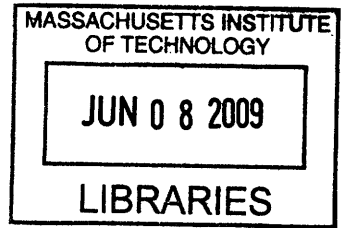


Land Use and Climate Change in Miami-Dade County

by

Haley Rose Peckett

B.A. Geography
Dartmouth College, 2005



ARCHIVES

Submitted to the Department of Urban Studies and Planning
in partial fulfillment of the requirements for the degree of

**Master in City Planning
at the
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June 2009

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ABSTRACT

Miami-Dade County, Florida, was one of the earliest jurisdictions to adopt a climate change plan in 1993. Land use features prominently in this plan as a means to reduce greenhouse gases through development patterns that allow people to lower their Vehicle Miles Traveled (VMT). Travel data show that average per capita VMT for the Miami area increased approximately 24% between 1993 and 2005, signifying that the land-use policies are not meeting their goal of VMT reduction. One apparent explanation is that land-use policies are not adequately implemented and enforced.

The Board of County Commissioners is the most powerful decision-making body and holds responsibility for land-use policy enforcement. The Board is constrained by a governmental structure in which each commissioner is accountable only to residents of his or her district. Commissioners make decisions based on immediate benefits for their districts with little incentive to consider the long-term issues of land use and climate change. The Urban Development Boundary illustrates how the competing agendas of economic development and affordable housing compel commissioners to approve developments that contradict existing land-use policies. The financial crisis of the Miami-Dade Transit system was exacerbated by district-based conflicts and limited commissioner accountability.

The district-based structure evolved from a history of racial and ethnic under-representation, which complicates the introduction of structural change. Instead, the County should introduce incentives that encourage commissioners to include long-term County needs in policy enforcement decisions. Recommendations include:

- Strengthened land-use advisory board
- Transparent calculation of the long-term impacts of proposed developments
- Temporary moratorium on 2011 UDB applications
- Strategic funding allocation to promote smart growth land use

Thesis supervisor: Judith Layzer

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In the effort to mitigate global climate change, planners struggle to create land-use policies that can reduce the need for driving and cut down transportation-related greenhouse gas (GHG) emissions. Without implementation and enforcement, however, such policies will do little to foster climate-smart land-use patterns. Miami-Dade County, Florida, is an illuminating example of pioneering policies whose implementation has been thwarted by political barriers. Despite decades of innovative leadership in land-use planning, transit integration, and climate change action, the number of miles driven by County residents continues to increase, and development inches further from the urban core and closer to the Everglades.

Climate change and land use are two policy arenas in which long-term planning and continuous action are necessary to affect change. Problematically, the governmental structure of Miami-Dade County encourages decision-making based on immediate, local benefits rather than long-term, County-wide needs. Despite stated intentions and policies to reduce GHG emissions and sprawl, the County is unable to effectively implement and enforce these policies.

Miami-Dade County is a jurisdiction of 2.4 million residents that covers approximately 2,000 square miles located in subtropical southeast Florida. Miami-Dade was one of the first fourteen municipalities in the world to create a climate change plan under the International Council for Local Environmental Initiatives (ICLEI) Cities for Climate Protection (CCP) program. In the land-use measures of the 1993 Dade County Long Term CO₂ Reduction Plan, the authors state an objective of reducing the amount of personal automobile driving that occurs in the County (measured in vehicle miles traveled or VMT) by 5 percent (Dade Board of County Commissioners 1993). Miami-Dade County is methodical about calculating emissions reductions attempted and achieved, but their measurements of land-use-related emissions were stalled prior to publication of the 2006 update to the 1993 Plan. The report states, "It is certain that the measures that are available in the Land-use Sector

Introduction

effectively result in emission reductions.” But the plan authors merely express a vague hope that “specific emission reduction numbers will be available in the future,” as developments are completed and raw data become available (Miami-Dade Board of County Commissioners 2006, 19).

The ambiguous conclusions in the 2006 update beg the question of whether land-use strategies are actually effective in reducing greenhouse gas emissions or changing travel behavior. Why do policies to foster emissions-reducing land uses have less impact on travel behavior than expected? Why does a jurisdiction with a stated intent to implement climate-friendly land-use policies not achieve its desired outcomes? To date, the precise calculation of how land use affects Vehicle Miles Traveled (VMT), and in turn GHG emissions, has eluded climate experts. Such calculations are particularly difficult in Miami-Dade County, where policies have been enacted so recently that there is no data yet to demonstrate their effects. In the absence of concrete data, this analysis uses the proxy measurements of national travel data and stakeholder responses to determine the effectiveness of land-use policies. Barriers to the effective implementation of land-use policies were uncovered using evidence from interviews, newspaper articles, and Internet coverage.¹ The clearest barrier to climate-friendly land-use policy implementation was a lack of enforcement on the part of County decision-makers, despite stated intentions within approved plans to progress smart growth and greenhouse gas reduction objectives.

The land-use measures in the 1993 Long Term CO₂ Reduction Plan far exceed those proposed in other metropolitan climate change plans of the same time period. The Comprehensive Master Development Plan (CDMP) and the zoning code include provisions for higher densities, mixed uses, pedestrian amenities, infill development, and transit-oriented development (Dade Board

¹ I interviewed 25 actors intimately involved with the land-use arena in Miami-Dade County including planners, transit officials, county commissioners’ aides, developers, environmentalists, agriculturists, and business owners. I also analyzed more than a decade of articles from The Miami Herald and other local newspapers.

of County Commissioners 1993). The measures suggested in the plan have been largely codified into policy, even as other cities struggle to put their climate change plans into action (Wheeler 2008).

A critical examination of land-use policy in practice reveals that the County's governmental structure impedes the implementation and enforcement of policies that aim to benefit the County as a whole. The 13-member Board of County Commissioners is the most powerful decision-making body in the County. The Board creates and approves ordinances and approves all proposed land-use policies, including major zoning and land-use changes. Each commissioner represents one of 13 racially-based districts and is accountable only to members of his or her district. The structure of district-based accountability limits the incentive for members of the BCC to make decisions based on the County's long-term needs, which is problematic given the long-term challenges posed by land use and climate change. No single actor, institution, or other barrier is responsible for the unrealized enforcement and implementation of land-use policies in the County, but the structure of the political system impacts how all land-use policies are carried out. Other perceived barriers, such as County agency capacity and soundness of land-use policy, are secondary to governmental structure in terms of interference with climate-friendly land-use progress. The validity of a governmental barrier rests on the assumption that fully implemented and enforced policies would actually result in reduced GHG emissions through travel behavior changes.

Land Use and Greenhouse Gas Emissions Reductions

Land Use and Greenhouse Gas Emissions Reductions

In the first generation of climate change plans, land use often played a supporting role to broader transportation initiatives, but recent research suggests that the land-use sector is critical to the reduction of transportation greenhouse gas (GHG) emissions (Ewing et al. 2008; Zahran et al. 2008). Land use is included in climate change plans primarily because of its relationship to transportation-based emissions, which are responsible for one-third of U.S. carbon dioxide emissions (Grazi and van den Bergh 2008). Ewing et al (2008) describe transportation emissions as a “three-legged stool” consisting of vehicle fuel economy, carbon content of fuel, and the number of vehicle miles traveled (VMT). Technological advances that address the first two legs have been offset by VMT, which has grown three times faster than the U.S. population since 1980 (Ewing et al 2008, 2). Mixed-use, higher-density, and pedestrian-friendly land uses can encourage non-automobile travel and shorter trip distances. While compact developments may have emissions “penalties” resulting from increased congestion, lower operating speeds, and cold starts, these would be outweighed by a 20 to 40 percent reduction in VMT per capita for residents. In total, experts estimate that climate-friendly land-use measures have the potential to reduce total U.S. transportation emissions by seven to ten percent (Ewing et al 2008).

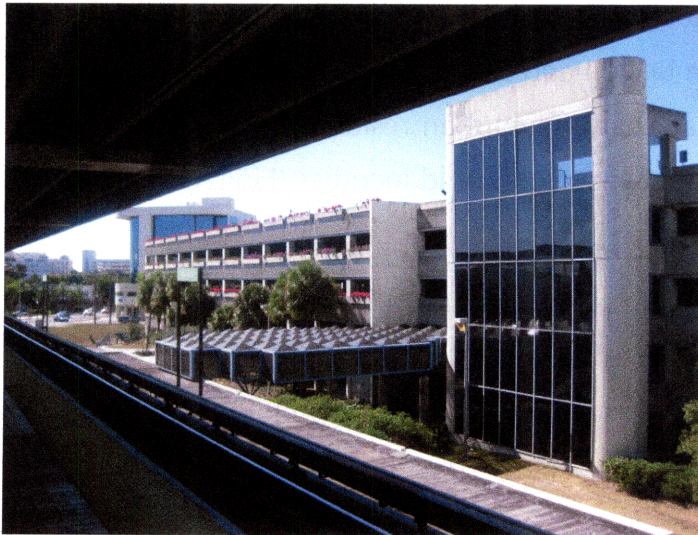
Initial studies show a significant relationship between land use and GHG emissions, but more mature studies linking transportation behavior with compact land uses and higher densities show a complex correlation (Maat et al 2005, Crane 2000). Land use can influence a reduction in VMT in three ways: mode shift to walking, cycling, and transit; reduced trip distance; and reduced total number of trips (Bagley and Mokhtarian 2002). Factors that have been correlated with mode shifts from auto-commuting include people’s proximity to non-residential units, proximity to medium or high density housing, location within the central city, short commutes, and low car ownership (Cervero 1996). Proximity to the city core and mixed land uses are also factors that total lower

Land Use and Greenhouse Gas Emissions Reductions

vehicle miles traveled (McCormack, Rutherford, and Wilkinson 1996; Miller and Ibrahim 1998).

Other researchers found socioeconomic and demographic variables to have a greater effect than land use on VMT (Cervero and Kockelman 1997; Kockelman 1997). Ewing and Cervero (2001) found that socioeconomic variables have a greater impact on trip frequencies and mode choice, and the built environment is the more significant driver of VMT. Kitamura, Mokhtarian and Laidet (1997) found that attitudinal measures, including attitudes regarding residential and travel lifestyles, explain travel behavior better than land use.

Much of the research that refutes the direct land use and travel behavior link is related to utility-based theories. Utility-based theories suggest that people make travel decisions based on the maximum utility, or personal benefit, gained from a combination of travel distance, travel mode, and destination. Therefore, a more distant destination that offers greater personal benefit may be selected over a nearer destination that is of lower quality. Individuals measure the benefit gained from travel options during a defined activity period, such as non-working weekday hours, rather than on a trip-by-trip basis (Maat et al 2005; Handy 1996). Mixed and intensified land uses have both positive and negative impacts on VMT. They can decrease VMT by increasing the number of accessible destinations and reducing the costs of a



Higher density land uses and transit-oriented developments can reduce greenhouse gas emissions by reducing VMT. All photographs by Haley Peckett.

Land Use and Greenhouse Gas Emissions Reductions

single trip. However, compact land uses can also increase VMT by increasing congestion due to the intensity of uses. In this case, people may elect to avoid compact areas and instead travel to a further destination in non-congested area (Crane 1996). Additionally, saved travel time may be allocated to other trips, again increasing VMT (Maat et al 2005). If compact, mixed-use land uses result in travel mode and destination options that are less appealing than options in non-compact land uses, VMT may actually increase. These findings reinforce the importance of attractive compact developments with mixed uses, pedestrian amenities, and higher densities located in infill areas with access to transportation alternatives and a diversity of jobs and services.

Transit-oriented development (TOD) is one tool that shapes land use to reduce VMT and has been highly encouraged in Miami-Dade County policies. TOD is defined as higher density, mixed-use development within one-half mile of a high-quality transit station (Center for Transit-Oriented Development 2008). TOD comes with travel and non-travel related benefits, including increased transit ridership, revitalization of neighborhoods, economic development, increased land values, and increased affordable housing opportunities (Cervero et al 2004). The increase in transit ridership can be as much as five to six times the rate of surrounding residents in the region. Cervero et al (2004) suggest that this outcome is partly because residents inclined towards transit-oriented lifestyles move to TODs. Nevertheless, a study of residents in TOD-like neighborhoods in Boston and San Francisco found that their annual average VMT was about half that of suburban residents in the same region, when controlling for factors such as household incomes (Holtzclaw 1999).

In sum, existing research shows that well-planned, mixed-use, higher-density land uses that encourage pedestrianism and transit use can lower VMT, and land use can significantly reduce transportation-related emissions over the long term. Thus, if Miami-Dade County fully implemented the land-use policies in its CO₂ Reduction Plan, VMT could be expected to decrease over the long term.

