2009 Freight Plan are as follows:

- Goal 1: Support economic development by enhancing freight system connectivity.
- Goal 2: Advance strategic freight initiatives that support job creation and retention to enhance the region's long-term competitive position.
- Goal 3: Enhance freight transportation safety and convenience to ensure mobility and access.
- Goal 4: Provide the secure movement of international and domestic goods.
- Goal 5: Address the varied freight improvement needs of area shippers, carriers and distributors at both a regional and corridor level.
- Goal 6: Improve multimodal access in order to enhance freight efficiency throughout the County.
- Goal 7: Promote methods for regional goods movement that are socially and environmentally responsible.
- Goal 8: Educate the public on the importance of freight transportation to the region as well as the needs and issues of shippers, carriers, and other affected stakeholders.
- Goal 9: Give greater priority and attention to freight in the regional planning process.
- Goal 10: Make public investments that help minimize the cost and improve the reliability of goods movement within the County.
- Goal 11: Implement and maintain freight initiatives that provide long-term returns on public investment.

Bicycle Facilities Plan
Increasing number of 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 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.
(Source: http://www.miamidade.gov/mpo/docs/MPO_bike_facilities_plan_2001.pdf)

Pedestrian Plan
Increasing numbers of County residents and visitors are choosing to walk or bike or all or a portion of their trip. To meet the needs of these travelers, the 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.

The goal of the 2025 Miami-Dade County Pedestrian Facilities Plan is to facilitate the construction of pedestrian improvements at locations that have been determined to address the County's most pressing needs.
(Source: http://www.miamidade.gov/mpo/docs/MPO_ped_plan_2001.pdf)

Miami-Dade County Aesthetics Master Plan (AMP)
Community aesthetics is a critical component of a vibrant, economically viable and sustainable metropolitan area. In Miami-Dade, we rely heavily on tourism as a primary economic engine. Furthermore, residents gauge their quality of life in the County with indicators that correspond to the aesthetic value of their neighborhoods and commercial areas they frequent. For this reason, community design of high aesthetic quality is directly tied to a community's socio-economic health.

To address the community aesthetics, in 2006 the Board directed the County Manager under the authority of Resolution No. R-108-06 to "develop a County Aesthetics Master Plan that addresses landscaping and landscape maintenance of all public roadways and County facilities..." The Community Image Advisory Board (CIAB) commissioned the development of the AMP that would provide design recommendations, guidelines, and standards for County Corridors, Gateways and Facilities. The CIAB reviewed other recent countywide community planning documents such as the Open Space Plan, the Street Tree Master Plan, the Urban Design Manual, the Landscaping Manual, and the Typical Roadway Section & Zoned ROW Update Study in order to develop the overall goals and objectives for including community design with current planning efforts.

The AMP provides guidelines for the design and appearance of the County transportation corridors, gateways, and key public facilities by providing examples of specific architectural, hardscape and landscape elements. The plan establishes clear objectives and standards for improving the appearance of the County's entrance gateways, the corridors which channel vehicular, pedestrian and marine traffic, and public facilities including public transportation centers, buildings, and parks.

Implementation of the AMP will include the development of a Community Design Element currently being drafted, that would be presented as an amendment to the CDMP. Also, a web-based portal would be created to serve as a clearing house for design standards, specifications, and municipal codes that restrict design. This portal would be promoted and accessible to the Architecture and Engineering industry as well as the general public.

- **Goal**: To articulate the principles and standards for establishing a practical, sustainable beautification and greening process for County Corridors, Gateways and Facilities.
- **Vision:** 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.

Existing Legislation

Because there are so many legislative directives impacting the transportation network, the following is a limited list of those identified through searching the county's legislative database for sustainable transportation strategies including infill, transit, and alternative modes. This is not intended to be a comprehensive listing of legislation related to transportation.

- *MPO Resolution-38-09: Resolution directing staff to investigate climate emission calculation tools and incorporate climate change emission calculations in transportation studies, analysis and recommendations - MPO should include as part of its analysis when planning multimodal transportation improvements in the Miami Urbanized Area the quantity of greenhouse gas emissions caused by different transportation scenarios, investigate climate emission calculation tools available through the International Council for Local Environmental Initiatives, the US Environmental Protection Agency, Miami-Dade County Department of Environmental Resources Management and the Miami-Dade County Planning & Zoning Department; and (2) include as part of MPO studies, analysis and recommendations regarding proposed transportation improvements in the Miami Urbanized Area such as proposed road projects and transit alternatives the quantity of greenhouse gas emissions caused by each transit or transportation option.*

- *R-828-96: Resolution approving the request from the federal national mortgage association (Fannie Mae) for the neighborhood infill and stabilization program (NISP), and that surtax/ship loans made under NISP allocation be subordinate to the borrower's equity*

- *R-817-99: Resolution directing the County Manager to undertake immediate steps to provide for bicycle storage facilities in appropriate county facilities*

- *R-370-01: Resolution directing County Manager to work with the Metropolitan Planning Organization to create a pilot program to lessen traffic congestion by encouraging the use of computer technology as a means of allowing work to be performed at home and at regional work places*

- *R-728-01: Resolution directing the County Manager to enter into discussions with the Miami-Dade Expressway Authority to develop short- and long-term solutions to traffic congestion on State Road 874 and State Road 878*

- *R-493-04: Resolution directing the County Manager to conduct a comprehensive study on the effects of unprecedented population and housing growth on the Urban Development*

Boundary in south and southwest Miami-Dade County and the impacts of infill development on the process of gentrification and displacement of current residents with limited means, with the purpose of development potential amendments to the comprehensive development master plan, and further directing the County Manager to allocate appropriate resources for conducting the study

- *R-1196-05: Resolution directing the County Manager to take steps necessary to allow the expeditious expenditure of road impact fees for mass transit roadway capacity enhancement in certain infill and redevelopment areas, and further directing the County Manager to report on steps taken and to recommend appropriate changes to road impact fee expenditure priorities when such mass transit expenditures are allowable*

- *R-593-07: Resolution directing County Manager to conduct a greenways and bicycle trails feasibility study to identify project areas in district 2, and to identify funding sources for such study and funding sources for the development of the greenways and bicycle trails*

- *R-237-09: Resolution urging the Obama Administration and Congress to rethink the federal government's approach to funding transit and take a new approach that has the goal of facilitating the expansion of mass transit in the interest of the environment, improved economic efficiency through reduced traffic congestion, and lower reliance on foreign oil*

- *R-742-09: Resolution directing the County Mayor or County Mayor's designee to implement a pedestrian safety campaign by posting safety messages on the interior and exterior of Metrobus and Metrorail cars*

- *R-1292-09: Feasibility of utilizing housing constructed thru infill*

- *O-00-107: Ordinance amending Chapter 33 of the Code of Miami-Dade County, Florida; amending Section 33-122.3, related to bicycle racks; providing severability, inclusion in Code, and an effective date*

- *R-416-08: Resolution directing the County Mayor or his designee to apply for United States Environmental Protection Agency's Smart Growth Implementation Assistance related to Miami-Dade County's Urban Development Boundary*

Special Transportation Services

MDT operates a demand-response service known as Special Transportation Service (STS). STS is a shared-ride, door-to-door transportation service for qualified individuals with disabilities who are unable to utilize the accessible fixed-route transit system. The service area includes most of urbanized Miami-Dade County and south to mile marker 50 in central Monroe County. Service is provided by sedans, vans and lift-equipped vehicles, seven days a week, 24 hours per day. Presently, there are 359 vehicles (sedans, standard vans, minivans, and wheelchair lift-equipped vans) available for ambulatory transportation. These vehicles are privately contracted through a brokerage agreement with Advanced Transportation Solutions (ATS). There are more than 21,600 eligible clients enrolled in the STS program including both ambulatory and non-ambulatory clients. The fare for Special Transportation Service (STS) users is $3.00. The projected FY 2010 cost for the STS service contract is $45.3 million, with an additional $2.2 million in MDT support staff costs.

South Miami Dade Busway

Since 1997, MDT has operated and maintained a 20-mile exclusive Busway paralleling US-1 from the Dadeland South Metrorail Station to SW 344th Street in Florida City. The Busway includes 29 stations with five Park and Ride facilities. The first segment of the extension to Florida City opened to revenue service on April 25, 2005 and extended the Busway five miles from SW 112th Avenue to SW 264th Street in Naranja. The second and final segment of the extension, which opened on December 16, 2007, extends the Busway another 6.5 miles south from SW 264th Street to SW 344th Street in Florida City, Miami-Dade County's southernmost municipality. Full-size buses, minibuses and over-the-road motor coaches operate on the Busway and in adjacent neighborhoods, entering the exclusive lanes at major intersections, providing both local and limited-stop service. Free parking is provided adjacent to the Palmetto Golf Course on SW 152nd Street (Coral Reef Drive), at SW 168th Street, at SW 200th Street, at SW 244th Street and SW 296th Street. Plans are in the works for a future Park and Ride lot at SW 344th Street, the furthest south station. An additional Park and Ride lot is provided at the Florida Turnpike exit on Coral Reef Drive (SW 152nd Street) and SW 117th Avenue.

Service Standards - Service Efficiency and Restructuring Initiative (SERI)

MDT has undertaken an initiative to establish specific transit service standards to assess the level of operational performance. The service standards were developed to provide a fair, equitable, and objective comparison of all requests and proposals generated from the general public, elected officials, and MDT staff. Service standards are maintained and applied to be consistent in the evaluation of service proposals and to ensure that the service being provided represents the most cost-effective use of the County's resources. MDT service standards establish minimum, maximum, and recommended levels of service. The purpose of MDT's standards is to identify routes which are most in need of service changes, such as restructuring to eliminate lower-productivity segments or branches, adjusting service frequency to better reflect the demand for service, or providing additional promotion of less patronized routes. Routes which do not meet MDT standards are not automatically selected for elimination. Elimination of routes is only intended as a last resort, when it has been determined that no cost-effective actions are available to improve the productivity of the route. The numerical values of these service standards will undergo an annual evaluation by MDT yearly, using the most recent twelve-month period for which data is available. The evaluation will compare the current values of productivity standards versus those from the previous year.

One example of a route developed through the SERI is a dedicated bus route from Miami International Airport to Miami Beach. The route makes one stop at Metrorail Earlington Heights Metrorail Station connecting passengers to Downtown Miami. This route began December 13, 2009 and carried more than 800 passengers on the first day of service, at a charge of $2.35 a trip.

Automated Fare Collection System

A comprehensive automated Fare Collection System with "smart" card (EASY CARD) technology was implemented October 1, 2009 to include:

- Photo ID/Easy Card System
- Data Center Rewiring/Redesign
- Automated Passenger Counters (APC) Data & Business Process Integration
- Easy Card Website
- Corporate Discount Program Website
- Upgrade MDT Network

Carpool & Vanpool Programs

South Florida Commuter Services (SFCS) is a commuter assistance program founded in 1988 which serves Miami-Dade, Broward, Palm Beach, Martin and St. Lucie Counties. The agency works with residents, private companies, and municipalities to reduce roadway congestion by promoting alternatives to single occupancy vehicle (SOV) travel. Free programs and services are promoted as alternatives, such as carpooling, vanpooling, ride-matching, transit trip planning, the Emergency Ride Home Program. By participating in these programs, individuals help to reduce traffic congestion, VMTs, VHTs, and consequently, vehicle emissions. These programs also benefit the participants by reducing money spent on gas and tolls.

South Florida Commuter Services facilitates carpooling by providing a free list of potential carpool partners to those who participate. In addition to the benefits mentioned above, carpooling can reduce the cost of commuting through cost-sharing, and greatly reduce commute times since participants benefit from access to the High Occupancy Vehicle (HOV) and I-95 Express Lanes. According to the 2008 Annual Report, "Due to escalating gas prices and an economic slowdown, SFCS achieved its highest level of participation in fiscal year 2007 – 2008 since the Program's Implementation." During Fiscal Year 2008 – 2009, the Carpool Program documented the following reductions and savings.

- Total Number of Commuters Switched from SOVs 39,200
- Total # of Vehicle Trips Eliminated 650,916
- Total # of Vehicle Miles Eliminated 14,105,448
- Total Commuter Costs Saved* $4,909,578

*Based on miles eliminated x $0.29 per mile – cost to commute.

Source: Jim Udvardy, SFCS Project Director, from "Annual Report 2008" Performance Measures

In addition to the Carpool Program, the Vanpool Program has also provided measurable savings and results. The SFVP was created in 1998 by the Miami-Dade Metropolitan Planning Organization (MPO). Under MPO Board resolution #39-95, Congestion Mitigation and Air Quality (CMAQ) funds were allocated for implementing the program. After the success and expansion of the program, Broward and Palm Beach MPOs joined the SFVP in 2002 and 2006, respectively. The program operates based on a 30-day lease agreement. This agreement is between the vanpool provider (VPSI, Inc.) and the volunteer driver. VPSI provides the van, insurance (no-deductible), all scheduled and non-scheduled maintenance, as well as a backup vehicle, if needed. All participants of the vanpool group are registered in the Emergency Ride Home (ERH) Program administered by the South Florida Commuter Services (SFCS). This program provides participants to have access to free taxi service in emergency situations. A monthly fee is charged based on the size of the van (7, 9 or 15 passengers) and the monthly mileage. A $400 subsidy per van per month is provided for the participants in the program.

Over 80 percent of the funding source for the program is federal, while the state has matched the rest of the funding. The program received $661,189.27 ($230,842 to Miami-Dade County) corresponding to the 2005 allocations. The estimated allocation for 2010 is approximately $1.2M. A new hardware and software is being installed in all active vans to provide real time data. Mileage and number of passengers will be reported on a daily basis. As of June 2009:

- 197 vanpools within the 3-county area (47 originating from M-DC)
- Average monthly mileage: 17,049 miles
- Average roundtrip mileage: 86.5 miles
- Average passengers/van: 6.9 persons
- Passenger-trips saved/year: 603,200 trips

- Passenger-miles saved/year: 26.1M miles
- Parking spaces saved per day: 1,160 spaces

(Source: http://www.miamidade.gov/MPO/docs/MPO_vanpool_facts_200906.pdf)

Private Sector Funded Transit Projects

Currently there at least two projects that are identified to include a public (M-DC Transit) private partnership. The first project includes a 260 space parking garage at the intersection of NW 107th Avenue and NW 12th Street to serve as a park and ride lot. The proposed project is a turn-key operation including M-DC Transit owning the land, once the garage is completed. The estimated cost to the owner is $14 million. The second project is a bus station and surface park and ride lot with 45 parking spaces at the Kendall Town Center. There is an existing commitment in place as a result of the Development of Regional Impact (DRI) process to meet transit concurrency.

The MIA Mover

Connecting MIA passengers to a new Rental Car Center and the future Miami Intermodal Center (MIC) will be the MIA Mover, a one-mile-long automated people mover system scheduled for completion in 2011. The MIA Mover will have the capacity to transport more than 3,000 passengers per hour between MIA and the MIC, Miami-Dade County's own grand central station. Completion of the MIA Mover and Miami Intermodal Connector (MIC)-Earlington Heights Metrorail Connector will also allow MIA passengers to travel from the airport to Miami-Dade County's downtown and business districts and various shopping areas within minutes for a minimal train fare.

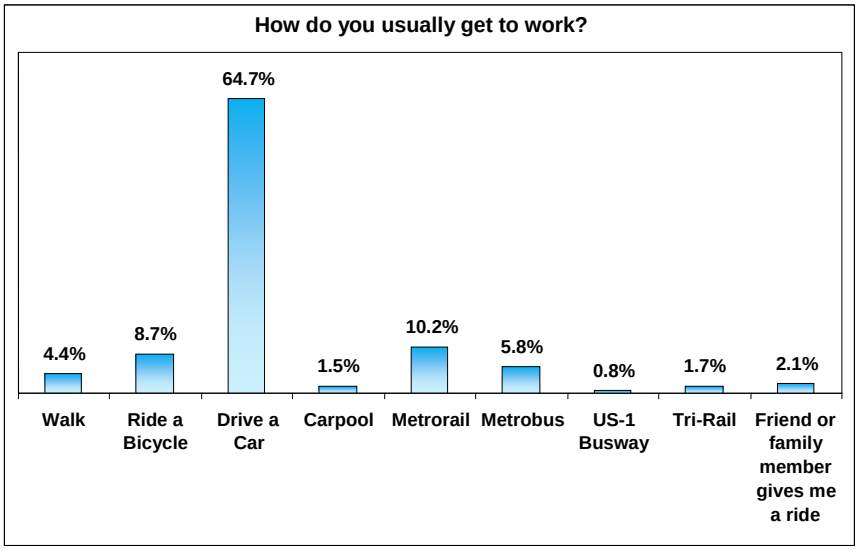
The MIC, scheduled for completion by the Florida Department of Transportation in 2012, will be the County's central transportation hub, providing MIA passengers access to all their ground transportation needs: the Rental Car Center (RCC); Miami-Dade County Metrorail and Metrobus service; Tri-Rail, a heavy-rail system that operates through Miami-Dade, Broward and Palm Beach counties; Amtrak; and taxi and other private transportation services.

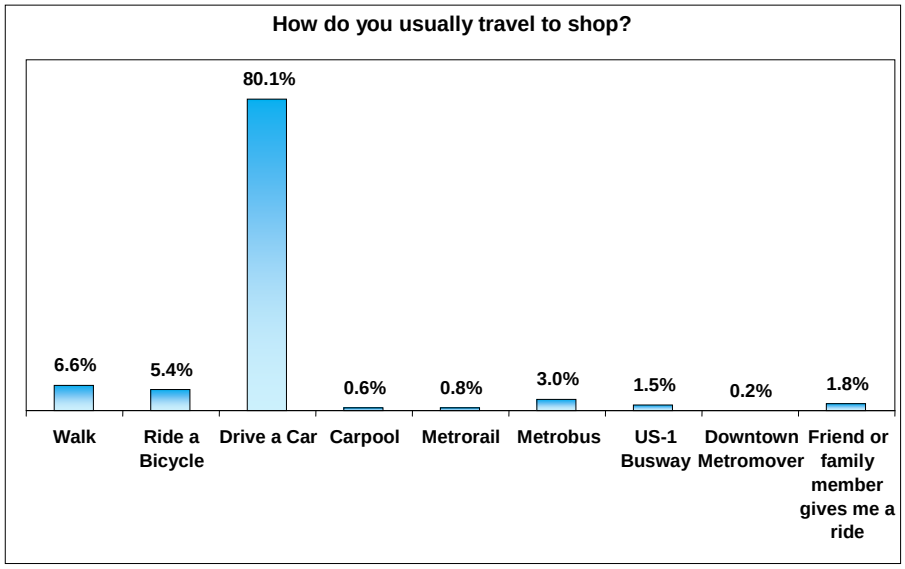
COMMUNITY FEEDBACK

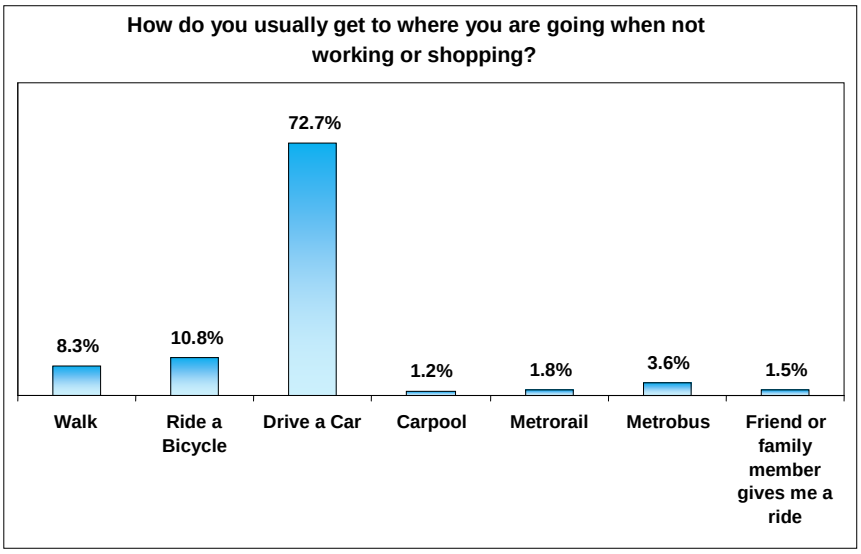
Feedback & results gathered though the planning process or surveys

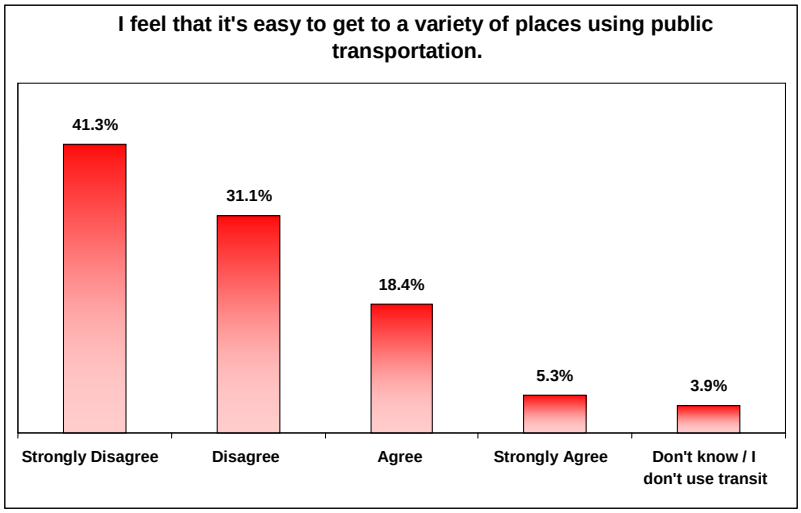
2035 Long Range Transportation Plan Public Survey

In October 2008, public feedback was collected through both an online survey and the use of the Option Finder Technology as part of the 2035 Long Range Transportation Plan public involvement process. A total of 417 responses were collected through the online survey, while a total of 294 responses were collected during public involvement sessions. The following are the results related to Traffic Congestion/Circulation**.**

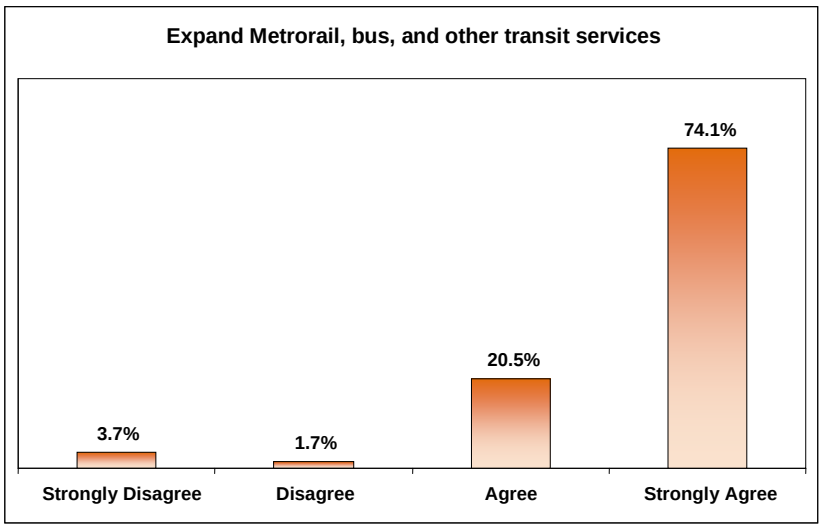

How do you usually get to work?
4.4%
8.7%
64.7%
1.5%
10.2%
5.8%
0.8%
1.7%
2.1%
Walk
Ride a Bicycle
Drive a Car
Carpool
Metrorail
Metrobus
US-1 Busway
Tri-Rail
Friend or family member gives me a ride

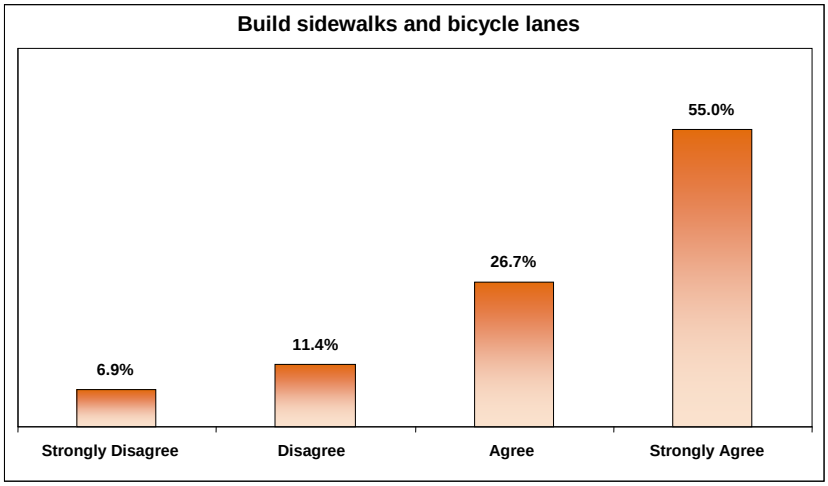

How do you usually travel to shop?
6.6%
5.4%
80.1%
0.6%
0.8%
3.0%
1.5%
0.2%
1.8%
Walk
Ride a Bicycle
Drive a Car
Carpool
Metrorail
Metrobus
US-1 Busway
Downtown Metromover
Friend or family member gives me a ride

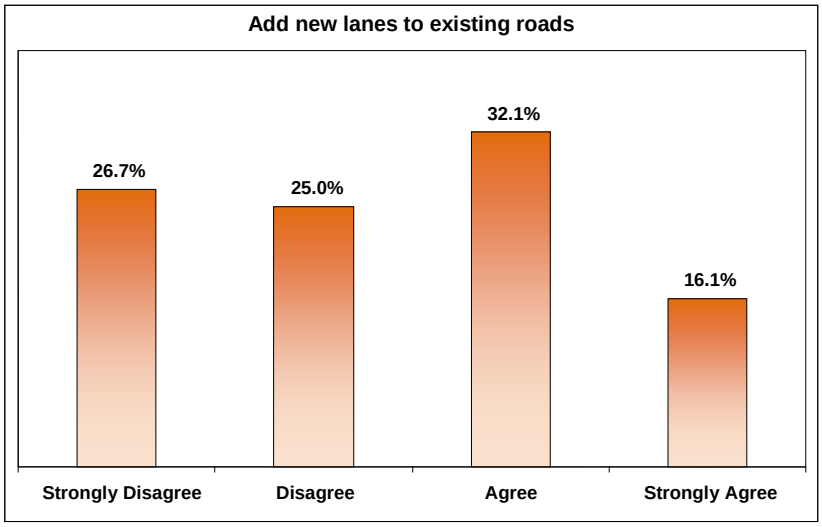

How do you usually get to where you are going when not working or shopping?
8.3%
10.8%
72.7%
1.2%
1.8%
3.6%
1.5%
Walk
Ride a Bicycle
Drive a Car
Carpool
Metrorail
Metrobus
Friend or family member gives me a ride

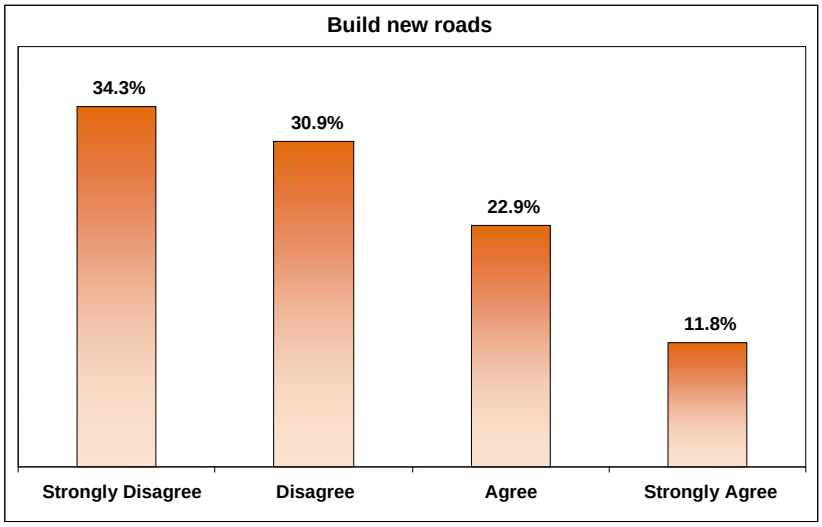


Participants responding to questions about future transportation needs and concerns revealed that the largest percentage of respondents (40.1%) believe that the focus of future transportation improvements should be mostly transit. A large percentage (31.6%) believes that future improvements should have an emphasis on transit with some additional roads. The smallest percentage of respondents (2.6%) believed that the focus should be mostly roads. Additionally, the majority of respondents (62.9%) would like to see more greenways, pedestrian and bicycle facilities in the transportation system. Only 9.2% of respondents disagree (5.6%) or strongly disagree (3.6%) with this statement. According to the results of the survey, expanding Metrorail, bus, and other transit services had the highest average rating (3.7). Building sidewalks and bicycle lanes also had a high average rating (3.3), while building new roads had the lowest average rating (2.1). The figures below show the percentage breakdowns of the responses to each of the individual items.




Build sidewalks and bicycle lanes
6.9%
11.4%
26.7%
55.0%
Strongly Disagree
Disagree
Agree
Strongly Agree


Add new lanes to existing roads
26.7%
25.0%
32.1%
16.1%
Strongly Disagree
Disagree
Agree
Strongly Agree

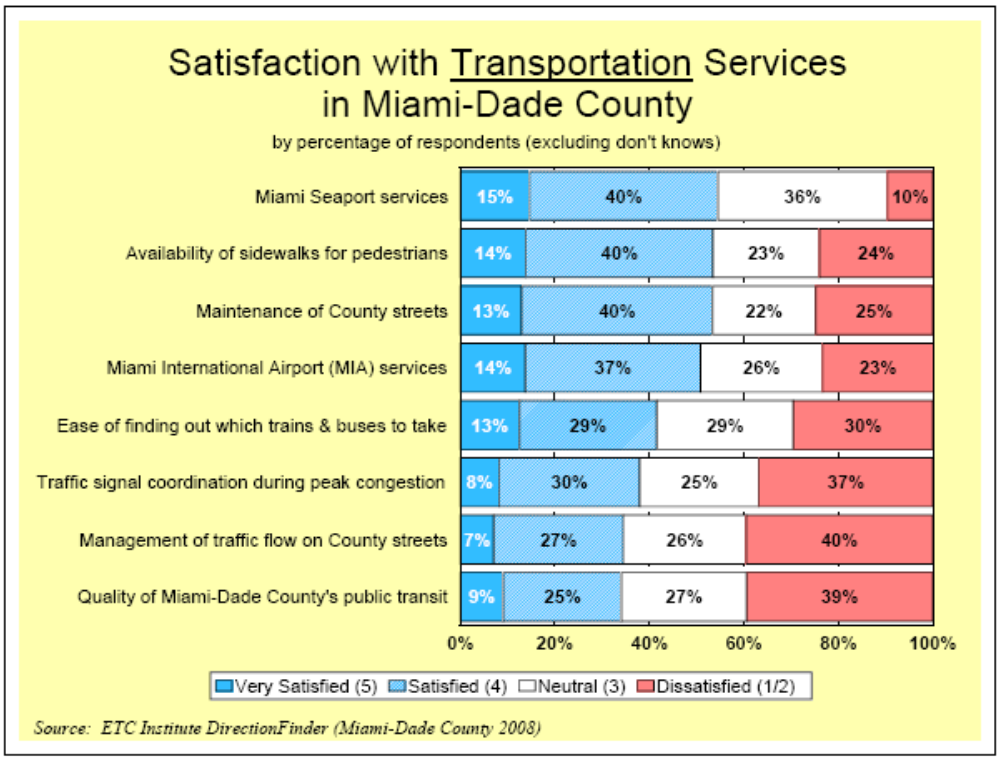

Build new roads
34.3%
30.9%
22.9%
11.8%
Strongly Disagree
Disagree
Agree
Strongly Agree

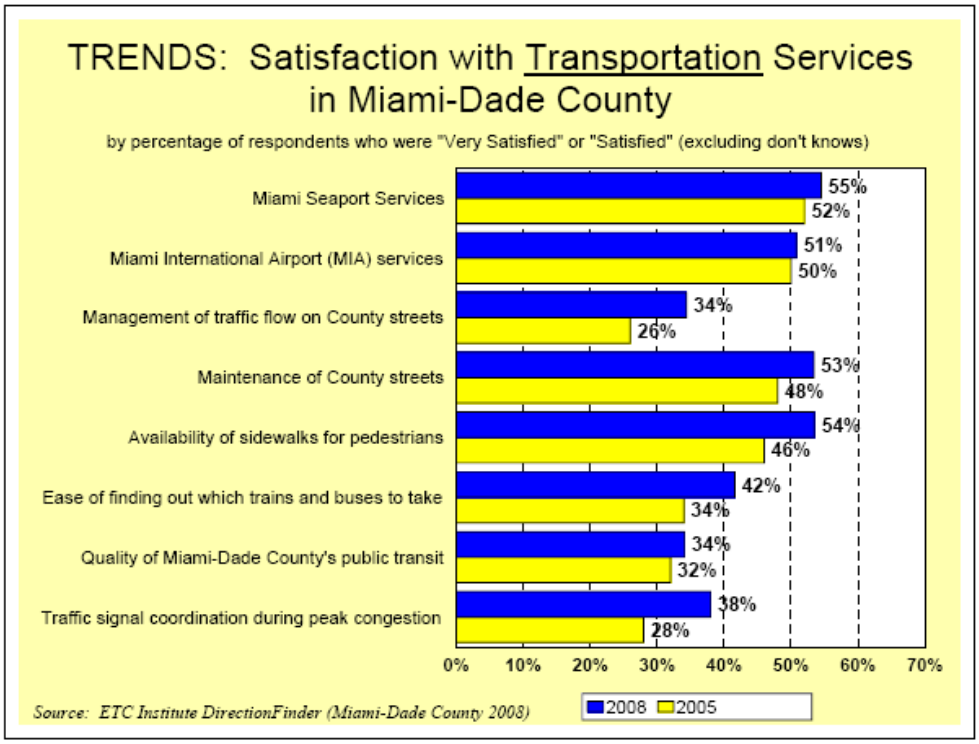
The last section of the survey measured respondents' level of agreement with a series of statements related to existing and future transportation concerns. The statement that said future transportation improvements should focus on making connections across the system received the highest average rating (3.5). The statements regarding transportation improvements needing to improve the connection between Miami-Dade and Broward counties and needing to provide better access to Miami-Dade county airports and seaports each received an average rating of 3.3. The lowest rating (2.2) went to the statement that said some existing roads should be partially converted into toll roads.

