

FROM COMPREHENSIVE PLANS TO SUSTAINABLE ENVIRONMENTS: THE  
INCORPORATION OF SUSTAINABLE PRINCIPLES INTO FLORIDA'S GROWTH  
MANAGEMENT FRAMEWORK.

By

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To my parents and my grandmother Betty K. Poucher

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The State of Florida has recently undertaken several initiatives aimed at sustainable development. These include the Century Commission for a Sustainable Florida, Executive Orders from the Governor ordering significant cuts in Greenhouse Gas emissions, and bills that make changes to growth management law and the Florida Building Code. Taken together, these offer major shifts from previous regulations and will require changes in the structure of resource permitting and growth management in the state.

Previous efforts to change state environmental and growth management regimes, such as those to implement a state comprehensive plan and efforts at alternative planning processes, have fallen far short of their intended goals. These failures are due in large part to changing political fortunes, economic considerations and the existence of a complex permitting system that has so far lacked the teeth to provide major leadership.

This thesis examines the range of new policy proposals and legislation and offers recommendations on needed changes to the growth management structure based on a range of sources. It also evaluates the programs and agencies tasked with their implementation for their effectiveness.

## CHAPTER 1 INTRODUCTION

The built environment contributes significantly to the total energy and water use in nations throughout the world. In Florida, there are currently many initiatives aimed at improving sustainability through a number of means including: water and wastewater management, comprehensive planning and growth management, green building, energy use, and ecosystem preservation and restoration. Taken together, these actions represent a substantial effort toward a sustainable future. This thesis will seek to determine the effectiveness of current regulation and the role that planners can play in coordinating the efforts of diverse groups in promoting environmental sustainability. This study will include four main areas:

1. Greenhouse gas emissions,
2. Water use and reuse,
3. Land use and transportation patterns, and
4. Protection and restoration of native ecosystems and rural land uses.

Planners can have significant influence in all of these areas, and their involvement is necessary to achieve any measure of environmental sustainability.

These issues and programs take place in the context of nationwide and worldwide concern over environmental issues that are both local and global in scale. Not surprisingly, they are also the problems likely to dominate future planning efforts as urbanized areas continue to grow and the problems of rapid urbanization affect the living standards of residents. Planning ahead to minimize the negative aspects of urbanization should and will continue to be a primary role for the planner.

With the consistent increase in Florida's population it is imperative that we begin to plan for how this growth will affect the state in a holistic manner. The carrying capacity of any

system can be surpassed for only so long before the human population feels consequences. Therefore, lessening the impact of current and future residents on the environment will be a major focus of planning in coming decades.

Planning for sustainable development in Florida may mean a substantial deviation from past practices, and this part of the equation may take some time to change. The general pattern of development in the state has been for communities to grow into their suburbs on formerly agricultural land and native ecosystems. Urban growth boundaries have been expanded to accommodate this growth and new towns have been created in the process. Along with this growth there has been a corresponding increase in energy and water use and growth of greenhouse gas emissions along with large-scale interruptions to many natural systems (IPCC 2009). These issues threaten the long-term viability of the state's environmental health and its future economic and social health. This thesis will provide a summary of the actions taken by the state and its departments to address these problems and evaluate the success of these programs. It will seek to answer three questions: 1. Can long-term environmental sustainability be achieved through existing mechanisms? 2. How can policies be changed to provide the desired level of sustainability? 3. What should be Florida's sustainable development policies?

### **Sustainability Defined**

In 1985, the UN World Commission on Environment and Development provided a boost to the idea of sustainability with the definition of sustainable development as "that [development] which meets the needs of the present without compromising the ability of future generations to meet their own needs" (Bruntland Commission 1987).

This definition has since been further refined to include a number of concepts very useful for planners in promoting sustainability in comprehensive planning. Berke and Conroy (2000) included the indicators: harmony with nature, livable built environments, place-based economy,

equity, polluters pay, and responsible regionalism. They then used these indicators to evaluate comprehensive plans for sustainable development based on the definition that:

“Sustainable development is a dynamic process in which communities anticipate and accommodate the needs of current and future generations in ways that reproduce and balance local social, economic and ecological systems, and link local actions to global concerns” (Berke and Conroy 2000, p.23). The European Commission measures progress through indicators that provide a subjective interpretation of this definition discussed in further detail below.

Developing criteria for promoting and measuring sustainability has been one of the biggest problems in the implementation of sustainable development practices. A criterion for a development or society to be considered ‘sustainable’ is “the yardstick against which a sustainability indicator is measured (i.e., the goal or ‘ideal’ condition in the relative comparison of indicators)” (Sahely 2004, p.73). Therefore the measurements of progression (or regression) toward the criteria, or goals, of sustainability are measured by indicators such as air or water quality.

The Century Commission for a Sustainable Florida has developed a set of proposed sustainability indicators that measure the quality of the environment, economy and social aspects of the community. Until these are adopted by the legislature though, they mean very little. Another aspect of defining sustainability, is that in addition to coming up with the tools to measure progress on sustainable development, we must have goals or benchmarks along the way. These can be set for each indicator, and progress can then be monitored year to year or at regular intervals. A good example of this is reducing carbon emissions. If we take the governor’s plan for an 80% reduction in emissions by 2050, that corresponds to roughly reducing carbon

emissions by 2% per year from 1990 levels. This indicator can be easily monitored, but reaching the benchmark is what is important.

### **Purpose of Study**

The purpose of this study is to compare the different regulatory strategies used to incorporate sustainable practices into the comprehensive planning process and environmental regulations of the state of Florida. Many different federal, state, and local initiatives have been undertaken in recent years to lessen the footprint of urban areas. Chief among these are the reduction of energy use in buildings and the desire to improve the living and working environments where people spend a large percentage of their lives. In addition, transportation options, land use and environmental policy, and water and air quality affect both the quality of life and the natural resources of the state.

This study will seek to compare and analyze the strategies of different agencies, commissions, and local governments in Florida to evaluate the success of their programs, determine what factors led to that success, and take lessons from their experiences that can be applied elsewhere. Key in these objectives will be to evaluate the role of planners in this process and to what extent the planning profession has a role to play in encouraging sustainable development through the comprehensive planning process. The State of Florida has long been a leader in environmental and land use regulation, and although many of the goals of these regulations have not been achieved, the framework is there for significant action to take place. Full use and expansion of existing powers may be necessary to achieve many environmental goals, but state, regional and local powers may not need to be increased significantly to have a powerful effect on the programs examined here. Therefore, this paper will examine what short- and long-term actions may be necessary to achieve the stated policy goals.