Measuring the Effectiveness of Land-Use Policies in Miami-Dade County

Miami-Dade County's creation and codification of the land-use policies contained in its climate change plan show a strong effort to make the plans become reality. In the past 15 years, the County has added numerous transit-oriented and infill-development principles to the zoning code, Comprehensive Master Development Plan (CDMP), and other Department of Planning and Zoning policies. Miami-Dade's inclusion of land use in its climate change action plan is consistent with the region's relatively high population density and high vulnerability to the impacts of climate change. Miami-Dade is the largest and most densely populated county in Florida and has the largest public transit system in the state. For these reasons, many planners regard the County as "Florida's most promising opportunity for [transit-oriented development]" (Cervero et al. 2004, 264). The County's proactive land-use policies may also be correlated with vulnerability to the effects of climate change. Zahran et al. (2008) found Miami to be the third most vulnerable metropolitan statistical area (MSA) in the U.S. to the impacts of climate change due to its high risk of sea-level rise and weather-related deaths from intensified hurricanes. The study found that cities with high risks for these impacts are more likely to participate in a climate action campaign (Zahran et al. 2008, 461). Despite the County's density and vulnerability to sea-level rise, it does not have a good track record of smart growth development over the last few decades. According to Galster and his coauthors (2001), Miami ranked second out of 13 major U.S. metropolitan areas in terms of sprawl. Both sprawling land-use patterns and risk of sea level rise may call for intervention within the land-use sector, providing an impetus to focus on this sector in the Urban CO₂ Reduction Plan.

The intention of the land-use objectives within the Plan was to create compact, mixed-use, infill, and transit-oriented development that would reduce the total number of miles traveled by shortening or eliminating car

Measuring the Effectiveness of Land-Use Policies

trips and shifting travel mode to transit or walking. The land-use section of the Urban CO₂ Reduction Plan specifically requires the following actions:

1. Review and amend regulations to encourage transit and pedestrian-oriented development principles in new development
2. Encourage infill by requiring TOD principles in activity centers and along major transit corridors
3. Promote “a sub-centered urban form” comprised of hierarchical activity centers, employment centers, and a transit network
4. Encourage the location of civic buildings within urban neighborhoods through site planning and capital improvements programs (Dade County BCC 1993, 5)

The County took action in each of these sub-areas through CDMP policies and zoning regulations. The CDMP requires “transit-supportive intensities” in planned transit areas and encourages mixed uses and higher densities to promote walking and transit use. The County identified infill sites and undertook a Residential Feasibility Study to compare costs of infill development with development near the Urban Development Boundary (UDB). The CDMP includes designated Community, Metropolitan, and Regional Centers, and the planning and transit departments have worked cooperatively to plan denser developments within these centers. The County also entered into an inter-local agreement with municipalities and the School Board to coordinate school and land-use planning (Miami-Dade Board of County Commissioners 2006). These actions show the County’s commitment to land-use policies in the CO₂ Plan, but they have not led to any noticeable VMT reduction.

Individual Efforts to Build Climate and Land-use Policy

The County’s adoption of progressive climate and land-use policies resulted from the efforts of individuals committed to smart growth and climate

Measuring the Effectiveness of Land-Use Policies

change mitigation. One such individual is Harvey Ruvín, who served as a County Commissioner from 1972 to 1992, during which time he oversaw the creation and adoption of the County's first General Land Use Master Plan (GLUMP) in 1976 and the Urban CO₂ Reduction Plan in 1993. He has served as the County Clerk since 1992 and recently spearheaded a new Climate Change Advisory Task Force (CCATF) with a joint focus on mitigation and adaptation. Ruvín was responsible for leading the coordination between the County's first comprehensive master plan and a transit plan. The GLUMP, he recalled, "was based upon our transit being a catalyst to implement our land-use plan." As a result of this coordination, the County won federal money to create the Metrorail elevated rail system in the late 1970s and early 1980s (Ruvín 2009).

In the late 1980s, Ruvín was involved in the founding of ICLEI, which arose from an informal caucus of local leaders who cared about environmental issues. Ruvín participated in ICLEI's first official meeting, where participants decided that the organization's first project would be a carbon dioxide reduction project. This project was to include 14 international communities from varying climate and population scales. Recruitment was "probably somewhat arbitrary" (Ruvín 2009), but undoubtedly Ruvín's early involvement with ICLEI led to Miami-Dade County's inclusion. The fact that Ruvín was instrumental in creating both the CDMP and the CO₂ Reduction Plan explains why land use is such a significant part of the CO₂ Reduction Plan.

After Ruvín's departure, Commissioner Katy Sorenson became a leader within the BCC to push climate-smart land use. She has long been active on land use and environmental issues, but until recently she was not permitted to take a leadership role on these issues. With her new role as chair of the Budget, Planning, and Sustainability Committee, Sorenson's leadership now forms "an overlay across a wide spectrum," giving her more power to advance an environmental and smart growth agenda (McCrackine 2009).

Measuring the Effectiveness of Land-Use Policies

Other local, state, and national leaders have created a policy environment that fosters smart growth and climate initiatives. County Mayor Carlos Alvarez has been an important force for policy and public enthusiasm for land-use and climate change. He regularly vetoes BCC decisions that are not compliant with County land-use policies, particularly in the case of the Urban Development Boundary (Brinkmann and Musibay 2007; Figueras Negrete 2005b; Pinzur and Rabin 2007). Since Alvarez is elected at-large, he is more widely accountable than any commissioner and therefore has more of an incentive to consider long-term County needs in his political actions. At the state and national levels, leadership regimes that foster progressive environmental attitudes present an opportunity to create local climate change and land-use policy. Florida Governor Charlie Crist is leading bi-partisan efforts towards alternative energy and climate change policies at the state level, and the Obama administration is bringing climate change policy to a prominent place in the national agenda (Murley 2009) Leadership at multiple levels brings climate action into the mainstream; greater public awareness of climate action can lead to greater endorsement, or at least acceptance, of local action.

Individuals may have driven the adoption of progressive climate-friendly land-use policies, but no individual can ensure or predict that codified policies are actually effective at reducing GHG emissions. Evaluating the effectiveness of land-use policies on travel behavior is problematic on several levels, as evidenced by the County's own inability to draw conclusions on these policies in its 2006 evaluation. Changes in travel behavior may be explained by socioeconomic factors, demographics, and attitudinal preferences, and data for the County is unavailable or insufficient for a comprehensive study. Given these difficulties, the following analysis of the impact of the County's land-use policies is conducted using quantitative data from national travel surveys and transit ridership and qualitative data from personal interviews.

Measuring the Effectiveness of Land-Use Policies

Figure 1: Average Daily VMT for Very Large Cities

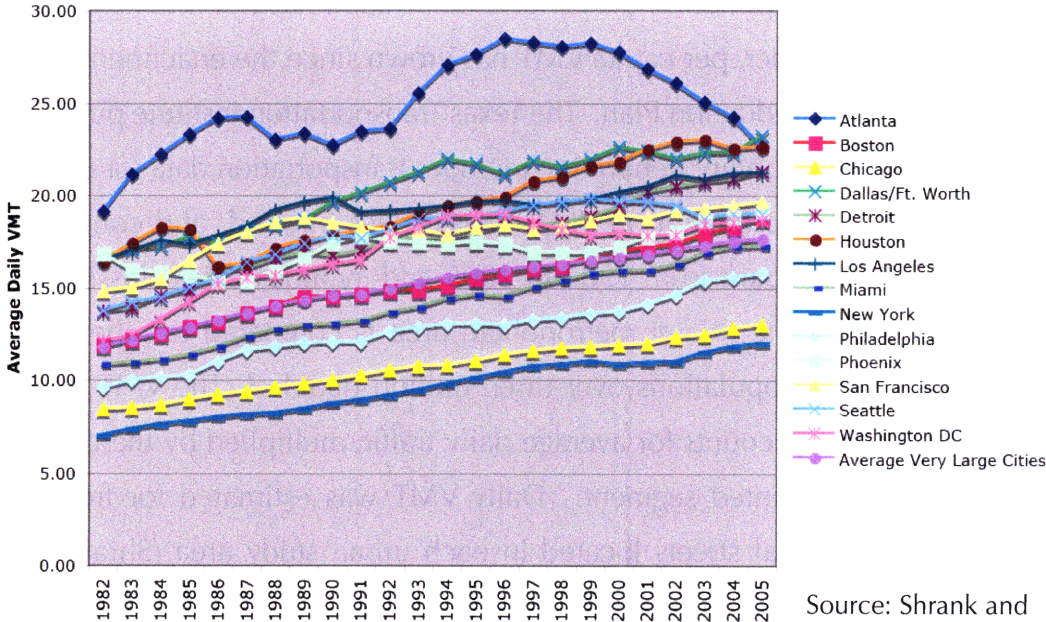


Table 1: Average Annual VMT Growth Rates in Very Large Cities

City	Average Annual VMT Growth Rate	Total % Change
New York	2.08%	26.65%
Boston	1.82%	26.40%
Miami	1.83%	24.02%
Philadelphia	1.75%	23.13%
Chicago	1.64%	20.93%
Detroit	1.48%	20.12%
Houston	1.66%	18.98%
All VLC	1.27%	15.50%
Los Angeles	0.80%	10.28%
Phoenix	0.70%	9.48%
Dallas/Ft. Worth	0.91%	9.22%
San Francisco	0.64%	8.30%
Washington DC	0.42%	2.23%
Seattle	0.37%	1.42%
Atlanta	-0.25%	-11.43%

Source: Shrank and Lomax 2007

Measuring the Effectiveness of Land-Use Policies

Travel Data Assessment

Existing transportation data shows that Miami has not met its goals of VMT reduction; rather, per capita VMT has grown since the enactment of the 1993 Urban CO₂ Reduction Plan. The Texas Transportation Institute publishes an annual Urban Mobility Report that includes transportation data for 85 U.S. cities, including information on VMT, transit miles traveled, and congestion indices. The data spans from 1982 to 2005 and includes cities classified by population size. The Miami metropolitan area is compared to other “very large cities” with populations over three million people.² The VMT figures are based on traffic counts for average daily traffic multiplied by the number of miles of the counted segment. Daily VMT was estimated for freeways and principal arterial streets located in each urban study area (Shrank and Lomax 2007, 3). This estimate may undercount VMT since minor arterial and secondary streets were not included in the calculation.

TTI data clearly shows per capita VMT growth during the period of climate change plan implementation. In 1993, the year that the Urban CO₂ Reduction Plan was adopted, Miami had an average daily VMT per capita of 13.91. In 2005, the most recent data available from TTI, this number had increased to 17.25, a growth of 24.02 percent or an average of 1.83 percent per year over the 12-year period. The per capita VMT slightly decreased (by 0.52 percent) in only one year of that period, between 1995 and 1996. Miami’s annual VMT growth rate of 1.83 percent was the third-highest of other very large cities, as shown in Figure 1 and Table 1; counterintuitively, only New York and Boston had greater growth of VMT per capita than Miami between 1993 and 2005.³ The relatively high growth rate suggests that Miami is not

2 The Miami metropolitan area includes some residents of Broward County to the north. The thirteen other U.S. cities in this classification are Atlanta, Boston, Chicago, Dallas/Ft. Worth, Detroit, Houston, Los Angeles, New York, Philadelphia, Phoenix, San Francisco, Seattle, and Washington DC.