Miami-Dade County Resident Satisfaction Survey

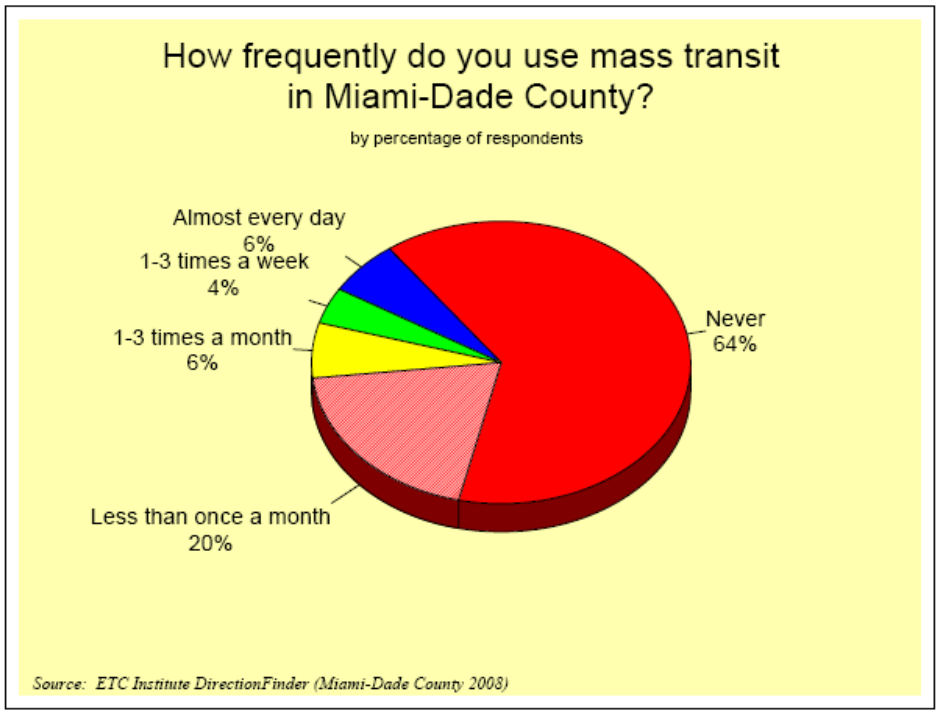
During the fall of 2008, ETC Institute administered a Resident Satisfaction Survey for Miami-Dade County to assess resident satisfaction with the delivery of major county services and to help determine priorities for the community as part of the County's ongoing planning process. Of the 20,000 households that received surveys, 5,522 were completed (a 27 percent response rate). The survey was administered in English, Spanish and Creole. Questions relating to County Transportation and Mass Transit are presented below.

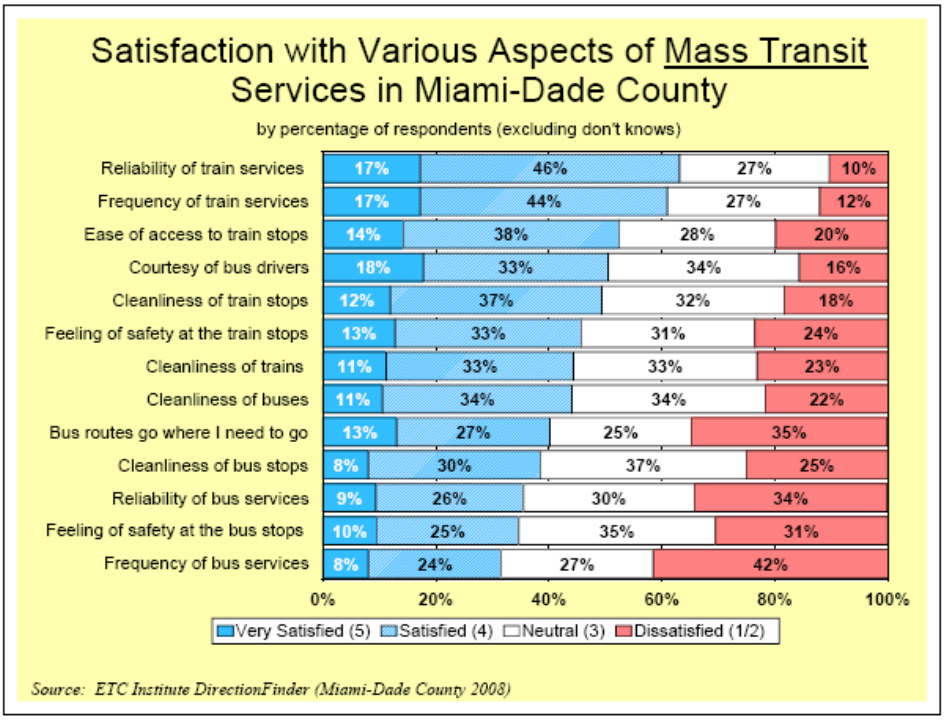
County Transportation: The highest levels of satisfaction with county transportation services, based upon the combined percentage of "very satisfied" and "satisfied" responses among residents *who had an opinion* were: Miami Seaport Services (55%), availability of sidewalks for pedestrians (54%), the maintenance of County streets (53%) and the Miami International Airport (51%). Residents were least satisfied with the quality of Miami-Dade County's public transit system (34%) and the management of traffic flow on County streets (34%).

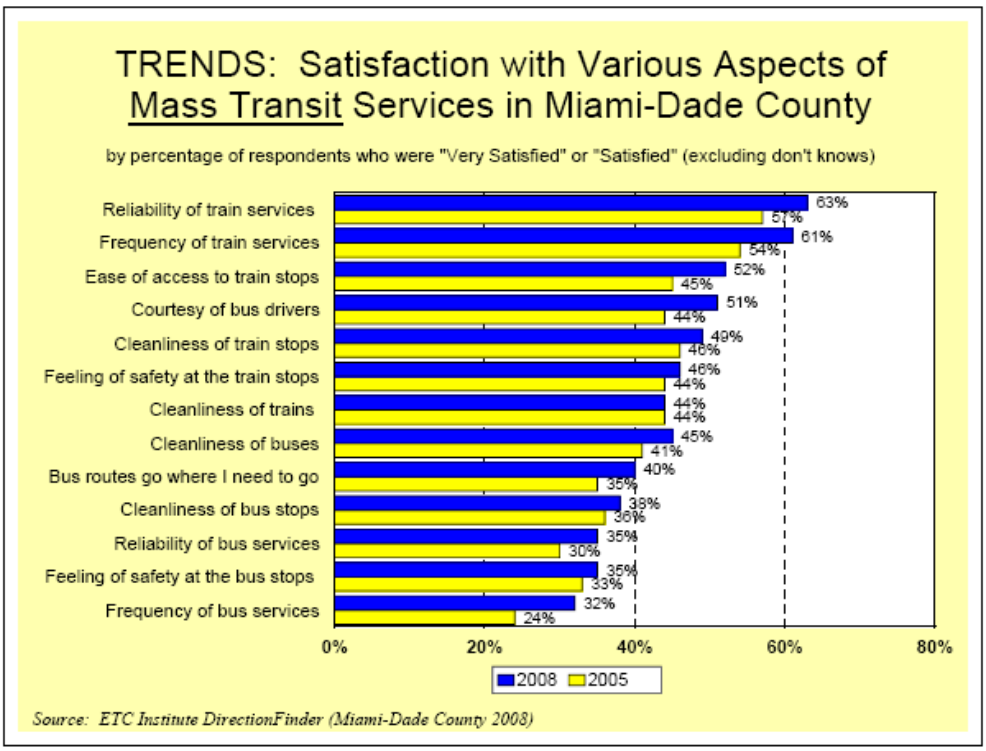


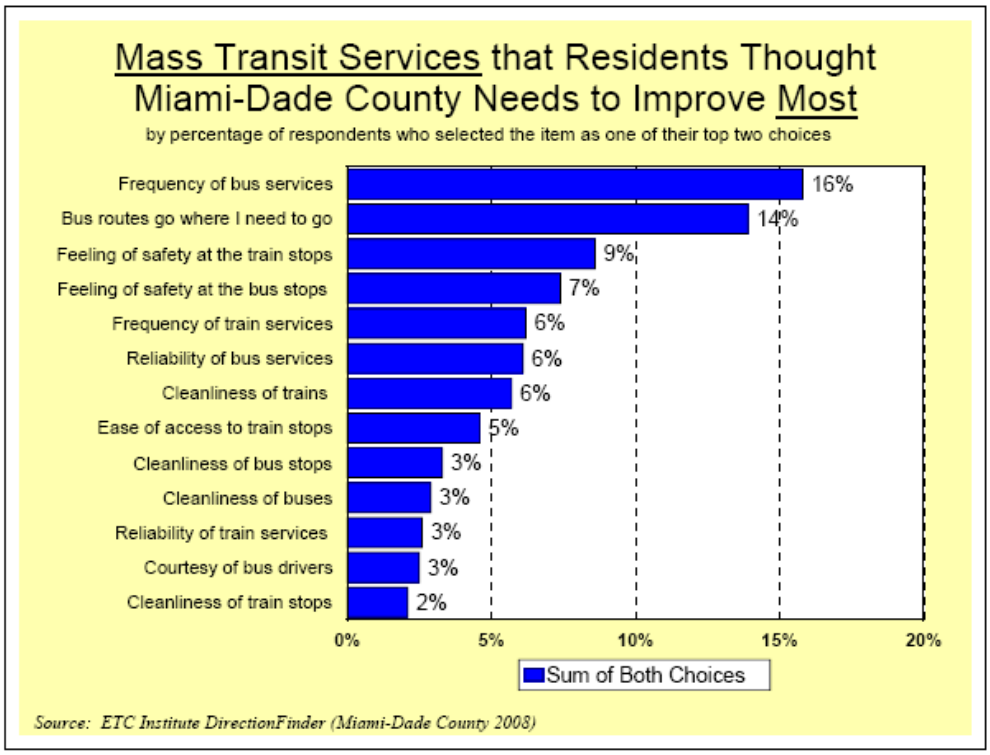


Mass Transit: The highest levels of satisfaction with mass transit services in Miami-Dade County based upon the combined percentage of "very satisfied" and "satisfied" responses among residents *who had an opinion* were: the reliability of train services (63%), the frequency of train service (61%), the ease of access to trains (52%) the courtesy of bus drivers (51%) and the cleanliness of train stops (49%). Residents were least satisfied with the frequency of bus services (32%).




Satisfaction with Various Aspects of Mass Transit Services in Miami-Dade County
by percentage of respondents (excluding don't knows)
Reliability of train services 17% 46% 27% 10%
Frequency of train services 17% 44% 27% 12%
Ease of access to train stops 14% 38% 28% 20%
Courtesy of bus drivers 18% 33% 34% 16%
Cleanliness of train stops 12% 37% 32% 18%
Feeling of safety at the train stops 13% 33% 31% 24%
Cleanliness of trains 11% 33% 33% 23%
Cleanliness of buses 11% 34% 34% 22%
Bus routes go where I need to go 13% 27% 25% 35%
Cleanliness of bus stops 8% 30% 37% 25%
Reliability of bus services 9% 26% 30% 34%
Feeling of safety at the bus stops 10% 25% 35% 31%
Frequency of bus services 8% 24% 27% 42%
0% 20% 40% 60% 80% 100%
Very Satisfied (5) Satisfied (4) Neutral (3) Dissatisfied (1/2)
Source: ETC Institute DirectionFinder (Miami-Dade County 2008)


TRENDS: Satisfaction with Various Aspects of Mass Transit Services in Miami-Dade County
by percentage of respondents who were "Very Satisfied" or "Satisfied" (excluding don't knows)
Reliability of train services 63% 57%
Frequency of train services 61% 54%
Ease of access to train stops 52% 45%
Courtesy of bus drivers 51% 44%
Cleanliness of train stops 49% 46%
Feeling of safety at the train stops 46% 44%
Cleanliness of trains 44% 44%
Cleanliness of buses 45% 41%
Bus routes go where I need to go 40% 35%
Cleanliness of bus stops 38% 36%
Reliability of bus services 35% 30%
Feeling of safety at the bus stops 35% 33%
Frequency of bus services 32% 24%
0% 20% 40% 60% 80%
2008 2005
Source: ETC Institute DirectionFinder (Miami-Dade County 2008)



2010 Evaluation and Appraisal Report (EAR) for the CDMP

The EAR process requires a series of public workshops, which were held in 2009. At these workshops, members of the public identified the following transportation/mobility concerns:

Transportation/Mobility

- Address the transportation component of HB 697 (Energy), Building Code Standards: Revises requirements for future land use element of local comprehensive plan to include energy-efficient land use patterns & greenhouse gas reduction strategies;
- Discuss how the County can more effectively achieve pedestrian friendly and walkable communities;
- Promote park connectivity on a countywide basis;
- Explore concepts such as mobility fee zones to help supplement existing transportation facilities and services; and
- Evaluate potential incentives for transit oriented development.

Water

The quality of drinking water in Miami-Dade County meets or exceeds all federal and state drinking water standards. Miami-Dade's per-capita use in calendar year 2009 was 139.6 gallons of water a 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. Because the Biscayne aquifer, Miami-Dade County's main source of water supplies, is located just a few feet below the surface, Miami-Dade County is diligent in the protection and conservation of this most important resource. Developing efficient practices and using water wisely is paramount to lessening the impact of future water shortages and protecting water quality. In addition to efficient water use, Miami-Dade County is ensuring the sustainability of the Biscayne aquifer and making certain that Miami-Dade County has sufficient water to meet future demand by developing Alternative Water Supplies (AWS). AWS projects will ensure that the Biscayne aquifer is sustainable even with future population growth. By improving water use efficiency, Miami-Dade County can meet future water demands without causing harm to our water resources and surrounding natural systems.

Water & Sewer

Assessment Area

The quality of drinking water in Miami-Dade County meets or exceeds all federal and state drinking water standards. Miami-Dade's per-capita use in calendar year 2009 was 139.6 gallons of water a day, down from 158 gallons four years prior. The per capita use is calculated by dividing the total water produced at the plants (finished water) by the population served. 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. The water supply comes from the Biscayne aquifer, the County's primary drinking water source. The Miami-Dade Water and Sewer Department (WASD) is the main public water supplier in Miami-Dade County. In addition to WASD, there are four municipalities in Miami-Dade, which are permitted to withdraw water for public water supply. All water supply sources in the County are managed and regulated by the South Florida Water Management District (SFWMD) through Water Use Permits (WUPs). The WUP provides Miami-Dade County with a framework for providing future generations with adequate supplies of drinking water.

Water availability and sewer capacity for most of Miami-Dade is provided by the Miami-Dade Water and Sewer Department (WASD) through three regional water treatment plants (WTPs), five smaller WTPs and three regional wastewater treatment plants (WWTPs). The principal responsibilities of WASD are water transmission, treatment, and distribution; and wastewater collection, treatment, reuse and disposal. WASD is one of the largest public utilities in the United States, and currently serves about 418,000 retail water customers and 336,000 retail wastewater customers. In addition, wholesale water service is provided to 13 of Miami-Dade County's 35 municipalities; wholesale sewer service is provided to 12 municipalities in the County.

The Biscayne aquifer, the main source of water supplies in Miami-Dade County has been designated as a sole source aquifer by the US Environmental Protection Agency. Because this water supply is located just a few feet below the surface, Miami-Dade County is diligent in the protection and conservation of this most important resource. Developing efficient practices and using water wisely is paramount to lessening the impact of future water shortages and protecting water quality. In addition to efficient water use, Miami-Dade County is ensuring the sustainability of the Biscayne aquifer and making certain that Miami-Dade County has sufficient water to meet future demand by developing Alternative Water Supplies (AWS). AWS projects will ensure that the Biscayne aquifer is sustainable even with future population growth. By improving water use efficiency, Miami-Dade County can meet future water demands without causing harm to our water resources and surrounding natural systems.

With the 2006 adoption of the Miami-Dade Water Use Efficiency Plan by the Miami-Dade County Board of County Commissioners, Miami-Dade County began educating residents on how to use water more efficiently to preserve these natural resources for future generations while reducing future water and wastewater infrastructure costs. The plan summarizes expected water savings from the implementation of a set of water use efficiency best management practices (BMPs) over a period of 20 years, which began in 2007 and extends through 2026.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Providing adequate water supply while protecting the water resources through compliance with all current and future regulations.
- Meeting future energy demands required to meet water and wastewater production projected by 2030 which is estimated to be three times that used to meet current demands.
- Promoting the designation of quantifiable water use efficiency as an alternative water supply (AWS) source instead of only pursuing major capital investments.
- Reducing the amount of water loss through leaks.
- Developing a funding strategy to address pipe replacement due to age and identification of areas where growth requires expansion, including an adequate water rate structure.
- Addressing state ocean outfall legislation, including the elimination of outfalls and implementing the 60 percent wastewater reuse requirements.
- Identifying and tracking the consumption rates of various sectors of water users in the absence of a comprehensive reporting system.
- Funding strategy to address needed upgrades of meters and submeters to adequately manage electricity use at the plants

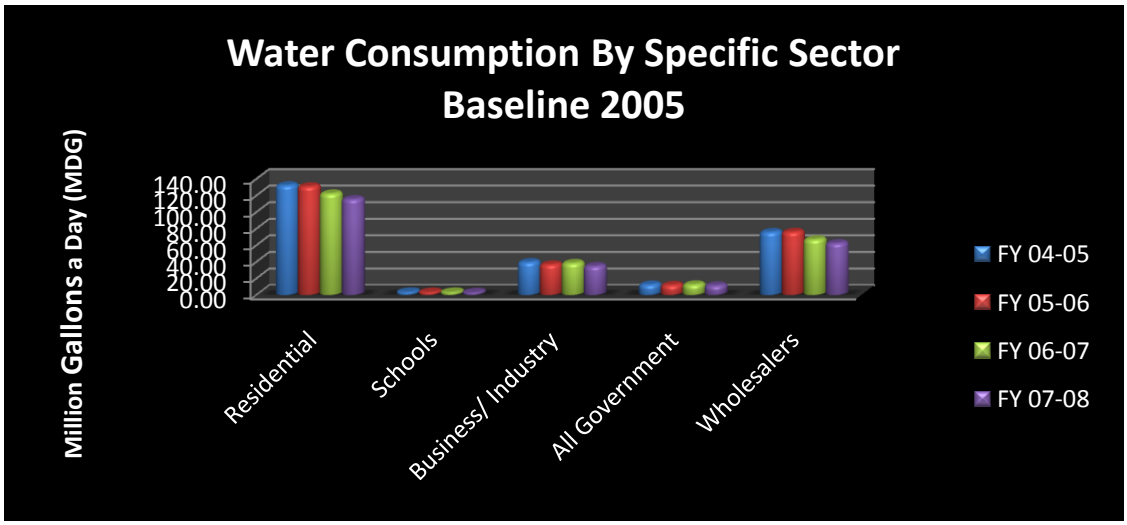
ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

A series of indicators is presented below to provide an understanding of water consumption and future projected demands on a per capita basis as well as by sectors within the community. Also included are indicators on water losses in the system and results of water conservation efforts.

Water consumption by all sectors is represented in Figure 1 in millions of gallons per day (MGD). Using the baseline consumption for Calendar Year 2005, the same users were tracked through 2008 to assess water use reduction patterns. The consumption reduction trend is a representation of the overall effectiveness of the County's conservation efforts.

Figure 1

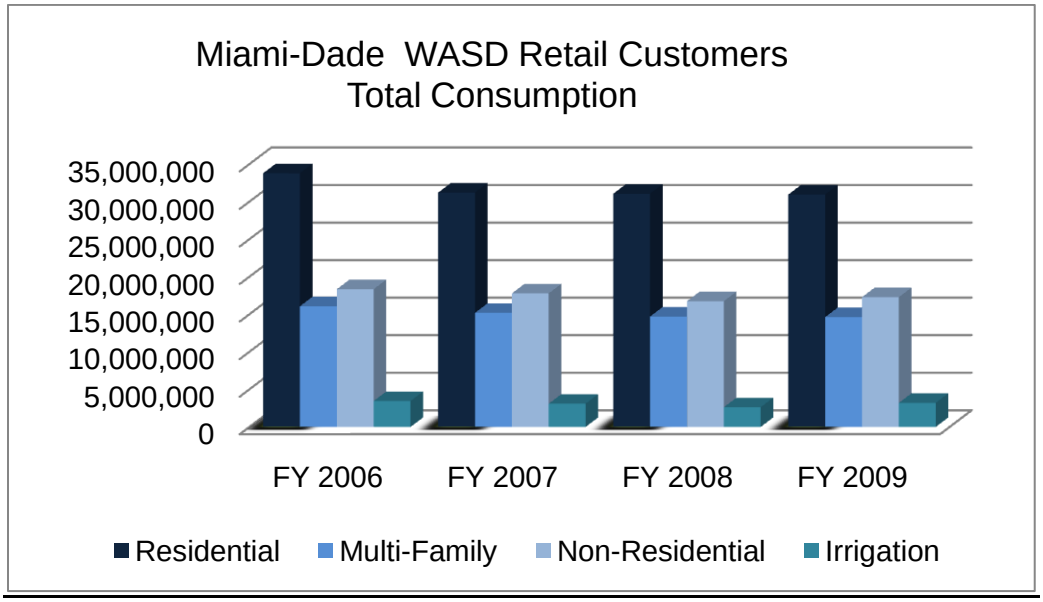


Data for Figure 1

	FY 04-05	FY 05-06	FY 06-07	FY 07-08
Residential	**132.13**	**130.84**	**122.23**	**115.60**
Schools	**3.71**	**3.48**	**3.62**	**3.13**
Business/ Industry	**39.56**	**36.73**	**38.40**	**34.77**
All Government	**12**	**12**	**13**	**11**
Wholesalers	**76**	**76**	**67**	**62**

The graph below, Figure 2, summarizes the annual consumption of residents, multi-family residences, non-residential customers, and water used for irrigation, which only includes the demand from those customers that have a separate irrigation meter. Most customers have only one meter, which accounts for all their uses. In addition, a large number of irrigation is done through the use of private wells. The South Florida Water Management District estimates that almost half of the total amount of water consumed by the residential sector is used outside the home for irrigation to maintain landscapes.

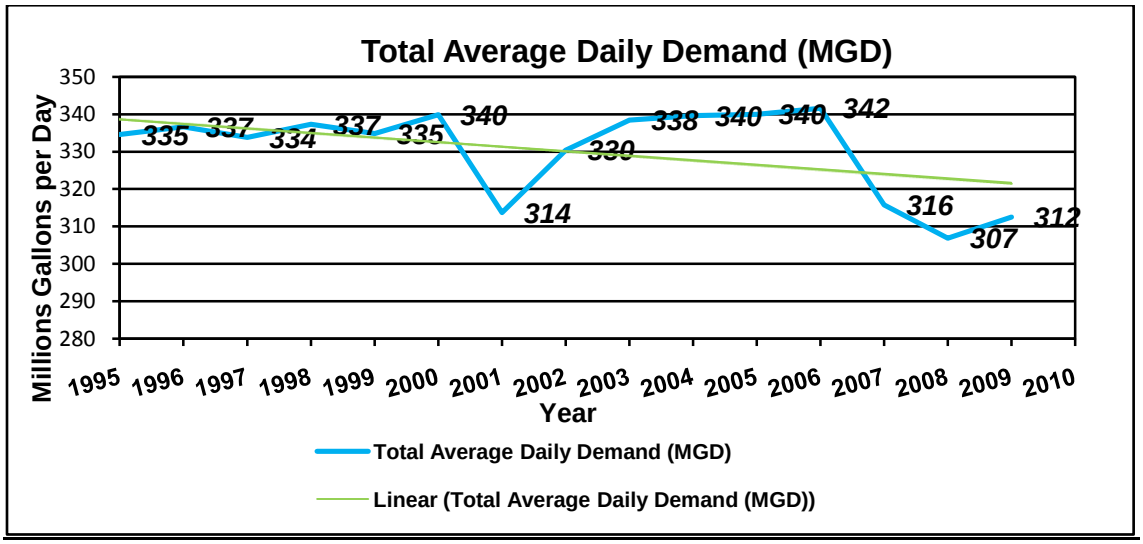
Figure 2: Residential, Non-Residential, and Irrigation Consumption



Per-Capita Daily Demand

Consumption of water in Miami-Dade was 181 gallons per capita per day (gpcd) in 1994, similar to most counties within the SFWMD's jurisdiction. Consumption has steadily fallen since 1994 exhibiting dramatic decreases during the 2001 and 2007 droughts as a result of mandatory water restrictions. Per capita consumption is expected to continue to fall, from the current level of 139.6 gpcd, with the implementation of the revised Building Code water efficiency and sustainable design standards for new construction.

Figure 3



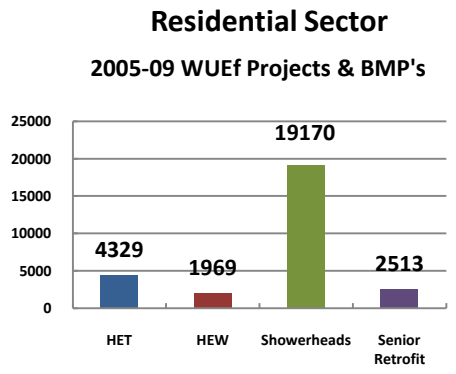
The Water Use Efficiency (WUE) Plan is a requirement of the 20-Year Water Use Permit (WUP) issued by the SFWMD to Miami-Dade County, in November 2007. The WUE Plan was developed for the area served by WASD, as well as the thirteen (13) municipalities that receive wholesale water from WASD. The Plan summarizes expected water savings from the implementation of a set of water use efficiency best management practices (BMPs) over a period of 20 years, which began in 2007 and extends through 2026.

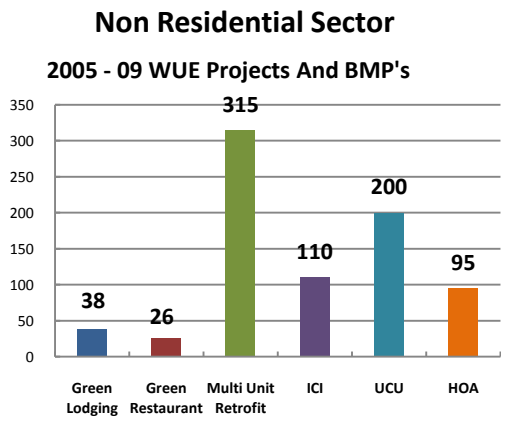
Water Savings from Implementation of Water-Use Efficiency Programs

WASD has expended considerable effort over the years implementing numerous water conservation measures and best management practices (BMP). The total water savings target of 19.6 MGD through 2026 has been consistently exceeded to-date. In 2009, the actual water demand was about 34 MGD lower than what had been projected in the WUP. This demand reduction is the result of a very successful WUE Program, mandatory restrictions in place since March 2007, slight decrease in population growth, and economic conditions. The charts below, Figures 4 and 5, show the savings directly attributed to the implemented best management practices and measures which include extensive public education campaigns, water irrigation restrictions and a number of projects and incentives such as:

- High Efficiency Toilets (HET) Rebate Program $100 rebate
- High Efficiency Showerhead (1.5 gpm) Rebate Program- $10 rebate
- Seniors HET Retrofit – free toilet replacement for Seniors that qualify for Senior Homestead exemption
- High-Efficiency Washer Rebate Program
- Green Lodging Hotel and Restaurant Project (evaluation/free water efficiency items)

Figures 4 and 5



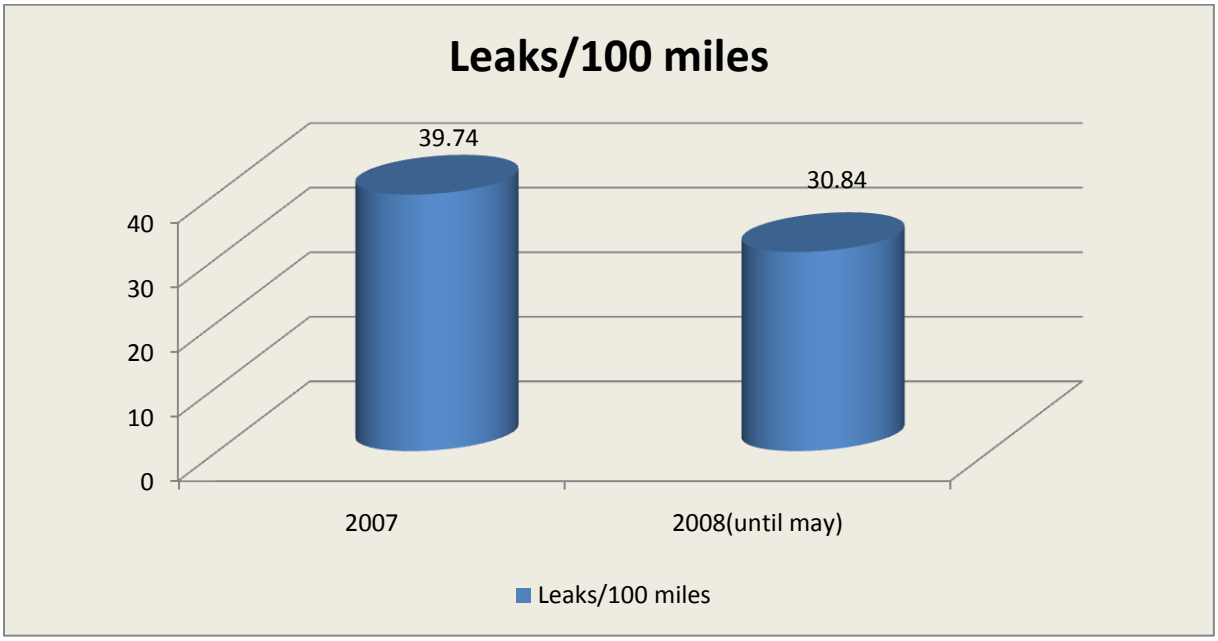


Key
HET – High Efficiency Toilets
HEW – High Efficiency Washers
ICI- Industrial-Commercial-Institutional
UCU- Urban Conservation Unit
HOA - landscape irrigation evaluations (soil moisture sensors)

Non-Revenue Water Loss

Non-Revenue Water Loss is an indicator of the difference between the water produced by the water treatment plants and water sold. WASD is implementing a Non-Revenue Water Loss Reduction Plan (NRWLR), which is a requirement of the WUP. The NRWLR Plan includes a proposed target for acceptable losses and specific actions that will be taken to achieve the goal. A Plan, to achieve the goal, including specific milestone dates extending through 2026, has been developed.

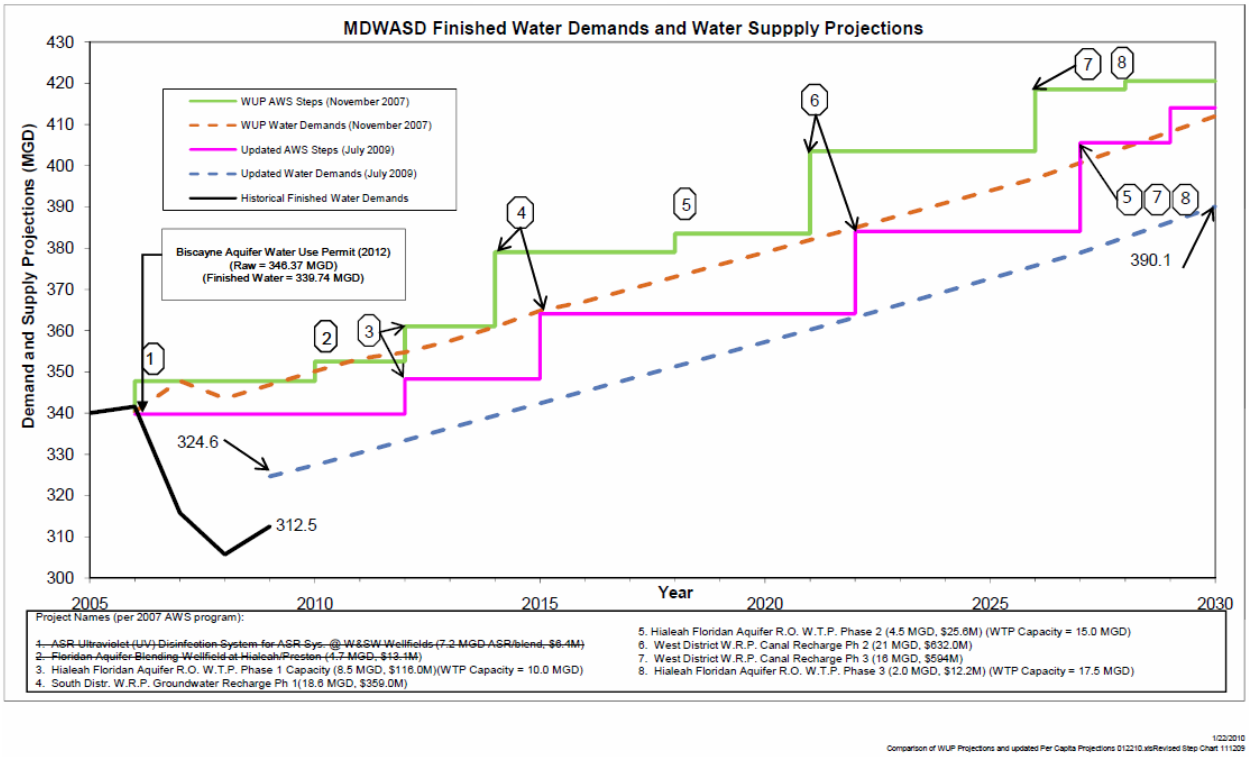
Figure 6



Water Saved

WASD compares the actual water demands (black solid line) with the allocation allowed by the WUP (green solid line). The dashed lines, in Figure 7, represent the projections as they were in the permit (light gray) and the revised projections (blue lines):

Figure 7



Water and Wastewater Treatment Plant Capacities

In Miami-Dade County Water Treatment Plant capacity is rated by both the Florida Department of Health and the Miami-Dade County Department of Environmental Resources Management (DERM), in terms of the capacity to treat maximum day flows. The wastewater treatment plant capacity is rated by the Florida Department of Environmental Protection and DERM, in terms of annual average daily flow (AADF). The actual flow treated by the plants is compared to the rated capacity.