## **Climate Change, Population Growth, and the Case for Sustainable Development**

With world population expected to rise significantly in the coming decades, a large increase in buildings of all types is forecast to accommodate expected growth (Urban Land Institute 2007). This will be especially important in urban areas, where most of the population growth is expected to occur. Today, more than one half of the world's population lives in urban areas. This population is living, or seeks to live, in a western standard enjoying a high quality of life, and therefore a high degree of energy use if existing patterns are followed for future development. With a projected increase to over 20 million residents by 2020, Florida faces a major wave of population growth (US Census Bureau 2005) and planning for this population increase can take place in a business as usual model or take a new approach that seeks to protect the resources and quality of life in the state.

Increasingly, global environmental issues such as climate change are becoming a priority in many different professions, and planning and building construction are no exception. The built environment consumes 30-40% of total energy use worldwide (United Nations Environmental Program 2007). While this number varies significantly by country, it is responsible for a large share of the total emissions in developed countries and is often the largest user of energy in the developing world. One reason that buildings have not become more efficient is the lack of accountability between builders and the eventual occupants of the buildings themselves. This lack is due to the different considerations between developers and eventual tenants. While a tenant may desire low operating costs for a building over time, they may not be willing to pay more up front for a healthier or more efficient building. Because of these very real economic concerns, builders have been slow to adopt energy efficient technologies, but as concern about global environmental issues has increased, so have the options for energy efficient buildings. This emerging environmental ethic is especially true in

the construction industry where green building is increasingly seen as a requirement for future projects rather than an option (UNEP 2007).

**Climate Change and the Built Environment.** As discussed above, the share of the built environment in total energy use is quite large. This corresponds to an equally large emission of carbon dioxide through the use of fossil fuels to produce this energy.

Buildings are large users of materials with a high content of embodied energy. Embodied energy corresponds to energy consumed by all of the processes associated with the production of building materials and components. This includes the mining and manufacturing of materials and equipment. Every building is a complex combination of many processed materials, each of which contributes to the building's total embodied energy. Embodied energy is proportional to the level of processing required by a material. The more complex the material is and the greater the amount of processing that is required, the higher is the amount of energy consumed. High levels of embodied energy imply high levels of pollution at the end of the production line, as the consumption of energy usually results in emissions (UNEP 2007, p.14).

In addition, the spatial characteristics of development and the transportation links between developed areas contribute significantly to the total energy use of the state. As sea levels are projected to rise over the coming decades, planning for the consequences of a changing climate and examining our role in the problem and its solutions is only prudent. Climate change may mean more frequent flooding and potentially stronger or more frequent hurricane activity. As vulnerable as the state is to these events, planners must examine what can be done from a global perspective to lessen the problem, and what can be done locally to adapt to a changing world while still accommodating a growing population.

#### **Definition of Environmental Sustainability for the Purposes of this Paper**

This thesis will use the indicators of sustainability proposed by the Century Commission for a Sustainable Florida and propose additional measures that may lead to a more independent way of evaluating the state's progress. Specifically, this paper will examine the following measures and their goals:

1. Greenhouse gas emissions (GHG) and a stated goal of 80% reduction by 2050.
2. Efforts at reducing water use to sustainable levels will be evaluated. The state has experienced frequent droughts and increased growth has led to unsustainable water use resulting in the degradation of natural systems including rivers and aquifers.
3. Land use and transportation patterns. The sprawling land use patterns in the state and their associated transportation networks lead to a number of environmental consequences. Efforts to guide future growth and transportation options will be evaluated for their goals and likely outcomes.
4. Protection and restoration of natural ecosystems and preservation of rural land uses. Florida sees large rates of conversion from agricultural and natural lands to urban and suburban uses. This sprawl leads to the degradation of natural systems and poor development patterns. Efforts to preserve native ecosystems and rural land uses and economies will be evaluated.

These indicators, taken as a group, will provide a good measure of the actions being taken in Florida, and these actions will be evaluated in terms of how they expect to achieve the above goals. The environmental indicators will also be evaluated for their positive and negative contributions to economic and social sustainability measures. These indicators of environmental sustainability have been chosen because of their relationship to Florida's growth management framework and the existing regulatory bodies that govern these resources. This choice is intended to reflect the easiest approach to implementation without large scale changes to regulatory bodies.

## CHAPTER 2 LITERATURE REVIEW

### **Introduction**

This review focuses on progress toward sustainable development in the State of Florida and elsewhere. The purpose of the review is to examine the relevant research and action taken by governments to address present and long-term environmental issues. Many actions have been taken in recent years by governments around the nation and world to address common problems related to environmental degradation, define the scope of a sustainable society in the future, and adopt measures at national, regional, and local levels to meet those goals. As more states and countries adopt climate change mitigation policies and land-use policies designed to promote efficient use of resources, examining the success of these regulations and if necessary, changing them to reflect new knowledge or conditions is important for planners in implementing policies to encourage a more sustainable environment.

With the Governor's new climate change policy, House Bill 697, and the Century Commission for a Sustainable Florida, planners must consider how to achieve the goals stated in these bodies and legislation through new and existing mechanisms. These and other long-term shifts toward a sustainable future will increasingly be a concern for planners, and comprehensive plans may have to be rethought with these goals in mind. Despite all the programs that the state is pursuing toward a more sustainable Florida, little research has been conducted to evaluate them as a whole. The lack of holistic research is partly because of the dispersed nature of these programs, both geographically through local governments and departmentally through various state departments, making measurement of progress difficult and limiting the application of successful programs because of scope, geography, or mission. The lack of a coordinating authority is one central problem here, but lack of coordination between levels of government and

departments is a serious problem for the successful implementation of a plan to move the state toward a more sustainable future.

### **Planning For Sustainable Development**

Many proposed models exist for the form that sustainable development should take and how sustainability policies should be implemented in communities. In the context of planning, strategies include land use policies to encourage dense and low-impact development, preservation of agricultural and environmentally sensitive lands and multi-modal transportation plans tied to land use and carbon emissions reduction strategies. These strategies come together in the comprehensive plan.

Kent (1964) describes the purposes of the general plan as: Improving the physical environment of the community, promotion of the public interest rather than the interests of specific groups within the community, facilitation of democratic determination of community policies, coordination of political and technical aspects of community development, injection of long-term considerations into short-term actions, and to bring professional and technical knowledge to bear on political decision making processes. These purposes expand on the general theory of the health, safety, and welfare of the community as being the realm of the planner. In adapting the idea of the general plan to ‘ecocities’ Register (2006) proposes a centers oriented development model, transfer of development rights (TDR) ordinance, innovative and restorative ecological demonstration projects, and the development of funding mechanisms for these policies. Register refers to these policies as being an ‘ecocity amendment’ to the general plan designed to push the existing framework in a new direction. Common (1995) suggests that no “solution” exists to the problem of creating a sustainable society rather, the goal is to “address the problems of poverty and inequality while also minimizing threats to ecological sustainability” and understanding that measures of ecological sustainability always involve some

imprecision. This assertion is echoed by Carley and Christie (2000) who point out that the role of government in managing emerging problems such as how to develop sustainably require “prospective thinking” including cooperation between agencies and strategic management of major issues in society because of the complexity of managing sustainable development. Cooperation is especially important because of the wider ecosystem implications of expanding urban areas and the necessary coordination among agencies and governments to minimize negative consequences.