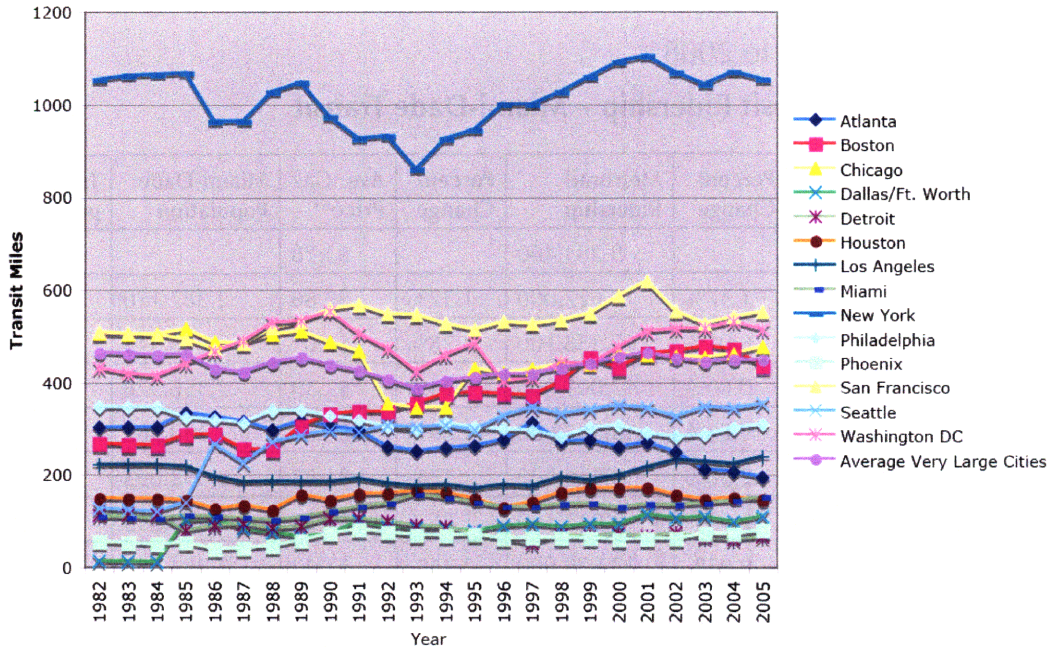
3 These findings may be explained by a few theories. First, Miami-Dade County has high percentage of retirees, whose annual VMT is lower than the national average, and immigrants, who may have lower car ownership rates during their first few years

Measuring the Effectiveness of Land-Use Policies

only not reaching its VMT reduction goals but that VMT is actually growing faster than other similarly sized metropolitan areas. A counter-trend shows that Miami-Dade's VMT is consistently the fourth lowest among the fourteen very large cities (behind New York, Chicago, and Philadelphia, respectively).

TTI also calculates transit miles traveled (TMT), and the average TMT per capita in Miami remains very low with an overall decline through the study period. The per capita TMT starts at 157 miles in 1993, drops to 129 miles in 1999, and grows back to 151 miles in 2005. The only very large cities with consistently lower per capita TMT are Phoenix, Dallas/Ft. Worth, and Detroit. See Figure 2.

Figure 2: Annual Transit Miles Traveled Per Person



Source: Shrank and Lomax 2007

in the U.S. Additionally, Boston and New York have concentrated infrastructure investment to the urban core. The population growth in these regions is occurring in the urban fringes, due at least in part to a lack of regional growth management. The new residents living areas underserved by transit, forcing most of the inhabitants of new developments to use cars.

Measuring the Effectiveness of Land-Use Policies

Although there has been considerable growth since 2003, probably as a result of rising gas prices, per capita transit trips in Miami-Dade remain low. Despite significant financing changes and political focus, Miami-Dade Transit has shown low ridership with little growth over the course of the CO₂ Reduction Plan implementation. The American Public Transit Association has recorded annual ridership on bus and rail transit in Miami-Dade County since 1995. Table 2 shows that both bus and rail ridership experienced periods of slight growth and decline between 1995 and 2003, but overall ridership stayed fairly constant. In 2004, both forms of transit saw a spike in ridership with modest annual increases through 2008. Gasoline prices for the Miami area, as recorded by the Energy Information Administration, also show significant increases between 2003 and 2008. The rise in gas prices may explain the massive ridership increase in 2004 and the modest but steady ridership increases from 2005 to 2008.

Table 2: Annual Transit Ridership – Miami-Dade Transit

Year	Bus Ridership	Percent Change	Metrorail Ridership	Percent Change	Avg. Gas Price**	Miami-Dade Population	Trips per person
2008*	42,535,000		9,283,400		\$3.78		
2007	84,218,300	1.37%	17,627,000	1.37%	\$2.86	2,387,170	42.66
2006	83,080,500	6.01%	17,388,100	2.28%	\$2.67	2,376,343	42.28
2005	78,373,000	0.60%	17,001,000	6.34%	\$2.39	2,356,378	40.47
2004	77,909,300	19.77%	15,987,600	11.66%	\$1.91	2,338,382	40.15
2003	65,046,900	2.56%	14,318,500	2.77%	\$1.57	2,332,093	34.03
2002	63,423,500	-2.53%	13,932,100	1.86%	\$1.35	2,308,355	33.51
2001	65,067,100	-0.95%	13,678,000	-2.46%	\$1.42	2,284,083	34.48
2000	65,689,800	2.24%	14,023,600	1.85%	\$1.48	2,259,863	35.27
1999	64,252,400	3.04%	13,769,400	3.54%	\$1.14		
1998	62,358,100	0.02%	13,298,900	-4.49%	\$1.03		
1997	62,344,200	3.11%	13,923,700	-2.26%	\$1.20		
1996	60,466,700	-1.71%	14,245,000	-1.39%	\$1.22		
1995	61,516,400		14,445,400		\$1.11		

*Calculations through June 2008 due to APTA only having first and second quarter data

**Figures for 2003-2008 Miami only. Figures for 1995 to 2002 are for the entire U.S.

Source: APTA Transit Ridership Report 2008, Energy Information Administration 2009, U.S. Census Bureau and South Florida Regional Planning Council 2008.

Measuring the Effectiveness of Land-Use Policies

Although per-capita VMT has grown over the implementation period of the CO₂ Reduction Plan, the data show that the County has potential to use its land-use patterns to improve travel behavior. The metropolitan area consistently shows lower VMT per capita than other very large U.S. cities, especially those with similarly warm climates and extensive sprawl. The reasons for this might be environmental constraints, higher densities of development, or a large elderly population. The County's land-use policies that encourage compact, high-density and mixed-use developments also may be more favorable to low VMT than the land policies of other U.S. municipalities.

Downtown Kendall Transit-Oriented Developments

Although the quantitative data can neither affirm nor refute a relationship between land use and VMT, a qualitative assessment uncovers how recent developments guided by smart growth land-use policies show limited influence upon travel behavior. The most prominent effort to implement climate-smart land-use policy is occurring in the Dadeland area transit-oriented developments, which are too recently built to have produced reliable quantitative data. Miami-Dade County's integration of higher intensity development near transit stations began prior to the adoption of a climate change plan but became an important component of the land-use strategy in the 1993 plan. The County established control over land adjacent to Metrorail stations well before rail operation commenced in 1983.



Dadeland Station at Dadeland North Metrorail station.

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In 1978, while the rail was under construction, the County designated the land occupied by the Metrorail and its stations as “Rapid Transit Zones” (RTZ). The County has jurisdiction over the zoning for all RTZs, including those located within other municipalities. It also established a Station Area Design and Development Program, in which a municipality works with the County to establish development standards for stations (Miami-Dade County 2008a; Read 2009).



Downtown Dadeland residential building adjacent to Dadeland South Metrorail station.

The County can thus maintain some control over development occurring adjacent to transit stations.

Miami-Dade Transit (MDT) has been issuing long-term leases for land in the RTZs to bring in additional revenue, but this strategy has not been uniformly successful in creating developments near the stations. While Requests For Proposals were issued for each of the 22 Metrorail stations in the 1980s, the actual development of most stations was never realized. At several stations north of downtown Miami, developers did not perceive a market for TOD; in other cases, residents opposed the creation of higher intensity developments near stations surrounded by residential and office uses. According to MDT lease manager Caroline Read, the two most important determinants of a successful TOD are market conditions and the support of the surrounding neighborhood (Read 2009). The transit-oriented developments at the two Dadeland Metrorail stations capitalized on both of these determinants, yet their effectiveness at changing travel behavior has thus far been limited.

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The convergence of transportation and socioeconomic advantages made the Dadeland Metrorail stations ideal places to initiate the County's concept of TOD. The Dadeland area is located approximately nine miles southeast of downtown Miami and includes Dadeland North and Dadeland South, the two southernmost stations on the Metrorail line. Between the two stations lies Dadeland Mall, one of the top three malls in the U.S. based on per-square-foot sales (Downtown Dadeland 2009). Dadeland South, the southern terminus of the Metrorail, also contains a bus transfer station to a 14.7-mile Bus Rapid Transit expressway linking municipalities in southern Miami-Dade County. The Dadeland area is directly connected to two major expressways and U.S. 1, a principal arterial accessing the County's most densely populated areas. Finally, Dadeland is located close to neighborhoods with an average household income that is more than double that of the rest of the County (Downtown Dadeland 2009; U.S. Census Bureau 2007).

The area containing the Dadeland Metrorail stations was the focus of a public-private charrette process in 1998. The charrette planning process was the County's first major attempt to implement land-use concepts of the 1993 CO₂ Reduction Plan in a systematic fashion. A steering committee of



*High-density
buildings in
the Downtown
Kendall TODs
as viewed from
Dadeland Mall.*

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County officials, the chamber of commerce, and citizen groups produced the Downtown Kendall Master Plan and a form-based code for a study area that included both Metrorail stations, Dadeland Mall, and the existing intense land uses. The results were codified into the Downtown Kendall Urban Center District ordinance, passed in December 1999 (Miami-Dade County 1999). The planning process for Downtown Kendall paved the way for a series of charrettes and small area plans run by the County's Urban Design Center (UDC); the subsequent charrettes also focus on compact development, mixed uses, and pedestrian and transit orientation.

By 2009, the TODs within Downtown Kendall were almost fully built out with a mix of uses and development types. The first developments surrounding these stations were built on land leased from Miami-Dade Transit. The lease for Dadeland South began in 1982, and the TOD now contains nearly a million square feet of office, retail, hotel, and conference space. Dadeland North was developed with Dadeland Station in 1996; its later start was due in part to legal conflict over the lease (Berkowitz 2009). Dadeland Station is a vertical retail mall with "big box" retailers stacked in a multi-story structure attached to a garage. Dadeland North also contains 168 residential units built since 2000.

Adjacent to the Dadeland South station, a new development called Downtown Dadeland was built to comply with the Downtown Kendall form-based code and has attracted attention across South Florida. The mixed-



Pedestrian amenities and high-density residential in Downtown Dadeland.

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Wide road separating Metrorail station and TODs from Dadeland Mall poses pedestrian hazard.

use development embodies New Urbanist principles, including extensive pedestrian amenities, ground-level retail, and underground parking. Downtown Dadeland consists of 125,000 square feet of retail and restaurant space and 416 residential condominium units on 7.5 acres of land. Occupancy of the first residential units and retail spaces began in 2004, and construction is still underway on several phases of the development. Occupancy rates are low, due in part to the economic downturn and, according to some real estate professionals, permitting delays from County agencies (Developer 2009). UDC planners experienced delays in passing the initial ordinances as the codification of a charrette process was new to County agencies and developers alike. Once the regulations were in place, however, developers responded immediately (Singh 2009). The unfamiliar nature of the process caused struggles between the County and developers and some construction delays (Spehar 2008, Developer 2009).

The creation of the Downtown Kendall Urban Center District ordinance codifies several of the objectives articulated in the CO₂ Reduction Plan: the encouragement of pedestrian and transit-oriented development principles, the encouragement of infill through requiring TOD in activity centers and major transit corridors, and an embodiment of a sub-centered urban form. County employees and local experts who extol the virtues of Downtown Dadeland seem to be most impressed by the actual completion of a mixed-use TOD that

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No crosswalk on one side of a major intersection between Downtown Dadeland and Dadeland Mall.



is consistent with the vision of the CDMP. In theory, Downtown Dadeland's pedestrian amenities, compact and mixed-use design, and proximity to transit and activities should reduce the VMT of residents, employees, and visitors. In addition to the location, demographics, and amenities available, including transit options (Shuffield 2009), the Dadeland area has the designation of Regional Urban Center on the County's CDMP land-use map, which allows higher densities and intensities than the Metropolitan or Community Urban Centers where most other transit stations are located. Downtown Dadeland also had a small number of original property owners, facilitating the consolidation of land prior to development (Blanco 2009). If Miami-Dade County has one place where the stars align to advance a pedestrian, transit-oriented development, Downtown Kendall would be that place.

Despite a prime location and amenities that should encourage a mode shift towards walking and transit, Downtown Kendall faces a number of obstacles to becoming a community that is independent from cars. First, many believe that the developments are still too young to fully realize mode shift. An immature development that is not fully occupied does not contain the intensity of uses that promote walking and transit. Also, the first residents of Downtown Dadeland are not accustomed to a car-free lifestyle, but they may gradually shift their habits over time. "As far as it being sustainable,

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wonderful, I don't think its there," said County planner Gilbert Blanco. "It's in its infancy."

Although there are numerous pedestrian amenities within the TODs, the immediate surrounding land uses are unfriendly to pedestrians. Residents of Downtown Dadeland may walk to the mall but they must walk through swaths of parking lots to reach their destination. Some officials express skepticism that residents actually walk to nearby amenities; instead they "driv[e] from one parking garage to another" (Goldenberg and Yoder 2009). The Downtown Kendall Master Plan calls for changes to local roadways to facilitate pedestrian mobility, but adjacent landowners have not followed the plan (Parker 2009). Crossing Kendall Drive to access the mall is difficult and scary, the hardscape is harsh, and parking is very tight. While the Metrorail adds a non-auto vehicle option, the transit service is limited and most residents and visitors "are in a middle ground where [they] still need cars" (Shuffield 2009). On the other hand, increased ridership recorded at the Dadeland stations since the occupancy of Downtown Dadeland has made some planners optimistic about the development's ability to influence travel behavior (Singh, Spehar, Blanco 2009), although the exact reasons for the increase in ridership have not been studied.