The High Level Disinfection (HLD) plant at the South District Wastewater Treatment Plant (SDWWTP)which is currently under construction and expected to be completed by 2014, will serve to expand the SDWWTP's maximum (peak) treatment capacity by 60 MGD, to 285 MGD, from the current 225 MGD. The HLD is a precursor to the water reclamation plant that is currently being designed. HLD addressed regulatory requirements but at the same time represent a challenge due to the high level of energy required for its operations. An additional HLD plant is in the planning stages for the Central District Wastewater Treatment Plant.

Sanitary Sewer Capacity Allocation

A sewer capacity certification letter issued by DERM is required prior to the approval of any building permit. The sanitary sewer allocation process ensures that development does not exceed the capacity of WASD's sanitary sewer system and the certification letter specifically identifies the allocation issued to the permit applicant. Any construction or change of use that

will cause an increase in wastewater discharge to a sanitary sewer also requires a certification letter.

Water Allocation

A water allocation certification letter issued by WASD will be required prior to the issuance of any building permit. The water allocation process ensures that development does not exceed the available water supply approved in Miami-Dade County's WUP and the certification letter specifically identifies the allocation issued to the permit applicant. Any construction or change of use that will cause an increase in water usage will require a certification letter.

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Comprehensive Development Master Plan

The County's Comprehensive Development Master Plan (CDMP) has a water and sewer element which include various indicators of sustainability and concurrency. Some of those indicators are:

- Water Capacity - treatment plant capacity for the system (water and sewer). (WS-2, CDMP).
- Water Capacity - Reserve capacity of raw and treated water (water). (WS-2, CDMP).
- Water Capacity & Watershed Health - Reserve capacity of raw water and capacity of the aquifer storage and recovery system. (WS-6, CDMP).
- Water Conservation Results - Average water use per capita (WS-5, CDMP).
- Water Conservation Results - Amount of water or wastewater that is reused or reclaimed within Miami-Dade County on an annual basis (WS-5, CDMP).

Water Supply Facilities Work Plan

Population changes directly impact water usage and in turn affect infrastructure and capacity. For that reason, WASD develops and maintains a Water Supply Facilities Work Plan. Consistency is maintained between the water supply projects identified in the Water Supply Facilities Work Plan and those listed in Miami-Dade County's WUP, the SFWMD's Lower East Coast Regional Water Supply Plan, and the Capital Improvements Element of the Miami-Dade County CDMP. Comparison of the projected 20-year water demands with the projected water supply projects is identified in the Work Plan. The Work Plan water demand projections are consistent with the 20-Year water use permit. WASD is in the process of revising the projections as a result of the successful water use efficiency plan.

Water and Sewer Facilities Master Plan

WASD updates its water and sewer master plans approximately every five years, for a planning horizon of 20 years. The Water Facilities Master Plan Update is to be completed in February 2010. The Wastewater Facilities Master Plan was completed in 2007. An Integrated Water, Wastewater and Reclaimed Water Master Plan is currently underway.

Existing Legislation

Legislative initiatives at the federal, state, and local level have changed the way water and sewer providers plan and manage public water and wastewater systems. Federal legislation requires a series of water quality regulations be implemented and permits acquired. At the state level, the Regional Water Availability Rule has provided strict limitations on water withdrawals, and the Ocean Outfall Legislation requires that Miami-Dade County's two outfalls that are being

used for treated wastewater disposal, be eliminated as a primary means of domestic wastewater discharge by 2025 and that 60% of the flows be reused. . Additionally, local ordinances adopted by the Board have enhanced indoor and outdoor water use efficiency.

Federal - Water Quality Requirements

- The Clean Water (CWA) Act, enacted in 1972, provided the statutory basis for the National Pollutant Discharge Elimination System (NPDES) permit program and the basic structure for regulating the discharge of pollutants from point sources, such as the County's ocean outfalls, to waters of the United States. Section 402 of the CWA specifically required the Environmental Protection Agency (EPA) to develop and implement the NPDES program. The CWA gives EPA the authority to set effluent limits on an industry-wide (technology-based) basis and on a water-quality basis for the protection receiving waters. The CWA requires anyone who wants to discharge pollutants to first obtain an NPDES permit, or else that discharge will be considered illegal. In Florida, the NPDES program has been delegated to the Florida Department of Environmental Protection, which issues permits to the County.
- The Safe Drinking Water Act (SDWA) was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells. SDWA authorizes the EPA to set national health-based standards for drinking water to protect against both naturally-occurring and man-made contaminants that may be found in drinking water.

State - Water Resources

- Senate Bills 444 and 360 addressed alternative water supplies (AWS) and growth management, respectively. AWS include salt water, brackish surface and groundwater; surface water captured predominately during wet-weather flows; sources made available through the addition of new storage capacity for surface or groundwater; reclaimed water; stormwater; and any other water supply source that is designated as nontraditional.
- Senate Bill 444 provides for AWS funding to encourage the development of sources other than the Biscayne aquifer for future demand projections.
- Chapter 373, F.S., authorized the SFWMD to revise to the "Basis of Review for Water Use Permit Applications" (Chapter 40E) in 2007 to limit the use of water from the Regional System in the Lower East Coast for new and existing uses.
- Senate Bill 1302, passed in 2008, requires that the six ocean outfalls along the southeast coast of Florida, that are being used for treated wastewater disposal, be eliminated as a primary means of domestic wastewater discharge by 2025. Three of these outfalls are located in Miami-Dade. The bill requires all facilities discharging domestic wastewater through ocean outfalls to achieve, at a minimum, 60 percent reuse by December 31, 2025. This requirement results in WASD having to implement 117 MGD of reuse by 2025. The bill also requires that ocean discharges after December 31, 2018, meet the requirements of advanced wastewater treatment or equivalent. The WASD intends to meet this requirement by diverting flows from the outfalls into existing and proposed injection wells, and is required to submit a detailed plan of how to meet these requirements by July 2013.

Local - Water Use Efficiency Code & Plan

In 2006, the Board adopted Resolution R-468-06 which directed the development of a Water-Use Efficiency Plan to improve the County's water use efficiency. The plan's reduction targets were established by the SFWMD at 1.5 million MGD for a total of 19.6 MGD by 2026.

The objectives of the plan are as follow:

Objective 1 - Improve Water-Use Efficiency

- Raise public awareness of water conservation and encourage responsible public behavior by implementing a public education and information program.
- Assist wholesale customers in continuing efforts towards water use efficiency.
- Implement plumbing retrofit incentive programs and water audit projects.
- "Lead by example" by assuring efficient use of water in County facilities through water use audits, and retrofit projects and Xeriscaping.
- Continue to include public and private stakeholder groups in new program development and the implementation processes.

Objective 2 - Reduce the Loss and Waste of Water

- 2.1 Limit unaccounted-for water from the County's system to no more than 10 percent of the volume of water delivered based on a moving five-year average.
- 2.2 Maintain a program of universal metering (metering of all uses) and meter replacement and repair.
- 2.3 Maintain Infiltration and Inflow (I&I) Reduction Program.
- 2.4 Enhance tampering monitoring program to reduce unauthorized use which contributes to better water accounting.
- 2.5 Upgrade water system data analysis capabilities so that data can be more easily obtained and evaluated for water conservation purposes.

Objective 3 - Comply with Statewide Legislative Criteria and New Initiatives

- 3.1 Guide the development of legislation, policies, guidelines and standards to improve water use efficiency.
- 3.2 Identify, acknowledge and learn from past and current water use efficiency initiatives in Miami-Dade.
- 3.3 Engage community leaders, governmental agencies, water utilities and the public in addressing water supply issues through creative partnerships.

The overall goal of the plan is to prevent and reduce wasteful, uneconomical, impractical, or unreasonable use of water resources. Miami-Dade's program has exceeded the cumulative water saving of 3.53 MGD established by the WUP. In 2009, the actual water demand was about 34 MGD lower than what had been projected in the WUP. This demand reduction is the result of a very successful WUE Program, mandatory restrictions in place since March 2007, slight decrease in population growth, and economic conditions. The WUE Program savings have been accomplished through a combination of extensive public education campaigns and a number of projects and incentives such as:

- High Efficiency Toilets (HET) - $100 rebate
- High Efficiency Showerhead (1.5 gpm) - $10 rebate
- Seniors HET Retrofit – free toilet replacement for Seniors that qualify for Senior Homestead exemption
- High-Efficiency Showerhead Exchange
- High-Efficiency Washers (Tier 3) (suspended)
- Residential landscape irrigation evaluations (Soil Moisture Sensor)
- HOA landscape irrigation evaluations ($2,800 rebate + sensor)
- Green Lodging Hotel and Restaurant Project (evaluation/free items)

- ICI Water use evaluations (County facilities and privately owned)
- A comprehensive public outreach campaign that targets each individual sector or the community
    - Empower the community by increasing communication and coordination with local, state, and federal entities. (NU2)
    - Promote responsible stewardship of natural resources and unique community environments. (NU3)
    - Provide timely and reliable public infrastructure services including road maintenance, storm water, solid waste and wastewater management, and a safe and clean water delivery system consistent with the Comprehensive Development Master Plan (CDMP). (NU6)
    - Ensure the timely acquisition of "best value" goods and services while maintaining integrity and inclusion. (ES3)
    - Attract, develop and retain an effective, diverse and dedicated team of employees (ES5)
    - Ensure the financial viability of the County through sound financial management practices. (ES8)
    - Deliver on promises and be accountable for performance. (ES9)

Most recently, the Board has further strengthened the Code through the following amendments:

- Chapter 32-84, establishes stricter water use efficiency standards for new residential and commercial development. Requires evaluation of AWS projects for new developments of regional impact.
- Chapter 32-8, establishes permanent two days a week irrigation restrictions and mandatory year-round landscape irrigation conservation measures.

COMMUNITY FEEDBACK

Feedback & results gathered though the planning process or surveys

2006 WASD Customer Satisfaction Survey

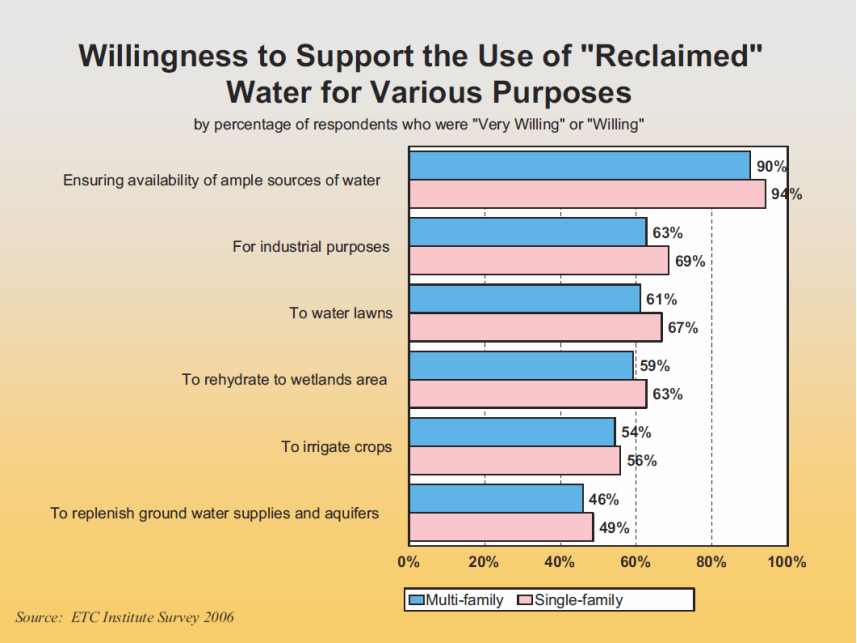
WASD conducted a Customer Satisfaction Survey of 1,207 residential customers during September and October 2006. The survey highlighted the excellent service provided by the department. The following is a summary of some of the responses:

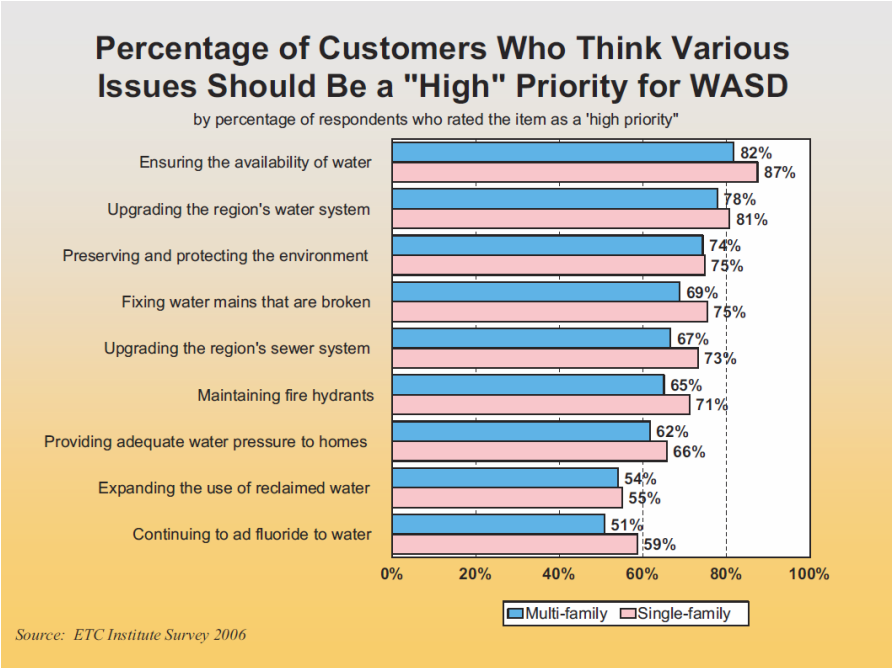
- 92 percent of single family and 85 percent of multi-family customers are either very satisfied or satisfied with the reliability of water service.
- 87 percent of single family and 81 percent of multi-family customers are either very satisfied or satisfied with the quality of water service.
- 82 percent of single family and 69 percent of multi-family customers are either very satisfied or satisfied with the quality of wastewater service.
- 89 percent of single family and 83 percent of multi-family customers rated WASD as always or usually reliable and the most reliable utility as compared to the local phone company, natural gas, cellular phone, electric company, internet service provider or cable/satellite companies.

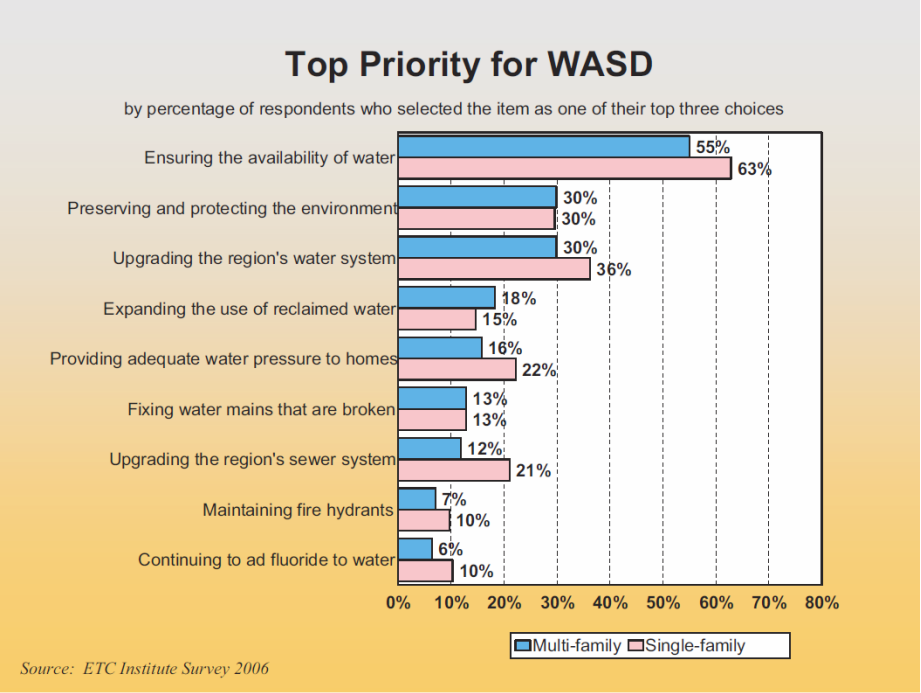
Of those residents who had used the various programs and services, almost all were satisfied. Some examples are:

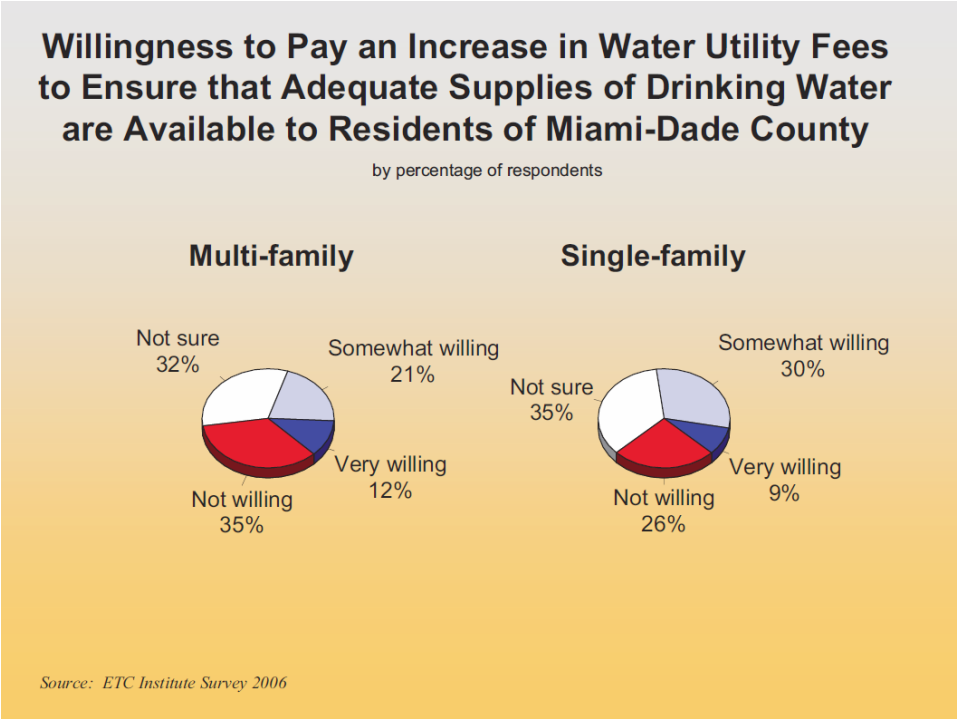
- 80 percent satisfied with WASD's 24-hour Communications Center
- 90 percent satisfied with public education on Showerhead Exchange Program. This information correlates with the number of showerheads exchanged at events and the department's customer service offices

The survey included some questions related to sustainability and the environment. The questions and the results are shown below:









Water Use Efficiency Survey

The WASD's Water Use Efficiency Section conducted a residential customer survey from March 26 to May 10, 2009. A total of 801 telephone interviews were conducted, drawn from random samples of households with at least one registered voter. In a pretest wave, 501 respondents were surveyed prior to the widespread implementation of the "Use Less" water conservation campaign. In a post-test wave, respondents were surveyed from May 1 to May 10, 2009 after

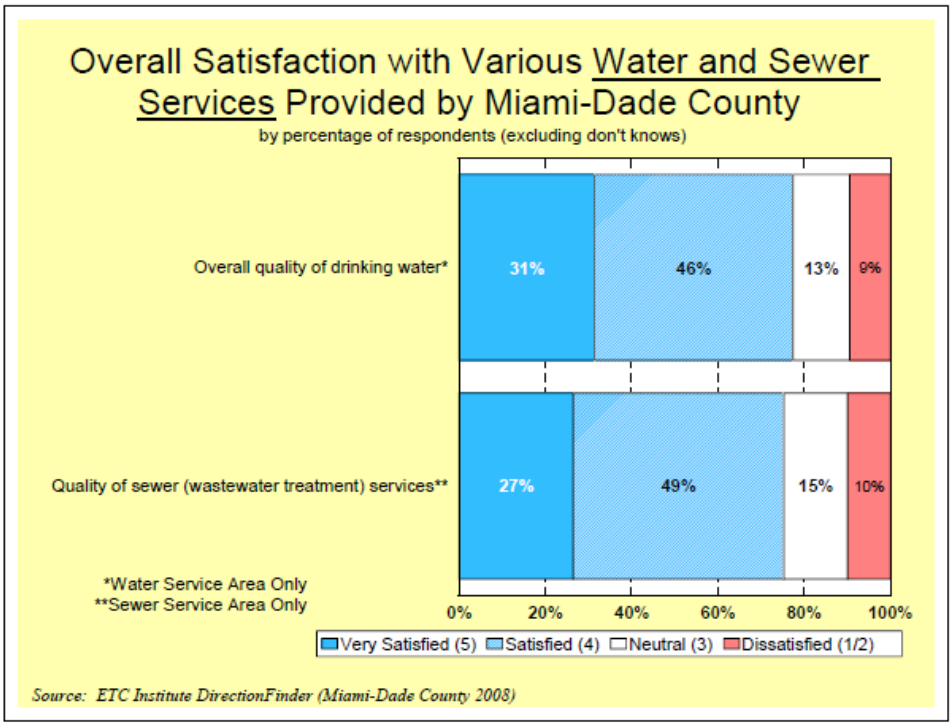
the campaign had peaked. The purpose of the research was to assess the baseline levels of awareness of the need for water conservation, to gauge the level of cooperation with restrictions on lawn and landscape watering, and to measure the impact of the "Use Less" campaign on public opinions.

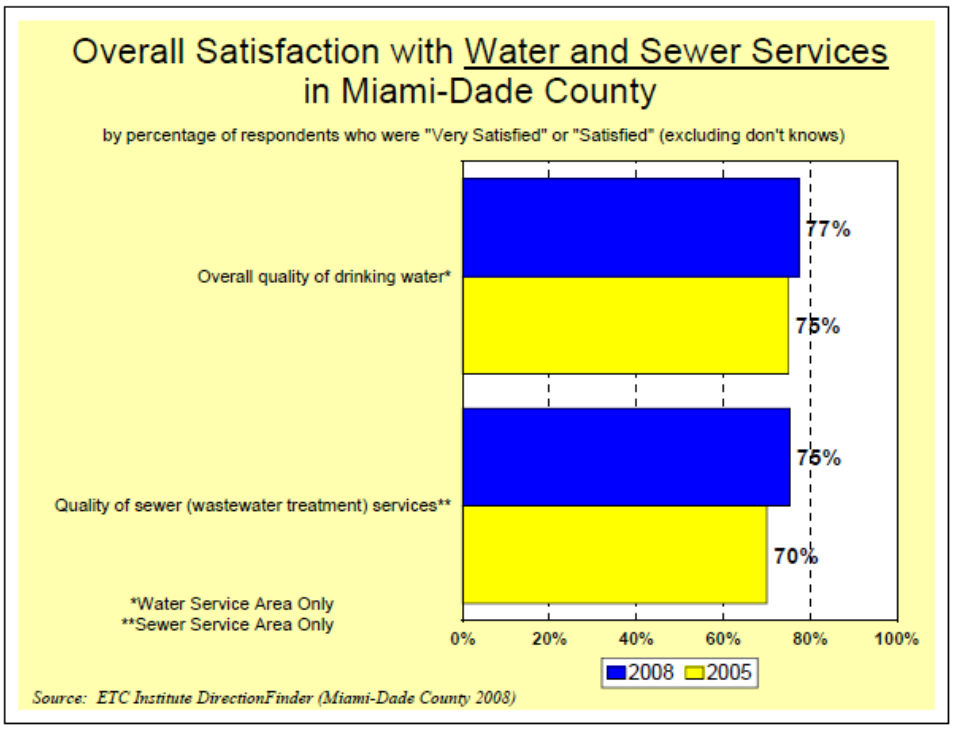
The survey results clearly indicated that the "Use Less" campaign built on a solid foundation of community awareness about the need for residential water conservation. The campaign was recognized by a significant number of Miami-Dade residents. In fact, 52 percent recalled seeing some water conservation related advertisement but major pro-conservation attitudes and behaviors were already in place at the time of the campaign was launched. This was made evident by the fact that 73 percent of the respondents were aware of and expressed compliance with the two-day watering restrictions.

Miami-Dade County Resident Satisfaction Survey

During the fall of 2008, ETC Institute administered a Resident Satisfaction Survey for Miami-Dade County to assess resident satisfaction with the delivery of major county services and to help determine priorities for the community as part of the County's ongoing planning process. Of the 20,000 households that received surveys, 5,522 were completed (a 27 percent response rate). The survey was administered in English, Spanish and Creole.

The level of satisfaction with water and sewer services was relatively high in all areas that were rated. Based upon the combined percentage of "very satisfied" and "satisfied" responses among residents *who had an opinion* 77 percent of those surveyed were satisfied with the overall quality of drinking water and 75 percent were satisfied with the quality of sewer (wastewater treatment) services.




Overall Satisfaction with Water and Sewer Services in Miami-Dade County
by percentage of respondents who were "Very Satisfied" or "Satisfied" (excluding don't knows)
Overall quality of drinking water*
77%
75%
Quality of sewer (wastewater treatment) services**
76%
70%
*Water Service Area Only
**Sewer Service Area Only
0%
20%
40%
60%
80%
100%
2008
2005
Source: ETC Institute DirectionFinder (Miami-Dade County 2008)

Appendices

- Acknowledgments
- Sustainability Related Legislation
- Initial Recommendations of the Miami-Dade County Climate Change Advisory Task Force
- Climate Change and Water Management in South Florida
- County Health Rankings 2010

ACKNOWLEDGMENTS

A well deserved thank you is in order for the voluntary members of the Mayor's Sustainability Advisory Board, the Core Planning Team and Interdepartmental Team. Without their hard work, commitment and passion to improve the quality of life for County residents, this important key first step could not have come to life.

Mayor's Sustainability Advisory Board
Honorable Katy Sorenson, County Commissioner - *Board Chairperson*
Honorable Shirley Gibson, Mayor, City of Miami Gardens
Veronica Benzinger, Sr. Vice President, Aon Environmental Services Group
Ray Castellanos, Owner, Authentic Construction
Truly Burton, Director of Government Affairs, Builders Association of South Florida
Tracey E. Gallentine, Senior Account Executive, Ameresco
Barry Johnson, President and CEO, Greater Miami Chamber of Commerce
Jim Murley, Director, Catanese Center for Urban and Environmental Solutions, Florida Atlantic University
Dr. Eduardo Padron, President, Miami-Dade College
Alternate: Colleen Ahern-Hettich, Director, Earth Institute, Miami-Dade College
Bill Riley, Business Manager, International Brotherhood of Electrical Workers Local Union 349
Traci Romine, Director of Climate Change Policy and Communications, Audubon of Florida
Dr. Mark B. Rosenberg, President, Florida International University
Paul C. Savage, Law Offices of Paul C. Savage, P.A.
John Scott, Director of Client Solutions, Cushman and Wake
Dr. Jose Szapocznik, Chair, Department of Epidemiology and Public Health, University of Miami
William D. Talbert, III, President and CEO, Greater Miami Convention and Visitor's Bureau

Sustainability Core Planning Team
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Devesh Nirmul, Sustainability Program Manager, Office of Sustainability
Paula Romo, Business Analyst, Office of Strategic Business Management
Susannah Troner, Sustainability Program Manager, Office of Sustainability

Sustainability Interdepartmental Team
County departments played a vital role in developing this assessment. The effort and support provided by County staff, in addition to that of their regular job responsibilities, are appreciated throughout the planning process.

Miami-Dade County - Sustainability Related Legislation

Energy Category	Date Adopted	Legislation Number	Title	Description	Sponsor	Status
BUILDINGS						
Buildings	05/11/2004	R-551-04	GRANT AGRMT TO RECEIVE & EXPEND FUNDS FROM FL GREEN BLDG COA	RESOLUTION RATIFYING THE COUNTY MANAGER'S ACTION IN EXECUTING A GRANT AGREEMENT TO RECEIVE AND EXPEND FUNDS FROM THE FLORIDA GREEN BUILDING COALITION, INC. TO ASSIST IN THE DEVELOPMENT OF A FLORIDA GREEN MUNICIPALITY STANDARD	DERM	**Completed**
Buildings	06/07/2005	O5-115	EXPED REVIEW & APPROVAL OF BLDG PERMIT APPS FOR GREEN BLDGS	ORDINANCE CREATING PROGRAM FOR EXPEDITED REVIEW AND APPROVAL OF BUILDING PERMIT APPLICATIONS FOR GREEN BUILDINGS; DEFINING GREEN BUILDINGS; PROVIDING FOR ADMINISTRATIVE ORDER; CREATING SECTION 8-6 OF THE CODE; PROVIDING SEVERABILITY, INCLUSION IN THE CODE, AND AN EFFECTIVE DATE	Sorenson	**Current Policy**
Buildings	08/03/2005	R-1200-05	SUSTAINABLE DEVELOPMENT BUILDING MEASURES	RESOLUTION DECLARING SUSTAINABLE DEVELOPMENT BUILDING MEASURES FOR COUNTY BUILDINGS AS A POLICY OF MIAMI-DADE COUNTY AND DIRECTING THE COUNTY MANAGER TO PREPARE A PLAN TO IMPLEMENT THIS POLICY	Sorenson	**Current Policy**
Buildings	05/08/2007	O-07-65	CREATING THE SUSTAINABLE BUILDINGS PROGRAM FOR COUNTY-OWNED	ORDINANCE CONCERNING THE SUSTAINABLE BUILDINGS PROGRAM; ESTABLISHING AS THE POLICY OF MIAMI-DADE COUNTY THE INSTITUTION OF SUSTAINABLE DEVELOPMENT PRACTICES AND MEASURES INTO BUILDINGS OWNED, FINANCED, AND/OR OPERATED BY MIAMI-DADE COUNTY; ESTABLISHING MEASUREMENT STANDARDS AND THRESHOLDS FOR COMPLIANCE; AMENDING CHAPTER 9 OF THE CODE OF MIAMI-DADE COUNTY, FLORIDA; CREATING SECTIONS 9-71 THROUGH 9-75 OF THE CODE	GSA	**Current Policy**
Buildings	12/04/2007	R-1342-07	COMMUNITY COUNCILS-GREEN BUILDINGS	RESOLUTION DIRECTING COMMUNITY COUNCILS TO PROMOTE, IN THEIR ROLE AS MEMBERS OF THE COMMUNITY ZONING APPEALS BOARDS, THE BENEFITS OF THE DESIGN AND CONSTRUCTION OF "GREEN BUILDINGS"	Heyman	
Buildings	01/25/2008	R-1309-07	I.O. 8-8: SUSTAINABLE BUILDINGS PROGRAM	RESOLUTION AUTHORIZING APPROVAL OF IMPLEMENTING ORDER 8-8: ESTABLISHING GUIDELINES TO FURTHER OUR SUSTAINABLE BUILDINGS PROGRAM INITIATIVE; AND AUTHORIZING THE COUNTY MAYOR OR HIS DESIGNEE TO EXERCISE ANY AND ALL OTHER RIGHTS CONFERRED THEREIN [SEE ORIGINAL ITEM UNDER FILE NO. 073319]	GSA	**Current Policy**
Buildings	06/02/2009	R-743-09	CONSTRUCTION OF GREEN AND SUSTAINABLE BUILDINGS	RESOLUTION DIRECTING THE MAYOR OR MAYOR'S DESIGNEE TO RESEARCH THE AVAILABILITY OF AND APPLY FOR AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 FUNDS TO BE USED AS GAP FUNDING FOR THE CONSTRUCTION OF GREEN AND SUSTAINABLE BUILDINGS IN THE HOPE VI PROJECT	Rolle	**Completed** - Grant awarded. Cross-reference with R-1280-09.