In a report on urban ecological footprints, Rees and Wackernagel (1996) discuss the resource use of city dwellers and the relationship of that usage to the larger ecosystem. They conclude that in North America, an average person uses roughly three times the energy and resources of their ‘fair share’ of global land area. That is, the total number of people in the world divided by the total land area. They argue for dense urban systems with less reliance on automobiles, increased reliance on local and regional sources of energy and goods, and preservation of ecosystems as the major tools for lessening the impact of urban areas. Additionally, the authors state that “no city or urban region can achieve sustainability on its own,” and that protection of rural areas is a prerequisite for sustainable cities (Rees and Wackernagel 1996, p.236). This regional perspective is valid, but coordination between government levels to achieve this goal is particularly difficult when a perception of competition exists among governments for financial or natural resources. In the absence of strong regional regulatory bodies, these solutions may be difficult to implement. This fair share approach follows other thinkers who advocate harmony with natural systems, human health, spiritual wellbeing, and livable built environments as the tenets of sustainable or ‘green’ communities (Berke 2008). Daniels (2009) further characterizes urban environmental planning as “the push

for air and water quality, energy conservation, walkability, multimodal transit, green spaces, social inclusiveness, and ultimately, sustainability” (Daniels 2009 p.188). These planning goals fairly sum up what environmental planning should encompass from the urban perspective but lack the regional context that provides monitoring for much of the air and water quality and other measures such as ecosystem protection. Daniels counters by pointing to the idea of an ecological footprint of a city and the fact that this footprint may extend well beyond the geographic area of a community.

Brugmann (1996) points to the United Nations Conference on Economic Development (UNCED) in 1992 as a turning point during which the goal for the UN Conference on Human Settlements began shifting its priorities away from purely housing toward sustainable human settlements. In these conferences, the UN stated that: “local authorities construct, operate, and maintain economic, social, and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and sub-national environmental policies” (Brugmann 1996 p.363). This argument that sustainable development can only be implemented at the local level is complemented by their assertions that traditional environmental planning is not sufficient for achieving sustainable development goals. While there may be truth to the assertion that local implementation is the most effective way to direct progress toward environmental goals, this is only true if local authorities have strong mandates and oversight from state and/or regional authorities.

Campbell (1996) argues that sustainability may not be a useful concept for planners because the goal is too far away to measure progress substantively. The concern here is that governments will race to adopt ‘sustainable planning’ without actually knowing what it means. That by simply calling their activities sustainable, governments will believe that they are

conducting sustainable planning whether or not measurable progress is being made. Campbell (1996) cites the economy, environment, and social equity as the foundations for sustainable development, and identifies conflicts between each of them: property conflicts arising from disputes about the highest value use of land; resource conflicts between environmental, social, and economic needs; and development conflicts between social equity and environmental conservation. This analysis takes into account that if people do not see the benefits of sustainable development in their pockets, they are unlikely to support its broader application, however, if a plan is formed and indicators measured year by year, progress on sustainability goals can be easily measured. Nelson (2004) affirms this process but points to the connectedness between indicators. In health, transportation, housing, education, and employment, he points to spending growth rates and examines how that money might better be spent on a sustainable future if a wider range of impacts were considered when policies are created.

The European Union (EU) has developed a set of 10 common indicators to measure progress in sustainable development. Some of these such as local contributions to climate change, ambient air quality, and noise pollution can be easily and objectively measured as environmental indicators. Others such as citizen satisfaction with the local community, sustainable management of local government and business, and support for products that promote sustainability are more subjective indicators. Finally, quality of life indicators such as local mobility and passenger transportation, children's journeys to and from school, sustainable land use, and availability of local public areas and services are indicators that planners are accustomed to measuring. These indicators provide a useful set of sustainability measures and should be considered by planners elsewhere in determining measures of sustainable

development. Some of these indicators are not easily measured however, and do not provide an objective way to measure progress (European Common Indicators 2009).

Florida has embarked on a set of locally monitored indicators that provide a vision of what a sustainable state will look like. In a report to the Century Commission, the Jacksonville Community Council Inc. (JCCI) provided a list of possible indicators to be used in measuring sustainability progress in Florida. Using the three main tenets of economy, environment, and society, the authors offer over 50 indicators. For a sustainable economy they sub-divide into housing accessibility, educational opportunity, and economic prosperity. Each of these categories has many sub-indicators, such as literacy and high school graduation rate for education. For environmental measures, the focus is on environmental protection, growth management, responsible energy use, and transportation efficiency. Sustainable society indicators measure community health, safety and security, arts, culture and recreation, civic engagement, and social strength. The indicators proposed are exhaustive, and combine a number of proposals from around the state as well as other states considering indicators of sustainability. In addition, most of the indicators suggested are currently measured, making implementation far easier (Warner 2007).

Levett (1998) examines the meaning of some sustainability indicators and their actual implementation. For example, does an improving air quality standard mean that the United Kingdom is meeting its goal of reducing energy intensity in its economy? Levett contends that some of the production capacity responsible for this pollution may simply be taking place in other regions or countries rather than having an overall beneficial effect on the environment. Similarly, he points to Seattle's air quality indicator of being able to see a mountain from a point in the city. This indicator could simply mean that polluting activities have been moved to the

other side of the mountain. Sahely (2005) follows Levett by examining sustainability criteria for urban infrastructure and develops a set of indicators for urban infrastructure systems. While focusing on three main areas: buildings, transportation, and water supply; they develop a set of indicators to measure their overall sustainability. Within these areas, they develop general criteria for environmental, economic, engineering, and social impacts of infrastructure development. For environmental impacts, resource inputs and waste outputs are measured. Economic inputs and outputs measure the expenditures and revenues for a proposed infrastructure project as well as including investments in innovation and research and development. Engineering performance is measured for the three categories, and finally the social aspects of sustainable infrastructure are measured through their accessibility and contribution to healthy and safe communities (Sahely 2005). This assessment of infrastructure projects offers a way to measure the larger costs or benefits to a community from an infrastructure project when these are reviewed by planners for consistency with a comprehensive plan. The narrow focus limits the application of these findings, but using this methodology in assessments of large government expenditures is important in determining long-term costs and benefits.