Retail commercial and parking below residential uses in Downtown Dadeland.

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Equity issues create a secondary challenge for the success of the County's climate-friendly land use policies in that most County residents cannot afford to partake in the benefits offered by transit-oriented developments. In Downtown Dadeland, Blanco believes the cost of condos is prohibitive for most people who work downtown; anecdotally, he has the impression that many residents in the development are foreign tourists or second-home owners. TODs are often built in affluent markets because these locations are lucrative for developers, but residents in the Downtown Kendall area are also less tolerant of affordable housing. Land uses surrounding the northern corridor of the Metrorail include affordable housing, but the market demographics of that corridor will not support the mixed-use developments similar to Dadeland's (Blanco 2009; Spehar 2009). In short, although Downtown Kendall is accessible by train to people of all income levels, non-residents are limited in their share of TOD-related benefits.

Finally, Downtown Kendall lacks a sense of place or a defined character, which translates into fewer people attracted to the development who take advantage of pedestrian or transit amenities. The UDC represents a unique effort by the County to drive the type of development it wants, but the County's control is limited. Downtown Dadeland consists of a series of buildings that occupy an entire block, eliminating the possibility of incremental build-out with more "mom-and-pop shops." The ordinance could have included a clause to encourage incremental build-out, but such an inclusion was infeasible due to the requirements of other County agencies. Although the Department of Planning and Zoning demonstrated innovation in its processes, other agencies were less flexible (Blanco 2009). The UDC also cannot dictate what types of uses will occupy retail space in Downtown Dadeland; consequently, the majority of retailers are large furniture stores, as opposed to the more "exciting" uses of florists, cafes, and galleries (Blanco 2009). "What's missing is a sense of community," said Blanco. One security guard employed in Downtown Dadeland expressed belief that the development would grow to be like

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Sunset Place, a nearby “lifestyle center” and popular shopping and dining destination with heavy pedestrian traffic.

County officials remain optimistic that the Downtown Kendall area will more effectively attract residents and visitors and reduce their VMT once the developments reach maturity. They expect empty units to eventually sell and blame low occupancy on the economy rather than the design of the development (Goldenberg and Yoder 2009). According to the UDC planners who have been intimately involved with building Downtown Kendall over the past decade, the TODs in this area have only begun to impact travel behavior in small ways. The maturity of the TODs and the development of a greater sense of place will attract more visitors who will take advantage of non-vehicle mode shares.

Barriers to Policy Implementation

Barriers to Policy Implementation

While land-use policies have not been successful in reducing VMT in Miami-Dade County, County officials express the potential of infill and transit-oriented developments to change travel behavior. The larger problem, though, is that many of the County's land-use policies are not actually being implemented (Hefty 2009; Shirreffs 2009) due to a governmental structure where decision-makers have little incentive to uphold existing policies. The Board of County Commissioners has greater power than many urban jurisdictions based on its ability to govern both incorporated and unincorporated parts of the County. Unlike other counties in Florida, Miami-Dade County has home-rule authority. The county's home-rule charter, passed in 1957, grants Miami-Dade oversight and review of some municipal ordinances and processes, including the ability to levy taxes on incorporated areas and charge mitigation fees for areas that annex into municipalities (Florida League of Cities 2009).

Although the BCC has the power to enact strong policies, its ability to use that power effectively is sharply constrained by the fact that commissioners are accountable only to constituents within their districts. For most of the County's history, commissioners represented a specific district but were elected County-wide; since a policy change in 1992, however, commissioners have been elected only by the constituents of their district (Ruvín 2009). Prior to redrawing the districts in 1992, seven out of nine commissioners were non-Latino whites; at the time, the County population was only 31 percent non-Latino white (Croucher 2002). A lawsuit filed in the late 1980s compelled the County to create a new system of commissioner elections, which translated into race-based districts. Effectively, there are seven Latino districts, four African-American districts, and two non-Latino white districts. The barrier formed by the district representational structure is difficult to uproot due to racial sensitivities.

Within the complex systems of the County government, the progress of plans and policies are subject to a host of internal and external influences.

Barriers to Policy Implementation

Previous studies have singled out deeply rooted socio-cultural and behavioral factors as the most significant barriers to the implementation of climate change plans (Burch 2007). A survey of Canadian municipal planners concluded that public support, municipal prioritization, budget limitations, and administrative capacity were the greatest barriers to action (Robinson and Gore 2005). Other potential barriers relevant to climate change planning and urban sustainability include information barriers, leadership initiative, organizational structure, jurisdictional fragmentation, fiscal mismanagement, decentralized goal setting, special interest groups, and resistance to innovation (Moore 1995, Keysar 2005, Wheeler 2000).

Other attitudinal, informational, organizational, and institutional factors impact the County's land-use scene, but most of these factors are secondary to governmental structure in their real impact on land use and climate change policy. For example, developers might argue that interagency problems and related development delays are a major barrier to the completion of smart growth developments (Berkowitz 2009; Developer 2009), but in fact Miami-Dade's planning and transit agencies are working hard to facilitate smart growth developments and coordinate various agencies. Another secondary barrier is outreach and education. While citizens engaged in transit and land use are influencing policy decisions, many others remain disengaged for reasons beyond the immediate control of the County. These citizens may not have the resources to attend meetings, contact their commissioners, or learn about the costs of climate change impacts (Plater-Zyberk 2009). The barrier of citizen engagement calls for education as part of the long-term solution, but limited outreach efforts are not the most significant roadblock for climate-smart land use.

Finally, inadequate policy implementation cannot be blamed on poor land-use regulations. An alternative paradigm to metropolitan land-use policy reasons that sprawl results from market barriers imposed by local zoning (Levine 2006). In Miami-Dade, much of the land surrounding transit stations

Barriers to Policy Implementation

has not reached the density permitted by zoning, particularly in the northern part of the County (Read 2009). The County provides plenty of opportunities for higher-density development in lower-income areas, but developers will not build in these riskier markets if sprawling development can be built more cheaply. The barrier is not inadequate zoning but rather a problem of incentives, associated with governmental structure and decision-making.

Short-Term Decisions and Long-Term Consequences

County commissioners profess support for climate change and smart growth policies, but they actively vote in favor of developments that go against these policies. Their paradoxical actions are rational under the constraints of district-based accountability. The decisions of individual commissioners may set back the progress of climate and land-use initiatives, yet the individuals are not fully responsible for their failure to uphold land-use policies. In most cases, commissioners face competing and compelling agendas when faced with development decisions, including the need to provide low-cost housing or support development industry jobs in their district.

The prioritization of short-term, local benefits is inherently disadvantageous to climate change and land-use action, which require sustained multi-decade efforts. Over the long term, physical planning significantly reduces travel volume, increases non-automobile transportation modes, and mitigates GHG when used in complement with other pricing strategies (Grazi and van den Bergh 2008). But land-use interventions are not useful in the short term, given the time needed to relocate activities, buildings and infrastructure (Greene and Schafer 2003, Rietveld 2006).

The disconnect between a structure that encourages immediate benefits and a problem that requires a long-term outlook leads to a failure to uphold land-use policies. In the case of the Urban Development Boundary (UDB), Commissioners undermine the GHG emissions reduction goals of Urban CO₂

Barriers to Policy Implementation

Reduction Plan by approving developments that will increase VMT. Poor fiscal management of Miami-Dade Transit, stemming from the fragmented interests of the BCC, results in a failure to advance the Urban CO₂ Reduction Plan by impeding the infrastructure development needed to support smart growth land use.



Low-density land uses adjacent to the Metrorail in northern Miami-Dade County show underutilization of transit corridors.

The Urban Development Boundary Battle

The Urban Development Boundary Battle: Undermining Climate-Smart Land Use

“This community would look a lot different – our use of energy would be a lot different – if we held the line.” – Harvey Ruvin, Clerk of Courts, Miami-Dade County

The battle over the Urban Development Boundary (UDB) is a symptom of the governmental structure that encourages the approval of developments based on the perceived immediate benefits for a specific constituency rather than a unified vision of the County’s best interests. The UDB case epitomizes Miami-Dade’s struggle with sprawl, contrasting the land-use strategies emphasized in the Urban CO₂ Reduction Plan. Sprawl is the unlimited outward expansion into undeveloped areas with a low-density built environment and leapfrog development that leaves pockets of buildings among greenfields (Burchell et al 2005). Any new developments built on the outskirts of an urban area, particularly those with low densities, necessitate lots of driving and therefore produce large amounts of greenhouse gas emissions. The battle over the UDB is a case study for why a fragmented leadership body hinders the progress of climate and land-use initiatives.

Origins of Land-Use Patterns

Miami-Dade’s struggle with sprawl is rooted in the geography and history of the city and has continued due to the structure and decisions of the BCC. Miami-Dade County is sandwiched between the Atlantic Ocean, Everglades National Park, and Biscayne Bay National Park, providing definite limits on its urban expansion. County planners took these natural boundaries a step further by instituting the UDB officially on the CDMP land-use map in 1983 (although it was implied through the CDMP map and policies in 1975). However, the creation of the UDB was preceded by decades of sprawl, which necessitated its establishment.

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Miami's early city planners created a land use pattern that encouraged compact, walkable, and mixed-use developments. The city was originally designed with a grid orientation in the late 1800s. At that time, planners divided land into one-square mile sections; roadways located on each section line have evolved into the current arterial roads. Early planners also established half-section and quarter-section roadways, creating subdivision sections (Kimley-Horne 2007, 3). Commercial nodes were located at the intersection of section and half-section roads. Therefore, all residents were within a quarter-mile walk of their basic needs and services (Fernandez 2009). The grid roadway system offered several benefits including enhanced connectivity, accessibility, and reduced VMT. On grids, travel is dispersed over more roadways, potentially alleviating congestion and accident rates. Land blocks carved by grid roadways accommodate mixed-uses and "town centers" better than strip development (Kimley-Horn 2007).

The compact urban patterns disintegrated slowly from a combination of an unforeseen development boom and naïve decisions on the part of planners and commissioners. As development progressed out from the central city, planners created ring roads that would serve as "walls" for development, the first of which was the Palmetto Expressway. Since no development existed west of the Palmetto at the time of its construction in 1958, County leaders saw no need to create a "permeable" highway that would maintain the urban fabric by allowing underpasses for arterial roads. When development did spread west of the Palmetto, it formed a non-grid roadway system with little connection to the urban grid to the east (Fernandez 2009). A similar situation occurred in 1974 when the Homestead Extension of the Florida Turnpike formed a second ring road (Florida's Turnpike Enterprise 2009). Lower densities in these areas cannot support the same frequency of commercial nodes, requiring longer car trips to access these services. Western parts of the County have higher congestion, due to the lack of a grid roadway system (Kimley-Horne 2007, 4). The development patterns created by non-grid networks lead to more driving-

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intensive lifestyles, and the UDB became one policy mechanism to counteract the continuance of sprawl.

The idea of the UDB surfaced during the rapidly suburbanizing period of the 1970s. According to Miami-Dade County, the purpose of the UDB is to prevent “leapfrog” development, provide efficient use of land resources, protect agricultural and environmentally significant land, and improve the economics of infill and redevelopment (Miami-Dade County 2008b). Permitted uses outside of the UDB include agriculture, mining activities, and very low density residential (Miami-Dade County 2008c, LU-3G). The UDB must contain enough land to sustain projected demand for housing for 15 years beyond the adoption date of a CDMP amendment.⁴ The CDMP also calls for an increase in densities around transit and other infill areas in order to meet housing demand within the UDB (Miami-Dade County 2008c, LU-8F). Containment programs, such as an urban development boundary, have been correlated with stimulated development activity in central cities; over time, the market responds to these spatial limits so long as they are enforced (Nelson et al 2004).

Supporters and Opponents of UDB Expansion

Applications to extend the UDB, usually in response to a proposed development, must undergo a public hearing process before the Board of County Commissioners. Interest groups on both sides of the conflict have worked strategically to push competing agendas of affordable housing, economic development, and environmental protection in hopes of gaining the commissioners’ support. Some special interest groups feed the commissioners

4 Studies to measure the capacity for housing growth within the UDB have mixed results. Developable land capacities range from 2017 to 2050, depending on the type of housing to be built and the policy changes enacted (Church 2009; Miami-Dade County 2003; Keith & Schnars, P.A. 2007). However, some believe the policy requiring a 15-year surplus is inherently problematic due to the finite amount of land in the County; the policy is also at odds with another county policy of no net loss of agricultural lands (Shirreffs 2009).