Miami-Dade County - Sustainability Related Legislation

Energy Category	Date Adopted	Legislation Number	Title	Description	Sponsor	Status
Buildings	11/04/2009	R-1280-09	CFRC RE: AMERICAN RECOVERY REINVESTMENT ACT	RESOLUTION AUTHORIZING THE COUNTY MAYOR OR THE COUNTY MAYOR'S DESIGNEE TO RECEIVE AND EXPEND THE CAPITAL FUND RECOVERY COMPETITION (CFRC) AWARD OF $16,643,865 IN AMERICAN RECOVERY REINVESTMENT ACT (ARRA) FUNDING FROM THE UNITED STATES DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (US HUD) ON BEHALF OF MIAMI-DADE COUNTY; AUTHORIZING THE COUNTY MAYOR OR THE COUNTY MAYOR'S DESIGNEE TO RECEIVE AND EXPEND SAID FUNDS; AND AUTHORIZING THE COUNTY MAYOR OR THE COUNTY MAYOR'S DESIGNEE TO EXECUTE ALL NECESSARY AGREEMENTS WITH US HUD FOR CREATING EFFICIENT GREEN COMMUNITIES IN PHASE II OF THE HOPE VI SCOTT/CARVER REDEVELOPMENT PROJECT	MDHA	**Completed** - Grant awarded. Cross-reference with R-743-09.
CLIMATE CHANGE						
Climate Change	1991	R-35-91	PARTICIPATION IN ICLEI'S CITIES FOR CLIMATE PROTECTION CAMPAIGN	RESOLUTION AUTHORIZING DADE COUNTY'S PARTICIPATION IN ICLEI'S CITIES FOR CLIMATE PROTECTION CAMPAIGN	Ruvin	**Completed** - Established MDC membership in ICLEI
Climate Change	1991	R-335-91	PARTICIPATE IN ICLEI'S URBAN CO2 INITIATIVE	RESOLUTION AUTHORIZING APPLICATION TO THE INTERNATIONAL COUNCIL FOR LOCAL ENVIRONMENTAL INITIATIVES TO PARTICIPATE IN THE URBAN CO2 INITIATIVE, COMMITTING STAFF RESOURCES, STATING INTENT TO IMPLEMENT SPECIFIC CO2 REDUCTION PROJECTS AND DEVELOP A LONG TERM CO2 REDUCTION PLAN BY 1993	Ruvin	**Completed** - Established original Urban CO2 Reduction Plan (1991 - 2005)
Climate Change	09/10/1996	R-970-96	DADE COUNTY STRATOSPHERIC OZONE PROTECTION PROGRAM	RESOLUTION AUTHORIZING THE COUNTY MANAGER TO EXECUTE AN AGREEMENT BETWEEN THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AND METROPOLITAN DADE COUNTY TO PROVIDE FUNDS TO SUPPORT DADE COUNTY'S STRATOSPHERIC OZONE PROTECTION PROGRAM; AND AUTHORIZING THE COUNTY MANAGER TO EXERCISE THE RENEWAL AND CANCELLATION PROVISIONS CONTAINED THEREIN	DERM	**Existing Program** - State funded program Initiated pursuant to 1990 Clean Air Act Amendments to mitigate emission of stratospheric ozone depleting compounds; requiring catpure/recycing of certain refrigerants & other compounds; and limiting sale and distribution of same.
	09/10/1996	R-969-96	EXPENDING FEDERAL ENVIRONMENTAL PROTECTION AGENCY FUNDS	RESOLUTION RATIFYING THE COUNTY MANAGER'S ACTION IN APPLYING FOR, RECEIVING AND EXPENDING FEDERAL ENVIRONMENTAL PROTECTION AGENCY FUNDS TO SUPPORT AN AIR POLLUTION CONTROL PROGRAM	DERM	**Existing Program** - This is an annually reoccurring EPA Grant. Miami-Dade County has been receiving EPA 105 Grant funding since ~ 1976
Climate Change	09/10/1996	R-1323-97	EXPENDING FEDERAL ENVIRONMENTAL PROTECTION AGENCY FUNDS	RESOLUTION URGING CONGRESS TO SUPPORT HOUSE CONCURRENT RESOLUTION 106 TO PROTECT THE EARTH'S CLIMATE		**Completed**
Climate Change	02/04/1997	R-111-97	GRANT FROM THE ENVIRON. PROTECT. AGENCY DEPT. FOR CLIMATE WISE	RESOLUTION RATIFYING THE COUNTY MANAGER'S ACTIONS OF APPLYING FOR, ACCEPTING, AND EXECUTING A GRANT FROM THE ENVIRONMENTAL PROTECTION AGENCY AND THE DEPARTMENT OF ENERGY FOR THE CLIMATE WISE PROGRAM	DERM	**Completed**
	11/04/1997	R-1323-97	GLOBAL WARMING NEGOTIATION	RESOLUTION URGING CONGRESS TO SUPPORT HOUSE CONCURRENT RESOLUTION 106 TO PROTECT THE EARTH'S CLIMATE	None	**Legislative Request**

Miami-Dade County - Sustainability Related Legislation

Energy Category	Date Adopted	Legislation Number	Title	Description	Sponsor	Status
Climate Change	10/06/1998	R-1148-98	COUNTY MANAGERS ACTION TO APPLY FOR CLIMATE WISE PROGRAM	RESOLUTION RATIFYING THE COUNTY MANAGER'S ACTION TO APPLY FOR, ACCEPT AND EXECUTE A GRANT IN THE AMOUNT OF $60,000 FROM THE INTERNATIONAL COUNCIL FOR LOCAL ENVIRONMENTAL INITIATIVES FOR THE CLIMATE WISE PROGRAM	DERM	**Completed**
Climate Change	12/16/1999	R-1356-99	GRANT CONTRACT SIGNATURES (ICLEI) CLIMATE WISE PROGRAM	RESOLUTION RATIFYING THE COUNTY MANAGER'S ACTION OF EXECUTING A GRANT FROM THE INTERNATIONAL COUNCIL FOR LOCAL ENVIRONMENTAL INITIATIVES FOR THE CLIMATE WISE PROGRAM; AND AUTHORIZING THE COUNTY MANAGER TO EXERCISE THE MODIFICATION PROVISIONS CONTAINED THEREIN	DERM	**Completed**
Climate Change	02/02/1999	R-132-99	PROJECT BY THE INTERNATIONAL COUNCIL FOR LOCAL ENVIRONMENTAL	RESOLUTION AUTHORIZING MIAMI-DADE COUNTY'S PARTICIPATION IN THE CITIES 21 PROJECT SPONSORED BY THE INTERNATIONAL COUNCIL FOR LOCAL ENVIRONMENTAL INITIATIVES	DERM	**Completed**
Climate Change	07/18/2006	O-06-113	CREATION OF CLIMATE CHANGE ADVISORY TASK FORCE	ORDINANCE CREATING THE MIAMI-DADE COUNTY CLIMATE CHANGE ADVISORY TASK FORCE; PROVIDING FOR MEMBERSHIP, ORGANIZATION AND PROCEDURE, APPOINTMENT AND TENURE, FUNCTION AND RESPONSIBILITY; PROVIDING SEVERABILITY, INCLUSION IN THE CODE, AND AN EFFECTIVE DATE	Seijas, Diaz, Gimenez, Edmonson, Jordan, Rolle, Sosa	In Progress - On April 22, 2008, the Board accepted the "Second Report and Initial Recommendations" as presented by the Climate Change Advisory Task Force. Periodic oral reports are made to the BPS Committee. The CCATF sunsets in 2011.
Climate Change/ Fuel	03/08/2007	R-324-07	CHICAGO CLIMATE EXCHANGE (CCX)	RESOLUTION AUTHORIZING AND DIRECTING THE COUNTY MANAGER TO APPLY FOR AND OBTAIN MIAMI-DADE COUNTY MEMBERSHIP IN THE CHICAGO CLIMATE EXCHANGE AS A PHASE II MEMBER FOR DIRECT EMISSIONS AND TO BUDGET SUFFICIENT FUNDS TO SUPPORT MEMBERSHIP IN THE CHICAGO CLIMATE EXCHANGE	Seijas	**In Progress -** The County is a member of the CCX**.** First report was sent to the Board on April 20, 2009.
Climate Change	12/16/2008	R-1431-08	PARTICIPATION IN "COOL COUNTIES" GOALS AND OBJECTIVES	RESOLUTION ENDORSING MIAMI-DADE COUNTY'S PARTICIPATION IN U.S. COOL COUNTIES PROGRAM AND ITS GOALS AND OBJECTIVES INCLUDING THE CLIMATE STABILIZATION DECLARATION	Seijas	**In Progress -** The County has formally embraced the goal of reducing the current carbon emissions by 90% by 2050. A effort has been initiated, and the County's Sustainability plan will bring together utilities, municipalities, schools, governmental organization, business and residents to reach this target.
Climate Change	11/17/2009	R-1334-09	URGE DEVELOPMENT OF THE NATIONAL MAP	RESOLUTION URGING THE COUNTY MAYOR OR MAYOR'S DESIGNEE, NO LATER THAN DECEMBER 1, 2009, TO APPLY FOR A GRANT FROM UNITED STATES GEOLOGICAL SURVEY, DEPARTMENT OF INTERIOR TO ASSIST IN THE DEVELOPMENT OF THE NATIONAL MAP	Seijas	**Completed** - Application was successfully submitted on December 1, 2009.
Climate Change	12/01/2009	R-1388-09	RESOLUTION ON CLIMATE CHANGE COMPACT	RESOLUTION ESTABLISHING SOUTHEAST FLORIDA REGIONAL CLIMATE CHANGE COMPACT; COMMITTING TO DEVELOP JOINT POLICY POSITIONS AND LEGISLATIVE POLICY STATEMENTS WITH BROWARD, PALM BEACH AND MONROE COUNTIES WITH RESPECT TO CLIMATE CHANGE ISSUES; COMMITTING TO DEVELOP A SOUTHEAST FLORIDA REGIONAL CLIMATE CHANGE ACTION PLAN WITH BROWARD, PALM BEACH, AND MONROE COUNTIES; COMMITTING TO PARTICIPATE IN A REGIONAL CLIMATE TEAM AND IN THE SECOND SOUTHEAST FLORIDA REGIONAL CLIMATE CHANGE SUMMIT	Sorenson	In Progress
ENERGY						

Miami-Dade County - Sustainability Related Legislation

Energy Category	Date Adopted	Legislation Number	Title	Description	Sponsor	Status
Energy	07/02/1996	R-737-96	DOE FUNDING FOR THE "REBUILD MIAMI" PROGRAM	RESOLUTION RATIFYING THE COUNTY MANAGER'S ACTION IN APPLYING FOR GRANT FUNDS, AUTHORIZING THE COUNTY MANAGER TO ACCEPT AND EXECUTE A GRANT FROM THE UNITED STATES DEPARTMENT OF ENERGY (DOE), AND AUTHORIZING THE COUNTY MANAGER TO EXERCISE THE CANCELLATION PROVISIONS THEREIN	DERM	**Completed**
Energy/ Lights	07/21/1998	R-872-98	MEMORANDUM OF UNDERSTANDING - GREEN LIGHTS PROGRAM	RESOLUTION RATIFYING THE COUNTY MANAGER'S ACTION IN EXECUTING AN ADDENDUM TO A MEMORANDUM OF UNDERSTANDING BETWEEN THE ENVIRONMENTAL PROTECTION AGENCY AND MIAMI-DADE COUNTY FOR THE GREEN LIGHTS PROGRAM	DERM	
Energy	04/21/1998	R-415-98	ENERGY CONSERVATION PERFORMANCE PROGRAM - RFQ 25	RESOLUTION INCREASING THE NUMBER OF AWARDEES FOR REQUEST FOR QUALIFICATIONS 25, MIAMI-DADE COUNTY'S ENERGY CONSERVATION PERFORMANCE PROGRAM	Seijas	
Energy	07/10/2001	R-756-01	ACCEPTANCE & EXECUTION OF GRANT FROM ICLEI	RESOLUTION ACCEPTING A GRANT FROM THE INTERNATIONAL COUNCIL FOR LOCAL ENVIRONMENTAL INITIATIVES FOR THE PROMOTION OF MIAMI-DADE COUNTY'S ENERGY STAR PROGRAM FOR BUSINESSES	DERM	
Energy/ Low Income	04/25/2006	R-399-06	CAA LOW-INCOME HOME ENERGY ASSISTANCE PROGRAM	RESOLUTION AUTHORIZING THE COUNTY MANAGER TO RECEIVE AND EXPEND FEDERAL FUNDS THROUGH THE STATE OF FLORIDA DEPARTMENT OF COMMUNITY AFFAIRS FOR THE CONTINUED OPERATION OF THE LOW INCOME HOME ENERGY ASSISTANCE PROGRAM (LIHEAP) FOR THE MIAMI-DADE COMMUNITY ACTION AGENCY	CAA	**Existing Program** - Funding for this program has been received by the County since 1996 and accepted via: R-1408-96, R-1271-97, R-166-99, R-937-99, R-1332-99, R-989-00, R-1108-00, R-992-01, R-108-02, R-744-02, R-884-03, R-1136-04, R-354-05, R-28-06, R-370-07
Energy	11/28/2006	R-1341-06	URGE NATURAL GAS UTILITIES TO EXTEND SERVICE THROUGHOUT MDC	RESOLUTION URGING NATURAL GAS UTILITIES AND/OR PROPANE GAS COMPANIES TO EXTEND SERVICE THROUGHOUT MIAMI-DADE COUNTY WHERE ECONOMICALLY FEASIBLE AND TO PROVIDE RESIDENTS WITH A DEPENDABLE AND RELIABLE ENERGY ALTERNATIVE TO ELECTRICITY THAT IS ESPECIALLY EFFECTIVE WHEN SEVERE WEATHER EVENTS INCAPACITATE ELECTRICAL POWER SYSTEMS [SEE ORIGINAL ITEM UNDER FILE NO. 061644]	Souto	**Completed** - A supplemental report responding to the resolution was adopted by the Board on November 28, 2006.
Energy/ Lighting/ Purchasing	04/26/2007	R-502-07	ENERGY STAR QUALIFIED COMPACT FLORESCENT LAMPS	RESOLUTION REQUIRING PHASED REPLACEMENT OF INCANDESCENT LIGHT BULBS IN COUNTY-OWNED AND COUNTY-OPERATED BUILDINGS WITH ENERGY STAR QUALIFIED COMPACT FLUORESCENT LAMPS (CFLS)	Martinez, Sorenson	**Completed** - On April 10, 2007 a memorandum was sent to Commissioner Heyman on the subject matter.
Energy	06/05/2007	R-737-07	RENEWABLE ENERGY CREDITS	RESOLUTION DIRECTING THE COUNTY MANAGER TO DETERMINE POTENTIAL FOR SELLING RENEWABLE ENERGY CREDITS FROM LANDFILL GAS PROJECT, DEVELOP PROCESS FOR SELLING RENEWABLE ENERGY CREDITS, ESTABLISH FRAMEWORK FOR TRADING ADDITIONAL RENEWABLE ENERGY CREDITS FROM FUTURE COUNTY ALTERNATIVE ENERGY PROJECTS, AND CREATE A RENEWABLE ENERGY TRUST FUND FOR NEW ALTERNATIVE ENERGY PROJECTS FUNDED BY NOT LESS THAN 80% OF SALE PROCEEDS OF RENEWABLE ENERGY CREDITS [ORIGINAL FILE NO. 071153]	Sorenson	**In Progress** - Interim Report sent to the Board on September 25, 2007 regarding Potential Sellings of Renewable Energy Credits Generated by a Landfill Gas Project
Energy/ Solar	05/13/2008	Directive at B&F on 5/13/2008	SOLAR PANELS AT SPCC	REQUESTED THAT THE ADMINISTRATION EXPLORE THE FEASIBILITY OF USING SOLAR PANELS TO PROVIDE ENERGY TO THE SPCC	Souto	**Completed** - On June 25, 2008 a memorandum was forwarded to the BCC in response to this directive.

Miami-Dade County - Sustainability Related Legislation

Energy Category	Date Adopted	Legislation Number	Title	Description	Sponsor	Status
Energy	07/01/2008	R-740-08	ENERGY PERFORMANCE CONTRACTING SERVICES	RESOLUTION AUTHORIZING CREATION OF ENERGY PERFORMANCE CONTRACTING PROGRAM PURSUANT TO STATE OF FLORIDA STATUTE 489.145 IN THE AMOUNT OF $40,000,000 FOR PERIOD OF FIVE YEARS; WAIVING COMPETITIVE BIDDING FOR SELECTION OF QUALIFIED VENDORS AND AUTHORIZING COUNTY MAYOR OR DESIGNEE TO ENTER INTO CONTRACTS VALUED AT LESS THAN $1 MILL WITH VENDORS IN STATE OF FLORIDA POOL OF FIRMS PREQUALIFIED TO PERFORM GUARANTEED ENERGY PERFORMANCE CONTRACTING SERVICES; AUTHORIZING TO ENTER INTO LEASING OR OTHER FINANCIAL ARRANGEMENTS WITH THIRD PARTIES TO FINANCE SAID PURCHASES; PROVIDING FOR BIANNUAL REPORT TO THE BOARD FOR RATIFICATION OF ALL CONTRACTS APPROVED UNDER PROGRAM	GSA	**Current Available Contract**
Energy/ Lighting	11/20/2008	R-1244-08	HIGH FREQUENCY PLASMA ELECTRODE LESS INDUCTION LAMPS	RESOLUTION DIRECTING THE MAYOR OR DESIGNEE TO EXPLORE USE OF HIGH FREQUENCY PLASMA ELECTRODE LESS INDUCTION LAMPS IN COUNTY BUILDINGS AND FACILITIES [ORIGINAL NO. 082626]	Sosa	**In Progress** - Directed to explore the use of >>various lighting technologies, including but not limited to<< high frequency plasma electrode less induction lamps >>and LED lighting<< in County buildings and facilities and to report to the Board of County Commissioners on the feasibility, financial and otherwise, of such use not later than **60 days** after passage of this Resolution.
Energy	03/03/2009	R-228-09	REDUCE ELECTRICAL ENERGY CONSUMPTION	RESOLUTION TO REDUCE MIAMI-DADE COUNTY GOVERNMENT'S ELECTRICAL ENERGY CONSUMPTION (20% by 2014-2007 as baseline)	Sorenson	**In Progress** - Report sent to Board on June 22, 2009
Energy/ Lighting	06/02/2009	R-746-09	LED CITY PARTNERSHIP - PILOT STUDY OF LIGHT EMITTING DIODE	RESOLUTION DIRECTING THE COUNTY MAYOR OR COUNTY MAYOR'S DESIGNEE TO EVALUATE THE POTENTIAL FOR MIAMI-DADE COUNTY TO JOIN THE LED CITY™ PARTNERSHIP; IDENTIFY AN APPROPRIATE PROJECT, FUNDING SOURCES, POTENTIAL GRANTS, AND EXPECTED EFFICIENCY AND CARBON EMISSION GAINS FOR A PILOT STUDY OF LIGHT EMITTING DIODE ("LED") OUTDOOR LIGHTING; AND PROVIDE RECOMMENDATIONS TO THE BOARD	Sorenson, Sosa	**In Progress** - Report due within 90 days. Assigned to OOS & GSA, to work with DERM and Grants. GSA will have a report on October GO Committee.
Energy	07/02/2009	R-928-09	CAMPAIGN INFORMING PEOPLE OF THE NEW ENERGY-SAVING REBATES	RESOLUTION DIRECTING THE MAYOR OR DESIGNEE TO PREPARE AND IMPLEMENT AN EDUCATIONAL CAMPAIGN INFORMING PEOPLE OF THE NEW ENERGY-SAVING REBATES AVAILABLE TO THEM	Martinez	In progress - This campaign/program will be funded with EECBG program funds. The Board was advised in a report sent on June 30, 2009. Click here for more information on rebates and incentives.
Energy	11/03/2009	R-1260-09	ENERGY CONSERVATION BLOCK GRANT PROGRAM	RESOLUTION RATIFYING THE MAYOR OR THE MAYOR'S DESIGNEE'S ACTION IN APPLYING FOR RECOVERY ACT (ARRA) UNITED STATES DEPARTMENT OF ENERGY, ENERGY EFFICIENCY AND CONSERVATION BLOCK GRANT PROGRAM (EECBG) FUNDS IN THE AMOUNT OF $12,523,700; AUTHORIZING THE MAYOR OR THE MAYOR'S DESIGNEE TO RECEIVE, EXPEND, AND EXECUTE SUCH CONTRACTS, AGREEMENTS, AND MEMORANDA OF UNDERSTANDING, AND AMENDMENTS AFTER APPROVAL BY THE COUNTY ATTORNEY	OOS	In Progress - Click here for more information.
FUEL						

Miami-Dade County - Sustainability Related Legislation

Energy Category	Date Adopted	Legislation Number	Title	Description	Sponsor	Status
Fuel	04/10/2001	R-378-01	MOU US DEPT OF ENERGY REDESIGN MDC AS CLEAN CITY	RESOLUTION DIRECTING THE COUNTY MANAGER TO EXECUTE A MEMORANDUM OF UNDERSTANDING (MOU) WITH THE UNITED STATES DEPARTMENT OF ENERGY REDESIGNATING MIAMI-DADE COUNTY AS A CLEAN CITY; DIRECTING THE COUNTY MANAGER TO DEVELOP AND IMPLEMENT A PROGRAM TO ENHANCE THE UTILIZATION OF ALTERNATIVE FUEL IN MIAMI-DADE COUNTY; AND URGING THE PARTICIPATION OF THE U.S. DEPARTMENT OF ENERGY IN PLACING ALTERNATIVE FUEL VEHICLES IN THE GOLD COAST	Sorenson	**Completed** - Created the Alternative Fuels Advisory Board
Fuel	09/09/2003	R-969-03	REDUCTION IN COUNTY'S CONSUMPTION OF GAS INCREASE FUEL EFFICIENCY	RESOLUTION DIRECTING COUNTY MANAGER TO DEVELOP AND IMPLEMENT A PLAN FOR REDUCTION IN THE COUNTY'S CONSUMPTION OF GASOLINE AND TO TAKE CERTAIN ACTIONS TO INCREASE FUEL EFFICIENCY OF THE COUNTY'S VEHICLE FLEET	Sorenson	**Completed** - On July 7, 2003 a memorandum was sent to the BCC on this resolution -On November 23, 2005 a memo was sent to the BCC with the two year results -On February 21, 2007 a memo was sent to the BCC with the three year results -On February 11, 2008 a memo was sent to the BCC with the four year results -On March 18, 2009, a memo was sent to the Board with the final results.
Fuel/ Hybrids	04/08/2003	R-330-03	PURCHASE OF MODEL 2003 TOYOTA PRIUS HYBRID VEHICLES	RESOLUTION AUTHORIZING THE PURCHASE OF MODEL 2003, TOYOTA PRIUS HYBRID VEHICLES UNDER THE COOPERATIVE CONTRACT COMPETED BY THE FLORIDA SHERIFF'S ASSOCIATION AND THE FLORIDA ASSOCIATION OF COUNTIES	DPM	**Completed**
Fuel	08/23/2005	R-936-05	COUNTY MANAGER TO CONDUCT STUDY THE USE OF FLEX-FUEL/GASOLINE	RESOLUTION DIRECTING THE COUNTY MANAGER TO CONDUCT A FEASIBILITY STUDY TO EVALUATE POTENTIAL COST SAVINGS THROUGH THE USE OF FLEX-FUEL/"GASOHOL" OR OTHER ALTERNATIVE FUEL SOURCES FOR MIAMI-DADE COUNTY'S VEHICLE FLEET AND TO REPORT SUCH FINDINGS TO THE REGIONAL TRANSPORTATION COMMITTEE (RTC) WITHIN 30 DAYS	Martinez	**Completed** - On October 14, 2005 a memorandum was sent to the Board in response.
Fuel	05/09/2006	R-559-06	PLUG-IN HYBRID ELECTRIC VEHICLES	RESOLUTION SUPPORTING DEVELOPMENT OF PLUG-IN HYBRID ELECTRIC VEHICLES	Sorenson, Gimenez, Jordan	**In Progress**
Fuel	01/22/2008	R-86-08	WEST VERGINA CORP. BIODIESEL REPORT W/MDTA	RESOLUTION AUTHORIZING THE WAIVER OF FORMAL BID PROCEDURES AND PROVISIONS OF ADMINISTRATIVE ORDER 3-38 AND AUTHORIZING THE COUNTY MAYOR, OR HIS DESIGNEE, TO EXECUTE AN AGREEMENT IN AN AMOUNT NOT TO EXCEED $150,000.00 BETWEEN MIAMI-DADE COUNTY AND THE WEST VIRGINIA UNIVERSITY RESEARCH CORPORATION (WVURC), FOR THE PREPARATION OF A REPORT ANALYZING THE FEASIBILITY OF USING BIODIESEL IN DEISEL BUSES OPERATED BY MIAMI-DADE TRANSIT	Transit	
Fuel	03/11/2008	Directive at B&F on 3/11/2008	COMPARATIVE ANALYSIS ON HYBRID VEHICLES	REQUESTED THAT THE ADMINISTRATION TO CONDUCT A COMPARATIVE ANALYSIS REFLECTING THE PROJECTED DECREASE IN FUEL COSTS TO THE COUNTY FOR USING HYBRID VEHICLES VERSUS THE INCREASED INITIAL VEHICLE COST FO THE COUNTY FOR PURCHASING HYBRID VEHICLES	Gimenez	**Completed**- On June 2, 2008 a memorandum was forwarded to the Board in response to this directive
Fuel	06/03/2008	R-673-08	USE ETHANOL IN COUNTY GAS STATIONS	RESOLUTION DIRECTING THE MAYOR OR HIS DESIGNEE TO EXPLORE USE OF ETHANOL IN COUNTY GAS STATIONS AND PUBLIC/PRIVATE PARTNERSHIPS FOR UTILIZATION OF ETHANOL	Martinez, Heyman, Sosa	**Completed** - On August 4, 2008 a memorandum was forwarded to the BCC in response to this resolution

Miami-Dade County - Sustainability Related Legislation

Energy Category	Date Adopted	Legislation Number	Title	Description	Sponsor	Status
Fuel/ Anti-Idling	08/02/2008	R-926-08	TURN OFF UNATTENDED VEHICLE	RESOLUTION REQUIRING COUNTY VEHICLES TO BE TURNED OFF WHEN UNATTENDED, EXCEPT IN EMERGENCIES OR AS OTHERWISE MAY BE NECESSARY FOR EFFICIENT AND SAFE OPERATION	Gimenez	**In Progress** - General policy/guidelines are being developed. Several departments, including Solid Waste, have already implemented departmental anti-idling policies.

Miami-Dade County - Sustainability Related Legislation

Energy Category	Date Adopted	Legislation Number	Title	Description	Sponsor	Status
Fuel	10/19/2004	R-1296-04	FEASIBILITY OF BIODIESEL FOR USE IN DIESEL FUEL BUSES	RESOLUTION DIRECTING THE COUNTY MANAGER TO PREPARE A REPORT REGARDING THE FEASIBILITY AND ADVISABILITY OF PURCHASING BIODIESEL FOR USE IN DIESEL FUEL BUSES OPERATED BY MIAMI-DADE COUNTY	Souto, Sorenson	**In Progress** - On February 5, 2009, a memo was sent to the Board advising them that all departments have been directed to begin purchasing 5% biodiesel fuel blends (65) for use in diesel powered County vehicles. 65 is a blend of 95% petroleum diesel and 5% biodiesel made from farm products such as soy, canola and palm oils. The County took its first delivery of 65 on May 19, 2009 for use in mobile equipment only. The decision to transition to biodiesel was made following an assessment of the feasibility and risks associated with using biodiesel to power our diesel equipment. This **completes the first phase** of our efforts to secure biodiesel supplies and is the first step to transitioning to higher biodiesel blends over the coming months. The **second phase** was to conduct a preliminary feasibility study of producing biodiesel locally to support the County's sustainability efforts. Additionally, the Board has directed the administration to investigate various energy alternatives to traditional fuels and electricity supplies, including self generation. The preliminary biodiesel assessment included the feasibility of producing quality biodiesel from algae (a plant commonly found in Florida lakes and ponds), atrophy (a plant that produces large seeds high in vegetable oil content), brown grease and yellow grease, both of which are referred to as restaurant grease. Based on the findings, we intend to test the market by soliciting proposals from the industry to construct and operate a multi-feedstock biodiesel refinery. The Board will be kept apprised of any new developments regarding the biodiesel initiative as they become available.
Fuel	12/11/2008	R-83-09	DIESEL CONVERSION NOW IMPLEMENTATION PLAN	RESOLUTION DIRECTING THE COUNTY MAYOR TO DEVELOP AN IMPLEMENTATION PLAN FOR MODIFYING COUNTY VEHICLES THAT CURRENTLY USE DIESEL FUEL TO ALLOW THEM TO BE ABLE TO USE OTHER AVAILABLE FUEL SOURCES SUCH AS BIO-DIESEL OR VEGETABLE OIL [SEE ORIGINAL ITEM UNDER FILE NO. 082611]	Jordan, Heyman	
Fuel	04/24/2007	R-461-07	BIOFUEL PRODUCTION FEASIBILITY STUDY	RESOLUTION DIRECTING COUNTY MANAGER TO DIRECT THE AGRICULTURAL MANAGER TO COMPLETE A BIOFUEL PRODUCTION FEASIBILITY STUDY, AND SEEK GRANTS AND OTHER FUNDING SOURCES FOR THE FEASIBILITY STUDY AND DEVELOPMENT OF FUEL CROPS, ETHANOL AND BIODIESEL PRODUCTION IN MIAMI-DADE COUNTY [SEE ORIGINAL ITEM UNDER FILE NO. 063610]	Sorenson, Souto	
Fuel	03/08/2007	R-327-07	SEEK GRANTS FOR ALTERNATIVE FUELS	RESOLUTION DIRECTING COUNTY MANAGER TO SEEK GRANTS AND OTHER FUNDING SOURCES FOR DEPLOYMENT OF ETHANOL AND BIODIESEL INFRASTRUCTURE AND FLEET VEHICLES, INVENTORY COUNTY FLEET FOR OPPORTUNITIES TO ENCOURAGE DEMAND FOR ALTERNATIVE FUELS, AND DEVELOP A FIVE-YEAR STRATEGY [SEE ORIGINAL ITEM UNDER FILE NO. 063609]	Sorenson, Diaz, Martinez, Gimenez, Sosa, Heyman	
Fuel	12/02/2008	R-1372-08	FEASIBILITY AND ADVISABILITY OF USING ALTERNATIVE FUEL	RESOLUTION DIRECTING MAYOR TO ANALYZE THE FEASIBILITY AND ADVISABILITY OF MIAMI-DADE COUNTY USING ALTERNATIVE FUEL VEHICLES WHICH ARE FUELED BY COMPRESSED NATURAL GAS	Gimenez, Sosa	
Fuel/ Purchasing	07/21/2009	R-996-09	FUEL SAVINGS PRODUCTS	RESOLUTION DIRECTING THE COUNTY MAYOR OR HIS DESIGNEE TO REQUIRE A POSITIVE COMPREHENSIVE REPORT FROM THE U.S. ENVIRONMENTAL PROTECTION AGENCY'S ENVIRONMENTAL TECHNOLOGY VERIFICATION PROGRAM, ALONG WITH OTHER CRITERIA, FOR BID SOLICITATION OR PROCUREMENT BY THE COUNTY OF ANY FUEL SAVINGS PRODUCTS	Jordan, Edmonson, Gimenez, Heyman, Martinez, Sorenson	**Completed**
RECYCLING/WASTE						
Recycling/ Purchasing	01/230/2001	R-64-01	RECYCLING PROGRAM FOR USED COMPUTERS	RESOLUTION DIRECTING THE COUNTY MANAGER TO STUDY THE FEASIBILITY OF A COMPUTER RECYCLING PROGRAM TO DETER THE DUMPING OF USED COMPUTERS IN LANDFILLS	Sorenson	Completed - click here for information and locations

Miami-Dade County - Sustainability Related Legislation

Energy Category	Date Adopted	Legislation Number	Title	Description	Sponsor	Status
Recycling/ Purchasing	04/22/2003	R-374-03	ENVIRONMENTALLY-BASED PROMOTIONAL ACTIVITIES	RESOLUTION ESTABLISHING A POLICY FOR MIAMI-DADE COUNTY FAVORING WASTE-REDUCTION, ENVIRONMENTALLY-BASED PROMOTIONAL ACTIVITIES AND THE PURCHASING OF COMMODITIES CONTAINING RECYCLED OR RECYCLABLE CONTENT	DERM	**RCC Committee Established; Efforts On-going**: This Reso reestablished the Recycling Management Committee under DERM with the new name, The Miami-Dade Resource Conservation Committee, and re-affirmed the County's committment to promoting waste reduction and encouraging County procurement of recycled-content products and supplies.
Recycling/ Waste	6/8/2004	R-768-04	PERMANENT HOME CHEMICAL DROP OFF LOCATIONS	RESOLUTION DIRECTING THE COUNTY MANAGER TO DETERMINE AVAILABLE AND FEASIBLE LOCATIONS FOR PERMANENT COLLECTION CENTERS FOR THE PURPOSE OF MAKING AVAILABLE HOME CHEMICAL COLLECTION DROP OFF LOCATIONS THROUGHOUT THE COUNTY	Sorenson	Completed - click here for information and locations
Recycling/ Waste	06/07/2005	R-702-05	MIAMI-DADE COUNTY RESOURCE CONSERVATION COMMITTEE	RESOLUTION DIRECTING THE COUNTY MANAGER TO IMPLEMENT THE RECOMMENDATIONS OF THE MIAMI-DADE COUNTY RESOURCE CONSERVATION COMMITTEE (MDRCC); ESTABLISHING POLICIES AND GUIDELINES TO FURTHER WASTE REDUCTION, RECYCLING, AND ENVIRONMENTALLY PREFERABLE PURCHASING (EPP) ACTIVITIES IN COUNTY DEPARTMENTAL OPERATIONS	Sorenson	**Existing Program** - Efforts on-going by RCC to promote recycling and waste reduction in County depts. and operations.
Energy/ Lighting	06/12/2009	R-873-09	RECYCLE OR SAFELY DISPOSE OF FLUORESCENT LIGHT BULBS	RESOLUTION DIRECTING THE COUNTY MAYOR OR HIS DESIGNEE TO PREPARE AND IMPLEMENT AN EDUCATIONAL CAMPAIGN TO INFORM THE PUBLIC ABOUT WAYS TO RECYCLE OR SAFELY DISPOSE OF FLUORESCENT LIGHT BULBS	Sosa	Completed - click here for information and locations
WATER						
Water	03/03/1998	R-229-98	MIAMI-DADE WATER & SEWER EFFICIENCY PROGRAM	RESOLUTION ENDORSING 'EFFICIENCY PROGRAM' TO OPTIMIZE EFFICIENCY IN OPERATIONS OF THE MIAMI-DADE WATER AND SEWER DEPARTMENT AND AUTHORIZING THE COUNTY MANAGER TO CONDUCT AN EXPEDITED COMPETITIVE REVIEW PROCESS FOR SPECIALIZED CONSULTING SERVICES FOR DEVELOPING THE 'EFFICIENCY PROGRAM'	Morales	
Water	04/10/2001	R-368-01	EDUCATIONAL PROGRAM TO PROMOTE WATER CONSERVATION	JOINT RESOLUTION URGING THE MIAMI-DADE SCHOOL BOARD TO IMPLEMENT A MANDATORY EDUCATIONAL PROGRAM AT ALL GRADE LEVELS TO PROMOTE WATER CONSERVATION BY ALL THE PEOPLE OF MIAMI-DADE COUNTY	Reboredo	
Water	12/17/2002	R-1502-02	SO. FLA. WATER MANAGEMENT DISTRICT TO MDWSD	RESOLUTION RETROACTIVELY AUTHORIZING EXECUTION OF A STATEMENT OF WORK FOR A WATER CONSERVATION ADVERTISING CAMPAIGN PROJECT WITH THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT FOR PUBLIC TRANSPORTATION COMMUNICATION PROGRAM UTILIZING TRANSIT ADVERTISING	WASD	
Water	04/08/2003	R-354-03	WATER CONSERVATION MONTH - APRIL	RESOLUTION DECLARING APRIL AS WATER CONSERVATION MONTH IN MIAMI-DADE COUNTY, FLORIDA	Carey-Shuler	
Water	04/05/2005	R-423-05	DECLARE APRIL WATER CONSERVATION MONTH	RESOLUTION PROCLAIMING THE MONTH OF APRIL AS WATER CONSERVATION MONTH IN MIAMI-DADE COUNTY	Seijas	
Water	11/03/2005	R-1271-05	DEVELOP LONG-RANGE WATER CONSERVATION PLAN FOR MIAMI-DADE	RESOLUTION DIRECTING THE COUNTY MANAGER TO DEVELOP A LONG-RANGE WATER CONSERVATION PLAN FOR MIAMI-DADE COUNTY	Martinez, Sorenson	