### **Climate Change**

One of the major drivers of sustainability initiatives in the US and elsewhere is climate change and its predicted effects on the global environment. With buildings accounting for 39% of emissions and transportation accounting for 33%, the actions of planners can have a substantial impact on the future growth or reduction of GHG emissions. In *Shrinking the Footprint of Metropolitan America*, Brown and Southworth (2008) argue that denser metropolitan areas have lower per capita emissions of greenhouse gasses. In addition to the usual strategies of improving vehicle and building carbon footprints, they point to the

overwhelmingly local framework on land-use decisions in the US as a major impediment to more efficient communities. This local control is due to traditional zoning with exclusive uses designed to attract investment and discourage the type of development that is undesirable or requires additional public facilities. The authors also point to a number of local and state models for reducing metropolitan greenhouse emissions, but criticize the lack of action on the part of the federal government in climate policy. They also point to regional metropolitan frameworks as a means of influencing large-scale land-use decisions and carbon emissions. The focus on regionalism compliments other research on the subject, but again, coordination between government levels may be more important than implementation at any one level (Brown and Southworth 2008).

The Urban Land Institute agrees with the regional approach and offers specific steps at the federal, state, regional and local levels of government. At the federal level, a new transportation act focusing on transit, high-speed rail, direct funding for Metropolitan Planning Organizations (MPOs), and a national cap and trade system and EPA regulation of GHG are advocated. At the state level, adopting reduction targets for Vehicle Miles Traveled (VMT), funding smart growth and adopting a 'complete streets' policy and program. Regionally, giving funding priorities to compact and transit served areas and regional TDR programs along with a carbon impact fee for new development are proposed. Locally, the authors propose dramatic changes such as major density increases, support for transit, and changes to building codes in existing zoning and comprehensive plans to promote climate friendly compact development. Finally, workforce housing close to employment centers to reduce the economic incentives (i.e. cheaper housing) of sprawl is important in reducing the need for long commutes. These principles provide a good summary of the actions required in land use policy to achieve many

sustainable development goals (ULI 2008). Using these recommendations along with policy instruments recommended by the UNEP to implement them could aid in making these ideas more palatable to developers and state regulators.

In terms of more strictly environmental indicators, the Los Angeles Climate Action Plan provides a strong set of indicators and targets in energy, water, transportation, development, waste, and open space. This report emphasizes how taking environmental actions will result in improved social and economic values, but does not focus on these aspects of sustainability (City of Los Angeles 2007). The use of greenhouse reduction strategies in achieving other goals is affirmed by Willson and Brown (2007) in changes to overall urban patterns through density increases and transit oriented development (TOD). The economic activity generated from GHG reduction strategies through energy performance retrofits and renewable energy investments are also pointed to as tenets of a green economy. Portland, Oregon has emerged as a leader in the US on environmental policies in pursuit of sustainable development, and their model of an oversight 'Office of Sustainable Development' is a useful concept for Florida. This office has since been merged with the Bureau of Planning to create the Bureau of Planning and Sustainability (City of Portland 2009). Adapting this model at the state level for Florida would be useful in developing and implementing sustainability goals for the state.

### **Transportation**

The role of transportation systems in dictating land use decisions and vice versa is a major factor in shaping the form of urban areas. While some point to more transit and TOD as a solution, others point out cities such as Atlanta where "MARTA [Metropolitan Atlanta Rapid Transit Authority] has had no discernable impact on total population or employment in rail station areas, but it has altered the composition of employment in these areas in favor of the public sector" (Bollinger and Ihlanfeldt 1997 p.180). This analysis may point to the problems of

inserting transit into an existing low density land use pattern. Planning for transit along with new development and redevelopment may result in better economic performance in areas where new mass transit is proposed.

In a 2006 study examining the practice of transportation planning and current environmental considerations, Amekudzi and Meyer examine how the environment and sustainable practices are being considered in the US and other countries. They use the Organization for Economic Cooperation and Development's (OECD) definition of environmentally sustainable transportation as: "transportation that does not endanger public health or ecosystems and that meets the needs for access consistent with (1) use of renewable resources at below their rates of generation; and (2) use of non-renewable resources below the rates of development of renewable substitutes" (Amekudzi and Meyer 2006 p.44). This definition sets the bar very high for a project to be considered sustainable, and would likely disqualify most road projects if it was implemented as a requirement. The Washington State Department of Transportation (DOT) has developed a policy statement that is less ambitious in its approach committing the department to: educate their staff, contractors, and consultants on the environmental mission of the DOT, maintain environmental management systems that support the role of the DOT, and communicate with staff and the public about how to improve their performance. Unfortunately, this policy statement is rather empty on actual actions to be taken, and appears as more of a feel-good mission statement than an actual strategy (Amekudzi and Meyer 2006). The Florida DOT's mission statement is to "provide a safe transportation system that ensures the mobility of people and goods, enhances economic prosperity and preserves the quality of our environment and communities" (FDOT 2009). This mission statement does not appear to reflect how the department actually conducts its business. In the

area of preserving the environment and communities of Florida, the department needs to reevaluate funding and planning priorities.

### **Smart Growth, New Urbanism, and Traditional Neighborhood Development**

In a presentation to the Florida Association of Counties, former governor of Maryland and president of the Smart Growth Leadership Institute, Parris Glendening, promoted three paths toward sustainability: “Utilizing systems and technology to become more efficient and ‘use less’, rethinking our land use patterns to reduce consumption, and overhauling the rules of the ‘development game’” (Glendening 2007 p.4). Glendening argues that projected increases in population, energy consumption, and emissions require urgent action by government in promoting smart growth. He points out that the energy consumed by people living in a ‘smart location’ is less than that consumed by the greenest residents of sprawling areas. This comparison looks at four types of housing, suburban average energy use, suburban green energy use, urban average, and urban green. The ‘green’ designation was defined as living in a green building and driving a hybrid. Both urban categories outperformed even the ‘suburban green’ category and provide a strong argument for compact, high-density growth. Kaatz and Root (2005) also point to the idea of green buildings having different values by location or performance and different evaluations by designers, managers and end-users.