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with rationale for voting against climate-friendly policies, while others safeguard the intentions of the CDMP and CO₂ Plan authors.

Immigrants, who arrived with a demand for affordable housing and a drive to pursue the American dream, became a key component of the support network to expand the UDB. From April to September of 1980, over 124,000 Cubans traveled by boat from the port of Mariel in Cuba to South Florida, an event known as the Mariel Boatlift. The Carter administration allowed nearly all of the refugees to stay in the United States on humanitarian grounds, resulting in a massive influx in population for Miami-Dade County. The Mariel refugees were racially and socio-economically distinct from the existing, wealthier Cuban community who came to Miami as exiles in the 1960s (Sagás 2008). The County absorbed nearly 200,000 Cuban and Haitian refugees in the early years of the decade (Ruvín 2009).

At this time, the County Commissioners were elected by the entire County population and the Board was generally supportive of the new land-use policies in the CDMP. The lobbying efforts of special interest groups became necessary to build support for westward development. Developers saw large tracts of greenfields in the western part of the County as the cheapest means to meet the growing demand for single-family homes, and thus affordable housing became an important impetus for westward development (Ruvín 2009). Homes built near the UDB could be sold for less than a similar home in a more urbanized area due to lower land value and economies of scale. The new immigration and development pressures fed the formation of the Latin Builders Association (LBA), an advocacy group started by 12 Cuban-American subcontractors in 1971. The LBA is dedicated to networking, training, and political representation for Latino businesses and employees of the construction industry in South Florida. Developers joined the LBA in the mid-1980s as they saw the need for organized pressure on the County to facilitate new housing on the western urban fringes, which was needed to accommodate the influx of immigrants. The LBA worked tactically through

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campaign contributions and lobbying on zoning and land-use cases, acquiring in the process a reputation for “political strong arming” (Whitefield 2000).

What started as a small group exclusively composed of Cuban-Americans became the largest and most powerful development lobby in the County and a major influence over BCC development approvals. The LBA predominantly became known as a one-issue organization: facilitating the development of more affordable housing on undeveloped lands, generally those outside the UDB. LBA strives to develop a “balance between the existing building boom and the increasing land values/ construction costs with our area’s great demand for affordable housing” (LBA 2009). In the 1990s, amendments sponsored by the LBA were largely responsible for the County’s failure “to use transit as a tool to achieve [CDMP] goals,” recalled Harvey Ruvin (2009). Jack Parker, Professor of Environmental Studies at Florida International University in Miami, singled out the LBA for acting in opposition to climate-related land-use policies that generally received a consensus of support. He notes, “Nobody is really against the [CO₂ Reduction] Plan as such; [the LBA] just does things contrary to what the plan wants to do” (Parker 2009). In recent years, the LBA has become more sensitive about the environmental and social consequences of moving the UDB, although the organization remains loyal to UDB expansion (Ruvin 2009).

Supporters of holding the UDB use lobbying and grassroots activism to push the agendas of environmental protection, smart infrastructure investments, and climate change mitigation. Supporters include high-ranking leaders like Mayor Carlos Alvarez and Governor Charlie Crist (Lowe 2009), but they also include thousands of citizens organized through grassroots efforts like Hold the Line. This advocacy group started in 2005 from the “public outrage over the backlog of infrastructure issues created by sprawl.” The organization has official support from nearly 140 organizations, businesses, homeowners associations, and municipalities (Shirreffs 2009; Hold the Line 2009). While the group is large in number, it is somewhat limited in geographic scope as

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it attracts constituencies primarily from districts in the eastern parts of the County. Thus the group has less power to influence the votes of many County Commissioners.

A third special interest group and “major player” in the UDB conflict is the agriculture industry, which also demands specific decisions from the Commissioners (Shirreffs 2009). Fruit and vegetable farmers have been struggling since the North American Free Trade Act (NAFTA) went into effect in 1994. NAFTA permitted crops grown in Mexico to be imported into the United States very inexpensively; Miami-Dade farmers cannot compete with prices on imports (Lyden 2009; Prono 2009). Many crop farmers can no longer stay afloat financially, and their land is their only means to recoup some capital to pursue other livelihoods. The injustice of an imposed line on development is a constant struggle, especially for those farmers with no other means of livelihood (Lyden 2009).

Political Conflict and Decision Rationale

Each of these special interest groups uses a different argument to support their cause, and the Commissioners receive plenty of justifications for votes that do not uphold County policies. In addition to the economic justice argument put forth by agriculturists, opponents of holding the line frequently cite affordable housing for working- and middle-class residents as a principal justification. Job creation, tax revenue for local governments, and revitalization for impoverished areas are also used as reasons for urban expansion (Hatcher 2005, Rabin 2004, Ross and Mozingo 2001, Haggman 2005, Haggman and Schwartz 2005). Affordable housing in particular presents a pressing social problem in Miami-Dade County. A statewide study found that Florida’s Growth Management Act, which requires comprehensive plans with growth management regulations for all Florida jurisdictions, has a significant and negative effect on housing affordability (Anthony 2003, 288). Since comprehensive planning fails to meet the housing needs of low-

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income residents, the BCC needs to supplement growth management policies with the provision of affordable housing through regulation or financing. The equity implications of sprawling development become particularly sensitive to Commissioners in districts with large low income populations, who may feel additional pressure to approve UDB expansions.

District-based interests have a tendency to fall along racial and ethnic lines. Many black commissioners' districts are near the core city and districts closer to the UDB in the west tend to be Latino (Miami-Dade County 2009). Commissioners representing black districts often vote to hold the line because "growth pressures revert back to urban areas" and they want to bring their districts needed revitalization (Murley 2009). Latino commissioners, particularly those with constituents in development industries, tend to support expanding the UDB. These generalizations do not hold true in all cases, but they help explain how race and equity are infused in the UDB battle (Murley 2009). Hold the Line advocates have made strides in coalition building with social justice communities, who understand that developments that require a car and a long commute are not affordable housing (Shirreffs 2009). "We've been pretty successful in . . . convinc[ing] cities in the urban core that continued expansion of [the UDB] siphons off redevelopment dollars," said Sean McCrackine, aide to Commissioner Sorenson (2009).

Hold the Line advocates want to encourage development in urban infill areas, such as these vacant lots adjacent to the Metrorail north of downtown Miami.



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As they struggle to balance environmental, economic, and equity concerns, Commissioners receive conflicting evidence on whether UDB expansion presents equity benefits to historically marginalized groups. Maintaining development within the UDB is the best choice for the environment as it preserves natural resources and reduces GHG emissions through reduced driving demand. In the short term and without government incentives for infill development, the economics play out in favor of moving the line, because land is cheaper, houses can be built less expensively, and new jobs can be created.⁵ Supporters and opponents of the UDB both believe they are fighting for equity. Immigrant communities favor the affordable American dream offered by westward expansion, and an urban, mostly black, contingent believes development dollars are best (and most equitably) spent in infill areas.

Ironically, climate change is used by both supporters and opponents of the UDB as ammunition to attract commissioners' votes. As expected, Hold the Line advocates cite climate change as a primary reason to maintain the UDB (Murley 2009; Lowe 2009). Echoing the land-use policies in the CDMP and the CO₂ Reduction Plan, they state that placing housing in low-density suburbs at the urban fringe will augment GHG emissions by increasing the VMT of residents and visitors. On Earth Day 2008, the Climate Change Advisory Task Force presented their recommendations to the BCC, including an emphasis on smart growth development and maintaining the UDB. Two days later, testifiers echoed these same arguments at a biennial hearing of applications to move the UDB (Murley 2009; Ruvlin 2009). Simultaneously, opponents of holding the line argue that developments at the urban fringe will decrease GHG emissions. They reason that the creation of new strip malls near western suburbs or housing near existing industrial centers will reduce driving as people can access employment and services closer to home (Yoder 2009).
5 Studies show that the long-term costs of sprawl negate the short-term advantages, and Hold the Line supporters have cited this data (Burchell et al 2005). However, Miami-Dade County has not historically offered significant incentives to encourage infill affordable housing, though some such policies are in development now.

Turmoil on the Train: Transit in Financial Jeopardy

Commissioners hear arguments that their votes for sprawling development would help climate change, leaving them in a position to interpret fact from fiction and making policy enforcement ambiguous.

Structural Challenges and Change

The conflict over the Urban Development Boundary places commissioners in a position where enforcement of land-use policies is easy to avoid. Since the commissioners only need to answer to their own constituents, they will be most interested in approving developments that bring benefits to their district, even if these developments counteract existing policies. Where localized interests are synonymous with development, the Commissioner votes inconsistently with the established land-use policies, citing affordability, job creation, and even climate change as rationale. Since there is limited affordable housing located within the urban area and little incentive for developers to pursue more difficult infill affordable developments, commissioners may be justified in approving more affordable housing on the outskirts. The County recognizes the need to strengthen infill affordable housing incentives, but policies that provide such incentives are still being developed and have not yet been adopted or tested.

Without real incentives to put affordable housing and new jobs in infill areas, Commissioners will continue to approve sprawling development and undermine the progress of climate-friendly land-use goals. Compact, infill, and transit-oriented development will never become the default development option as long as Commissioners fail to enforce the Urban Development Boundary. If the structural barriers remain, the UDB will remain a conflict of competing agendas that drives rational commissioners to vote against smart growth land-use policies.

Turmoil on the Train: Transit in Financial Jeopardy

Turmoil on the Train: Transit in Financial Jeopardy

"[The Metrorail] was a magnificent step in the right direction that has been misdirected." - Jeff Berkowitz, Berkowitz Development Group

The Board of County Commissioners has a heavy hand in long-range transportation plans and spending, which adds the challenges of district-based interests to an already cash-strapped transit system. Conflicts over the planning and fiscal management of Miami-Dade Transit (MDT) have resulted in a transit system inadequate to serve Miami-Dade County. Transit-oriented developments in infill areas cannot occur without transit. Transit provides the infrastructure to help people drive less, and high density, mixed land uses surrounding transit corridors help people access their needs with fewer VMT. Conversely, a stagnant or troubled transit system handicaps the creation of development that changes travel behavior and reduces GHG emissions. The transit system in the County, while the most comprehensive in the state, is inadequate to support the County's dispersed 2.4 million residents. The financial crisis that now plagues MDT has made the creation of an extensive rail network fiscally impossible. The crisis was caused by mismanagement, poor planning, and troubled public relations, with key decisions made or overseen by the BCC.



*Miami-Dade Transit
Metrobus on the move.*

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Transit Structure and Financing

The problematic political structure that encumbers policy enforcement for land use is also present in the transportation governing body. The Metropolitan Planning Organization oversees transportation planning and project approval and makes final decisions on all policies, plans, budgets, and regulations for transportation projects in the County (Miami-Dade MPO 2009). The MPO governing board consists of 21 voting members, of which 13 are the Miami-Dade County Commissioners, meaning that all the politics that hinder progress of smart growth and climate change policies also impact transportation decisions. Well-intentioned and often well-structured policies crafted by smart, capable department staff lose their impact by the time they make it through the MPO and BCC boardrooms.

With planned expansions stagnated by boardroom policies, the Miami-Dade Transit system remains limited relative to the size of the County. The system consists of 21 miles of elevated heavy rail, 4.4 miles of a people mover, a 20-mile dedicated busway and 95 bus routes (Miami-Dade Transit 2009b). The 21-mile Metrorail, which became operational between 1983 and 1985, was intended to be Phase I of a multi-phase system resulting in more than 100 miles of rail transit fed by buses reaching all parts of the County (Miami-Dade Transit 2009a; Viglucci 2002a). An Orange Line extension has been in various planning stages since the 1980s and would include up to 90 miles of new rail.