Miami-Dade County - Sustainability Related Legislation

Energy Category	Date Adopted	Legislation Number	Title	Description	Sponsor	Status
Water	03/21/2006	R-341-06	DECLARE MONTH OF APRIL WATER CONSERVATION MONTH 2006	RESOLUTION DECLARING THE MONTH OF APRIL, 2006 AS WATER CONSERVATION MONTH IN MIAMI-DADE COUNTY	Martinez	
Water	04/25/2006	R-468-06	WATER USE EFFICIENCY FIVE-YEAR PLAN	RESOLUTION APPROVING THE MIAMI-DADE WATER AND SEWER WATER USE EFFICIENCY FIVE-YEAR PLAN THAT IS GOAL BASED, ACCOUNTABLE AND MEASURES WATER CONSERVATION EFFORTS	Martinez	
Water	09/12/2006	R-1041-06	GREEN LODGING PROGRAM	RESOLUTION AUTHORIZING THE EXECUTION OF A MEMORANDUM OF UNDERSTANDING WITH THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION FOR THE PURPOSE OF ASSISTING IN IMPLEMENTATION OF THE GREEN LODGING PROGRAM, WHICH ASSISTS HOTELS AND MOTELS IN PROTECTING FLORIDA'S NATURAL RESOURCES	Martinez	
Water	12/05/2006	O-06-177	ORDINANCE CREATING SECTIONS 32-83.1 OF MIAMI-DADE CO CODE	ORDINANCE CREATING SECTION 32-83.1 OF THE CODE OF MIAMI-DADE COUNTY; PROVIDING FOR PUBLICLY OWNED WATER DISTRIBUTION SYSTEMS TO PREPARE WATER CONSERVATION PLANS AND SUBMIT SAME TO THE COUNTY; PROVIDING ENFORCEMENT PROCEDURE AND REMEDY; PROVIDING SEVERABILITY, INCLUSION IN THE CODE AND AN EFFECTIVE DATE	Martinez	**Current Policy**
Water	01/10/2008	R-41-08	AGREEMENT BETWEEN MIAMI-DADE COUNTY & UNIVERSITY OF FLORIDA	RESOLUTION APPROVING EXECUTION OF AGREEMENT BETWEEN THE COUNTY AND THE UNIVERSITY OF FLORIDA FOR THE PROVISION OF WATER CONSERVATION ANALYSIS BY THE UNIVERSITY OF FLORIDA'S INSTITUTE OF FOOD AND AGRICULTURAL SCIENCE TROPICAL RESEARCH AND EDUCATION CENTER IN THE AMOUNT OF $385,000	WASD	
Water	02/05/2008	O-08-14	WATER USE EFFICIENCY STANDARDS	ORDINANCE RELATING TO WATER USE EFFICIENCY STANDARDS; CREATING SECTION 8-31 OF THE CODE OF MIAMI-DADE COUNTY, FLORIDA; ADOPTING LOCAL TECHNICAL AMENDMENTS TO FLORIDA BUILDING CODE FOR NEW RESIDENTIAL AND COMMERCIAL DEVELOPMENTS; REVISING AND PROVIDING FOR MAXIMUM FLOW RATES AND CONSUMPTION FOR PLUMBING FIXTURES, FIXTURE FITTINGS AND APPLIANCES; CREATING SECTIONS 32-84, 32-85 AND 32-86 OF THE CODE OF MIAMI-DADE COUNTY, FLORIDA; PROVIDING FOR PUBLICATION OF WATER USE EFFICIENCY STANDARDS MANUAL FOR NEW RESIDENTIAL AND COMMERCIAL DEVELOPMENTS; PROVIDING FOR EVALUATION OF ALTERNATIVE WATER SUPPLY PROJECTS FOR NEW DEVELOPMENTS OF REGIONAL IMPACT; PROVIDING FOR WATER USE EFFICIENCY AND CONSERVATION EDUCATION AND OUTREACH; AMENDING SECTION 8A-381 OF THE CODE OF MIAMI-DADE COUNTY, FLORIDA TO REQUIRE SUBMETERS IN MULTI-FAMILY RESIDENTIAL DEVELOPMENTS; PROVIDING SEVERABILITY, INCLUSION IN THE CODE AND AN EFFECTIVE DATE	Seijas, Sorenson	**Current Policy**
Water	12/01/2008	R-89-09	EDUCATING SCHOOLCHILDREN ABOUT BENEFITS OF WATER	RESOLUTION DIRECTING MAYOR OR MAYOR'S DESIGNEE TO DEVELOP AN OUTREACH PLAN FOR EDUCATING SCHOOLCHILDREN ON THE IMPORTANCE AND BENEFITS OF WATER CONSERVATION	Seijas, Diaz, Edmonson, Gimenez, Heyman, Martinez, Rolle, Sosa	

Miami-Dade County - Sustainability Related Legislation

Energy Category	Date Adopted	Legislation Number	Title	Description	Sponsor	Status
Water	12/16/2008	R-1426-05	COUNTY'S WATER-USE EFFICIENCY STANDARD MANUAL	RESOLUTION APPROVING MIAMI-DADE COUNTY'S WATER USE EFFICIENCY STANDARDS MANUAL	WASD	
Water	03/17/2009	R-313-09	WATER CONSERVATION MONTH	RESOLUTION DECLARING THE MONTH OF APRIL 2009 AS WATER CONSERVATION MONTH IN MIAMI-DADE COUNTY	Gimenez	
Water	04/07/2009	O-09-25	AMEND SEC. 32-8.2 RELATING PERMANENT LANDSCAPE IRRIGATION	ORDINANCE AMENDING SECTION 32-8.2 OF THE CODE OF MIAMI-DADE COUNTY, FLORIDA, RELATING TO PERMANENT LANDSCAPE IRRIGATION RESTRICTIONS; PROVIDING MANDATORY YEAR-ROUND LANDSCAPE IRRIGATION CONSERVATION MEASURES; AMENDING CHAPTER 8CC OF THE CODE OF MIAMI-DADE COUNTY, FLORIDA, RELATING TO CODE ENFORCEMENT; PROVIDING SEVERABILITY, INCLUSION IN THE CODE AND AN EFFECTIVE DATE	Seijas	**Current Policy**
Water	04/07/2009	R-381-09	S FLA WATER MGT DISTRICT ACCEPT IRRIGATION RESTRICTIONS	RESOLUTION SUGGESTING SOUTH FLORIDA WATER MANAGEMENT DISTRICT ACCEPT MIAMI-DADE COUNTY'S RECOMMENDED LANGUAGE REGARDING PERMANENT IRRIGATION RESTRICTIONS OF NEW LANDSCAPING FOR INCLUSION IN DISTRICT RULE	Seijas	
OTHER						
Bike Plan	07/13/1999	O-99-81	ORDINANCE RELATING TO BICYCLE RACKS	ORDINANCE CREATING SECTION 33-122.3 OF THE CODE OF MIAMI-DADE COUNTY, FLORIDA TO REQUIRE BICYCLE RACKS AT CERTAIN PARKING LOTS; PROVIDING SEVERABILITY, INCLUSION IN THE CODE, AND AN EFFECTIVE DATE [SEE AGENDA ITEM NOS. 7Q2A AND 9A1]	Souto	
Trees	06/05/2001	R-650-01	COUNTYWIDE COMPREHENSIVE MASTER PLAN FOR STREET TREES	RESOLUTION DIRECTING THE COUNTY MANAGER TO FORMULATE A COUNTYWIDE COMPREHENSIVE MASTER PLAN FOR STREET TREES TO GUIDE ALL FUTURE PLANTINGS AND TO DEVELOP MAINTENANCE PROGRAM FOR EXISTING INVENTORY OF LANDSCAPING AS WELL AS ALL NEW PLANTINGS	Morales, Sorenson	
Green Incentives/ Jobs	05/03/2005	O-05-91	TARGETED JOBS INCENTIVE FUND PROGRAM	ORDINANCE AMENDING SECTIONS 2-1254 AND 2-1258, RESPECTIVELY, OF THE CODE OF MIAMI-DADE COUNTY, FLORIDA, RELATING TO THE TARGETED JOBS INCENTIVE FUND PROGRAM (TJIF); ADDING ELIGIBLE INDUSTRY, MODIFYING TJIF PROGRAM PARAMETERS AND ADDING ADDITIONAL BONUS INCENTIVES; PROVIDING SEVERABILITY, INCLUSION IN THE CODE, EFFECTIVE DATE AND PROVIDING FOR SUNSET	OCED, Sorenson, Diaz, Rolle	**Current Policy** - An annual report is provided to the Board on both the Qualified Target Industry (QTI) and TJIF programs, which work to complement each other.
Green Infrastrure	03/06/2007	R-306-07	COLLABORATE ON AN URBAN ECOSYSTEMS ANALYSIS WITH SANBORN	RESOLUTION AUTHORIZING A MEMORANDUM OF UNDERSTANDING BETWEEN THE CITY OF MIAMI AND MIAMI-DADE COUNTY TO FACILITATE AN ECOSYSTEM ANALYSIS BY AMERICAN FORESTS AS A FRAMEWORK TO INCORPORATE GREEN INFRASTRUCTURE INTO FUTURE PLANNING	CEO/CIAB	
Fuel & Energy	07/03/2008	R-811-08	NACO'S GREEN CHALLENGE	RESOLUTION DIRECTING THE MAYOR OR DESIGNEE TO ENTER MIAMI-DADE COUNTY INTO 2 NACO GREEN COMPETITIONS THAT BEGIN JULY 1, 2008, THE "DRIVE $SMARTER CHALLENGE" AND THE "CHANGE THE WORLD, START WITH ENERGY STAR" CAMPAIGNS; DIRECTING THE MAYOR OR DESIGNEE TO PROMOTE AND ACTIVELY ENCOURAGE MIAMI-DADE COUNTY RESIDENTS AND EMPLOYEES TO PARTICIPATE IN THESE PROGRAMS	Martinez	**Completed**

Miami-Dade County - Sustainability Related Legislation

Energy Category	Date Adopted	Legislation Number	Title	Description	Sponsor	Status
Green Jobs	06/02/2009	R-747-09	SIGN LOCAL GOVERNMENT GREEN JOBS PLEDGE	RESOLUTION AUTHORIZING THE MAYOR OR THE MAYOR'S DESIGNEE TO SIGN LOCAL GOVERNMENT GREEN JOBS PLEDGE	Sorenson, Sosa	**Completed** - Signed by Mayor Alvarez on September 10, 2009.
Green Purchasing	06/23/2009	R-1053-09	GREEN PROCUREMENT PREFERENCE	RESOLUTION DIRECTING THE MAYOR TO PREPARE AND PRESENT TO THE BOARD WITHIN 90 DAYS A "GREEN" PROCUREMENT PREFERENCE PROGRAM FOR THE PURCHASE OF ENVIRONMENTALLY RESPONSIBLE PRODUCTS AND SERVICES	Martinez	**In Progress** - This report was presented to the Budget, Planning and Sustainability Committee on November 9, 2009 and will be presented again on December 8, 2009.
Green Celebration	07/21/2009	R-993-09	40TH ANNIVERSARY OF EARTH DAY	RESOLUTION DIRECTING THE MAYOR OR HIS DESIGNEE TO BEGIN PLANNING FOR EARTH DAY 2010, THE 40TH ANNIVERSARY OF EARTH DAY	Sorenson	**In Progress** - A report was provided on October 27, 2009. A planning team has been created by the County Executive Office.
Green Portal	12/01/2009	Pending	GREEN PORTAL ON COUNTY WEBSITE	RESOLUTION DIRECTING MAYOR OR MAYOR'S DESIGNEE TO RE-ORGANIZE AND RE-CONSTITUTE THE COUNTY'S GREEN PORTAL ON COUNTY WEBSITE	Sorenson, Sosa	Completed - Portal will become live by the close of the 2009 calendar year.
LEGISLATIVE REQUESTS						
Fuel	04/19/1994	R-554-94	INCREASING THE CORPORATE AVERAGE FUEL ECONOMY (CAFE) STANDARDS	RESOLUTION URGING CONGRESS AND THE PRESIDENT TO SIGN LEGISLATION INCREASING THE CORPORATE AVERAGE FUEL ECONOMY (CAFE) STANDARDS TO 45 MILES PER GALLON TO SIGNIFICANTLY REDUCE DIOXIDE EMISSIONS		**Legislative Request**
Climate Change	11/04/1997	R-1323-97	GLOBAL WARMING NEGOTIATION	RESOLUTION URGING CONGRESS TO SUPPORT HOUSE CONCURRENT RESOLUTION 106 TO PROTECT THE EARTH'S CLIMATE	Ruvin	**Legislative Request**
Climate Change	09/19/2000	R-966-00	RESOLUTION URGING STATE AND FEDERAL ACTION/GLOBAL WARMING	RESOLUTION URGING STATE AND FEDERAL ACTION AND RESPONSE PLANNING REGARDING GLOBAL WARMING	Ruvin, Morales, Sorenson, Souto	**Legislative Request**
Energy/ Solar	03/21/2006	R-360-06	CREATE FLA SOLAR INCENTIVE PROGRAM & PROVIDE FINANCIAL INCEN	RESOLUTION URGING THE FLORIDA LEGISLATURE TO PASS LEGISLATION CREATING THE FLORIDA SOLAR INCENTIVE PROGRAM AND PROVIDE FINANCIAL INCENTIVES THAT WOULD ENCOURAGE THE INSTALLATION OF SOLAR ENERGY SYSTEMS	Sorenson	**Legislative Request**
Recycling/ Waste	04/25/2006	R-464-06	URGE FL LEG ENSURE WASTE TIRE FEES ALOCATED TO COMMUNITIES	RESOLUTION URGING THE FLORIDA LEGISLATURE TO PASS LEGISLATION ENSURING THAT WASTE TIRE FEES ARE ALLOCATED TO THE RECYCLING, COLLECTION AND DISPOSAL OF WASTE TIRES IN THE COMMUNITIES WHERE THESE FEES ARE COLLECTED	Martinez, Sosa, Rolle	**Legislative Request**
Energy/ Solar	02/20/2007	R-190-07	SOLAR WATER HEATER INSTALLATION FOR LOW INCOME HOMEOWNERS	RESOLUTION URGING THE FLORIDA LEGISLATURE TO ESTABLISH A PROGRAM TO PROVIDE MATCHING FUNDS FOR SOLAR AND OTHER ENERGY SAVING WATER HEATER INSTALLATIONS FOR LOW-INCOME HOMEOWNERS [SEE ORIGINAL ITEM UNDER FILE NO. 070054]	Sorenson, Rolle, Edmonson	**Legislative Request**
Energy	06/26/2007	R-768-07	ENERGY AND ENVIRONMENT BLOCK GRANT	RESOLUTION URGING CONGRESS TO ADOPT THE ENERGY AND ENVIRONMENT BLOCK GRANT ACT OF 2007	Seijas, Jordan, Martinez, Sorenson, Sosa	**Legislative Request**

Miami-Dade County - Sustainability Related Legislation

Energy Category	Date Adopted	Legislation Number	Title	Description	Sponsor	Status
Energy/ Renewable	02/05/2008	R-134-08	SOLAR WATER HEATER INSTALLATION FOR LOW INCOME HOMEOWNERS	RESOLUTION URGING THE FLORIDA LEGISLATURE TO ESTABLISH A PROGRAM TO PROVIDE MATCHING FUNDS FOR SOLAR AND OTHER ENERGY SAVING WATER HEATER INSTALLATIONS FOR LOW-INCOME HOMEOWNERS	Sorenson, Diaz, Gimenez, Martinez, Sosa, Edmonson, Heyman	**Legislative Request**
Energy/ Renewable	02/05/2008	R-133-08	NET METERING FOR RENEWABLE ENERGY SYSTEMS	RESOLUTION URGING THE FLORIDA PUBLIC SERVICE COMMISSION TO ADOPT FINAL RULES THAT WILL ENCOURAGE THE USE OF CONSUMER-OWNED SOLAR AND OTHER RENEWABLE ENERGY SYSTEMS THROUGH NET METERING AND BY FACILITATING THE INTERCONNECTION BETWEEN SUCH SYSTEMS AND ELECTRIC UTILITIES	Sorenson, Diaz, Gimenez, Martinez, Sosa, Edmonson, Heyman	**Legislative Request**
Energy/ Renewable	02/05/2008	R-135-08	REINSTATE PROPERTY TAX EXEMPTION FOR SOLAR ENERGY SYSTEM	RESOLUTION URGING THE FLORIDA LEGISLATURE TO PASS AND THE GOVERNOR TO SIGN INTO LAW LEGISLATION REINSTATING A PROPERTY TAX EXEMPTION FOR SOLAR ENERGY SYSTEMS AND OTHER RENEWABLE ENERGY SYSTEMS AND TO STREAMLINE THE PROCESS FOR APPLYING FOR SUCH AN EXEMPTION	Sorenson, Diaz, Gimenez, Martinez, Sosa, Edmonson, Heyman	**Legislative Request**
Fuel & Energy/ Alternative Renewable	02/05/2008	R-136-08	ALTERNATIVE ENERGY SOURCES AND RENEWABLE ALTERNATIVE FUELS	RESOLUTION URGING THE FLORIDA LEGISLATURE TO EXPRESSLY INCLUDE IN THE "FLORIDA OPPORTUNITY FUND" VENTURE CAPITAL FIRMS THAT ARE DEVELOPING ALTERNATIVE AND RENEWABLE ENERGY SOURCES AND TRANSPORTATION FUELS	Sorenson, Diaz, Martinez, Gimenez, Sosa, Edmonson, Heyman	**Legislative Request**
Fuel & Energy	11/20/2008	R-1249-08	URGING CONGRESS TO PASS H.R. 6052	RESOLUTION URGING CONGRESS TO PASS H.R. 6052 OR SIMILAR LEGISLATION PROVIDING ADDITIONAL FUNDING FOR TRANSIT AS PART OF A COMPREHENSIVE ENERGY STRATEGY	Rolle, Jordan	**Legislative Request**
Energy/ Renewable	02/17/2009	R-124-09	ENERGY FROM RENEWABLE ENERGY SOURCES BY THE YEAR 2020	RESOLUTION ENDORSING THE GOVERNOR'S GOAL OF HAVING FLORIDA DERIVE 20 PERCENT OF ITS ENERGY FROM RENEWABLE ENERGY SOURCES BY THE YEAR 2020 WITH AN EMPHASIS ON SOLAR AND WIND ENERGY; URGING THE FLORIDA LEGISLATURE TO ENACT LEGISLATION CREATING AN AGGRESSIVE RENEWABLE PORTFOLIO STANDARD THAT WILL REQUIRE 20 PERCENT OF FLORIDA ENERGY TO BE GENERATED BY RENEWABLE RESOURCES BY 2020	Sorenson, Heyman, Sosa	**Legislative Request**

Second Report and Initial Recommendations

Presented to
The Miami-Dade
Board of County Commissioners
April 2008

Miami-Dade County
Climate Change Advisory Task Force

MIAMI-DADE COUNTY

Carlos Alvarez

Mayor

BOARD OF COUNTY COMMISSIONERS

Bruno A. Barreiro

Chairman

Barbara J. Jordan
Vice Chairwoman

Barbara J. Jordan
District 1

Dorrin D. Rolle
District 2

Audrey M. Edmonson
District 3

Sally A. Heyman
District 4

Bruno A. Barreiro
District 5

Rebeca Sosa
District 6

Carlos A. Gimenez
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Katy Sorenson
District 8

Dennis C. Moss
District 9

Senator Javier D. Souto
District 10

Joe A. Martinez
District 11

José “Pepe” Diaz
District 12

Natacha Seijas
District 13

Harvey Ruvin

Clerk of Courts

George M. Burgess

County Manager

Robert A. Cuevas Jr.

County Attorney

Chairman's Letter

I want to express my sincere appreciation to the Board, the Mayor, and the Manager for the impeccable quality of their appointees to this effort. I am both honored and humbled to be working alongside such a knowledgeable, committed, and distinguished group of individuals.

The Climate Change Advisory Task Force's Initial Report (Appendix II) outlines how the Task Force Committees are organized and establishes its work plan. Since July 2007, the Committee members have met regularly in order to share research, listen to expert testimony, and deliberate on recommendations. The Recommendations presented in this report emerged from 48 meetings of the various committees, involving some 175 volunteers and stakeholders, and seven (7) meetings of the full Task Force itself - staff estimates over 5,000 person hours of in-depth presentations and robust discussion.

While resisting an attempt to paraphrase or summarize the specifics to follow (for each recommendation deserves separate focus), I would point out that the Science Committee's Report (Appendix I), which was designed to inform the process, established a clear sense of urgency that permeated the deliberations.

THE RECOMMENDATIONS COMING FORWARD AT THIS TIME ARE A MERE BEGINNING, WITH MANY TOPICS YET TO BE APPROACHED. BOTH THE RATHER DAUNTING ADAPTATION RESPONSIBILITY AND THE CHALLENGE TO FIND MORE AND MORE WAYS TO REDUCE OUR GREENHOUSE GAS (GHG) EMISSIONS ARE ONGOING TASKS. IN ADDITION, OUR EFFORTS WILL BE LINKING WITH THE FLORIDA ENERGY COMMISSION, GOVERNOR CRIST'S CLIMATE ACTION TEAM, AND NATIONAL AND INTERNATIONAL STAKEHOLDERS.

We have a critical duty to do everything we can to both manage the unavoidable as well as to help avoid the unimaginable. IMPLEMENTATION of these initial steps, as well as those to follow, may well prove to be the most important legacy the County can leave to the future.

Respectfully,

Harvey Ruvin

Harvey Ruvin, Clerk
Chair, Climate Change Advisory Task Force (CCATF)

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Appendices
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Appendix V: Ordinance 06-113 Creating Climate Change Advisory Task Force

Appointed Members

Clerk Harvey Ruvin, Chairperson
Mr. Jim Murley, Vice-Chairperson

Mr. Leonard Abess, Chairman of the Board, President & Chief Executive Officer, City National Bank

Dr. Adriana Cantillo, Chemist, National Oceanic and Atmospheric Administration (Retired)

Ms. Carolyn Dekle, Executive Director, South Florida Regional Planning Council

Mr. Alan Farago, Executive Director, Everglades Defense Council

Mr. Marcus A. Frankel, President, Frankel Benayoun Architects, Inc.

Mr. Jose Fuentes, South Florida Director, The WREN Group

Dr. Hugh Gladwin, Director, Institute of Public Opinion Research, Florida International University

Ms. Cynthia Guerra, Program Director, Environmentally Endangered Lands, Miami-Dade County Department of Environmental Resources Management

Mr. Dan Kimball, Superintendent, Everglades National Park

Capt. Dan Kipnis, Director At Large, Florida Wildlife Federation

Dr. Stephen Leatherman, Chair Professor and Director, International Hurricane Research Center, Florida International University

Mrs. Nancy Liebman, Former Miami Beach City Commissioner

Mr. Sean McCrackine, Environmental & Land Use Policy Aide, Commissioner Katy Sorenson

Mr. Arsenio Milian, President, Milian, Swain & Associates, Inc.

Mr. Tony Moss, Esquire, Law Office of Tony Moss, Inc.

Mr. Jim Murley, Director, Center for Urban & Environmental Solutions, Florida Atlantic University

Mr. Guillermo Olmedillo, Urban & Regional Planner, OLMEDILLO X 5, Inc.

Dr. Jack Parker, Environmental Studies Department, Florida International University

Mr. Richard Pettigrew, Esq., Former Chair, Governor Chile's Commission on a Sustainable South Florida

Ms. Elizabeth Plater-Zyberk, Principal, Duany Plater-Zyberk & Company, LLC

Dr. Alfredo Ravinet, Research Scientist Asst. Professor, Applied Research Center, Florida International University

Mr. Rafael Rodon, Executive Vice President, Flagler Development

Mr. Manny J. Rodriguez, P.E., Miami Dade Regional Director, Florida Power and Light

Mr. Harvey Ruvin, Clerk of Courts, Miami-Dade County

Dr. Hal Wanless, Professor and Chair, Department of Geological Sciences, University of Miami

The Miami-Dade County Climate Change Advisory Task Force greatly benefited from professional guidance and early suggestions on organizational structure generously provided by the late Nick Bollman, Senior Research Fellow at the Center for Urban and Environmental Solutions at Florida Atlantic University. Nick was committed to engaging all parts of society in the challenge of addressing climate change. He inspired all of us to see the unlimited opportunities that might come from a united, committed effort by government, business, academia, and not-for-profit organizations.

Initial Recommendations

These initial recommendations were drafted at the committee level for review by the Miami-Dade Climate Change Advisory Task Force (CCATF). After extensive deliberations and further development, the recommendations were unanimously approved by the full Task Force on March 20, 2008. The items proposed focus on both mitigation activities and adaptation strategies. Mitigation efforts include activities that attempt to slow the process of global climate change by lowering the level of greenhouse gases [GHG] in the atmosphere, such as reducing fossil fuel consumption. Adaptation efforts include proactive steps we can take now to begin the process of making the County more resilient to the impacts that we are likely to experience.

A. Science

Initial Statement: The Science Committee was tasked with providing the Task Force and its Committees with a scientific assessment of the magnitude and timing of expected climate change impacts to Miami-Dade County. This assessment provided the basis for many of the Committees' recommendations. Human-induced global warming is real and has begun. Global warming will result in many types of changes, including changing atmospheric circulation and temperature patterns, changes in rainfall and severe weather, changes in biologic community distribution, increased extinction rates, changes in disease and pest distribution, and changes in sea level. While all these will significantly impact the United States in the coming century, the primary concern for South Florida and Miami-Dade County will be rising sea level. As explained in the attached Statement on Sea Level in the Coming Century (Appendix I), there is a very high likelihood that there will be at least a further 3-5 feet of sea level rise during this century. This rise will most certainly continue at an accelerated rate into the following century. Miami-Dade County will not be able to defend against such a rise and must begin a responsible and serious re-evaluation of all aspects of its present laws and approaches to growth, development, permitting, zoning, infrastructure, waste disposal and pollution, adaptation, and natural area preservation. The following two recommendations are the critical first steps in recognizing the reality of the future and providing a baseline map of elevations from which rational decisions and realistic planning for the future can be made.

Recommendation A.1:
The CCATF Science Committee's report, Statement on Sea Level in the Coming Century, is provided under Appendix I. The County should use the Science Committee's Statement on Sea Level in the Coming Century to guide future climate change mitigation and adaptation policy.

***Rationale**: The County must plan for, mitigate, and adapt to climate change even though uncertainty remains in determining which impacts may occur first and the type and severity of the changes. County executive staff and elected leaders need a basic scientific framework to guide them as they begin to formulate policy that properly addresses climate change and associated impacts.*

Recommendation A.2:
The County should commission detailed maps for all of Miami-Dade County created from calibrated LIDAR (Light Detection and Ranging) surveys (or other elevation survey technology that employs best

known practices). These maps will show mean high, high water (MHHW) levels for 1- foot through 6-foot rises in sea level. (MHHW level is the spring high tide level which occurs every 14 days around full moon and new moon.) The maps will allow identification of which areas will become flooded in association with different sea levels and will provide a basis for assessing risk to the County's development and infrastructure.

Rationale: *Light Detection and Ranging (LIDAR) is a remote sensing system used to collect topographic data. Data are collected with aircraft-mounted lasers capable of recording elevation measurements at a rate of 2,000 to 5,000 pulses per second and have a vertical precision of 15 centimeters (6 inches). After a baseline data set has been created, follow-up flights can be used to detect changes. Calibrated LIDAR maps will detail the elevations of infrastructure and roadway elements throughout the County, determine the susceptibility of coastal, wetland, and artificial fill areas to erosion; define areas of potential pollution and contamination release; determine changing drainage and storm surge risks; assess structural viability of buildings and levees with changing groundwater levels and saline water intrusion; help assess future fresh potable water sources; and define modifications necessary to maintain connectivity of roadways. Note: Some LIDAR mapping has already occurred in the region, undertaken by various entities. These maps need to be assessed for quality and proper calibration.*

B. Greenhouse Gas (GHG) Reduction

Initial Statement: The Greenhouse Gas Reduction Committee is tasked with identifying and promoting ways in which the County can further reduce its Greenhouse Gas (GHG) emissions. This effort was divided into two primary categories – energy conservation and transportation/fuel reduction. While developing recommendations, the GHG Committee took into consideration past and present County "sustainability" initiatives, including policies that facilitate GHG emission reductions. (For more details see the "1993-2006 Long Term Urban CO2 Reduction Plan Report" at:
http://www.miamidade.gov/derm/library/air_quality/CO2_Reduction_Final_Report.pdf
and Miami-Dade County's recent "Green Government Report" at:
http://www.miamidade.gov/govaction/matter.asp?matter=070355&file=true&yearFolder=Y2007 .

Due to Miami-Dade County's recent membership in the Chicago Climate Exchange, the Committee began by focusing on transportation and fuel reduction to develop recommendations related to Miami-Dade County fleet operations. In addition, two recommendations concerning the taxicab industry were included due to a related County Ordinance scheduled for consideration by the Board of County Commissioners in early 2008. The Committee will begin looking into emission reduction opportunities for energy conservation and green buildings in 2008.

While emphasizing efficiency and conservation, the integration of alternative fuels into County fleet operations, namely ethanol and biodiesel, was a major focus of this first set of recommendations. The Committee recognizes that cellulosic ethanol and biodiesel from algae and other more "sustainable" and locally produced crops, while currently unavailable, are preferable as they represent the greatest opportunity for overall greenhouse gas reductions and net environmental benefit. Recommendation B.3 addresses the desire of the Committee to scientifically assess the net environmental benefit of all fuel types. Keeping in mind that the most preferable alternative fuel is a moving target in the rapidly expanding fuel market, however, the recommendations call for the County to consider displacing fossil fuel with alternative fuels at this time, despite sourcing concerns.

Recommendation B.1:
The Climate Change Advisory Task Force recommends that Miami-Dade County ordinances related to the award/allocation of taxicab medallions include a requirement for all new medallions issued after January 1, 2008 to be allocated to hybrid or other vehicles having a combined average fuel efficiency of 28 MPG or higher**.**

Rationale: *The Climate Change Advisory Task Force supports the Consumer Service Department's (CSD) current efforts to link taxicab medallion issuance to more fuel-efficient vehicles. CSD's proposed ordinance is expected to be heard by the Board of County Commissioners in April 2008 and establishes an annual lottery of 38 taxicab medallions for a three-year period directed to the South Miami-Dade and underserved taxicab areas. The requirements of this ordinance are in support of one of the major goals of the taxicab reform effort to foster a system of owner-drivers to improve the quality of taxicab services and are designed to align with recent local environmental initiatives.*

The CCATF would like to encourage the CSD and BCC to strengthen its proposed medallion ordinance to incentivize a higher level of fuel efficiency. About 75 percent of Miami-Dade County's current fleet of taxicabs is made up of Ford Crown Victoria vehicles, which only get an estimated 17 miles per gallon (mpg) in city traffic. A 2008 Ford Escape hybrid gets 34 mpg and a 2008 Toyota Prius gets 48 mpg (in city traffic). Although a hybrid vehicle may cost more initially, the fuel cost savings and other benefits,

including tax credits and being able to use the High Occupancy Vehicle (HOV) lanes at all times, outweigh the drawbacks. Many new hybrids have been developed in the last few years, and not all of them are fuel-efficient; this is why the recommendation specifies a particular MPG rating.

There are several areas in the country with similar taxicab requirements including San Francisco and New York. In addition, on November 9, 2007, the City of Miami Commission approved a resolution urging the County to use hybrid vehicles as part of its taxi fleet. Upon implementation of this ordinance, the County would have the third largest number of hybrid taxicabs in the country.

Recommendation B.2:
Require that taxicabs being retired in accordance with Miami-Dade County's taxicab retirement schedule be replaced with new hybrid or other vehicles having a combined average fuel efficiency of 28 MPG or higher**.** Implementation of this recommendation is expected to affect 300 owners each year. The County should develop a financing mechanism to either subsidize the initial purchases or provide a revolving loan fund to assist owners to purchase new hybrids on reasonable terms and at reasonable interest rates. Such an assistance program is urgently needed to alleviate the harsh economic circumstances currently affecting taxicab owners and drivers.

Rationale: *Conversion of the entire taxicab fleet will achieve substantial emissions reductions and save taxicab operators an estimated $2,500 each year in gasoline costs. These savings can offset part of the cost differential of hybrid purchases. Individual medallion owners are often forced to obtain loans from non-bank sources under onerous terms, including elevated interest rates such as 12%. These costs are passed on to drivers. The recent increase in fuel prices is compounded by the use of older inefficient Ford Crown Victoria vehicles (EPA estimated 17/25 mpg). There is a need to provide individual medallion owners an alternative means of financing these new hybrid purchases. Due to the "pass on" of costs to drivers, many drivers are forced to work very long hours in an effort to realize a marginal profit above operational costs resulting from high costs per-mile-traveled. Miami-Dade County should consider further incentives for conversion to hybrids such as establishing an additional "hybrid-only" lane at the queue at the Miami International Airport. Upgrading our taxicab fleet would also benefit our tourist-dependent economy.*

Recommendation B.3:
It is recommended that Miami-Dade County regularly evaluate greenhouse gas emission reductions and the net environmental benefit of each fuel and vehicle under consideration for purchase and use in internal operations in order to ensure the use of the most efficient vehicles and sustainably-sourced alternative fuels, including those that are locally produced, and adjust investment accordingly. Net environmental benefit shall be determined through the consult of peer-reviewed nationally accepted studies and through the use of evaluation tools, available or to be developed, which will include the analysis of the overall environmental impact of the complete fuel cycle, including land use conversion, feedstock cultivation, raw material extraction, processing, transport, distribution, storage, and combustion. This will be compared to the net environmental impacts of the use of fossil fuels.

Rationale: *While Miami-Dade County is striving to reduce fossil fuel consumption and associated greenhouse gas (GHG) emissions through the use of alternative fuels, it is important to carefully evaluate these alternatives in order to achieve the most GHG emission reductions and net environmental benefits. From an environmental and sustainability perspective, not all alternative fuels are equal. While new federal energy legislation requires at least a 20% net GHG emissions reduction*

benefit from corn-based ethanol, the eventual objective must be to achieve much higher benefits such as those anticipated from using sugar cane, cellulosic materials, or algae. Decisions regarding alternative fuels should support Miami-Dade County's overall goal of sustainability.