New urbanism shares many of the same principles as smart growth. The main differences in the principles of new urbanism are that they emphasize connectivity, density, traditional neighborhoods, and sustainability in addition to the principles above. The differences are really very slight, and the concepts of smart growth and new urbanism should be taken together as a package (New Urbanism 2007). Brown and Cropper (2001) compared standard suburban subdivisions to new urbanist development and found that new urbanist developments do not necessarily produce the social values espoused by their creators and that indeed, some

residents were very dissatisfied with their communities. Resident dissatisfaction was largely related to the crowding of cars, not necessarily the density itself, creating challenges for designers in allowing more parking than they might prefer. Berke and Macdonald (2003) examine whether new urbanism makes a difference in protecting watersheds. They found first that new urbanist developments did more to protect watershed resources through management, restoration and reduction of impervious surfaces than standard subdivisions. Conversely, the majority of communities studied were greenfield developments and had an overall negative effect on the surrounding watershed. Despite this, they conclude that effects on watersheds are largely positive because of increased density and therefore, other areas remaining as open space. In terms of solutions for VMT reductions from mixed use developments, Cervero and Duncan (2006) found that occupationally matched employment in proximity to residential uses had a much greater effect than access to retail uses, because internal capture of activities from new urbanist communities may vary largely from one to another.

Although recent new towns have been billed as new urbanist communities that will internally capture the activities of their residents, the record still points to these as a new form of sprawl that does not adequately address the issue of sustainable development. Even so, new communities are still being proposed, such as a 40,000-home development in Osceola County called Destiny that is billed as “the country’s first self-contained eco-sustainable city” (Miller 2008 p.2). This proposed city would grow biofuel crops for power and sit on over 27,000 acres. Building 40,000 new homes on current agricultural land is a clear example of what should be avoided in planning for a sustainable Florida, and the continued sprawl pattern of development is one of the greatest threats to sustainable development.

Land is a non-renewable resource, and consumption of land for development is in many ways the same sprawl pattern of development that has occurred over the last few decades. The development model practiced since the 1950s has left a number of issues that challenge the idea of planning for sustainability. Unfortunately, as the geographic area of a city grows, a number of problems occur that lower the efficiency of an urban area and make greener alternatives difficult to implement.

### **Green Building**

In the United States, green buildings are largely certified by the United States Green Building Council (USGBC), a non-profit organization that sets the standards for green building through their LEED standards. These standards have been created for different categories of development and are set at different levels depending on a building's performance. These categories include neighborhood developments, commercial building interiors, core and shell, new construction, schools, healthcare, and retail. While the standards are not the same for each category, the principles behind them are similar. The differences between categories are related more to the specific needs of each category. According to Kibert:

The ideal green building should have five major features: (1) Integration with local ecosystems, (2) Closed loop materials systems, (3) Maximum use of passive design and renewable energy, (4) Optimized building hydrologic cycles and (5) Full implementation of Indoor Environmental Quality measures (Kibert 2007 p.147).

Recently, there have been:

increasing amounts of litigation related to green development activities primarily because there is no universally accepted standard for what qualifies as green development and consumers that have paid a premium for green development activities have heightened performance expectations. Consequently, architects, engineers, planners and environmental consultants offering green development services may face accusations of fraud, negligence, breach of contract, or violations of unfair competition laws (Bingeman 2008 p.2).

Legal considerations such as these may make developers less likely to engage in green development because of fears of legal backlash, however, with appropriate expectations from developers and tenants, these problems should be surmountable. Part of the problem is that lower levels of LEED certification offer only modest energy and water efficiency over conventional buildings and even these gains are subject to proper maintenance of building systems.

The Florida Green Building Coalition (FGBC) has also developed standards specific to the state for homes, new development, high-rises, local governments, and commercial buildings. While the development of place-specific standards is highly desirable, the standards need to be scrutinized against national rating systems to determine their validity.

The green home and green local government standards are innovative and offer opportunities for green development that are not currently available through the USGBC. One major problem with the statewide standards is that they do not necessarily provide the same benefits as LEED certified buildings or developments. In areas where there are overlapping standards, it only makes sense to aim for targets that are nationally recognized for building performance. The focus of the local government standard on offering incentives and creating ordinances is valid and should be continued. While education and environmental work done in-house on government projects is necessary to fostering these incentives their impact may be limited (FGBC 2008).

The American Institute of Architects (AIA) has embraced green building and established their own benchmarks for improving the efficiency of the built environment. They have set a goal for 2030 to have carbon neutral buildings. Carbon neutrality is achieved through immediately reducing carbon output by 50% and then reducing output by 10% every 5 years

until the goal is reached (Rainwater 2006 p.7). This method of adopting a goal (2030 neutrality in this case), using an indicator (carbon output), and setting benchmarks over a period of time is the most desirable form of intervention to promote sustainable development.

### **Policy Instruments to Encourage Sustainable Development**

While in many cases green building practices are embraced voluntarily because of market forces, necessity often demands the use of regulatory measures and incentives to encourage wider adoption. A number of policy instruments are available for governments to encourage green building. Control and regulatory measures such as standards for appliances, building codes, and energy efficiency requirements are frequently used to mandate standards for building efficiency. Economic instruments such as emissions trading and energy efficiency certification are additional measures but are not as widely used. Incentives such as tax incentives and exemptions, government subsidies, decreased permitting times, and grants have been used with mixed success in some areas. Finally, government support through certification and labeling, public leadership programs, public and professional education, and voluntary programs are examples of how government can also offer support without imposing increased regulations (UNEP 2007).

Control and regulatory instruments can be very effective in certain circumstances and are an integral part of government guidance of industry. Measures such as energy standards for appliances, building codes, and energy efficiency requirements for business, governments, and utilities are all areas where direct government intervention is used to promote the common good. Labeling and certification programs for goods and professionals can also be a part of these regulatory measures. The US government's energy star program is an excellent example of product labeling for efficient appliances. In the future, government control instruments are likely to play an increasing role in greenhouse gas reductions as they already have in reducing other

types of pollutants. Control and regulatory instruments are ultimately the quickest and most effective way to achieve concrete results, but they are resisted by industry and often difficult to put into place because of political or short-term economic factors.

Economic and market based measures are often very popular with industry groups because they provide a market mechanism to achieve what may be a non-market goal. Programs such as Energy Performance Contracting (EPC), where a contractor will undertake design and installation of energy saving systems and guarantee savings, can provide positive results with minimal government action (EPA 2008). Some of the flexible measures contained in the Kyoto Protocol fall into this category but have yet to be adopted.

Fiscal instruments and incentives can be an excellent way to encourage green building practices. Tax credits or reductions can allow developers and owners of projects to recoup initial investments in meeting Leadership in Energy and Environmental Design (LEED) certification. More aggressive measures such as public-private partnerships for key projects may be a good way to stimulate green development in important areas. “Financial incentives can be helpful to kick start the market for new energy efficient products as well as for developing countries where funding is not available” (UNEP 2007 p.2). Payments or cost matching for particular technologies such as solar cogeneration in new projects may be an important way to support measures that go above and beyond basic certification. Incentives that target the highest levels of certification or that address locally important issues such as storm water runoff should be considered based on the varying needs of different locations.