Insufficient funding of the transit system has fueled a multi-decade battle and halted nearly all proposed extensions. Miami-Dade Transit has never had a sustainable revenue source and depends heavily on supplemental financing. In FY 2008-2009, the agency's total expenditure was \$463,762,000 and the total fare collections were only \$110,627,000, or 23.9 percent of total revenue, as shown in Table 3 (Miami-Dade Transit 2008, 17). MDT also receives money from general County funds and gas taxes, but measures to increase funding shares from those sources have not received support (Lebowitz 2005a). MDT

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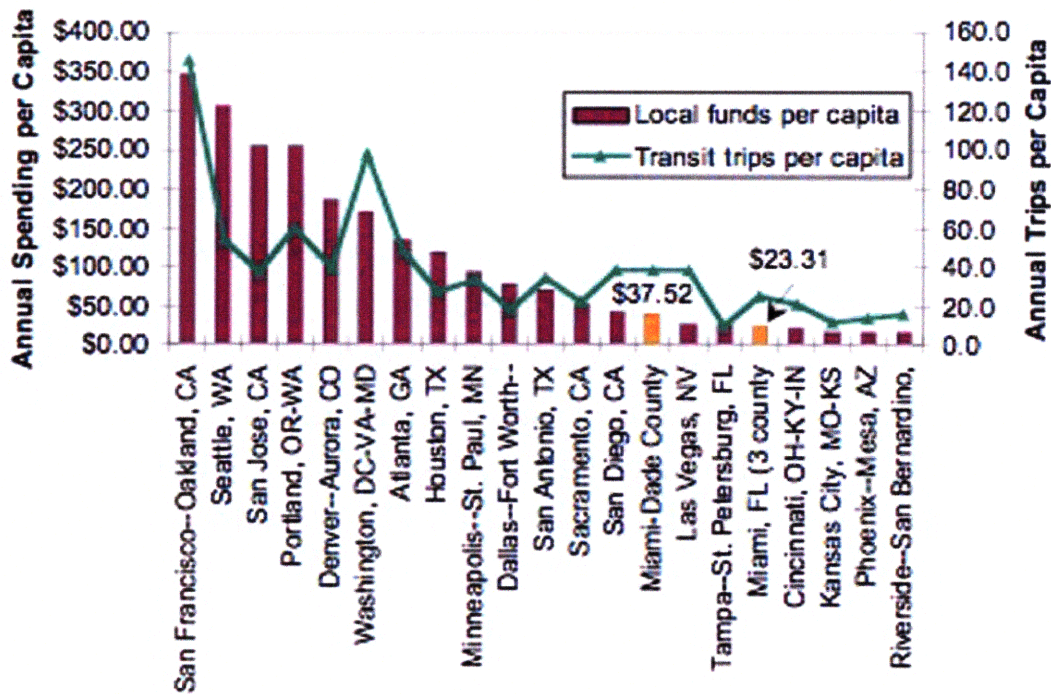
turned to selling land immediately adjacent to Metrorail stations and selling naming rights on Metromover stations (Miami-Dade Transit 2008).

Table 3: Miami-Dade Transit Revenue Sources, FY 2008-2009

Revenue Source	Amount of Revenue (thousands)	Percent of Total Revenue
General Fund Countywide	\$145,743	31.4%
PTP Sales Tax Revenue	\$169,024	36.5%
Transit Fares and Fees	\$110,627	23.9%
State Assistance and Grants	\$27,151	5.9%
Federal Grants	\$0*	0%
Other	\$11,217	2.4%

*Historically the federal government has provided \$4.2 million in funding (Miami-Dade Transit 2008, 17)

Figure 3: Transit Spending and Trips Per Capita



Source: Polzin and Chu 2002

Based on its financial challenges, Miami-Dade Transit ranks poorly against other metropolitan transit systems in terms of investment dollars. The

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View of downtown Miami over elevated Metrorail tracks from South Miami station.



Center for Urban Transportation Research at the University of South Florida conducted a 2002 study that compared Miami-Dade County to other major metropolitan areas based on 2000 Census data. The authors found that Miami-Dade had the greatest need for investment in public transportation, based on data about density, transit funding, transit trips per capita, and congestion delay. As shown in Figure 3, Miami-Dade County spends little on transit per capita relative to the annual per capita trips (Polzin and Chu 2002).

Transit Tax and Fiscal Mismanagement

The reasons for the consistent underinvestment in transit are complex, but management decisions by the MPO and the BCC have caused most of the delays and controversial policies that underlie the funding problems. In hopes of establishing a more consistent source of revenue, the County put a half-cent sales tax dedicated to transit on the ballot four times between 1976 and 1999, all of which failed (Lebowitz and Barry 2008). The MPO, responding to an overwhelming defeat of a transit tax ballot measure in 1999, called off rail expansion plans and turned instead to dedicated bus lanes (Chardy 1999). Two years later, a Miami grand jury called for another go at a transit sales tax; without additional revenue, the community would face “dire consequences” from congestion and transit system failure (Rabin and Weaver 2001).

With external sources calling for sustainable revenue, the transit tax was placed on the ballot again in 2002 with a new campaign focus. County officials

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imagined using the \$150 million in annual revenue towards vastly expanding bus service and creating 90 miles of new Metrorail lines (Viglucchi 2002a). Major transit expansion promised to the voters included 24-hour Metrorail service, free fares for seniors, two new Metrorail lines, and increased number and frequency of buses (Viglucchi 2002a). “When they got [the potential for] a dedicated source of revenue, the only way they could convince people to vote for it was by promising people more than they could deliver,” recalled Yoder (2009).

The potential use of deception in the transit tax campaign added to the already elevated degree of government mistrust held by county citizens. This mistrust indirectly relates to the BCC’s inconsistent relationship between policy creation and enforcement. This deficit of citizen confidence is particularly acute when it comes to transit, where promises and action often diverge. “Talk to bus and rail riders, and it’s hard to find anyone who doesn’t support the [2002] transit tax, even though many don’t quite trust county government,” writes Andres Viglucchi in *The Miami Herald* (2002b). When Miami-Dade voters were polled in 2002 about their voting priorities, the number one issue of importance was “traffic” but “political corruption” was the second-most important issue (Ross 2002). Part of this mistrust stems from the intense politics infused through the MPO, the County Commission, and the Mayor’s office where conflicts often end in standoffs rather than consensus.



Low-density land uses adjacent to the Metrorail in northern Miami-Dade County show underutilization of transit corridors.

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In response, the 2002 campaign tried to focus on building citizen trust and move away from historic corruption. The 2002 proposal also provided for an independent citizens trust to oversee spending, setting up a safeguard against the special interests that typically influenced transportation decisions (Viglucchi 2002a). With a broad array of promises and a campaign strategy to uproot perceived corruption, the 2002 ballot measure was approved by a 2-1 margin (Lebowitz and Barry 2008).

Despite initial support for the tax, the revenue system was implemented by the BCC in a way that weakened citizen safeguards. The Citizens Independent Transportation Trust, “an independent watchdog panel” intending to prevent misspending of the tax, had its power “diluted” from the outset. The enabling legislation, approved by the BCC, created an advisory board with limited power rather than an independent trust. Furthermore, the Trust is controlled by the BCC because they appoint 13 of the 15 members (Lebowitz 2008b). The BCC gave themselves the final say in the spending of tax proceeds (Miami Herald 2008). The citizens’ safeguard against government mismanagement was essentially designed by the BCC to have limited powers.

The BCC also slowed the progress of Metrorail extensions due to the internal conflicts between the commissioners and the MPO. These conflicts caused the County to miss several federal deadlines for rail funding. Commissioners argued internally over which rail corridor should be the priority for expansion, an issue heavily tied to district interests. One corridor option is a nine-mile north-south NW 27th Avenue line through predominantly black districts that was part of the original Metrorail alignments; some blacks still believed they were betrayed in the 1980s when officials rerouted the tracks towards Hialeah at the last minute. A second corridor option is the ten-mile east-west FIU corridor through Latino districts. A statement from Mayor Alvarez that alignment decisions should not be made on historic promises but rather on current data prompted criticism from black commissioners. Black commissioners voted controversially to use the 2002 transit tax proceeds for

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deficit relief so as to keep federal funding applications for the north-south line on track (Lebowitz 2005c). This internal conflict over prioritization of Metrorail expansion escalated project costs and has resulted in the failure to expand in either rail corridor.

The larger failures of the Miami-Dade Transit system are not solely the responsibility of the BCC but rather can be attributed to a series of poor decisions and minor cover-ups by an array of actors. Transit problems have been blamed on overspending and mismanagement by a special office created to oversee transit expansion (Viglucchi 2003), and managers from this agency formed easy scapegoats after the office closed in 2003. Through the past decade, Commissioners and agency officials tried to create band-aid solutions to what was increasingly becoming a financial black hole. Yet the BCC could have abated some of the damage if the Commissioners had jointly recognized the funding inadequacies and used their power to unite the stakeholders in collaborative problem solving.

Without a unified problem-solving approach, the fiscal problems escalated and it became clear that the cost of proposed Metrorail expansions far exceeded the proceeds from the transit tax. A 2005 investigation by The Miami Herald blamed budget failures on unrealistic forecasts presented by County officials during the 2002 campaign, large-scale transit expenditures that were never approved by voters, backroom deals to raise bus driver wages, and an inexplicable drop in farebox collections. Outstanding deficits and fleet replacement added to the transit agency's budget imbalance (Lebowitz and Barry 2008, Lebowitz 2005b). The BCC attempted to balance the budget through the use of tax revenue for operating deficits, but the Board barely got enough votes to approve this use as many commissioners did not believe unpermitted expenditure of tax revenue was an acceptable solution. Mayor Carlos Alvarez vetoed the approval in early 2005 with the knowledge that the BCC did not enough votes to override his veto (Lebowitz 2005a; Lebowitz 2005b; Lebowitz 2005c). Commissioners were divided between a fiscally

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responsible solution and accountability to taxpayers.

The BCC and the Potential for Change

The BCC made a remarkable display of leadership in late 2008 and early 2009 that signaled a potential new direction for transparency in transit management. The Board recognized that the financial situation and the angry constituency were only intensifying with time, and they made attempts to face their shortcomings. Through a public summit and subsequent public hearing, the Commissioners heard citizen complaints and then approved new regulations that allowed 90 percent of transit tax proceeds to be used towards non-capital transit costs. Only three Commissioners dissented, bowing to public outcry of broken promises. New rail and bus projects went from mandated to “aspirational” since tax dollars could be allocated towards routine operations and maintenance for the transit system (Lebowitz 2008c; Lebowitz 2009a; Lebowitz 2009b; Lebowitz 2009c). BCC Chair Dennis Moss convened the public summit, and he convinced a majority of the Board and the Mayor that such an airing of grievances would be necessary to move forward. The Board was able to garner enough support to hold the summit, and commissioners voted by a large margin to make unpopular policy decisions to use tax revenue for operations. The Board did not come together to make these difficult decisions until the system reached a crisis. It remains to be seen if this situation will instruct future commissioners to make unpopular policy decisions as preventative measures before a crisis occurs.

Not only does a transit system in upheaval cause financial distress and citizen protest, it also has negative implications for climate-smart land-use planning. Land-use policies and climate change planning based on transit infrastructure cannot keep up with the annual changes in transit planning. Several transit nodes planned as part of the NW 27th Avenue corridor extension have land-use and development plans in place, based on a train that may never arrive at the station. County planners, therefore, must create concrete

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plans and enlist the support of elected officials and citizens in the face of uncertainty and delay. Since long-range land-use and transportation planning are necessarily inseparable, land-use planning and policy implementation suffers as a result of unreliable transit plans. The BCC might be a natural leadership body to coordinate enforcement of land-use and transit planning, but their fragmented nature has led to inconsistency in both areas.

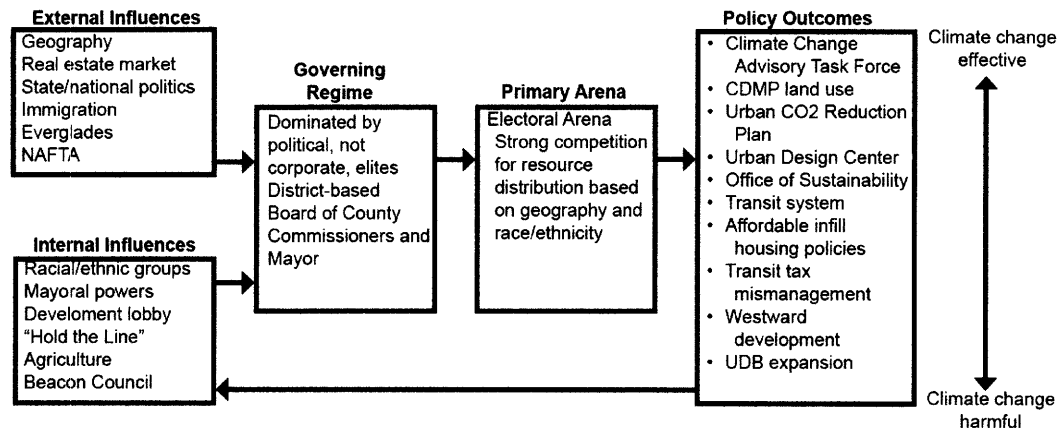
Conclusions

Conclusions

Land-use policy implementation in Miami-Dade County relies on commissioner decisions to bring immediate, localized benefits to their district, whereas climate-smart land-use requires long-term, County-wide coordination. Individual leaders have pushed the BCC to create strong land-use policies with potential to cut GHG emissions. Commissioners may recognize that a policy decision is a climate-friendly, but they face pressures from competing alternatives that offer more direct benefits to their district. The governmental structure that encourages trade-offs between policy enforcement and localized constituent satisfaction has deleterious consequences for land-use and transportation policy. First, in terms of westward sprawl, geographically-based districts ensure that competition for resources will continue to pit immigrant-based western districts against black and non-Latino-white eastern districts, fueling the UDB conflict. Second, on the subject of transit, since the BCC forms the majority of the MPO, all transportation decisions are also subject to divided agendas and spending priorities. The battle over where to extend the Metrorail (north through black districts or west through Latino districts) is one example of commissioner conflict extending into the transit realm.