Recommendation B.4:
The County's Procurement Management Department should take necessary steps to improve pricing and access to sustainably-sourced alternative fuels and high efficiency vehicles for County operations. This would include forming a joint committee or committees to pursue collective purchasing opportunities and to evaluate the costs and benefits of collective bids. Joint committee(s) could be formed with organizations operating large fleets such as federal, state, local municipal and county governments, airports, large corporations, public school districts, state agencies, universities and large non-profit organizations. GSA, Transit, and other Miami-Dade County departments should participate in collective purchasing committees, as needed, to best meet purchasing needs**.**

Rationale: *The purpose of this recommendation is two-fold:*

1. *To improve the pricing of and/or access to alternative fuels and high efficiency vehicles for the Miami-Dade County fleet.*
2. *To encourage the use and improve the accessibility of alternative fuels and high efficiency vehicles throughout the region.*

Recommendation B.5:
The Climate Change Advisory Task Force recommends that as Miami-Dade County fueling facilities are built, modified, or upgraded, they be designed and constructed to accommodate alternative fuels, including, but not limited to, E85 and B100. In addition, the County should consider dispensing E85 at two Miami-Dade County fueling stations within 6 months of it becoming locally available as determined by the process described in Recommendation B.3. It is recommended that Miami-Dade re-evaluate the use of E85 six months after dispensing is initiated to assess local availability, overall net costs and environmental impacts. Furthermore, new vehicles being purchased now and in the future by Miami-Dade County should have the capability of using ethanol and biodiesel, without the need for retrofit.

Rationale: *The Climate Change Advisory Task Force supports the County's General Services Administration Department's (a) recent decision to upgrade its fueling equipment at two stations in order to accommodate E85 fuel (in conjunction with required tank replacements that are taking place to comply with EPA 2009 double wall requirements) and (b) future plans to dispense E85 fuel at these two facilities once availability and fuel cost-differential issues are resolved. The CCATF recommendation expands the County's effort by requiring that <u>all</u> fueling facility upgrades incorporate equipment that can accommodate E85, B100, and other alternative fuels. Although only B20 blends are accepted by engine manufacturers at this time, equipment upgrades should be built to accommodate the highest biodiesel blend available, which is B100. In addition, the CCATF recommends that the County begin dispensing E85 fuel at the two upgraded facilities when it becomes locally available.*

Thirteen percent (940 vehicles) of the Miami-Dade County's light fleet is E85 Flex Fuel compatible. The use of E85 Ethanol in the flex fuel vehicles in the fleet would displace 994,500 gallons of gasoline. There is no firm pricing information available since local vendors don't supply ethanol at this time, but based on an unofficial quote in October 2007 of $2.49 from a vendor, it is estimated that Miami-Dade County would pay an additional $790,000 annually for using corn-based E85 transported from the Midwest United States, in the 940 flex fuel vehicles. Other feedstocks for ethanol, such as sugarcane

and cellulosic ethanol are reported to have less adverse environmental impacts than corn-based ethanol. Specifically, cellulosic ethanol, which can be made from the tough, fibrous material found in a variety of materials including herbaceous and woody perennials, wood chips, paper manufacturing sludge, etc. is projected to lower greenhouse gas emissions by 90.9 percent. In addition, cellulosic feedstock can be grown with less fertilizer and water and on poorer quality lands than those currently used to grow crops for conventional ethanol production. While currently there is no commercial production of cellulosic ethanol, there is a general consensus among Committee members familiar with the biofuel industry that cellulosic ethanol will be commercially available in the foreseeable future. In addition to this overall consensus on availability of cellulosic ethanol, Miami-Dade County's Agricultural Manager's Office is working on several local projects to assist in the local production of biofuels. Specifically, the office is assisting local farmers in forming a cooperative to grow and process crops into biofuels, the planting of test crops, and pursuing grants for the production and evaluation of fuel crops.

Recommendation B.6:
Require the use of sustainably-sourced biodiesel in all County diesel fleet vehicles and equipment (except standby equipment) as determined by the process described in Recommendation B.3, starting with B5 and increasing to B20 in 6 months. The Climate Change Advisory Task Force recommends that a portion of the local option gasoline tax be used to offset the cost difference for biodiesel.

Rationale: *Once sustainably-sourced biodiesel is available, this is perhaps the most economical, seamless, and immediately available option for Miami-Dade County to reduce its carbon emissions to meet its Chicago Climate Exchange emission reduction targets. The use of biodiesel, which has experienced a sharp increase in use over the past several years, does not require retrofits of vehicles or changes in fueling infrastructure for blends of up to B20 and is widely reported to provide similar fuel consumption, horsepower, torque, and haulage rates as conventional diesel fuel. Furthermore, there are more than 109 agencies using biodiesel in the southeast region (AL, FL, GA, KY, MS, NC, SC, TN) of the United States alone (http://www.southeastdiesel.org/Projects%20List/Biodiesel.pdf). More than thirty (30) of those organizations are county, city, or state vehicle fleets and at least ten (10) are transit bus fleets. A phased-in approach to a B20 blend should address the concerns of providers unfamiliar with handling biodiesel, as well as provide Miami-Dade County the opportunity to monitor and respond to any unexpected impacts of integrating a new fuel, without interruption to the services so essential to its residents.*

The issue of engine warranty coverage is an important concern always at the forefront of fleet managers' minds. Most major engine companies have stated formally that the use of blends up to B20 will not void their parts and workmanship warranties. This information can be found at http://www.biodiesel.org/resources/fuelfactsheets/standards_and_warranties.shtm under the "Summary Chart: OEM Biodiesel Statements" link. All diesel engine companies warranty the product they make - engines. Typically, an engine company will define what fuel the engine was designed for and will recommend the use of that fuel to their customers in their owner's manuals. Engine companies do not manufacture fuel or fuel components. Therefore, engine companies do not warranty fuel - whether that fuel is biodiesel or traditional fossil-fuel diesel. Therefore, the most important aspect regarding engine warranties and biodiesel is whether an engine manufacturer will void its parts and workmanship warranty when biodiesel is used, and whether the fuel producer or marketer will stand behind its fuels should problems occur.

Finally, it is recommended that Miami-Dade County use a portion of the local option gasoline tax to offset any cost difference for biodiesel. Miami-Dade County's fuel contract price for B20 averaged

fourteen (14) cents higher in 2007 than regular (#2) diesel. The prices quoted are provided by the fuel vendors currently under contract with the County. Recently, GSA worked to facilitate future procurement of biofuels by adding additional language to Section 2, Paragraph 2.37 of the Invitation to Bid (ITB) for Gasoline and Diesel fuel. The revised wording of the fuel solicitation allows for the addition of alternative fuels and blends and for the addition of vendors. These changes should result in decreasing the price differential between biodiesel and regular diesel. Biodiesel users have reported minor cost increases, no increase in cost, or actual savings in purchasing biodiesel.

Recommendation B.7:
Require that Miami-Dade County develop a vehicle procurement process, which ensures that vehicles owned by MDC increase their mpg by 5% annually per vehicle class (whenever higher MPG vehicles are available) and that the cost of carbon emissions is included in the life cycle cost analysis process.

Rationale: *It is the goal of the Climate Change Advisory Task Force to put forth recommendations that will ultimately result in the reduction of Miami-Dade County's greenhouse gas emissions. One way that these reductions may be undertaken is by increasing the fuel efficiency of the County's fleet vehicles. There are many existing fleet vehicles that do not have the top fuel efficiency ratings in their respective classes. When these vehicles have reached the end of their life cycles/years of service, they must be replaced with a vehicle that has a higher fuel efficiency rating than that of the expiring vehicle. The minimum increase in fuel efficiency must be 5% higher than the most efficient vehicle (within the same vehicle class) purchased in the previous year.*

This recommendation applies to all Miami-Dade County fleet vehicle classes. Based on information provided by GSA, the Miami-Dade Police Department (MDPD) has 39% of the County's light fleet vehicles, which use 58% of the County's total unleaded gasoline. Therefore, this recommendation shall apply to police department vehicles as well, with implementation starting with non-pursuit police vehicles.

Recommendation B.8:
The purchase of a hybrid SUV shall be an allowable alternative for Miami-Dade County fleet procurement if that vehicle is determined to be more fuel-efficient than a light truck or other comparable vehicle.

Rationale: *Currently, Miami-Dade County is restricted from purchasing SUVs. When this ordinance was passed, there were no hybrid SUVs available. While hybrid SUVs remain less fuel-efficient than other sedan alternatives, there are now several hybrid SUVs on the market with higher fuel efficiencies than the light trucks Miami-Dade County is currently purchasing. If a department justifies the need for a non-sedan vehicle for operational purposes, a hybrid SUV may offer a more fuel-efficient option compared to a light truck.*

Recommendation B.9:
Direct the Office of Sustainability to initiate an energy and fuel conservation incentive and awareness campaign for employees in conjunction with the Miami-Dade County's Resource Conservation Committee, DERM's Pollution Prevention and Environmental Education work groups, and the GSA Department. This campaign should use information from the Chicago Climate Exchange membership, the Climate Change Advisory Task Force (CCATF) Science Committee, and other pertinent sources to

highlight the environmental, health, and economic benefits of energy conservation and communicate the importance of conserving energy and fuel. The information about energy efficiency and fuel conservation currently provided as part of the Miami-Dade County's New Employee Orientation Program should be expanded to include the campaign components listed above. Funding needs and options shall be identified for the implementation of this recommendation.

Rationale: *According to the Alliance to Save Energy, a national leader in energy conservation initiatives, no-cost and low-cost behavioral and operational solutions can reduce energy and fuel consumption by 5-15%. With proper funding and organizational support, a County-wide awareness and incentive campaign will save costs and significantly reduce greenhouse gas emissions generated by the County. This initiative would include trainings for drivers on idling and proper tire inflation and for office workers on energy efficiency and conservation related to lights, computers, and other electronics. It would also include working with facilities, information technology, and fleet managers on operational changes that could improve energy efficiency.*

Recommendation B.10:
The Climate Change Advisory Task Force supports any recommendations put forth as a result of the most recent Miami-Dade County fleet analysis that lead to an increase in fleet fuel efficiency and a reduction in vehicle miles traveled (VMT). The Task Force recommends that the County further strengthen these recommendations by creating incentives to reduce VMT and by not excluding any departments or vehicle types in reduction initiatives. As an example, it is recommended that hybrid sedans be purchased for non-pursuit police vehicles at the time of replacement.

Rationale: *See Appendix IV, Miami-Dade County 2007 Review of County Owned Light Vehicles.*

C. Built Environment Adaptation

Initial Statement: The Built Environment Committee's task was to focus on adaptation rather than mitigation strategies. The Committee understands that an appropriate foundation and structure among governmental agencies is necessary before significant mitigation and adaption investments are made. An early list of the components of the built environment intended to be addressed by mitigation and adaptation actions was set aside in favor of laying the groundwork for the appropriate agencies to identify vulnerabilities and reactive strategies. Thus, topics such as seawalls, raising infrastructure, and private building retrofits among others, although discussed, were not reviewed in any depth. The Committee also discussed mitigation strategies that directly relate to the built environment and that might be good short term regulatory actions; these were documented for future discussions.

Recommendation C.1:
Require all County agencies (and entities that receive County funding for significant infrastructure or built investments) to assess climate change impacts on the agency's/entity's responsibilities. This assessment should be incorporated into their master planning agenda or such a planning process should be initiated if it does not exist. The assessment should include the impact of sea level rise on all public investments and identification of vulnerabilities in order to produce strategies for mitigation and adaptation. These assessments should utilize a 50-year planning horizon.

Rationale: *It is suggested this mandate utilize a 50 year window for planning (assuming at least 1.5 ft. sea level rise within that time frame and at least 3-5 ft. over 100 years) with interim benchmarks. There is an urgent need to incorporate climate change impacts into all basic planning and permitting. There is also a great need to coordinate action plans among related agencies. For instance, coordination of use and protection of the Biscayne and Floridan Aquifers (by the County's Water and Sewer Department (WASD) and the South Florida Water Management District (SFWMD)) is of critical importance to address the impact of salt water intrusion on the fresh drinking water supply and on vegetation, including agriculture, in the County. The protection of drinking water quality/purity implies increasing the groundwater level to maintain hydrostatic water pressure landside to counter the sea's rise. Higher groundwater changes stormwater drainage functionality and increases inland vulnerability to flooding. The Committee also began initial discussions about how some current capital projects could be impacted by sea level rise and targeted those issues for further discussion and possible future recommendations - for instance, the planning of the new Port Tunnel and how to incorporate the implications of sea level rise projections.*

Recommendation C.2: (Note: see also Recommendations D.4 and E.1)
Use County charter authority to establish minimum criteria and standards related to climate change (including sea level rise), for public investment for all municipalities in Miami-Dade County.

Rationale: *The County should engage and offer assistance to the municipalities and develop criteria and standards in consultation with them. This effort would encourage each municipality to assess its vulnerabilities and to propose strategies that incorporate climate change into all public investment processes and decisions, including those concerning infrastructure and buildings. Such criteria and standards might include establishing new street grade and building first floor elevation requirements that exceed current County and FEMA standards and would be required for both municipal and county projects.*

Recommendation C.3: (Note: see also Recommendation F.4)
Expand the mission of the County's Office of Sustainability (OOS), and thus its resources and staffing, to provide a centralized agency for climate change information, monitoring, analysis, and benchmarking. Three activities in particular were identified:

a.) Establish a base case of information at an identified current or recent past date, to which all ensuing data might be compared;

b.) Assist in integrating the activities of the various entities including the coordination of data collection so that it can be used across departments/disciplines for analysis and comparison; and determine the appropriate metrics for critical issues;

c.) Monitor the effects of climate change on Miami-Dade County using the evolving data base, and publish the results for use by elected leaders, public agencies, and the general public.

Rationale: *It is understood that a variety of entities and agencies are already collecting and will continue to collect information, but that the OOS would encourage the integration and distribution of this knowledge.*

The data to be tracked was not fully identified, but might be expected to include population change, emissions levels, salt water intrusion, groundwater levels, vehicle miles per household, total land area of impervious surface, tree canopy, etc.

D. Natural Systems Adaptation

Initial Statement: Based on the projected impacts of climate change to natural systems in Miami-Dade County, the NSA Committee prepared a Preliminary Draft Report that included recommendations related to the restoration of natural systems; the protection and management of natural, open, and agricultural lands, groundwater, and wildlife and plant species; the development and implementation of monitoring, modeling, and adaptive management approaches; and the establishment of climate change-related partnerships. The main initial recommendations proposed by the NSA Committee are listed below.

Recommendation D.1:
Fully support the Comprehensive Everglades Restoration Plan (CERP), and increase funding and resources for other regional and local habitat restoration and preservation efforts and initiatives.

***Rationale**: Restored ecosystems will be more resilient and better able to adapt to climate change. As such, ecosystem restoration is a crucial component in mitigating and adapting to the effects of climate change in Miami-Dade County. Restoration needs to go beyond the current CERP and include additional degraded habitat and other open space in the County. CERP is expected to provide the proper quantity, quality, timing, and distribution of water to both reduce the potential for saltwater intrusion into the Biscayne Aquifer, the County's principal source of drinking water, as well as provide a healthier natural environment more capable of being resilient to climate change. Additionally, scientific experts have found that the Everglades contains some of the largest stocks of soil organic carbon per area in all of North America and that reductions of these carbon stocks can be minimized by maintaining hydroperiods and implementing an appropriate fire management scheme.*

Beyond CERP, restoration of additional lands in the County is needed. Remaining undeveloped coastal areas should be restored and preserved. This will allow for habitats to adjust and change with rising sea level and give coastal species the ability to adjust as habitat changes occur. Upland habitat needs to be restored and preserved as well. Fragmentation of upland habitat, such as pine rocklands, creates barriers to species movement. In addition, isolated parcels of these habitats frequently cannot provide all of the necessary components to support plant and animal populations, and are more susceptible to colonization by invasive species. These fragmented areas need to be reconnected.

Recommendation D.2:
Increase funding and resources for land acquisition and management programs of Miami-Dade County. Investigate new and creative mechanisms to boost funding, such as the creation of a County-administered "carbon credit purchasing" program, as a potential alternative to current development, industry, and government mitigation requirements.

***Rationale**: The retention of natural and open land provides many critical public services such as replenishing drinking water supplies, protecting against saltwater intrusion, contributing to the implementation of regional restoration efforts, conserving native wildlife and habitats, providing recreational space, and sustaining agriculture as a viable industry. Open 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. Different preservation tools must be deployed to offer the greatest amount of protection to existing open lands in public and private ownership. 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.

Recommendation D.3:
Acquire all undeveloped lands needed for restoration purposes and for mitigation and adaptation to climate change effects. Secure strategic open lands to provide transition zones to accommodate retreat or spatial shifts in natural areas, such as coastal wetlands and freshwater marshes.

***Rationale**: See Rationale under Recommendation D.2.*

Recommendation D.4: (Note: see also Recommendations C.2. and E.1)
Create a plan to locate infrastructure and development outside coastal or flood hazard prone areas using projections of sea level rise to identify those areas. Describe a transitional zone between the hazard area and the built area to be protected and prohibit incompatible land uses that would convert open lands in the transitional zone. Establish a comprehensive planning and zoning policy, such as development setbacks and limits on density and infrastructure in coastal and transitional zones to consider vulnerability to sea level rise and saltwater intrusion.

***Rationale**: See Rationale under Recommendation D.2.*

Recommendation D.5:
Encourage the continued funding of the County Agriculture Purchase of Development Rights Program beyond the current funding levels to maintain open lands for aquifer recharge, habitat, and buffers.

***Rationale:** See Rationale under Recommendation D.2.*

Recommendation D.6:
Provide incentives to study and develop best practices for agricultural management that contribute to carbon sequestration and reduce greenhouse gas emissions.

***Rationale:** Adaptation to more tolerant tropical crops and crop varieties and migration of more sub-tropical or winter season crops out of the area could mitigate climate change impacts to the agricultural industry in Miami-Dade County. However, compounded with current economic challenges, pest and disease, and a sometimes conflicting regulatory environment, even minor climatic changes would have significant economic and social impacts on local agriculture. That said, agriculture can play a role in helping to mitigate climate change. Currently, Florida forest products and agriculture account for a relatively small percent of the state's overall CO2 emissions; however, these industries represent a great potential to sequester atmospheric CO2. While agriculture is a net producer of greenhouse gases, studies are emerging that show effective management practices such as no tillage or conservation tillage can increase crop yields and stimulate accumulation of soil organic carbon, thereby sequestering CO2 from the atmosphere.*

Recommendation D.7: (Note: see also Recommendation F.2)
Review current stormwater management operations, including the operation of canals and structures, in order to eliminate unnecessary over-drainage and limit the extent of saltwater intrusion into ground and surface water resources. Additionally, require water conservation measures for all users of the Biscayne Aquifer.

Rationale: *As sea level rises, there will be a further incursion of brackish water into the Biscayne Aquifer and into freshwater wetland systems. Incursion of brackish water into the Biscayne Aquifer will not only cause a change in habitats from fresh to brackish systems, and potentially cause degradation of habitats through colonization by invasive plant species, it will also endanger the potable water supply of Miami-Dade County. This will be exacerbated by brackish/salt water flowing into canals emptying into coastal waters. In addition, over-drainage of areas via secondary and tertiary canals will reduce the freshwater that is available to recharge the aquifer. Water conservation measures will also need to be part of the strategy. Reduced draws on the Biscayne Aquifer will allow more freshwater head pressure in the aquifer, slowing brackish water intrusion.*

Recommendation D.8: (Note: see also Recommendations D.2 and D.3)
Increase funding for County-administered management activities like those programs within Natural Areas Management and Environmentally Endangered Lands. Establish a multi-agency task force to expand County capacity and coordinate conservation activities. Develop a collaborative and integrated approach to conservation involving universities, government agencies, landowners, botanic gardens, zoos, and non-governmental organizations.

Rationale: *The natural habitats of Miami-Dade County hold populations of wild plant and animal species that are locally, nationally, and internationally important. As the surviving habitats of the County are increasingly influenced by climate change, we can expect the wild populations of many species to change in both distribution and abundance. Indeed, we can expect that some species will be lost from Miami-Dade County. The projected changes in global temperature will have a number of impacts upon wild species. This will include changes in the ecology of habitats, such as changes in sea level and storm impacts upon coastal strand-line species, the effects of fire on the pine rocklands, and the impact of new invasive species and pathogens on all habitats. Species-specific responses will include changes in behavior in reaction to changing climate. These can include changes in seasonal breeding behavior, changes in migration, and impacts on reproductive success.*

The importance of Miami-Dade County as habitat for an important range of wild species cannot be underestimated. Miami-Dade County holds important areas of unique Florida habitats such as pine rocklands and tropical hammock, coral reefs, mangrove wetlands, and important areas of a globally unique freshwater wetland ecosystem, the Everglades. Some of these surviving habitat areas are managed by Miami-Dade County (more than 84 natural areas), while others are managed by a wide variety of private owners, non-governmental organizations, and State and Federal agencies.

Recommendation D.9:
Develop a "Vital Signs" monitoring program, following the model of the National Park Service, to serve as a multi-parameter ecosystem monitoring program that will help track climate change effects. Expand current ongoing monitoring efforts, such as those within the Comprehensive Everglades Restoration Plan (CERP), to include specific areas of Miami-Dade County, to provide a better view of how natural areas are changing over time and what forces are responsible. Key parameters may

include: rate of sea level rise; saltwater intrusion boundary and monitoring wells; landscape-level vegetation patterns; percent coral cover in offshore reef zones; water temperature in reef areas; and occurrence and range of invasive exotic plant and animal species. Dedicate a source of funds to collect information and establish and maintain a long-term data management system.

Rationale: *Some of the potential consequences of climate change, such as sea level rise, are predictable, and can be directly monitored and compared to expected outcomes. Other potential responses, such as habitat alteration or loss of species, are less predictable, are poorly understood, or may also be affected by other human causes or natural events. That said, it is also recognized that monitoring everything that seems important is not feasible and that existing local monitoring programs, driven by regulatory requirements and fees, are not designed to address large space and time scales associated with climate change. Therefore, a refined approach, focusing on monitoring a suite of key indicators or "vital signs," used in conjunction with applied modeling and assessment, is recommended. The effort should build upon or be integrated with regional environmental programs led by State and Federal agencies.*

Recommendation D.10: (Note: see also Recommendations D.3, D.8, F.2, and F.3)
Miami-Dade County should establish partnerships, both formal and informal, with other governmental entities, including local, State, and Federal governments; the private sector; non-governmental organizations; and other stakeholders in the County. Partnerships should focus on cooperative efforts to restore existing natural ecosystems; protect natural and open lands; mitigate impacts; and monitor natural systems and indicators of climate change. Partnerships should also be undertaken to effectively practice adaptive management as we increase our understanding over time of the effects of climate change on natural systems in the County and implement management actions to restore and protect natural systems in the County.

Rationale: *Partnerships are integral to restoring and protecting natural systems in a time of climate change and to assure the effective implementation of the recommendations of the NSA Committee.*

E. Economic, Social, and Health Adaptation

Initial Statement: A recent study was conducted by a number of international scientists with expertise in climate modeling, risk management, policy and economics. The associated report, *Ranking of the Worlds' Cities Most Exposed to Coastal Flooding Today and in the Future,* by the Organization for Economic Co-operation and Development, lists the metropolitan area of **Miami as the number one most vulnerable worldwide in terms of assets exposed if a 1 in 100 year surge-induced flood event were to happen today and predicts dramatic economic loss estimated at roughly $416 billion**. Economic losses are estimated to increase to **$3.5 trillion** by 2070 for this type of catastrophic event. When considering climate change and projected sea level rise, the report lists **Miami as one of the top ten** cities worldwide for population exposure related to coastal flooding for present day conditions. Another study published in November 2007 by Tufts University, *Florida and Climate Change: the Costs of Inaction*, projects **annual costs of inaction totaling $92 billion** by 2050 and **$345 billion** by 2100, figures that constitute 2.8 percent and 5.0 percent of the state's projected Gross State Product respectively. These estimates only include economic costs from loss of tourism revenue, increased hurricane damages, at-risk residential real estate, and increased electricity costs and would be even larger if they included other sectors like agriculture, fisheries, insurances, transportation, water systems, and ecosystem damages.
(Webpage URL to the OECD report is http://www.oecd.org/dataoecd/16/10/39721444.pdf and the Tufts report can be found via the following webpage URL:
http://www.ase.tufts.edu/gdae/Pubs/rp/Florida_hr.pdf?bcsi_scan_EAC41357C45D053C=0&bcsi_scan_filename=Florida_hr.pdf)

The projected impact of sea level rise and resulting coastal flooding will require all agencies and entities in the County involved in economic development, planning, public health, and water supply to develop a unified and comprehensive response to the challenges of climate change. A key issue is maintaining flexibility in the face of uncertainty about the magnitude of sea level rise. Flexibility conferred by maintaining undeveloped agricultural areas and other open space would be compromised by new development that would require future sea level rise mitigation or would put current and future investments in public infrastructure at risk. Unwisely building in at-risk areas will precipitate extreme financial losses in the event of projected sea level rise.

Developing comprehensive and effective mitigation and adaptation strategies to address climate change will also require the understanding and support of informed citizens, thus requiring the collaboration of media, educational institutions, environmental NGOs, and other groups, to focus on education and two-way communication with the public about choices that have to be made.

Recommendation E.1: (Note: see also Recommendations C.2 and D.4)
The Task Force recommends that the Miami-Dade County Comprehensive Development Master Plan (CDMP) be revised to include a new policy to restrict land uses in areas that would be at risk from sea level rise and associated impacts within the next 50 years as per the CCATF Science Committee's Statement on Sea Level in the Coming Century report and projections. A continuous 50-year planning horizon should be used.

Rationale: *Sea level is anticipated to rise at least 1.5 feet over the next 50 years and a total of at least 3-5 feet by the end of the century. It is possible that these estimates could be exceeded. The purpose of the policy will be to maintain land use flexibility to allow for future mitigation measures that may*

become necessary. Flexibility will be accomplished by restricting land uses that would require future sea level rise mitigation and/or put at risk current and future investments in public infrastructure. For example, this policy would encourage the retention of agricultural areas that may be prone to sea level rise in the near future. Since these areas are technically undeveloped open space, they could continue to be utilized and remain economically productive until a time that they can no longer be farmed. Maintaining these as agricultural areas pre-empts conversion to development, which would most likely necessitate mitigation or some type of financial assistance for property owners to be re-located, etc. Agricultural areas can also be used to begin locally growing and processing biofuels.

This policy would be in addition and complementary to the proposed Coastal High Hazard amendment to the CDMP, which is based on current estimates of hurricane storm surge and is being mandated by the State.

Note: Any proposed regulations that have potential impacts on agriculture need to be brought before the BCCs Agricultural Practices Advisory Board, which is an official review body for agricultural regulations.

Recommendation E.2:
Initiate an additional long-term CCATF advisory board committee composed of representatives from federal, state, and local environmental agencies (including Miami-Dade County DERM, WASD, Cooperative Extension), the Miami-Dade County Department of Health, local colleges and universities, and community leaders to address potential human infectious disease changes and increases that may accompany climate change and to make technical and funding recommendations to the Miami-Dade County Board of County Commissioners. With the goal of disease prevention, the advisory board would advocate for:

- Vector control programs that address mosquitoes, rodents, and other animals and that are adequately maintained and expanded as necessary.
- Chemical and biological monitoring programs within Biscayne Bay's waters and other surface waters to be expanded to detect potential pathogens before they cause illness.
- Adequate funding allocated to the Miami-Dade Water and Sewer Department's (MDWASD) budget to allow for research and planning of alternative water treatment systems that can manage additional pathogens.

***Rationale**: The Office of Epidemiology and Disease Control of the Miami-Dade County Health Department has the responsibility of doing surveillance and investigation of reportable diseases and conditions as well as investigation of outbreaks. In addition, the office does syndromic surveillance to detect increases in symptoms of diseases and discover outbreaks sooner. However, environmental monitoring may be more effective in detecting potential pathogens before they cause illness. Our recommendations are based on available knowledge of epidemiologic trends and distribution of diseases and their vectors. Sea level rise, an increase in average temperatures, salt water intrusion in fresh water bodies, and decrease in the level of fresh surface water bodies and wells may expand areas hospitable to disease-bearing organisms (vectors of disease), thus increasing the risk of infectious diseases.*

Recommendation E.3: (Note: see also Recommendations F.4, F.5, and F.6)
The County shall form an interdisciplinary, community-wide working group, including the media and institutions of higher education, which (a) focuses on public education and information regarding climate change and adaptation and (b) assesses public opinion regarding these subjects.

Rationale: *This working group would focus on increasing public awareness (education), assessing risk and adaptation preferences within the community, and providing comprehensive estimates of mitigation and adaptation costs. Assessing mitigation and adaptation costs, including social and environmental externalities, would provide a more accurate mechanism for comparing proactive proposed policies with the costs of inaction. The working group should actively work toward mainstreaming knowledge regarding climate change, increasing adaptive capacity and climate change resilience, and promoting cognitive and behavioral adaptation changes. It should create dialog (public discussion and participation) within broad social networks to share both problems and solutions and to promote individual and collective empowerment. The group should propose near and long-term alternative courses of action (at the individual and community level) to the business as usual (BAU) scenario, with respect to both GHG mitigation and adaptation strategies. The Commission should make certain that non-regulatory county agencies involved in public education (e.g., the Cooperative Extension) are part of such an advisory board or working group.*

Recommendation E.4:
The Task Force recommends that the County bring together all agencies and entities involved in economic development and planning in order to develop a unified and comprehensive response to the challenges of climate change, housing, economic development, and quality of life

Rationale: *Expert testimony at the ES&HA Committee meetings has made it clear that even without climate change, the County is facing serious challenges that require better coordination in planning. For example, the current housing market does not provide housing in the price range required for the workforce growth that successful economic development requires, particularly the homeowner housing essential to sustainability of neighborhood quality of life. Another example is water availability and quality, now critical for economic growth, household needs, and environmental sustainability. Planning for challenges like these in the County is now fragmented across different agencies at many levels of government — municipal, county, regional, state, and federal. Climate change will accelerate the need for coordinated planning to meet these challenges as it potentially limits resources like areas for workforce housing expansion and water supply free of saltwater intrusion. Although the County does coordinate planning for hurricane readiness among agencies and municipalities with its Local Mitigation Strategy Working Group, the Task Force has identified a coordination need that will involve agencies and planning in a much more fundamental way.*

F. Intergovernmental Affairs

Initial Statement: A primary focus of the IGA Committee's mission involves working with a broad range of public, private, civic, and non-profit organizations to identify opportunities for collaboration. The Committee has focused its initial efforts on developing strategies that will build support for climate change related initiatives within Miami-Dade County. To that end, the Committee's discussions have focused on how to: (1) engage and partner with the County's municipalities in efforts to mitigate and adapt to climate change; (2) engage local, regional, and state agencies in a discussion about their activities related to climate change; and (3) educate and reach the general public, particularly children and their parents.

Recommendation F.1:
Conduct a survey of Miami-Dade County municipalities to gauge their level of knowledge and engagement in climate change issues, learn about their activities, and begin the creation of an intergovernmental, learning network that allows members to work with each other and the County on adaptation / mitigation issues.

Once the survey has been completed, engage the cities in a dialogue about the survey findings and work of the Climate Change Advisory Task Force. This dialogue could happen in a number of ways including a meeting with the Miami-Dade League of Cities and/or a convening of Miami-Dade municipal and county leaders in a shared discussion of the issues and information exchange.

Rationale: *Fifty-five percent of the Miami-Dade County's population, approximately 1.4 million residents, resides within one of the County's 35 municipalities. Any effort to comprehensively address climate change, mitigation, and adaptation in Miami-Dade County will be well served through a collaborative partnership of County and municipal elected leaders and staff. Local governments around the country are leading the way in identifying and implementing strategies that reduce greenhouse gas emissions and create more climate change resilient communities. A partnership of the County and the municipalities will improve efficiency, conserve resources, reduce duplication of effort, and create synergies that will lead to better opportunities and outcomes than would otherwise be possible.*

Recommendation F.2: (Note: see also Recommendations D.7, D.10, and F.3)
Convene local and state agencies and water and sewer utilities around a discussion of climate change and impacts on water quantity, quality, and availability and implications for infrastructure planning and investment.

Rationale: *Communication and collaboration at all levels of government will improve efficiency, conserve resources, reduce duplication of effort, and create synergies that will lead to better opportunities and outcomes than would otherwise be possible.*

Recommendation F.3: (Note: see also Recommendations D.10, and F.2)
Convene a broader group of local and state agencies around a discussion of their activities related to climate change. Agencies / groups would include, but not be limited to, DOT 4 & 6, DEP, SFWMD, DCA, Health Planning Agencies, Ecosystem Restoration Task Force, etc. In this conversation we will gain a better understanding if there are issues or concerns that we need to be aware of and identify opportunities for collaboration moving forward.

Rationale: *See Rationale under Recommendation F.2.*

Recommendation F.4: (Note: see also Recommendations C.3 and E.3)
Develop a County internet website with up-to-date information about the work of the Miami-Dade Board of County Commissioners, the CCATF, and municipalities with links to information and best practices related to climate change, adaptation and mitigation efforts by individuals and organizations.

Rationale*: Miami-Dade County residents are more likely to support County and municipal efforts to reduce greenhouse gas emissions, conserve resources, and adopt adaptation measures if they are provided with balanced information about climate change and the steps they can take to reduce negative impacts on the environment and contribute to positive change. An internet site with up-to-date information about climate change related efforts in Miami-Dade County and beyond will be a resource for residents, elected officials, and a wide range of public, private, nonprofit, and civic partners. Educational efforts which help children understand the world around them, particularly the richness of South Florida's environment and the challenges and opportunities posed by global climate change, will contribute to the creation of a more informed and supportive citizenry, in this generation and beyond.*

Recommendation F.5: (Note: see also Recommendation E.3)
Work with the region's children's museums and foundations to create and fund educational exhibits on climate change, green technologies, clean cities, etc.

Rationale: *See Rationale under Recommendation F.4*

Recommendation F.6: (Note: see also Recommendations C.3 and E.3)
Identify and develop educational materials that can be incorporated into a Miami-Dade Public Schools curriculum on climate change, the environment, and sustainability. The materials should be shared with other educational institutions to facilitate the dissemination of information to Miami-Dade residents.

Rationale: *See Rationale under Recommendation F.4*

CLIMATE CHANGE AND WATER MANAGEMENT IN SOUTH FLORIDA

November 12, 2009

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South Florida Water Management District

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Executive Summary

Global climate change and variability, particularly at regional levels, are not completely understood. Therefore, there are many significant uncertainties associated with forecasting future change and variability in places like South Florida. The purpose of this paper is to provide a high-level foundation for future discussions of the effects of global climate on water management planning and operations. By highlighting the current state of scientific knowledge, it provides policy- and decision-makers with important information when considering any potential actions.