Support, information and voluntary actions, while being less aggressive than regulatory and control instruments, may have substantial influence on a community and are often a first step in adopting a wider range of initiatives to encourage green building and the overall sustainability

of a city. Included in this category, and adopted by a number of cities and states, are government leadership programs. These programs may provide a catalyst for private sector adoption of green building through creating an initial market and building expertise within a community that can be used on non-governmental projects. In addition, governments may have a large number of buildings including police, fire stations, schools, and administrative and support buildings. A government program requiring that all new buildings and major renovations adopt LEED Silver certification or better can act to support an economy of scale for green building products and builders specializing in green building that has positive spillover effects for the community in private sector development and lower operating costs for governments. Multiple ways of adopting this type of policy exist, including executive orders by a governor as has been used in California and by ordinance in Atlanta, GA.

Tassos (2007) examines how states have used the low income housing tax credit to produce healthy and environmentally sound homes. He found that a majority of states are tying their site selection to transportation options, environmental considerations, and services. In addition, most states also require energy efficient appliances and water conserving fixtures, and have taken measures to improve indoor air quality in affordable homes.

### **Summary**

Beginning with Kent's concept of the general plan and the powers necessary to implement it, this review has examined how planning for sustainable development is becoming the norm for planners because of growing environmental problems and projected impacts of ongoing policies. The arguments for more dense, walkable, and less wasteful urban areas connected by transit and served by a greener infrastructure are the key to achieving this vision, and through work at all levels of government, solutions to many urban environmental problems are being presented and incorporated into the planning structure. These are summarized in Table

2-1, and show the different planning concept and how their methods lead to a more sustainable environment. By developing indicators and working toward their improvement, urban areas have the tools to measure progress and adopt policies designed to achieve their goals. Adopting policies designed to mitigate the effects of climate change can be used to support other sustainability goals through low carbon development strategies and alternative transportation. Refining the state's growth management and environmental regulatory regimes is necessary to adopt many of these policies, and as discussed later, changes to these regulations are already occurring.

Table 2-1. Literature Review

Literature Review	Source	Method	Goal or Indicator
Planning for Sustainable Development	The General Plan Adaptation of the General Plan for 'Ecocities' Is sustainability useful for planners as a concept?	Addressing poverty and inequality while minimizing environmental damage Using Indicators to measure progress	Urban Ecological Footprints Local resource management
Planning for Climate Change	Los Angeles Climate Action Plan ULI policy actions UNEP policy instruments for reducing GHG emissions	Use of GHG reduction strategies to achieve other goals	Changes to overall development patterns Economic activity generated in achieving long term reductions Conservation of Ecosystems
Transportation	Transportation systems in determining land use patterns OECD Definition of sustainable transportation Washington State DOT	Need to coordinate transportation and land use	Concurrency Consistency Need for hubs of high density to support transit
Traditional Neighborhood Development	Smart Growth New Urbanism Green washing	Different values based on density, mix of uses, location Standard subdivisions vs. new urbanist in water quality, advertised social benefits	VMT reductions Lower trip generation rates Access to transit
Green Building	USGBC FGBC Government leadership Future standards Legal considerations AIA goals	Need to integrate more fully into standard development practice Neighborhood Development Maintenance and verification of promised reductions	Reduced Electricity use, water use, Improved occupant health Reduced impact on surrounding areas Redevelopment of brownfields

## CHAPTER 3 METHODOLOGY

Many researchers have discussed the concept of sustainable development and the form of policy action necessary to implement it as a goal of planning practice. The variety and volume of research are testament to this, but this breadth of knowledge also serves to point out that actions taken to date may not be adequate to reach the desired outcomes. This chapter will describe the method used to evaluate Florida's performance in terms of the goals that the state has set and the actions being taken to reach these goals.

Considering that the idea of sustainable development is relatively new to many planning and building professionals, determining what measures should be taken to provide education and support for the development and regulatory atmosphere are needed to support sustainable development goals. Many actions by federal, state, and local governments to encourage sustainable practices have varying standards in different locations or levels of government that can make it difficult to take advantage of existing programs. Professional education detailing what current regulations and incentive programs exist supports current programs, but the number of diverse initiatives in different locations makes it difficult to implement sustainability programs if they differ from standards that professionals are accustomed to dealing with. Therefore, in designing policies to encourage sustainable development, understanding what the existing planning and development community sees as the most effective course of action, and what measures exist through current regulations to support sustainable development policy. This thesis focuses on the environmental aspects of sustainable development rather than the social and economic aspects. These aspects include land use, transportation, water use, energy use and green buildings. These main issues have been chosen because of their large influence on natural resources and their effects on urban form and the resulting costs and benefits to society. They

also have distinct permitting authorities that are divided by location, mission, and authority. These permitting authorities, local planning bodies, the Department of Community Affairs (DCA), DOT, Water Management Districts (WMDs), and Regional Planning Councils (RPCs) represent the most important actors for implementing a strategy to achieve sustainable development, and it may be that this existing framework is all that is necessary to achieve the state's goals.

This thesis examines places in Florida that have sought to provide an increased level of sustainable development through the use of innovative planning techniques or increased levels of regulation. This study examines the implementation of these programs for their short- and long-term goals.

The questions that this study seeks to answer are:

1. Can long term sustainability be achieved through existing mechanisms?
2. How, if at all, can these regulations and policies be changed to provide the desired outcome of social, economic, and environmental sustainability?
3. What should be the goals of any sustainable development program for the State of Florida?

The research conducted for this thesis is from existing sources and include analysis of existing measures such as Florida's existing growth management and environmental departments to support sustainability through comprehensive planning, environmental and land development regulations, and other programs. It also includes research into sustainable development as the organizing principle for comprehensive planning and evaluates this method of incorporating sustainability principles into the planning process. In addition, it reviews case studies in Florida to evaluate the implementation of statewide and local efforts to meet sustainable development goals; these include Rural Land Stewardship in Collier County and sector planning in Bay County. These were chosen as potential innovations in the comprehensive planning process that

might help meet conservation and land use goals. Lastly, interviews were conducted with planning professionals to determine support for different policies and to seek a consensus among planners on what actions should be taken in future efforts. These include interviews with a public planner, a private sector planner and a LEED certified building construction professional. The interviews provide on the ground context for the policy options examined. They consisted of informing the person about the Century Commission and the goals being created by them. Participants were then asked what policies would help in the implementation of these goals and if the existing regulatory structure was adequate for implementing the necessary policies to achieve those goals. Interviews were completed during the spring of 2009.