Figure 4 illustrates how government structure, operations, and influences impact policy outcomes related to land use and climate change. An array of internal and external influences shapes the Board of County Commissioners' activities, which occur in a racially-based, competitive arena. Some of the policies and programs that pass through this system are climate friendly, like the long-standing CDMP containing many smart growth land-use policies that can reduce CO₂ emissions. Others are harmful to climate change goals, like votes to approve large-scale developments outside the UDB. The mixed results of policy outcomes then influence the actions of other internal forces, such as the development lobby and racial/ethnic political segregation.

Figure 4: Regimes and Urban Arenas in Miami-Dade Climate and Land Use



Source: Flow chart adapted from Ferman 1996, Figure 1.1

The racial nature of the district-based divisions complicates the introduction of change in the system. Over a half century of competition and discrimination has created a population deeply sensitized to interracial relations and allocation of resources among racial and ethnic groups. The structural problems are more closely related to geography than to race, but constituents align themselves politically according to race and ethnicity. As evidenced through the County's at-large mayoral election, political party is irrelevant as nearly all voting occurs based on race or ethnicity (Croucher 2002). Especially within the highly immigrant population of Miami-Dade County, race and ethnic relations set off strong emotions and thereby form an invisible fence around political structural reform in the County that leaders of any race or ethnicity are reluctant to cross.

Policy Recommendations for Climate-Smart Land Use

While the current system of district-based interests is fraught with problems, there is no one feasible alternative that would overcome the tendency towards racial barriers and inequities. It would be unacceptable for Miami-Dade to return to its previous political structure in which BCC members were elected at-large but nearly all commissioners were non-Latino white and

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the majority of citizens were Latino and black. The 1993 CO₂ Reduction Plan authors avoided addressing governmental structure as an obstacle to land-use policy implementation, either because it was not an apparent barrier or because it was a politically sensitive issue.

The drawback of Miami-Dade's climate change planning is not the avoidance of governmental structure, but rather the failure to address the tradeoffs involved in making decisions for the good of future generations. Climate-smart land use faces tradeoffs with affordability, economic development, property rights, mobility, and the default desire to take the path of least resistance. These tradeoffs can be addressed through a suite of tools that consider competing pressures in the enforcement of existing land-use policies. These include a more powerful advisory board to oversee land-use decisions, the transparent calculation of the long-term impacts of proposed developments, a temporary moratorium on UDB expansion, and a strategic allocation of funds to promote smart growth land use. Table 4 presents a summary of each proposed recommendation, problems addressed, and the relative associated costs.

Table 4: Policy Recommendations for Climate-Smart Land Use

Recommendation	Description	Problem Addressed	Cost
1. Strengthened land use advisory board	<ul style="list-style-type: none"> • Advises BCC for major land use decisions • Employs a diverse range of stakeholders to determine membership and structure • Requires the BCC to have a supermajority to decide against the advisory board's recommendation • Oversees strategic allocation of funds 	<ul style="list-style-type: none"> • Poor incentives for commissioners to uphold current policy • No body to oversee or enforce long-term land-use and climate change needs 	\$\$
2. Calculated long-term costs of developments	<ul style="list-style-type: none"> • Include long-term impacts on infrastructure, GHG emissions, hydrology, etc. for development (and related land-use change) applications over a certain threshold • Monetize impacts and make these easily accessible to the public 	<ul style="list-style-type: none"> • Myth of "affordable" housing in greenfields • Short-term outlook on BCC land-use decisions 	\$\$
3. Temporary moratorium on UDB applications	<ul style="list-style-type: none"> • Halt UDB applications for the 2011 cycle • Provide County staff with time to develop incentives and policies for infill affordable housing and job creation 	<ul style="list-style-type: none"> • Ease of providing affordable housing through sprawling development • Pace of development that exceeds pace of policy-making 	\$
4. Strategic allocation of funding	<ul style="list-style-type: none"> • Provide incentive for BCC to uphold climate-friendly land-use polices • Fund affordable housing, economic development, TOD, and transit improvements in infill areas • Create affordable housing and employment centers clustered in activity nodes in outlying districts • Purchase development rights from farmers 	<ul style="list-style-type: none"> • Structural barrier of decisions based on district benefits • Poor incentives for commissioners to encourage climate-smart land uses 	\$\$\$

Conclusions

While Miami-Dade has agencies that envision the County's long-term needs, these agencies have limited influence over the decision-making powers of the BCC. An explicit connection between the County's future needs and the enforcement of policies to achieve these needs would better accomplish the land-use goals set in the CDMP and climate change plans. The County already has two boards charged with imagining and planning for future land use and built environment patterns. The Planning Advisory Board advises the BCC on CDMP amendments and other major land-use decisions, and the Built Environment Subcommittee of the Climate Change Advisory Task Force (CCATF) makes recommendations to the BCC regarding land use and buildings to mitigate and adapt to the impacts of climate change.

Either of these groups could be granted greater authority over the land-use decisions of the BCC. In order to avoid a "puppet" group that is effectively controlled by the BCC, the composition and structure of a new advisory group should be determined by group of stakeholders representing citizens, County Commissioners, County planners, and CCATF members. One potential power for the advisory group should be the review of development or land-use applications of a determined size or location and the recommendation to approve or deny the application based on strict measures of consistency with CDMP policies. If the group advised denial, the BCC would need a supermajority (perhaps three-fourths or another determined proportion) to approve the development. The advisory group could also be charged with managing the strategic allocation of funds to incentivize climate-smart development. The actual structure of the group should be developed to ensure that the group's power is not weakened or controlled by the BCC or any other agency and that the group advances the climate goals of the County. Long-standing advisory commissions can help ensure continuity in land-use and climate decisions even through changes in leadership and finances.

Second, the County should require that applicants for land-use amendments or developments over a certain threshold calculate the long-term

monetary impacts of the proposed change. Calculated impacts should include infrastructure improvements and costs, such as the creation and maintenance of water, sewer, and transportation systems. Long-term hydrologic and other environmental impacts, such as new stormwater management techniques, can be monetized as well. The Department of Planning and Zoning laid the foundation for these cost calculations in their Residential Feasibility Study, which compared costs of infill and sprawl housing and arose in response to the CO₂ Reduction Plan. The impact calculation should also estimate the GHG emissions that will result from the proposed use compared to the current use of the land; ICLEI software already in use by Miami-Dade County's Office of Sustainability can aid in emissions calculations. Impact analyses should be verified by appropriate County staff and made easily accessible to decision-makers and the general public through the Internet and public hearings. A calculation of the hidden costs of sprawling developments would not necessarily change behavior, but the transparency of this information would make it more difficult for commissioners to endorse sprawling developments as affordable.

A third tool to help Miami-Dade County regain control of its land-use patterns is a moratorium on applications to expand the UDB for the 2011 cycle. In the current regulatory climate, developers and landowners can make a good case to expand the UDB for reasons of affordable housing and job creation. The County must find solutions to create affordable housing and jobs in infill areas near existing transit and infrastructure to realize the land-use patterns that will reduce its GHG emissions. Such solutions face uphill battles and need additional time for implementation and refinement. A moratorium on UDB applications for at least one cycle would allow County staff to develop or improve policies that would lessen the need for westward development. This strategy rests on the hope that County agencies could present convincing arguments or measurable results at future UDB hearings that prove affordable housing and jobs can be found in smart growth areas.

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The County has already begun the creation of supplementary policies for infill affordable housing that strengthen the enforcement of smart growth development policies, but these policies face challenges in receiving adequate County funding and support. The Miami-Dade Department of Planning and Zoning (DPZ) submitted new CDMP amendments that would grant moderate density bonuses to all developers providing affordable housing or more significant density bonuses and a highly expedited approval process for mixed-income developments that meet locational criteria. These criteria involve proximity to transit, parks, and schools; energy efficiency; and infrastructure concurrency. The amendments represent a balance between the need to encourage growth in desired areas and the reality that more conditions placed on development approvals would increase the expense for developers (Davis 2009).

While the earliest these amendments could be enacted is August 2009, they are still several battles away from adoption. The limited number of qualifying sites for infill affordable housing automatically decreases opportunities, and it will take a pioneering developer to prove that this can be successful. The density bonuses and streamlined development may not be enough to encourage South Florida developers to battle community opposition and take a risk in a poor market. Additionally, planners anticipate opposition to the higher densities proposed, the expedited review process, and the preference for government-sponsored sites (Davis 2009).

Finally, the County must strategically provide the financial support to control its long-term growth. An important lesson emerges from the first decades of TOD and Traditional Neighborhood Development in the County: developers are reluctant to take a risk on a new type of development, but they quickly latch onto a concept that has proven effective by a pioneer who successfully takes on that risk (Plater-Zyberk 2009). Tax credits, density bonuses, technical assistance, and especially streamlined approval can encourage developers to build affordable housing in infill or redevelopment areas and

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Affordable rental housing near Allapattah Metrorail station, developed in conjunction with the Miami-Dade County Office of Community and Economic Development.

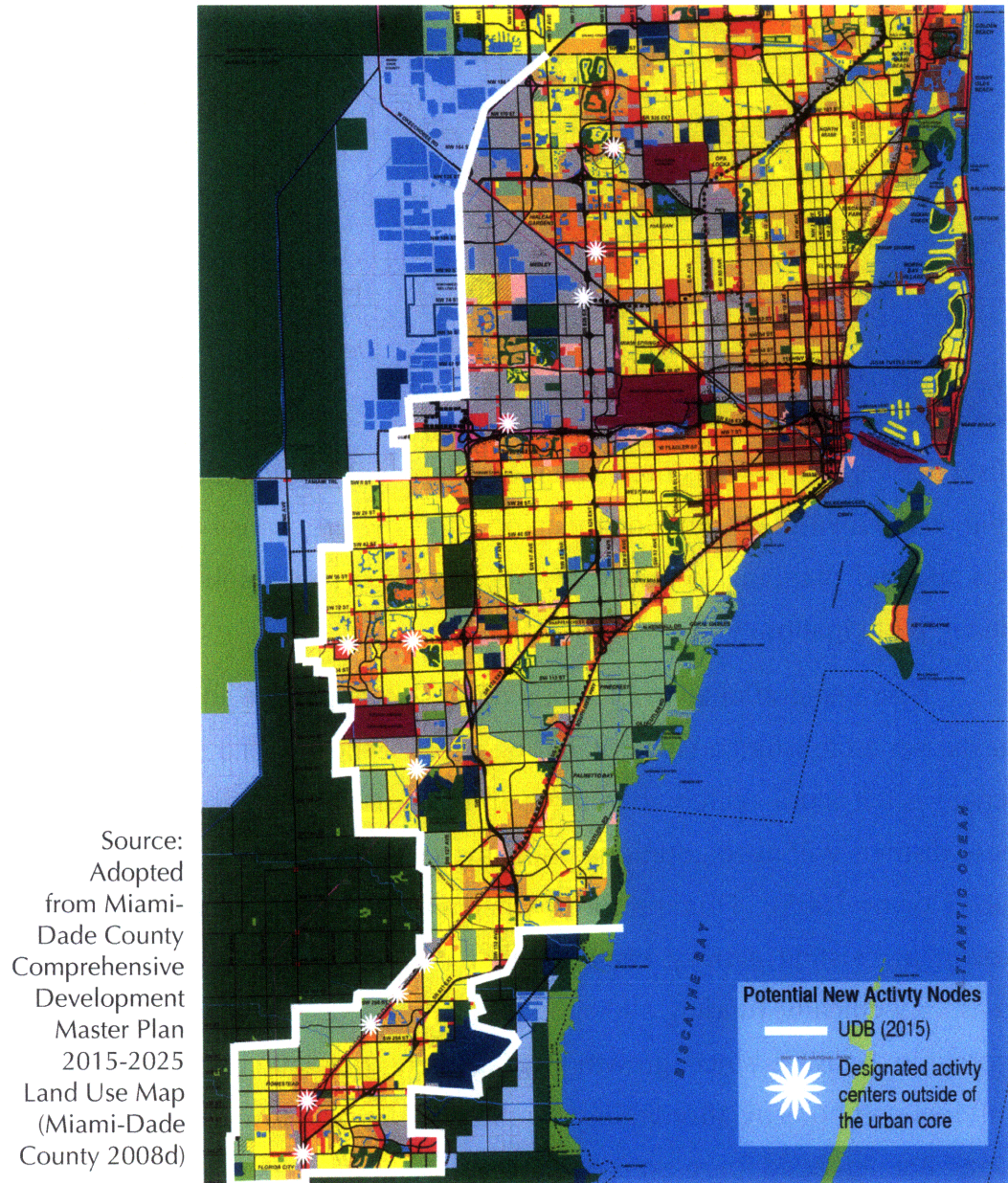
offset the losses felt in districts where development restrictions are enforced. Infill areas can also use funding for aging infrastructure, transit improvements, and targeted planning to create livable, denser urban neighborhoods with citizen participation.