More importantly, the intent is to focus the global concepts of climate change at the regional level by providing an overview of how it may affect South Florida's resources and the mission responsibilities of the South Florida Water Management District. The paper includes an initial vulnerability analysis of the potential threats of climate change and sea level rise to water supply, flood control, coastal ecosystems, and regional water management infrastructure. Due to the broad range of uncertainty, descriptions of the potential impacts of climate change on South Florida's water resources are based on the best-available science combined with the collective experience and best professional judgment of District staff.

The impacts of climate change are divided into four areas: 1) rising seas, 2) temperature and evapotranspiration, 3) rainfall, floods and drought, and 4) tropical storms and hurricanes.

Sea levels have been rising at a more rapid pace in the recent past in comparison to the last 2,000 years. Over the next fifty years, South Florida may experience seas that are in the range of 5 to 20 inches higher than current levels. As a result, there may be significant flooding of property and infrastructure, greater vulnerability to storm surges and erosion, and the destruction of coastal habitats. Sea level rise could accelerate saltwater intrusion of the coastal aquifers that are currently used to provide water for much of the region.

Temperatures and evapotranspiration in South Florida are predicted to rise, though projections vary greatly. With any rise in these factors, regional water demands will likely increase as well.

Changes to South Florida's rainfall have proven difficult to predict. Some studies suggest the region will be wetter, while others project 20 percent less rainfall. Either way, the environmental and operational impacts may be significant. In addition to changes in precipitation amounts, the intensity and timing of rainfall may also change, which could lead to more frequent droughts and floods.

Much like the rainfall predictions, scientists continue to debate how tropical storms and hurricanes will be different as a result of global climate change. The current research indicates overall storm frequency may decrease, while the number of strong hurricanes is expected to increase. Tropical storms and hurricanes cause significant damage to South Florida, but also provide huge amounts of rain for the area. The loss of storm-associated rainfall could have significant implications for the District's regional water supplies.

Although many aspects of climate change are still uncertain, the District is considering its possible impacts on South Florida. The combination of changes to sea levels, temperature, rainfall patterns, and tropical storms has the potential of significantly altering how the District operates to achieve its legislatively mandated mission.

I. Introduction: Confronting Change

According to the United Nations' Intergovernmental Panel on Climate Change, global climate change is real. The scientific consensus presented in their 2007 report is that warming of the Earth's climate system is unequivocally taking place[9]. The United States Supreme Court has ruled that the "harms associated with climate change are serious and well recognized."[*] And according to a 2009 special report prepared for the Florida Energy and Climate Commission by the Florida Oceans and Coastal Council[6], the question for Floridians is not whether they will be affected by global warming, but how much – that is, to what degree it will continue, how rapidly, what other climate changes will accompany the warming, and what the long-term effects of these changes will be.

Although current available models – including those used by the Intergovernmental Panel on Climate Change – are too coarse to provide useful projections for smaller, specific regions such as South Florida, the potential implications of the published range of modeled climate change impacts could be significant. While debate and research gaps continue to surround the nature, magnitude, speed, and ultimate impact of global climate changes, the potential risks to South Florida's natural and managed systems are high and oblige us to investigate possible water management ramifications.

While the study of natural and human-induced global climate change includes a multitude of far-reaching aspects, the four primary areas of focus for the District are sea level rise, temperature, rainfall patterns, and tropical storms/hurricanes. The impacts of these four elements alone could fundamentally alter traditional water management assumptions.

Recognizing the significant level of uncertainty, this paper addresses these four issues in terms of what is currently known, what is probable, and what is possible. "Probable" means an effect is highly likely to occur in the future, while "possible" means it may occur, but predicted impacts must be carefully qualified to reflect the level of certainty. The paper also examines the potential consequences on existing water management infrastructure and flood protection capabilities, along with water supply and restoration/natural systems impacts.

It is important to note that parts of the current regional network are over 50 years old and were designed and built according to known climate averages and extremes of the time. Over the last two decades, South Florida Water Management District scientists have researched how natural, global climatic patterns such as the El Niño/La Niña-Southern Oscillation and the Atlantic Multidecadal Oscillation are linked to South Florida's weather and climate. Based on this expanded experience and knowledge, the District has already adopted progressive measures to incorporate climate outlook into its planning and operations. Other District scientists continue to study the natural climate cycles affecting South Florida, including the rates of soil accretion near Florida Bay and its potential to offset the effects of sea level rise.

The development of any recommendations or adaptation strategies regarding global climate change requires a holistic investigation of the current state-of-the-science, along with an initial assessment of vulnerabilities with respect to the District's mission responsibilities. The intent of this paper is to provide that solid foundation.

[*] Massachusetts v. EPA, 2007

II. Climate Change and Water Management: Historical Climate Variability

Cyclical changes in climate are well known. Long-term data show rises and falls in temperature, precipitation, extreme events, and every other climate factor. However, many recent changes appear to be outside normal historical variability. The last few decades have experienced higher temperatures than much of the past two millennia[11]. Arctic sea ice levels have reached record or near-record lows over the last three summers and scientists are witnessing changes in seasonal migrations, pollen release, and bird nesting as plants and animals adjust to what is happening around them[12]. While climate changes are occurring over the entire planet, the impacts differ from one region to another.

In South Florida, annual rainfall is a perfect example of climatic variability. The amount of rain from one year to another can cause the area to swing between extreme dry and wet conditions (**Figure 1**). These annual changes in precipitation are a major challenge to water management. While surface and groundwater storage compensates for short-term variations, droughts have dried wetlands and lowered lake levels significantly. On the other extreme, wet conditions can result in local flooding and trigger freshwater flood control discharges to delicate estuarine environments. For water managers, understanding past and predicting future climate variability is vitally important.

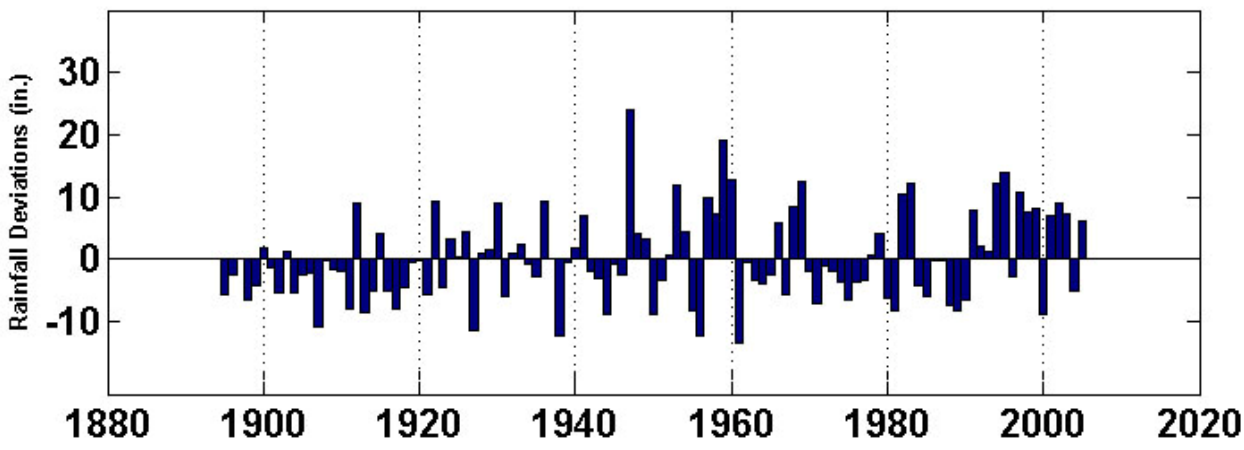

Figure 1. Deviations from average District-wide, long-term rainfall patterns demonstrate the extreme variability of dry and wet periods in the region over more than a century.

Scientists are now able to link climate variability in specific regions (such as South Florida) to global patterns. The District uses this knowledge to prepare and adjust operations prior to changes due to El Niño/La Niña, the Atlantic Multidecadal Oscillation, and other global patterns.

Predicting climate change and its consequences remains an inexact science. Many factors, including solar radiation, atmospheric composition, cloud cover, ocean currents, and land activities (for example, deforestation and urbanization), influence climate and make longer-term

change difficult to predict. Further complexity comes from the circular relationships between elements of the system. For example, as temperatures rise, the atmosphere holds more water vapor. Since water vapor is one of the most effective greenhouse gases, more of it means the atmosphere will continue to get warmer and thus be able to hold more water vapor[3].

Similar relationships exist between the amount of ice coverage and the reflectivity of the Earth's surface and the amount of carbon dioxide in the atmosphere and plant productivity. Scientists have been studying these relationships for years, but still have limited knowledge of their effects on climate change.

Despite the broad range of unknowns and uncertainties, any significant change in the natural cycles could limit the flood control effectiveness of existing and planned water management infrastructure in the region, increase the likelihood of further encroachment of sea water into groundwater supplies, and virtually inundate the southernmost tip of the peninsula and other low-lying areas.

III. The Global Climate Change Quartet and Implications for Water Management

For the purposes of this paper, the discussion of impacts is limited to implications on the effective management of South Florida's water resources. These have been categorized into four critical areas:

- Rising seas
- Temperature and evapotranspiration
- Rainfall, floods and drought
- Tropical storms and hurricanes

Each of the following sections summarizes the state of the science and identifies the possible implications for water management in South Florida. Although separated into four distinct sections here for discussion purposes, the impacts of global climate change are very much interrelated.

Given the extremely wide timeframe of global climate change predictions, a planning period for projections of approximately 50 years – to 2060 – is generally used in this document based on District planning experience. Changes and impacts will certainly extend beyond this period, but with increasingly more unknowns and less certainty. Much of the research cited in this paper covers a wide range of projections, many continuing far past the paper's planning period.

A. Rising Seas

Sea Level Rise – Historic Rates and Projection Ranges

Global sea levels rose about 400 feet as the glaciers of the last ice age retreated approximately 21,000 years ago. Between 3,000 and 2,000 years ago, the rate of sea level rise slowed dramatically and continued at that pace until recently[9]. In the more recent past, the pace of rise of global mean sea levels has been increasing (**Figure 2**). From 1961 to 2003, sea levels rose about 3 inches, an average of 0.071 inches per year[9]. However, the average sea level rise was faster during the last 11 years of that period (1993 to 2003), increasing to a rate of about 0.12 inches per year. Well in line with those figures, the seas around Florida have been rising about 0.1 inches per year[6].

Two primary factors account for most sea level rise:

- Thermal expansion. As the oceans warm, their volume increases – a process called thermal expansion. Since the world's oceans absorb roughly 80 percent of the heating of the climate associated with global warming, thermal expansion is expected to have the greatest influence on sea level rise as the planet warms.
- Melting ice. Sea levels also rise as water is added to the oceans from melting glaciers, ice caps, and ice sheets. Differences in scientific opinion regarding the melting of Greenland and Antarctic ice sheets contribute greatly to the uncertainty in sea level rise projections.

Land-based water input (extraction of groundwater, building of reservoirs, changes in runoff, and seepage into aquifers), along with vertical land movement (subsidence in river delta regions, land movements, and tectonic displacements) also contribute to changes in sea levels.

What is known:

Sea level has been rising in the nineteenth and twentieth centuries; the rate of rise has also been increasing over the last few decades. The majority of sea level rise is due to thermal expansion, but projections vary greatly due to uncertainties regarding the future of land-based ice sheets in Greenland and Antarctica.

What is probable:

Sea level rise may range from 5 to 20 inches in South Florida by 2060.

What is possible:

Rising seas will likely have direct impacts on coastal beaches, infrastructure, and wetlands due to high tides and storm surges. Urbanized areas along the coasts may be more prone to flooding. Coastal water supplies could be impacted by accelerated saltwater intrusion. Natural systems may suffer significant impacts.

Information gaps:

Projections for sea level rise vary greatly. Without more regional-specific and firm projections, it is difficult to accurately predict the potential affect and develop adaptation strategies of sea level rise on District mission elements. A better understanding of the uncertainties in the sea level rise projections and a detailed analysis are needed to identify the impact of projected sea level rise on urban flooding, utility wellfields at risk of saltwater intrusion, and wetlands in the coastal areas.

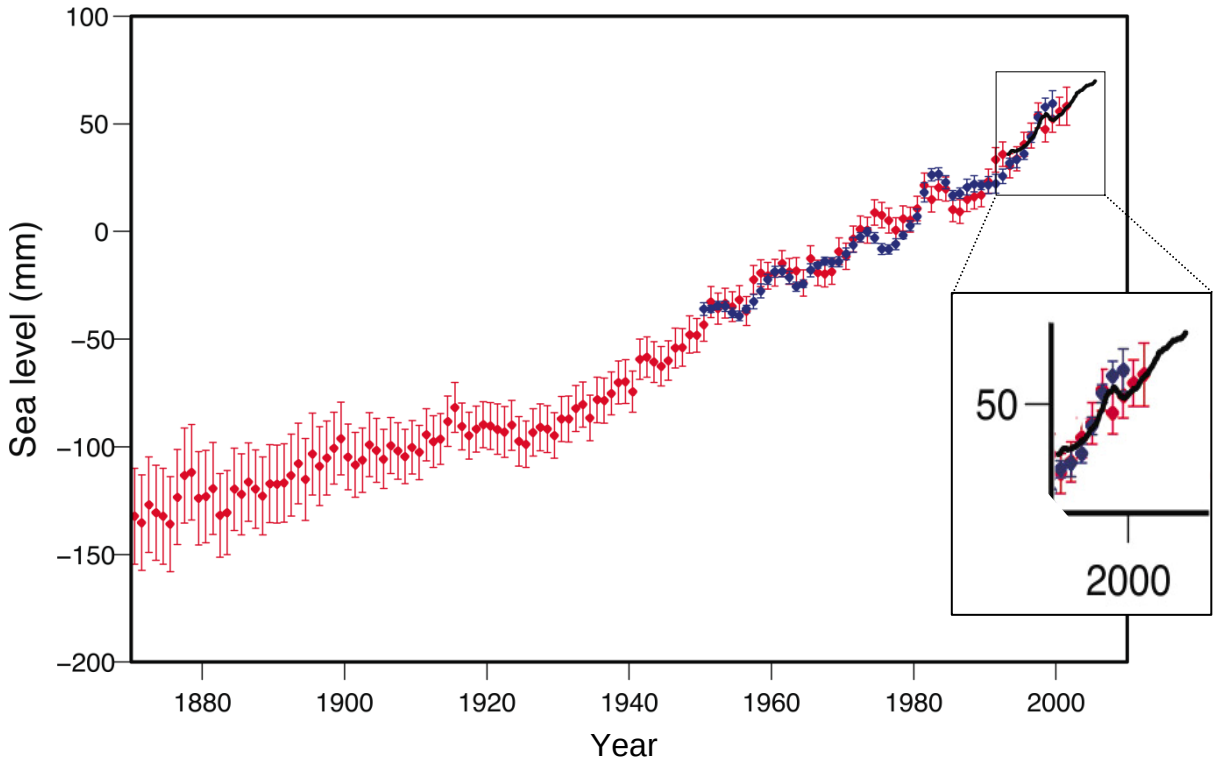

Figure 2. The present rate of both global and local sea level rise is approximately 12 inches per century. This chart reflects the rise of sea levels since the nineteenth century and the accelerated pace over the last few decades. Red points show reconstructed data since 1870, blue points show coastal tide gauge measurements since 1950, and the black curve is base on modern satellite altimetry. Fifty millimeters is approximately two inches (from Figure 5.13, Intergovernmental Panel on Climate Change[9]).

The projections from the Intergovernmental Panel on Climate Change indicate that sea levels will rise from 7 to 23 inches by the year 2100[9]. The Miami-Dade County Climate Change Task Force projects up to 60 inches of rise in that same period due to an expectation of much faster ice sheet melting[13]. Many others have attempted to produce sea level rise trends to predict the sea level rise through 2100. Clearly, there are wide-ranging uncertainties in the projections as shown in **Figure 3**. Based on the information from multiple sources summarized in this figure, **the District may experience sea level rise on the order of 5 to 20 inches within the next 50 years.** This range provides a lower and upper bounds for planning purposes until better and region-specific information is made available from scientific research being conducted by various organizations.

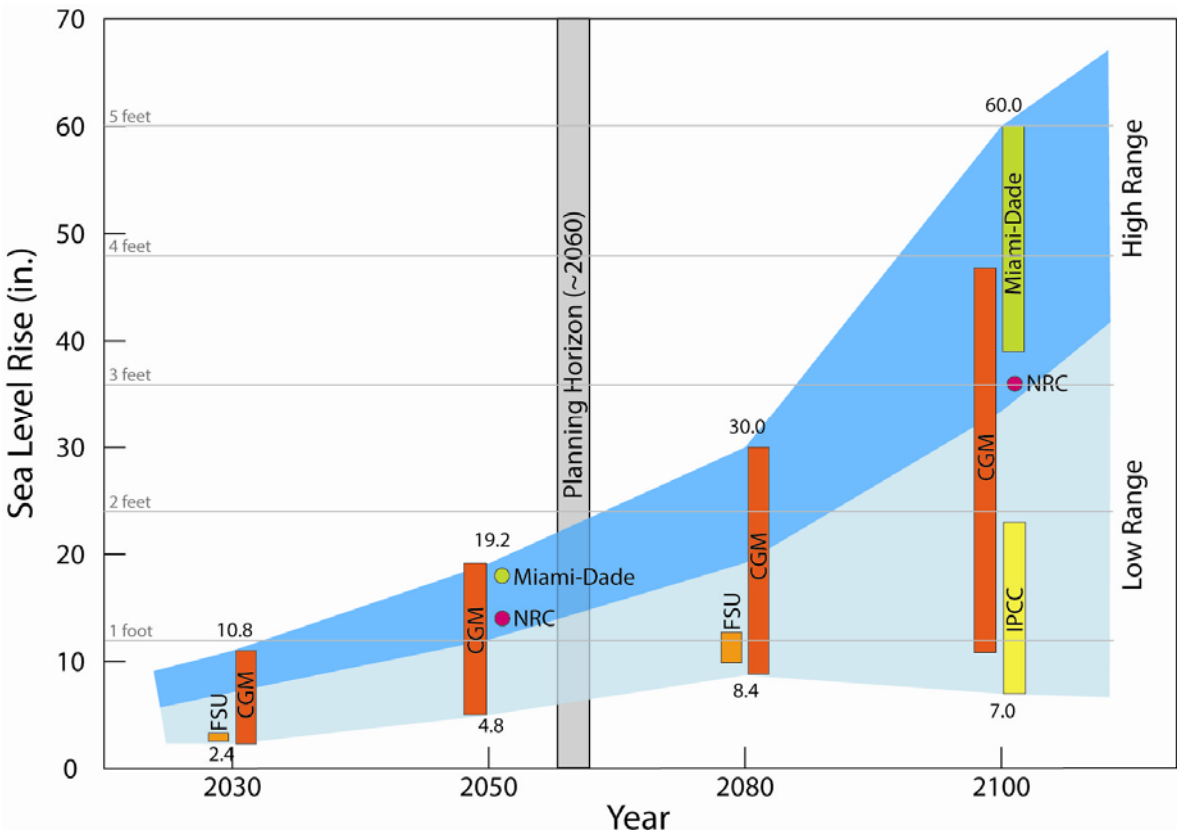

Figure 3. Range of sea level rise projections through 2100 with 1990 as the reference year. Projections were derived from CERP Guidance Memorandum (CGM)[5], National Research Council (NRC)[15], Miami-Dade County Task Force (Miami-Dade)[13], Florida State University (FSU)[7], and the Intergovernmental Panel on Climate Change (IPCC)[9]. The District is focusing on the 50-year planning horizon (2060) range of 5 inches to 20 inches above the 1990 level. These estimates will be revised to incorporate additional information provided for regional application by the U.S. Army Corps of Engineers' Engineering Circular 1165-2-211[19].

Potential Implications

South Florida's coast is extremely vulnerable to sea level rise. While projections of impacts of sea level rise specific for South Florida are not readily available in peer-reviewed scientific literature, District scientists and engineers are able to make the following general predictions of potential impacts based on extensive knowledge and experience with the region's managed and natural systems.

Flood Control / Operations and Maintenance

Projected sea level rise may cause significant saltwater flooding of coastal property and infrastructure, greater vulnerability to storm surges and erosion, and the destruction of vital coastal habitats[6]. Water management infrastructure and regional water control structures located near the coast may be highly vulnerable.

The projected rises in ocean levels may limit the District's ability to protect areas of South Florida from rain-driven flooding. The canal networks in Palm Beach, Broward, and Miami-Dade counties and in the lower West Coast are typically maintained at predetermined water

levels to reduce saltwater intrusion into the wellfields that provide drinking water to the region and to provide flood protection. Water control structures maintain the water levels of the canals. When these structures discharge to the ocean, the water level difference between upstream (land side or headwater) and downstream (ocean side or tailwater) may be as little as 6 inches or less for some structures under design conditions. Projected sea level rise may reduce the flood discharge capacity of coastal structures, thus affecting flood protection in urban areas. The location of existing District coastal structures potentially impacted by sea level rise is shown in **Figure 4**.

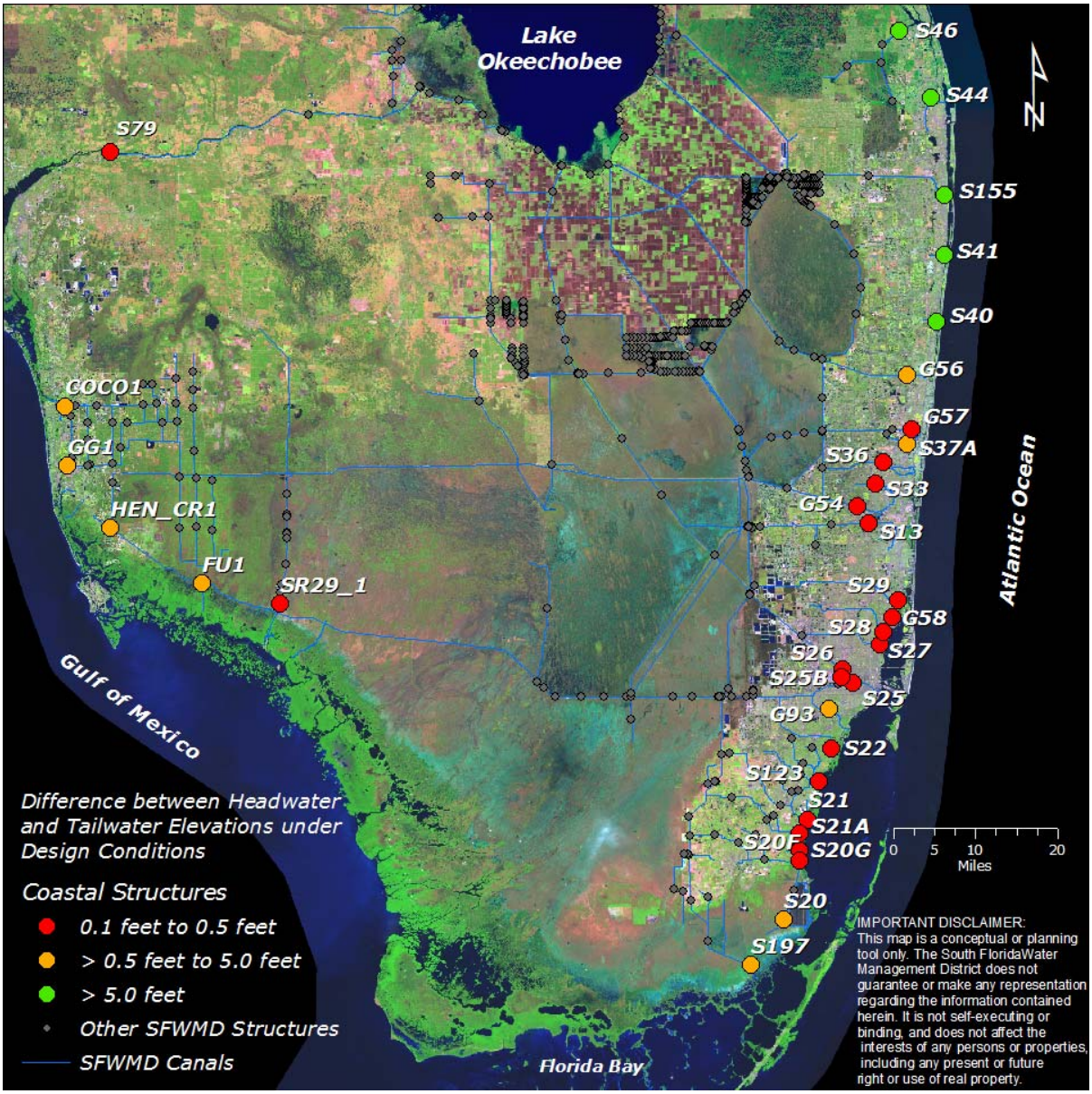

Figure 4. Vulnerability of District coastal structures to potentially rising sea levels. High vulnerability structures are red, medium vulnerability are orange, and low vulnerability are green. (Map produced by the SFWMD.)

Water Supply

Most coastal communities in South Florida depend on wellfields that tap underground freshwater aquifers for their water supply. Saltwater intrusion into these aquifers due to the current sea level and coastal development already threatens the region's water supply. Between the years 1995 and 2000 a compilation of county data[2,8,17] has resulted in an approximate location of the freshwater/saltwater interface on the Lower East Coast with measured chloride levels of 100 mg/L to 250 mg/L and above at the base of the aquifer (**Figure 5**). The highly populated area from Miami to Palm Beach is considered especially vulnerable by the Florida Oceans and Coastal Council[6]. A more detailed analysis is needed to identify the impact of projected sea level rise on selected utility wellfields at risk of saltwater intrusion. Miami-Dade and Broward counties have both initiated studies to help with this determination. Similar studies are needed to understand the vulnerability of the aquifers of the Lower West Coast.

Figure 5. Estimated freshwater/saltwater interface in the lower east coast for the years 1995 through 2000 based on measurements from 100 mg/L chloride to 250 mg/L chloride and above. (Map produced by the SFWMD.)

Environmental Systems

Much of South Florida, including many of the region's most environmentally sensitive areas, is at low elevations. The low elevation of these areas makes them prone to flooding at today's sea levels and sea level rise will cause them to become permanently inundated or prone to flood more frequently (**Figure 6**). The environmental impacts of the flooding depend on how much and how quickly water levels change.

A slow rise of 1 to 2 feet could result in both environmental benefits and harm. This rate of expansion would slowly affect salinity in areas that were once fresh, allowing habitats to transition into new states without massive fish kills or die-offs of vegetation. With sea levels rising gradually, the productive and diverse estuarine zone would probably grow. This landscape would change as some wetlands become open water and some terrestrial habitats convert to mangroves. A gradual change in sea level may allow for shifts in community structure and some species like manatees may thrive. While animals and plants may shift locations, for the most part, the environment will remain healthy. However, there also could be environmental costs because the rise of sea levels and associated conversion of habitats increases the turbidity of waters discharged into coastal zones, which in turn would cause reefs and underwater plant communities to degrade. For some endangered or listed species, such as the Cape Sable seaside sparrow, coastal mice species, and even the Florida panther, critical habitats may be lost. Turtles and sea birds would have to shift to new locations as rising seas drown traditional nesting areas.

In comparison, a very rapid sea level rise would likely have more severe implications for the South Florida environment. As waters rise, the estuarine zone would shrink and coastal wetlands and terrestrial habitats may be lost as they become open water marine habitats. Oxygen levels would drop and concentrations of hydrogen sulfide (a toxin) would likely increase as large amounts of newly submerged organic matter decompose. Large sediment plumes would likely discharge into coastal zones and this increased turbidity may cause most reefs and submerged aquatic vegetation communities to die. If these habitats disappear, then so would the keystone and endangered species they support, such as sea birds, turtles, Cape Sable seaside sparrow, coastal mice species, alligators, and Florida panthers. If freshwater flows are not restored, most plants and animals would not have time to adjust to the saltwater flooding and there may be catastrophic food web changes across thousands of acres in the Everglades, river mouths, coastal lagoons, and bays.

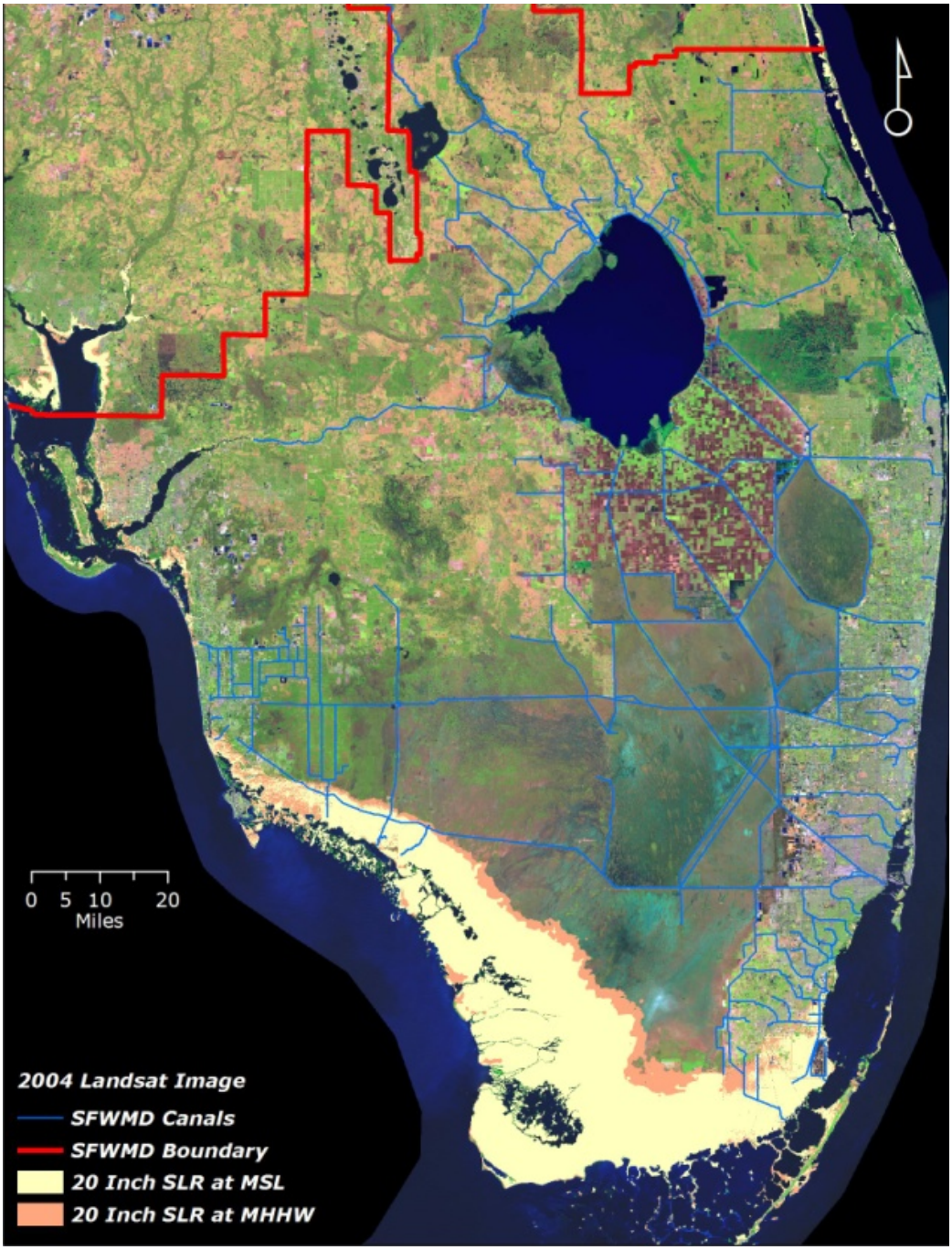

Figure 6. Possible permanent inundation and/or increased flooding of land within the District with a sea level rise (SLR) of 20 inches, the upper bound of projections for this paper, at mean sea level (MSL) and mean higher high water (MHHW). Tidal station data is averaged across the District and related to NAVD88. (Map produced by the SFWMD.)

B. Temperature and Evapotranspiration

Temperature Projections

Global temperatures are expected to increase by about 0.4°F per decade according to the Intergovernmental Panel on Climate Change[9]. Based on those estimates, temperatures will be about 2°F warmer by 2060 and almost 4°F warmer by 2100. Improvements in climate science allow limited projections of temperature changes for specific regions. A 2001 report by the Union of Concerned Scientists expects winter lows to increase 3°F to 10°F and summer highs to rise by 3°F to 7°F by the end of the century along the Gulf Coast. The July heat index, which represents the temperature actually felt, could rise by 10°F to 25°F[18,21]. Considerable uncertainties exist in the regional projections of temperature resulting from climate change.

Water demands are expected to increase significantly as temperatures rise (**Table 1**). Agricultural and domestic water use will likely rise as temperatures go up. The potential for wildfires, especially during the dry season, will also increase.

What is known:

The majority of climate models predict an increase in temperature during the next 50 years. In addition, evaporation from open water and soil and transpiration from plants will likely increase.

What is probable:

Climatologists predict air temperatures will increase, with projections of summer temperatures being up to 3°F to 7°F warmer by 2100[18,21]. Evaporation and transpiration are expected to increase. Impacts include increased/competing water demands; more rapid loss from surface water supplies and disruption in the ecosystem food chain.

What is possible:

Temperatures could significantly increase over time. Impacts include much higher water demand as less water is available due to evaporation from surface water supplies. Increased temperatures could also impact freshwater and marine ecosystems.

Information gaps:

Some gaps exist in the information available on temperature and evapotranspiration projections, especially changes in timing, amounts, and spatial distribution. This limits the ability to predict changes in the water cycle and its impacts to South Florida's natural vegetation, water supply, urban areas, and ecosystems.

Evapotranspiration Projections

Increases in air temperature, solar radiation, and water vapor deficit due to climate change are expected to increase evapotranspiration, which is the combined loss of water through evaporation from soil and surface water and plant transpiration. Models used by Calanca et al. predict a 20 percent increase in evapotranspiration if summer temperatures increase from 4°F to 7°F[4]. Increased evapotranspiration may, in turn, increase water demand for irrigation and natural wetlands areas.

In South Florida, evapotranspiration is expected to increase due to climate change, though there is great uncertainty in the projections. Maps produced by the Intergovernmental Panel on Climate Change suggest annual evapotranspiration rates in South Florida may increase by up to an estimated 15 percent for the period 2080 to 2099 compared to the historical measurements from 1980 to 1999[1].

Table 1. Potential impacts due to increased temperature.