The state's progress on implementing sustainability programs is measured against the expected outcome of those measures and how that projected outcome compares to the sustainability goals of the state. These goals are the major indicators of sustainability proposed by JCCI for the Century Commission for a Sustainable Florida.

Looking at the proposed indicators for environmental sustainability: environmental protection, growth management, responsible energy use, and transportation efficiency; the state's regulatory bodies and their roles in achieving the desired results were examined. For environmental protection, the water management districts (WMDs) and Department of Environmental Protection (DEP) as well as local authorities have the largest role to play in land conservation and water use. For growth management, the Department of Community Affairs (DCA) approves local plans, but these are created at local levels of government. The Regional Planning Councils (RPCs) play a role in regulating large developments but their reach is limited. Additionally, issues of property rights, state growth management mandates, and the pace of development are examined. The concept of responsible energy use is complex, because of the

relationship between producers and consumers of electricity. The Florida Public Service Commission (PSC) has been tasked with developing renewable energy goals for the state and determining what types of renewable power will be used. Their recommendations are compared with the goals being set by the state and methods of achieving those goals are discussed in the analysis chapter of this document. The relationship of energy use to growth management is also discussed and ways of planning for communities that require less energy for transportation and buildings are evaluated for their effectiveness and method of implementation. Finally, policy options such as transportation concurrency are discussed and changes to growth management laws that affect them are analyzed.

As part of the conclusions of this study, recommendations are made as to what measures support the sustainable development goals of communities in Florida and what the best practices are for achieving those goals. This mainly qualitative approach is intended to provide context sensitive solutions to Florida's obstacles that are accepted by the majority of people and geographic areas of the state.

## CHAPTER 4 FINDINGS

Based on the state's actions to date, Florida is continuing to pursue policies toward a sustainable future. From a growth management perspective, the state has passed HB 697, designed to promote more efficient buildings and take GHG emissions into the comprehensive planning process. The state has also continued to pursue land conservation strategies such as the purchase of US Sugar lands and the Florida Forever Program. Although more actions are needed, the state has also pursued policies to develop a renewable portfolio standard for electricity generation and has a goal of reducing emissions significantly in the coming decades. In the area of environmental protection, the water summit held in Orlando stands out as the largest achievement in following up the recommendations of the Century Commission and policies for increasing the use of reclaimed water and reducing groundwater pumping are being instituted through the WMDs. Transportation has been a difficult area, and much more work is needed, but the development of TOD guidelines and new proposals for mass transit exist and are being pursued. These are discussed in more detail below and include a number of useful concepts.

The list of prospective indicators presented to the Century Commission is an excellent and very comprehensive set compared to other approaches. The EU for example, has a number of indicators that are more difficult to manage compared to those proposed in Florida. Another benefit of the Florida indicators is that many of them are already measured in census and other data. If benchmarks were set on desired levels of these indicators and action plans created to achieve these results, many of the problems of achieving sustainable development will appear less daunting. The difference between appearance and practice is particularly true of many of the social indicators of sustainability. Addressing specific communities with poor performance

indicators may be the correct way to address problems that have existed for long periods of time without intervention.

Table 4.1 shows the indicators submitted to the Century Commission by JCCI. The indicators for a sustainable environment are discussed below with attention given to current actions and proposed policies to work toward the goals. Table 4.2 shows the indicators with goals, current policy actions, and needed policy actions. The lack of concrete goals for many of the indicators is telling in that there are no goals for a number of them. Some indicators, such as land area in conservation, would be expected to be judged by general positive trends rather than a final land area conservation goal. The relationship between these indicators and state policy is discussed in detail in the following chapters.

## **Growth Management**

### **History of Growth Management in Florida**

Although there had been some earlier efforts to regulate growth management in the State of Florida with tools such as zoning regulations, 1972 marks the beginning of real programs to manage the long term growth of the state. The Environmental Land and Water Management Act of 1972 (Florida Statutes 380.012-380.07) provided for designation of Areas of Critical State Concern (ACSC) and defined Developments of Regional Impact (DRI). The Florida Water Resources Act of 1972 (F.S. 373) established the five WMDs and gave them significant authority through the creation of water management plans, authority to issue consumptive permits, and *ad valorem* taxing authority. The Florida State Comprehensive Planning Act of 1972 (F.S. 186.001) ordered the creation of a state comprehensive plan. Although a plan was mandated no plan has ever been implemented by the legislature. The Local Government Comprehensive Planning Act of 1975 required all local governments in the state to adopt comprehensive plans and ensure that development conformed to these plans.

The 1979 Resource Management Task Force set up by Governor Graham was charged with reviewing Florida's planning system and authority under the existing rules. Among other conclusions, the task force determined that Florida needed a more integrated structure of state, regional and local planning authority. The 1982 Environmental Land Management Study returned with similar recommendations.

The State and Regional Planning Act of 1984 again called for the development of a state comprehensive plan, an elusive goal, and required agencies to draft plans on how they would comply with the state plan. It also required the state's planning councils to develop Comprehensive Regional Policy Plans and submit them to the legislature.

The Local Government Comprehensive Planning and Land Development Act of 1985 (F.S. 163.3161) is the most powerful piece of recent legislation in the governance of planning in Florida. It made large changes to the 1975 Local Government Comprehensive Planning Act, and required that local governments amend their plans for consistency with the State and Regional Comprehensive Plans. Additionally it required that all local comprehensive plans be certified by the DCA and directed the DCA to make detailed rules defining the minimum criteria for an acceptable comprehensive plan.

### **Urban and Regional Planning in the State of Florida**

In Florida, planning decisions at the state level are administered by the Department of Community Affairs. This Department operates under chapter 163 of the Florida Statutes (among others, such as Chapter 380 for Developments of Regional Impact) and administers this legislation through Rule 9J-5 which requires specific elements for comprehensive plans. Required elements are: future land-use, housing, sanitary sewer, solid waste, stormwater management, potable water, and groundwater recharge coastal management, conservation, intergovernmental coordination, capital improvements, public school facilities, and

transportation. Optional elements exist that cities or counties may choose to use, and often do, for additional planning priorities. The comprehensive plan must be consistent with a local government's land development regulations (LDRs). The comprehensive plan is the basis for all development and transportation decisions, and changes to what is required can have strong effects on the development pattern.

### **House Bill 697**

House Bill 697 made a number of relevant changes to the Florida Statutes that may improve the future environmental sustainability of the state and affect how comprehensive plans are created in the state. The bill relates to building code standards and makes changes to Chapter 163 and to the Florida Building Code. First, it changes the requirements of the Future Land Use Element (FLUE) of local comprehensive plans to require that they discourage urban sprawl, promote energy efficient land-use patterns, provide for greenhouse gas reduction strategies, and provide for current and future power generation and transmission systems. It also requires the Traffic Circulation Element to incorporate strategies to reduce greenhouse gas emissions and that the Conservation Element of a plan address factors that affect energy conservation and efficiency, and that the use of renewable energy sources be addressed in the Housing Element.