A strategic allocation of funds must also appeal to the citizens and businesses established on the urban fringes. Since the loss of a potential future benefit is felt more acutely than the gain of an uncertain benefit, citizens in these districts will need additional incentives to accept a change in the status quo (Downs 2005). Funding for this part of the County should encourage growth in existing activity centers rather than in undeveloped or unused areas. Specifically, funding allocated to districts near the UDB must address affordable housing since growth management regulations are associated with reduced housing affordability (Anthony 2003) and low-cost low-density homes are defended for reasons of affordability. Job creation and agricultural land values are also cited for UDB expansion. If the County can finance solutions to these problems, Commissioners lose their justification to approve sprawling developments.

Districts near the UDB may always be more car-dependent than those in the urban core, but the creation of mixed-use nodes with a greater availability of goods and services can reduce trip length and frequency. The County

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Figure 5: Potential New Activity Nodes Outside of the Urban Core



has already designated several Community Urban Centers and Metropolitan Urban Centers in the western and southern reaches of the County, as show in Figure 5. These activity centers are ideal starting points for densification and adaptive reuse or redevelopment of existing buildings would be integral to this strategy. In several Urban Centers, existing strip commercial uses can be transitioned into mixed-use centers, as was done successfully with Mashapee

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Commons in Massachusetts and Santana Row in San Jose, California. The County should designate funds to create duplexes, moderate density multi-family developments, live-work units, and “cottage”-style small homes within one-half mile of existing activity centers. These housing units would be more affordable due to their smaller size, but some units could be restricted specifically for affordable or workforce housing. Existing citizens should be empowered to create design standards to allow smooth integration of new units; to this end, the County’s Urban Design Center can hold charrettes to engage citizens in the planning process. Residents of these new units could be given free transit passes valid for one to three months after occupancy. This incentive program would build the ridership for bus routes that traveled between the activity centers on the urban fringe, further reducing VMT.

Activity centers and existing business and industrial parks should be targeted for new job creation. Established business parks and warehouses could be densified vertically to become community employment centers. The County may also fund an incubator program for small businesses in vacant warehouses or offices of employment centers, granting preference for residents within a five-mile radius. The provision of tax credits for businesses using existing commercial nodes could actually save the County money due to reduced need to expand infrastructure to underserved areas. Once employment centers are established with more employees, bus routes or point-to-point transit-on-demand service could be targeted between employment centers and other nearby activity or residential centers.

Lastly, funds could provide farmers who own agricultural land outside the UDB with a more profitable exit strategy. Agricultural easements or the direct purchase of farmland development rights are established methods to maintain lands in agricultural use (Platt 1996). Bill Lyden, a nursery owner in south Miami-Dade County, believes a program established between the County and agricultural landowners would help ease development pressures on farmland (2009).

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The strategic allocation of funds faces challenges, the greatest of which being a scarcity of resources with which to finance these programs. From a long-term perspective, investment in smart land-use patterns now can save millions of dollars in future infrastructure and climate change adaptation costs. The strategic nature of the funding – in which citizens and commissioners feel real benefits to their communities – is an important motivation to influence development approvals in a cooperative manner that benefits the entire County. Funding allocation in which all constituencies get a share of the pot should broaden citizen support for allocation of public funds into this program. The underlying goal is to motivate commissioners to work cooperatively to make land-use decisions based on the County's long-term interests. Strategic allocation of funds should be significant enough to provide an alternative to sprawl in the urban fringes and to facilitate affordable housing and investment in the urban core.

Opportunities for a Climate-Smart Future

The implementation of these policy recommendations would strengthen Miami-Dade County's existing potential for progressive climate and land-use actions. The County covers a population and geographic area that rivals most regional governments, and the County has the added advantage of regulatory power over its inhabitants, which brings the opportunity to coordinate regional systems for a greater impact on land-use patterns. Typically, regional governance in the United States is weak because local governments are reluctant to cede authority to a regional body (Dyble 2008, 288). Local governments fear that they may sacrifice concrete benefits in their own jurisdiction for the sake of a benefit that will be diluted and dispersed throughout the region. Similarly, the structure of the BCC encourages commissioners to bring local benefits to their district or else make the tough sell to their constituents that long-term County needs supercede short-term district needs. The County can coordinate quasi-regional systems only if commissioners forgo their district-based mindsets.

Regional governance leads to improved management of transportation systems, ecosystems, development markets and other urban and natural systems that are not confined to city limits. Research points to powerful regional governance as a key tool towards achieving urban sustainability (Wheeler 2000, Rosan 2007). Furthermore, South Florida is a national leader in regional coordination for Everglades preservation (Downs 2005), signaling a capacity to shift local power to regional bodies in recognition of larger goals.

Even within the problematic political structure, Miami-Dade has positive signs of citizen participation and climate advocates. Many citizens are active and aware of key issues such as the UDB and the trials of the transit tax, as evidenced by groups such as Hold the Line and packed hearings about tax expenditures. Understandably, a large percentage of residents are immigrants and/or have limited incomes, and activism in politics takes a backseat to the provision of basic needs (Plater-Zyberk 2009). However, a base of activism may be the beginning of a culture of civic participation. Citizens who are more engaged with land-use and other political issues can better understand the true costs of sprawl and the long-term costs of climate inaction

Finally, Miami-Dade County has a team of climate advocates who can envision a County with smarter land-use patterns. Elected officials, agency staff, academics, and citizen supporters work hard to develop policies and create more climate-friendly developments and infrastructure, both from the top down and from the bottom up. These advocates are trying to stay innovative with small area charrettes and incentives for affordable housing in infill areas. They have created CDMP policies that encourage infill, mixed-uses, higher densities, and integration with transit systems. All they lack is a leadership body to provide the funding and enforcement to bring these ideas to life. While BCC members declare support for the Climate Change Advisory Task Force, those within the task force understand that many of the recommendations will not make it through the BCC process (Hefty 2009). If the BCC deepened their support of climate change action through incentives

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and stricter land-use enforcement, more of the efforts by planners and climate advocates could bear fruit.

Miami-Dade County has made important progress in the land-use and climate arena since the early 1970s. The cultural attitudes, climate advocates, geography, racial tensions, and especially the district-based commissioner political structure all interacted to bring the County to its current slate of policies and degree of action. This analysis has uncovered how a fragmented political structure has impeded enforcement of land-use policies related to climate change. While the Miami-Dade dynamic may be unique, the case study can provide key lessons for other jurisdictions about the importance of creating a political structure in which the greater, long-term benefit of the jurisdiction is emphasized over short-term special interests. Miami-Dade's opportunities for progressive land-use and climate actions will continue to make it an intriguing example in the future of urban governance and sustainability.

Miami-Dade County is truly international in its residents, its economy, and the rhythms of everyday life. Fittingly, some of the best ideas in the world are at play in Miami-Dade to meet the challenges of climate change, environmental protection, and land use. Unfortunately, conflicts inherent in the joining of diverse cultures block the progress of these ideas. Whether the County can overcome these challenges to embody international leadership in climate change and land use will depend on the commitment by citizens and leaders to plan for a future that meets the economic, social, and environmental needs of Miami-Dade County.

Index of Acronyms

- BCC: Board of County Commissioners
13-member elected body responsible for major governance decisions in Miami-Dade County
- CCATF: Climate Change Advisory Task Force
Advisory board to provide climate change-related technical assistance, identify climate change impacts, and recommend mitigation and adaptation measures for the County
- CDMP: Comprehensive Development Master Plan
Master plan that includes future land use designations and guiding policies with which all land use regulations must comply
- DPZ: Department of Planning and Zoning
Department responsible for comprehensive planning, zoning, charrettes and small area plans, and other land use issues
- GHG: Greenhouse gas
Air pollutants, including carbon dioxide, that contribute to global climate change
- GLUMP: General Land Use Master Plan
The first master plan adopted by Miami-Dade County in 1976
- ICLEI: International Council for Local Environmental Initiatives
Worldwide council of local governments engaged in climate change action
- LBA: Latino Builders Association
Lobbying and professional group for the Latino construction industry in South Florida
- MDT: Miami-Dade Transit
Department responsible for mass transit in Miami-Dade County; includes Metrorail train, Metromover, Metrobus, and paratransit
- MPO: Metropolitan Planning Organization
21-member body that makes final decisions on all policies, plans, budgets, and regulations for transportation projects in the County

Index of Acronyms

RTZ:	Rapid Transit Zone <i>County designation for the land occupied by the Metrorail and its stations</i>
TMT:	Transit Miles Traveled <i>A calculation of the amount of miles traveled by persons using transit; can be calculated in aggregate or as a per-capita average</i>
TOD:	Transit-Oriented Development <i>Higher density, mixed-use development within one-half mile of a high-quality transit station</i>
TTI:	Texas Transportation Institute <i>Research institution that publishes annual Urban Mobility Report with comprehensive transportation data for 85 U.S. cities</i>
UDB:	Urban Development Boundary <i>A line that delineates the area in Miami-Dade County designated for urban development and served by public infrastructure</i>
VMT:	Vehicle Miles Traveled <i>A calculation of the amount of miles traveled by personal vehicles; can be calculated in aggregate or as a per-capita average</i>

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List of Interviewed Persons

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Name	Position	Department	Organization/ Company	Interview Date
Herb Balfour	Outreach	DERM	Miami-Dade County	February 6, 2009
Maria Batista	Principal Planner	Transit	Miami-Dade County	January 6, 2009
Jeff Berkowitz	President		Berkowitz Development Group	February 2, 2009
Gilberto Blanco	Principal Planner	Planning and Zoning	Miami-Dade County	January 5, 2009
Paula Church		Metropolitan Planning	Miami-Dade County	January 5, 2009
Rosa Davis	Principal Planner	Planning and Zoning	Miami-Dade County	February 26, 2009
Developer (requested to remain anonymous)	Owner's Representative		Development company associated with Downtown Dadeland	February 2, 2009
Wilson Fernandez	Transportation Systems Manager	MPO	Miami-Dade County	January 6, 2009
Bertha Goldenberg		Water and Sewer	Miami-Dade County	February 3, 2009
Glen Hadwen	Environmental Programs Manager	Office of Sustainable Initiatives	City of Miami	February 2, 2009
Nichole Hefty	Climate Change Coordinator	DERM	Miami-Dade County	February 6, 2009
Shirley Lowe			Sierra Club	February 10, 2009
Bill Lyden	Owner		Farm Life Nursery	February 17, 2009

List of Interviewed Persons

Name	Position	Department	Organization/ Company	Interview Date
Sean McCrackine	Environmental and Land Use Policy Aide	Office of Commissioner Katy Sorenson	Miami-Dade County	February 24, 2009
Jim Murley		Center for Urban and Environmental Studies	Florida Atlantic University	February 11, 2009
Devesh Nirmul	Director	Office of Sustainability	Miami-Dade County	January 5, 2009
Jack Parker	Professor Emeritus	Environmental Studies	Florida International University	February 3, 2009
Elizabeth Plater-Zyberk	Dean	School of Architecture	University of Miami	February 11, 2009
Carolyn Read	Right-of-Way, Utilities and Leasing	Transit	Miami-Dade County	January 3, 2009
Harvey Ruvin	Clerk of Courts		Miami-Dade County	February 2, 2009
Napoleon Samoza	Transportation Planner	Planning and Zoning	Miami-Dade County	January 5, 2009
Dawn Shirreffs	South Florida Community Organizer	Hold the Line	Clean Water Action	March 6, 2009
Ron Shuffield	President		Esslinger-Wooten-Maxwell, Inc.	February 4, 2009
Shailendra Singh	Director	Urban Design Center	Miami-Dade County	January 5, 2009
Tom Spehar	Section Supervisor	Planning and Zoning	Miami-Dade County	January 5, 2009
Doug Yoder	Deputy Director	Water and Sewer	Miami-Dade County	February 3, 2009