	Temperature Variables – Potential Duration and Intensity	
	<u>Warmer</u> Compared to Normal	**<u>Much Warmer</u> Compared to Normal**
Flood Control	Not much impact	Not much impact
Water Supply	Increased water demand, including high irrigation water demand due to higher evapotranspiration	Increased water demand, including much higher irrigation water demand due to higher evapotranspiration
Natural Systems	Lower dissolved oxygen and loss of fish and wildlife; increased coral bleaching	Extreme reduction in dissolved oxygen and a significant loss of fish and wildlife; widespread coral mortality

Potential Implications

South Florida's ecosystems may go through a variety of changes if the region gets 3°F to 7°F warmer. In general, higher temperatures may make it harder for ecosystems to resist and recover from the various threats they face, such as hurricanes, droughts, fires, invasive species, and diseases. Warmer temperatures will likely cause increases in water needs, bacterial processes, nutrient cycling, and peat degradation. If these potential changes occur, there will be less food for fish and wildlife, more disease, less oxygen, and more carbon dioxide. The lower oxygen levels will increase the number and severity of fish kills.

Regional surface water storage systems (lakes, rivers, canals, reservoirs, water conservation areas) will most likely experience more rapid water loss when compared to current levels, ultimately impacting availability of water supplies. In addition, accelerated evaporation losses from Stormwater Treatment Areas could impact their phosphorus removal performance, increasing the need for supplemental water for these facilities.

While warmer temperatures will cause increased evapotranspiration and make droughts more severe, extreme high temperatures can have more abrupt affects on human health, agriculture, water availability and quality, and the health of existing ecological systems over a much shorter time span. Increases in the extreme high temperatures in the future may require changes in both societal and agricultural practices.

C. Rainfall, Floods and Droughts

Rainfall Projections

There is a significant gap in the available literature on the impact of climate change on rainfall and the uncertainty associated with it. Some climate models predict South Florida will get wetter, while others predict a drier region. An Intergovernmental Panel on Climate Change report predicts up to 20 percent less rainfall for South Florida for the period between 2080 and 2099 in comparison to historical measurements from 1980 to 1999[9].

The intensity of rainfall events is also changing. The District's data indicate that there has been an increase in heavy downpours in many parts of the region, while the percentage of the region experiencing moderate to severe drought increased over the past three decades. In the future, more frequent intense rainfall events are projected to occur, with longer dry periods in between[6]. While periodic heavy downpours may increase overall precipitation totals, much of the water may be runoff that is eventually lost to tide.

Changes in rainfall patterns associated with global climate change will likely influence the occurrence and severity of floods and droughts throughout much of the world.

What is known:

Rainfall amounts and intensities will likely change, but projections vary greatly. Some scientists predict rainfall increases while others forecast decreases compared to historical observed normal amounts.

What is probable:

Rainfall amounts in South Florida are projected to either increase or decrease by as much as 20 percent. This could result in longer stretches of wet and dry periods with droughts more likely to occur.

What is possible:

Changes in rainfall (intensity and frequency) can cause significant damage to managed and natural environments. Major impacts to the regional water supplies could occur.

Information gaps:

Significant gaps exist in the information needed to project rainfall accurately, especially changes in timing, amounts, and distribution. Due to the amount of uncertainty of rainfall projections, the need for changes in the flood control system is currently unknown.

Climate models predict longer stretches of dry days between more intense rain events in the subtropics. The combination of these conditions increases the likelihood of more severe floods in the region. For droughts, multiple models predict they will be more likely to occur. One study suggests that within 100 years, some 30 percent of the world's land area may be under extreme drought[20].

Potential Implications – Rainfall

Whenever there is a change in rainfall, there is an expected change in storm-generated runoff. Since runoff is normally non-linear, the impacts from changing rainfall patterns can be dramatic. While much uncertainty remains in projecting future rainfall in the region, the following scenarios are possible:

1. Wetter than normal: Under this scenario, the rainfall volume is higher than normal during the wet or dry season. The runoff from these scenarios could generate flood conditions. The duration, depth, and extent of flooding would vary from one event to another. Wetter than normal conditions also could involve more rain events, more successive rain events without a break, increased duration of rain events, and more intense (higher rainfall rate) rain events.

When combined with higher temperatures, the ecosystem impacts of wetter than normal conditions would be mixed. More freshwater runoff could further degrade the Caloosahatchee and St. Lucie systems, while creating improved estuarine habitats across the southern end of the Florida peninsula (**Table 2**).

2. Drier than normal: In this scenario, the rainfall volume is lower than what normally occurs during the wet or dry season. These conditions could result in drought; the intensity and duration of which would depend upon the amount of rainfall, the intensity and duration of rain events, and the number of dry days between rain events.

   Drier conditions with higher temperatures will likely harm many of the region's natural areas. Less rain will cause vast areas that are now shallow or marginally aquatic to dry out, causing fish, amphibian, reptile, bird, and mammal populations to significantly decline. Coastal freshwater habitats will see an intrusion of salt water, even if sea level does not rise. Large areas of freshwater wetland communities may dry up or change to short-lived inland lakes. Wildfire occurrence and extent would depend on the number of days between rain events and the soil moisture during the dry season. Increased fires and oxidation of soils could reduce ridge and slough habitats, tree island elevations, fish habitat, wading bird nesting sites, and peat accumulation. As a result, this scenario could significantly alter the community structure and biodiversity of the freshwater Everglades.

As with many aspects of the regional effects of climate change, there is a gap in the information regarding the impacts on the seasonality of rainfall. If the expected beginning or ending of the wet and dry seasons were to change, water supply and flood control assumptions related to water management would require revisions.

The possibility of wetter dry seasons also may have significant impacts on coastal ecosystems. During the winter, evapotranspiration is much lower than that during the summer. Extra rain could create a significant surplus of water that, without adequate storage, must discharge through the coastal estuaries to tidewater during a time of the year when excess water is especially undesirable for the natural estuarine ecosystems.

Table 2. Potential impacts due to changing rainfall conditions.

	Rainfall Variables – Potential Volume, Duration, Intensity, and Frequency	
	Higher than Normal High	**Lower than Normal Low**
Flood Control	Adequate storage concerns; required discharges to estuaries; possible crop damages; reduced flood protection	Not much impact
Water Supply	More irrigation water available (if captured and stored); higher surface water and groundwater levels	Higher demands/less available stored waters; lower groundwater levels with increased threat of saltwater intrusion into coastal wells; possible crop damage
Natural Systems	Terrestrial systems will degrade; some aquatic systems will improve; other aquatic systems will degrade due to loading of pollutants	Fire-adapted systems will improve; aquatic systems will degrade due to a loss of habitat for fish and wildlife

Potential Implications – Floods and Droughts

In developed parts of Florida, heavy rainfall poses a threat to homes, businesses, and water control structures. If flooding were to reach new extremes, the water management system already in place may not be adequate to provide the necessary levels of flood protection. Flooding could also further degrade water quality due to increased runoff, the loss of positive pressure in sewer systems, damage to septic systems, and pollutants washed into water bodies. Extreme flooding would significantly affect a water management system initially designed to protect 2 million people but that now serves a population of more than 7.5 million.

At the other end of the spectrum, the potential of increased frequency and duration of droughts poses a number of problems for water management. Water demands will likely increase if there is not enough rainfall to satisfy water supply and irrigation needs. Without adequate water to maintain vegetation during droughts, the performance of Stormwater Treatment Areas may be impacted when rains return.

The environmental impact of changes to floods and droughts depends on the relationship between the climate extremes.

- If flooding and drought frequency increase together, the Everglades may return to a more natural slough-ridge-island landscape because the floods would redistribute soils and sediments onto ridges and the droughts would allow recruitment of trees on islands.
- More droughts, without an increase in flooding conditions, pose a threat to the entire South Florida system. They would likely cause large shifts in community structure due to saltwater intrusion into freshwater habitats, drying of inland wetlands, disappearance of ridge and slough microtopography, and an increase in frequency of fires (both terrestrial and wetland). Without the ability to maintain minimum flows and water levels in South Florida, agriculture and public water supply wellfields may not be able to function as designed. In addition, wellfields may be contaminated by saltwater intrusion and higher salt levels in coastal waters may limit the usefulness of currently installed desalinization plants.
- More flooding may be good for the Everglades ecosystem because it would stimulate ridge-slough development and restore historic salinity regimes in Biscayne Bay and Florida Bay. However, increasing flooding alone may also create more frequent water level reversals during critical wading bird foraging periods, thus causing further declines in nesting success for wood storks, roseate spoonbills, white ibis, and others.

D. Tropical Storms and Hurricanes

What is known:

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

What is probable:

Hurricane and tropical storm frequency will continue to change in comparison to the historical record.

What is possible:

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.

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.

Tropical Storm Activity

According to the National Center for Atmospheric Research, Florida tops all other states with the costliest damage due to extreme weather events through 2007. When ranked by event type, Florida was first in damage from hurricanes, fourth in flooding, and ninth in tornadoes[14]. Tropical storms and hurricanes also contribute significant amounts of water to the state, which make them an important part of water management planning and assumptions.

The frequency of tropical storms and hurricanes changes as part of natural cycles that occur over decades. The region is currently in a multiyear period of higher than average tropical storm activity that is largely due to a combination of a shift of the Atlantic Multidecadal Oscillation and, to a lesser extent, global climate change[6,16].

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. Wind shear increase is expected to reduce the number of storms in the Atlantic Ocean[6].

Potential Implications

If a decrease in the number of storms does occur, there may be significant changes to the distribution of rainfall, which will affect the water supply and natural ecology of South Florida. Less rainfall may mean the region is under drought conditions more often.

If tropical storms and hurricanes become more intense, the potential damage to levees, canals, and other water control structures may also increase – resulting in an increased likelihood of flooding on a local and regional scale. Water supply and water quality may also be adversely affected by this extreme.

Ecologically, if tropical storms and hurricanes increase, the damage to the Everglades and coastal mangroves may also increase. Large regions of coastal pines could be destroyed. More wind may increase the extent that seeds and spores of plants, including invasive species, are spread across South Florida. When combined with rising sea levels, more tropical storms may cause vast areas of mangroves to die-off, creating a cascading impact on soil and nutrient processes. This, in turn, may lead to coastal erosion and large redistributions of sediments resulting in high turbidity. While hurricane-related damage to developed areas may increase, the ecosystems of South Florida will likely remain resilient, unless they are overwhelmed by other aspects of climate change.

IV. Conclusion

The District has used the historic record as the primary tool for predicting future water trends and making water management decisions. However, in view of the potential of future climate change, history alone is not a sufficient predictor of the future climate characteristics.

Some effects of global climate change, such as sea level rise, have already been documented. Other aspects could occur within the coming decades or not until well into the future. While specific data for the South Florida environment is limited, the data available and summarized in this paper suggests the following potential scenarios:

- Relative to 1990 level, a rise of 5 inches to 20 inches in sea levels by 2060. This range provides lower and upper bounds for planning purposes until better and more specific regional information on future sea level rise is available.
- An increase in air temperatures of up to 7°F and evapotranspiration up to 15 percent by 2100.
- A change in rainfall of up to ±20 percent.
- A change in the strength and frequency of tropical storms and hurricanes. Exact extent of the changes due to global warming is not clear at this time.

Despite all the research and continued scientific debate, the only certainty is the uncertainty of the wide-ranging projections. That makes it difficult to produce reasonable assumptions for planning purposes. **Over the next two years, more work is needed to understand the current trends and uncertainties in climate projections, and to develop tools for understanding the exact vulnerabilities of the water management system and regional water resources. During this period and beyond, appropriate adaptation strategies will be developed and implemented.**

The South Florida Water Management District will be continuously challenged to appropriately confront the impacts of global climate change and fulfill its mission to “manage and protect water resources of the region by balancing and improving water quality, flood control, natural systems and water supply.”

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County Health Rankings

Mobilizing Action Toward Community Health

2010

Florida

Robert Wood Johnson Foundation

UNIVERSITY OF WISCONSIN

Population Health Institute

Translating Research into Policy and Practice

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Introduction

Where we live matters to our health. The health of a community depends on many different factors, including quality of health care, individual behavior, education and jobs, and the environment. We can improve a community's health through programs and policies. For example, people who live in communities with ample park and recreation space are more likely to exercise, which reduces heart disease risk. People who live in communities with smoke-free laws are less likely to smoke or to be exposed to second-hand smoke, which reduces lung cancer risk.

The problem is that there are big differences in health across communities, with some places being much healthier than others. And up to now, it has been hard to get a standard way to measure how healthy a county is and see where they can improve.

The Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute are pleased to present the 2010 *County Health Rankings*, a collection of 50 reports that reflect the overall health of counties in every state across the country. For the first time, counties can get a snapshot of how healthy their residents are by comparing their overall health and the factors that influence their health, with other counties in their state. This will allow them to see county-to-county where they are doing well and where they need to improve. Everyone has a stake in community health. We all need to work together to find solutions. The *County Health Rankings* serve as both a call to action and a needed tool in this effort.

All of the *County Health Rankings* are based upon this model of population health improvement:

In this model, health outcomes are measures that describe the current health status of a county. These health outcomes are influenced by a set of health factors. These health factors and their outcomes may also be affected by community-based programs and policies designed to alter their distribution in the community. Counties can improve health outcomes by addressing all health factors with effective, evidence-based programs and policies.

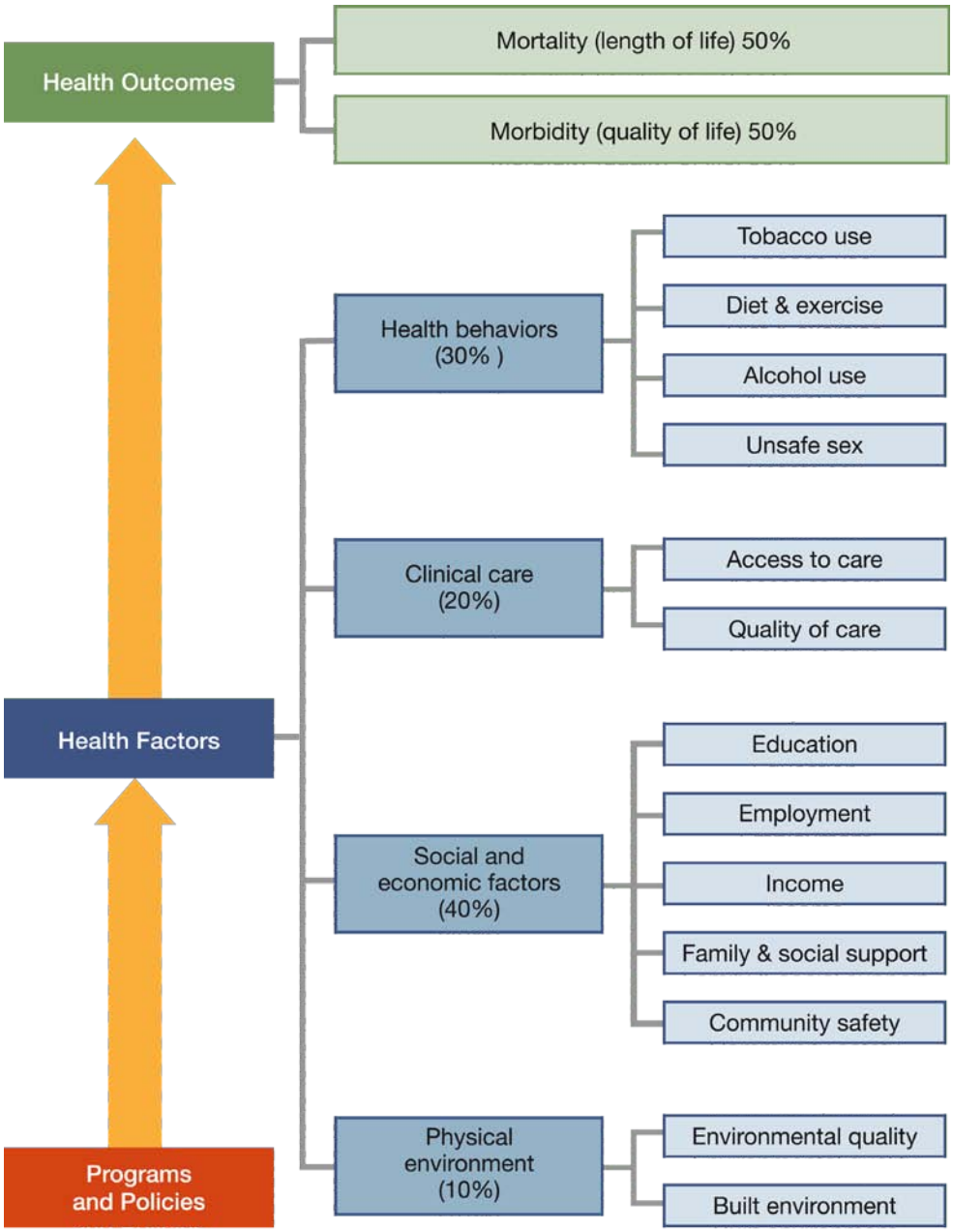
Institute of Medicine, 2002

To compile the *Rankings*, we built on our prior work in Wisconsin, worked closely with staff from the Centers for Disease Control and Prevention and Dartmouth College, and obtained input from a team of expert advisors. Together we selected a number of population health measures based on scientific relevance, importance, and availability of data at the county level. For a more detailed explanation of the choice of measures, see www.countyhealthrankings.org.

The Rankings

This report ranks Florida counties according to their summary measures of **health outcomes** and **health factors**, as well as the components used to create each summary measure. The figure below depicts the structure of the *Rankings* model. Counties receive a rank for each population health component; those having high ranks (e.g., 1 or 2) are estimated to be the "healthiest."

Our summary **health outcomes** rankings are based on an equal weighting of mortality and morbidity measures. The summary health **factors** rankings are based on weighted scores of four types of factors: behavioral, clinical, social and economic, and environmental. The weights for the factors (shown in parentheses in the figure) are based upon a review of the literature and expert input, but represent just one way of combining these factors.

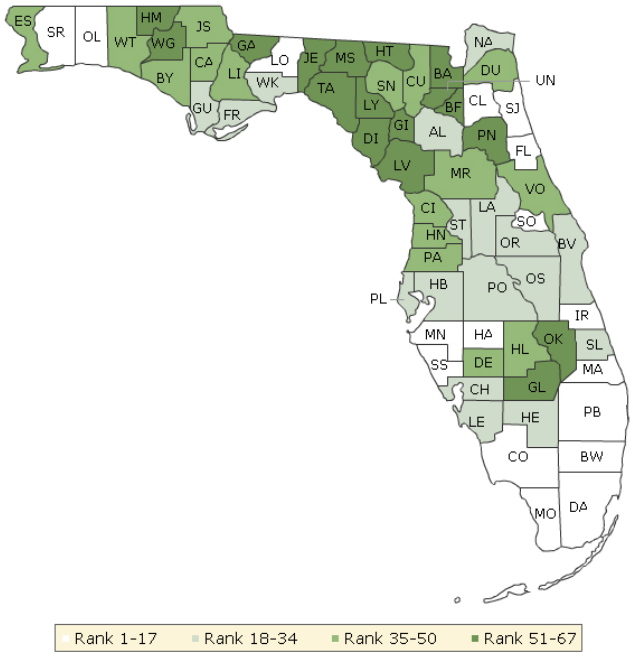


County Health Rankings model ©2010 UWPHI

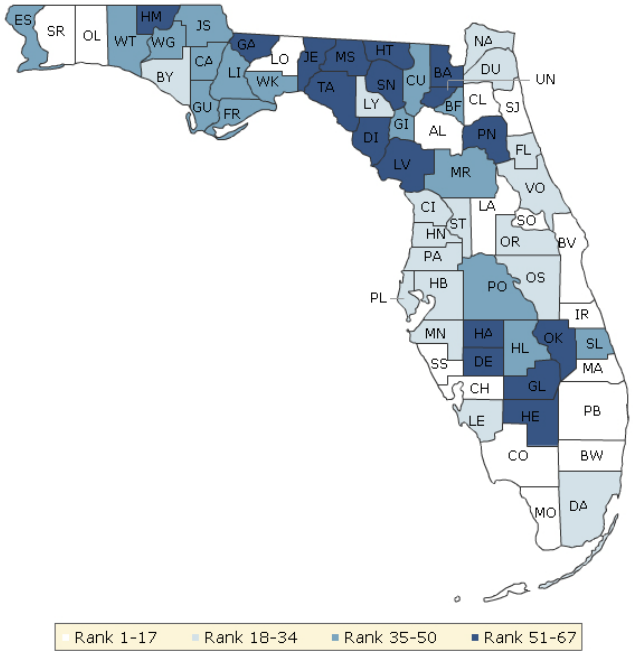
The maps on this page display Florida's counties divided into groups by health rank. The lighter colors indicate better performance in the respective summary rankings. The green map shows the distribution of summary health outcomes. The blue displays the distribution of the summary rank for health factors.

Maps help locate the healthiest and least healthy counties in the state. The health factors map appears similar to the health outcomes map, showing how health factors and health outcomes are closely related.

HEALTH OUTCOMES



HEALTH FACTORS



Summary Health Outcomes & Health Factors Rankings

Counties receive two summary ranks:

- Health Outcomes
- Health Factors

Each of these ranks represents a weighted summary of a number of measures.

Health outcomes represent how healthy a county is while health factors are what influences the health of the county.

Rank	Health Outcomes	Rank	Health Factors
1	Collier	1	St. Johns
2	St. Johns	2	Broward
3	Seminole	3	Okaloosa
4	Sarasota	4	Martin
5	Martin	5	Leon
6	Indian River	6	Seminole
7	Clay	7	Sarasota
8	Leon	8	Alachua
9	Okaloosa	9	Palm Beach
10	Santa Rosa	10	Santa Rosa
11	Miami-Dade	11	Collier
12	Palm Beach	12	Indian River
13	Flagler	13	Clay
14	Broward	14	Brevard
15	Hardee	15	Monroe
16	Monroe	16	Lake
17	Manatee	17	Charlotte
18	Alachua	18	Flagler
19	Charlotte	19	Orange
20	Orange	20	Sumter
21	Lee	21	Manatee
22	Wakulla	22	Miami-Dade
23	Brevard	23	Nassau
24	Sumter	24	Pinellas
25	Lake	25	Pasco
26	Osceola	26	Bay
27	Hillsborough	27	Hernando
28	Gulf	28	Osceola
29	Pinellas	29	Citrus
30	St. Lucie	30	Lee
31	Franklin	31	Hillsborough
32	Hendry	32	Lafayette
33	Nassau	33	Volusia
34	Polk	34	Duval
35	Volusia	35	Highlands
36	Bay	36	Marion
37	Pasco	37	Jackson
38	DeSoto	38	Wakulla
39	Hernando	39	Walton
40	Citrus	40	Gilchrist

Rank	Health Outcomes	Rank	Health Factors
41	Highlands	41	Franklin
42	Liberty	42	Washington
43	Walton	43	Escambia
44	Duval	44	Columbia
45	Marion	45	Gulf
46	Jackson	46	Polk
47	Escambia	47	Bradford
48	Suwannee	48	St. Lucie
49	Columbia	49	Calhoun
50	Calhoun	50	Liberty
51	Jefferson	51	Dixie
52	Taylor	52	Union
53	Bradford	53	Jefferson
54	Lafayette	54	Holmes
55	Gilchrist	55	Levy
56	Okeechobee	56	Glades
57	Glades	57	Baker
58	Hamilton	58	Suwannee
59	Dixie	59	Hardee
60	Baker	60	DeSoto
61	Holmes	61	Putnam
62	Gadsden	62	Madison
63	Madison	63	Taylor
64	Washington	64	Gadsden
65	Levy	65	Hamilton
66	Putnam	66	Okeechobee
67	Union	67	Hendry

Health Outcomes Rankings

The summary health outcomes ranking is based on measures of mortality and morbidity. Each county's ranks for mortality and morbidity are displayed here. The mortality rank, representing length of life, is based on a measure of premature death: the years of potential life lost prior to age 75.

The morbidity rank is based on measures that represent health-related quality of life and birth outcomes. We combine four morbidity measures: self-reported fair or poor health, poor physical health days, poor mental health days, and the percent of births with low birthweight.

Rank	Mortality	Morbidity
1	Seminole	Martin
2	Collier	Sarasota
3	St. Johns	Collier
4	Leon	St. Johns
5	Miami-Dade	Clay
6	Okaloosa	Indian River
7	Flagler	Monroe
8	Sarasota	Seminole
9	Broward	Hardee
10	Indian River	Hendry
11	Orange	Franklin
12	Santa Rosa	Santa Rosa
13	Clay	Palm Beach
14	Osceola	Okaloosa
15	Palm Beach	Lee
16	Alachua	Manatee
17	Wakulla	Charlotte
18	Martin	Sumter
19	Manatee	Broward
20	Hillsborough	Flagler
21	Lake	Miami-Dade
22	Charlotte	Nassau
23	Brevard	Leon
24	Hardee	Alachua
25	Gulf	DeSoto
26	Pinellas	Brevard
27	Monroe	Polk
28	Lee	Pinellas
29	St. Lucie	Orange
30	Liberty	St. Lucie
31	Sumter	Bay
32	Volusia	Gulf
33	Gilchrist	Lake
34	Hernando	Jefferson
35	Jackson	Wakulla
36	Pasco	Volusia
37	Polk	Hillsborough
38	Bay	Suwannee
39	Nassau	Pasco
40	Hamilton	Walton

Rank	Mortality	Morbidity
41	Escambia	Okeechobee
42	Calhoun	Citrus
43	Marion	Hernando
44	Highlands	Highlands
45	Citrus	Columbia
46	Lafayette	Osceola
47	Duval	Duval
48	DeSoto	Taylor
49	Franklin	Dixie
50	Walton	Glades
51	Hendry	Holmes
52	Columbia	Bradford
53	Taylor	Marion
54	Bradford	Escambia
55	Suwannee	Calhoun
56	Baker	Jackson
57	Jefferson	Lafayette
58	Gadsden	Liberty
59	Okeechobee	Union
60	Glades	Baker
61	Washington	Putnam
62	Dixie	Madison
63	Madison	Levy
64	Holmes	Gadsden
65	Levy	Gilchrist
66	Putnam	Hamilton
67	Union	Washington

Health Factors Rankings

The summary health factors ranking is based on four factors: health behaviors, clinical care, social and economic, and physical environment factors. In turn, each of these factors is based on several measures. Health behaviors include measures of smoking, diet and exercise, alcohol use, and risky sex behavior. Clinical care includes measures of access to care and quality of care. Social and economic factors include measures of education, employment, income, family and social support, and community safety. The physical environment includes measures of environmental quality and the built environment.

Rank	Health Behaviors	Rank	Clinical Care	Rank	Social & Economic Factors	Rank	Physical Environment
1	Miami-Dade	1	Alachua	1	St. Johns	1	Palm Beach
2	Broward	2	Leon	2	Okaloosa	2	Broward
3	Palm Beach	3	Escambia	3	Santa Rosa	3	Miami-Dade
4	Sarasota	4	Martin	4	Clay	4	Martin
5	Indian River	5	Sarasota	5	Leon	5	Washington
6	Collier	6	Duval	6	Seminole	6	Gilchrist
7	Martin	7	St. Johns	7	Monroe	6	Lafayette
8	St. Johns	8	Clay	8	Walton	6	Suwannee
9	Orange	9	Okaloosa	9	Wakulla	9	Union
10	Seminole	10	Volusia	10	Sarasota	10	Hardee
11	Manatee	11	Seminole	11	Alachua	11	DeSoto
12	Flagler	12	Brevard	12	Lafayette	12	Charlotte
13	Sumter	13	Pinellas	13	Brevard	13	St. Lucie
14	Lake	14	Indian River	14	Lake	14	St. Johns
15	Pasco	15	Santa Rosa	15	Bradford	15	Flagler
16	Charlotte	16	Palm Beach	16	Martin	16	Clay
17	Okaloosa	17	Hillsborough	17	Broward	17	Collier
18	Alachua	18	Hernando	18	Collier	18	Okeechobee
19	Monroe	19	Broward	19	Nassau	19	Pinellas
20	Leon	20	Orange	20	Bay	20	Indian River
21	Highlands	21	Dixie	21	Union	21	Citrus
22	Osceola	22	Jackson	22	Sumter	22	Dixie
23	Pinellas	23	Marion	23	Gilchrist	23	Marion
24	Nassau	24	Flagler	24	Charlotte	24	Gulf
25	Citrus	25	Lee	25	Liberty	25	Levy
26	Brevard	26	Pasco	26	Franklin	26	Wakulla
27	Santa Rosa	27	Manatee	27	Hillsborough	27	Monroe
28	Hernando	28	Gadsden	28	Orange	28	Sumter
29	Lafayette	29	Charlotte	29	Jackson	29	Osceola
30	Marion	30	Union	30	Osceola	30	Brevard
31	Hillsborough	31	Lake	31	Pasco	31	Nassau
32	Bay	32	Nassau	32	Palm Beach	32	Glades
33	Gulf	33	Jefferson	33	Baker	33	Highlands
34	Lee	34	Bradford	34	Flagler	34	Manatee
35	Duval	35	Bay	35	Holmes	35	Putnam
36	Volusia	36	Sumter	36	Manatee	36	Volusia
37	Jefferson	37	Collier	37	Lee	37	Lee
38	Franklin	38	Baker	38	Columbia	38	Bay
39	St. Lucie	39	St. Lucie	39	Citrus	39	Liberty
40	DeSoto	40	Citrus	40	Pinellas	40	Hernando

Rank	Health Behaviors	Rank	Clinical Care	Rank	Social & Economic Factors	Rank	Physical Environment
41	Washington	41	Columbia	41	Indian River	41	Leon
42	Levy	42	Polk	42	Calhoun	42	Lake
43	Jackson	43	Highlands	43	Hernando	43	Polk
44	Columbia	44	Wakulla	44	Glades	44	Seminole
45	Polk	45	Calhoun	45	Polk	45	Okaloosa
46	Dixie	46	Gulf	46	Escambia	46	Duval
47	Walton	47	Levy	47	Volusia	47	Pasco
48	Gilchrist	48	Osceola	48	Washington	48	Santa Rosa
49	Calhoun	49	Washington	49	Duval	49	Alachua
50	Clay	50	Taylor	50	Highlands	50	Bradford
51	Escambia	51	Franklin	51	Marion	51	Columbia
52	Holmes	52	Miami-Dade	52	Gulf	52	Franklin
53	Hendry	53	Madison	53	Suwannee	53	Madison
54	Glades	54	Gilchrist	54	Jefferson	54	Jackson
55	Liberty	55	Monroe	55	Miami-Dade	55	Orange
56	Hardee	56	Liberty	56	St. Lucie	56	Sarasota
57	Putnam	57	Suwannee	57	Hardee	57	Taylor
58	Hamilton	58	Putnam	58	Dixie	58	Walton
59	Wakulla	59	Hardee	59	Levy	59	Hendry
60	Gadsden	60	Holmes	60	Taylor	60	Calhoun
61	Okeechobee	61	Walton	61	Okeechobee	61	Holmes
62	Madison	62	Hendry	62	DeSoto	62	Hamilton
63	Bradford	63	Hamilton	63	Putnam	63	Hillsborough
64	Suwannee	64	Lafayette	64	Madison	64	Escambia
65	Baker	65	DeSoto	65	Hamilton	65	Gadsden
66	Taylor	66	Glades	66	Gadsden	66	Jefferson
67	Union	67	Okeechobee	67	Hendry	67	Baker

2010 County Health Rankings: Measures, Data Sources, and Years of Data

	Measure	Data Source	Years of Data
HEALTH OUTCOMES			
Mortality	Premature death	National Center for Health Statistics	2004-2006
Morbidity	Poor or fair health	Behavioral Risk Factor Surveillance System	2002-2008
	Poor physical health days	Behavioral Risk Factor Surveillance System	2002-2008
	Poor mental health days	Behavioral Risk Factor Surveillance System	2002-2008
	Low birthweight	National Center for Health Statistics	2000-2006
HEALTH FACTORS			
HEALTH BEHAVIORS			
Tobacco	Adult smoking	Behavioral Risk Factor Surveillance System	2002-2008
Diet and Exercise	Adult obesity	National Center for Chronic Disease Prevention and Health Promotion	2006-2008
Alcohol Use	Binge drinking	Behavioral Risk Factor Surveillance System	2002-2008
	Motor vehicle crash death rate	National Center for Health Statistics	2000-2006
High Risk Sexual Behavior	Chlamydia rate	National Center for Health Statistics	2006
	Teen birth rate	National Center for Health Statistics	2000-2006
CLINICAL CARE			
Access to Care	Uninsured adults	Small Area Health Insurance Estimates, U.S. Census	2005
	Primary care provider rate	Health Resources & Services Administration	2006
Quality of Care	Preventable hospital stays	Medicare/Dartmouth Institute	2005-2006
	Diabetic screening	Medicare/Dartmouth Institute	2003-2006
	Hospice use	Medicare/Dartmouth Institute	2001-2005
SOCIOECONOMIC FACTORS			
Education	High school graduation	National Center for Education Statistics[1]	2005-2006
	College degrees	U.S. Census/American Community Survey	2000/2005-2007
Employment	Unemployment	Bureau of Labor Statistics	2008
Income	Children in poverty	Small Area Income and Poverty Estimates, U.S. Census	2007
	Income inequality	U.S. Census/American Community Survey[2]	2000/2005-2007
Family and Social Support	Inadequate social support	Behavioral Risk Factor Surveillance System	2005-2008
	Single-parent households	U.S. Census/American Community Survey	2000/2005-2007
Community Safety	Violent crime[3]	Uniform Crime Reporting, Federal Bureau of Investigation	2005-2007
PHYSICAL ENVIRONMENT			
Air Quality[4]	Air pollution-particulate matter days	U.S. Environmental Protection Agency / Centers for Disease Control and Prevention	2005
	Air pollution-ozone days	U.S. Environmental Protection Agency / Centers for Disease Control and Prevention	2005
Built Environment	Access to healthy foods	Census Zip Code Business Patterns	2006
	Liquor store density	Census County Business Patterns	2006

[1] State data sources for KY, NH, NC, PA, SC, and UT (2007-2008).

[2] Income inequality estimates for 2000 were calculated by Mark L. Burkey, North Carolina Agricultural & Technical State University, www.ncat.edu/~burkeym/Gini.htm.

[3] Homicide rate (2000-2006) from National Center for Health Statistics for AK, AZ, AR, CO, CT, GA, ID, IN, IA, KS, KY, LA, MN, MS, MT, NE, NH, NM, NC, ND, OH, SD, UT, and WV. State data source for IL.

[4] Not available for AK and HI.

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