The bill also made a number of important changes to the Florida Energy Efficiency Code for Building Construction. These include using the most recent version of the International Energy Conservation Code as a basis for the Florida Building Code and the adoption of an updated version of the National Electric Code and a requirement that energy efficient technologies be incorporated into the code. Most significantly, the bill requires a schedule of increases in the energy performance of buildings of 20% by 2010 as compared to the 2007 Florida Building Code, 30% by 2013, 40% by 2016, and 50% by 2019. The bill requires the DCA to review and make recommendations regarding assistance for weatherization of homes

and for the Low Income Energy Assistance Program. The bill also makes changes to the building code relating to storm and wind protection. These code changes are important to the state from a building perspective because a structure not there after a storm is by definition not energy efficient (HB 697 2008). The DCA is currently evaluating how to implement this bill through changes to rule 9J-5 and expects to hold a rule development workshop in Tallahassee soon (DCA 2009). This bill, along with other policy actions being considered for changing growth management guidelines, could have a strong effect on buildings and development patterns.

### **Statewide Moves Toward Sustainable Planning**

In Florida there have been a number of initiatives aimed at making the state a more sustainable place. These have included statewide policies adopted by the governor, long held water policies of the WMDs, comprehensive planning mandates, citizen driven initiatives, and local policies in the cities and counties to lessen the human impact on the environment. Until recently, these have been largely uncoordinated, but with state executive support, there is an opportunity to expand upon the accomplishments of a few places and apply the lessons learned to the rest of the state.

One potential problem in the state is that a state comprehensive plan has never really been implemented. Statewide coordination of planning efforts has long been sought in Florida, and the inability of state leaders to implement this aspect of growth management has led to local and regional planning efforts that lack state coordination. At the very least, a statewide future land use map (FLUM) would give an idea of what the state might look like if fully developed. The Century Commission's Critical Lands and Waters Identification Project (CLIP) uses GIS to define habitat conservation priorities, and in setting state policy, this will be an important tool for

guiding growth management decisions, however, implementation of these decisions is often through the regional and local authorities discussed in the following paragraphs.

### **Regional Planning**

The three main bodies that are responsible for regional planning in the state are:

1. WMDs, 2. RPCs, and 3. the DOT. Each of these has different mandates and focus, and all three could work more closely with each other on regional issues.

The WMDs, while responsible for regional water use, also have an important role in growth management and land conservation. The conservation strategy that they pursue is the protection of ecosystems that ensure water quality and sustainable sources. For growth management, the WMDs must sign off on new development that will be both a consumer of water and potentially a source of runoff that could damage water sources. Balancing the need for new development and clean water sources is a difficult task, and the WMDs have been very successful in protecting water sources by preserving the land around them. However, if given a broader planning mandate, these bodies might be more effective at achieving growth management goals.

The RPCs operate under FS Chapter 380, the same law that defines and regulates DRIs, to review these developments for impacts to multiple jurisdictions. The RPCs also review local comprehensive plans for consistency with strategic regional policy plans. Reviewing the consistency of comprehensive plans gives them a valuable role in coordinating projects that may or may not meet regional planning goals that relate to environmental, land use, and transportation goals. The councils also fill various other roles in support of emergency preparedness, economic development, regional transportation, affordable housing, and natural resources. This broad scope makes the councils a perfect coordination authority for regional environmental planning, however, they lack the authority to implement the necessary changes to local government

planning bodies and have the lowest budget of the three main regional authorities. (OPPAGA 2006)

The DOT's mandate is to provide mobility for the residents of the state. This mandate however, is not up to the task of providing a sustainable transportation network, and has led to sprawl in many areas. The lack of coordination between local and regional bodies and the DOT has led to regional transportation networks consisting solely of roads and low density development dependent on them. Instituting controls on development in regard to how it affects transportation systems has been difficult in Florida, and although proportionate fair share payments and impact fees have been used in the past, transportation concurrency has never been fully implemented. This has led to a disconnect between available resources to fund transportation projects and the need for new capacity on roads. Instituting full concurrency and giving funding priorities to rail and transit projects rather than highways is needed to achieve a more sustainable state. Planning at the regional level is important to achieve many environmental goals, and implementing state policy through regional and local levels of government is key to the coordination of these efforts

### **Local Planning**

Florida has undertaken many initiatives through the Growth Management Act aimed at supporting compact development. Pelham (2007) examines the three Cs of consistency concurrency and compact development. In his evaluation of these three policies, he points out that they all provide valuable tools for growth management but each suffer from implementation problems. Consistency has been plagued with exemptions that allowed developers to skirt the intended purpose of the rules while compact development provisions were hurt by discretionary implementation. (Steiner 2007) The issue of implementation has continued to be the problem for efforts to provide transportation facility concurrency and compact growth in the state, but this

process has also served as a learning experience for planners and changes to concurrency may still make this a viable process. The creation of multimodal transportation districts that use transit, walking, and biking in addition to cars has the potential to reduce VMT and promote the kind of compact mixed-use growth that is necessary for more sustainable land development and transportation options. Requirements in the Growth Management Reform Act of 2005 required governments to address the design and mobility factors necessary for compact growth in their concurrency exception areas and update their capital improvements elements yearly to ensure that they were following through on concurrency requirements. The incorporation of proportionate fair share funding for developers appears to be a negative outcome of this act as it allows developers to proceed with projects even though facilities may not be available. (Steiner 2008 p.214) Overall though, these policies help the growth management structure in Florida to steer development to core areas and to make it more friendly to the sustainability goals of higher density and multimodal transportation.

At the local level, cities and counties have adopted a narrower version of sustainability criteria than the one currently being considered by the state. Green local government criteria sponsored by the Florida Green Building Coalition does not address many of the social and economic issues related to sustainable development. The environmental focus of these standards has led many cities and counties to pass a number of ordinances aimed at ‘greening’ government operations and providing incentives for green building initiatives and other programs. This narrow focus is partly because local governments have far less influence on the indicators that measure sustainable development. In areas such as electricity generation and water use, resources are managed by state and regional bodies rather than at the local level. The main area where local governments do have significant influence, land-use decisions, has not been

addressed from a sustainability perspective. Rather, policies maintaining the status quo in land-use and transportation planning have been the norm. In order to lower VMT and promote efficient and compact land uses, major changes in comprehensive plans are necessary. In addition, there must be greater cooperation between local governments in the formation of comprehensive plans. Finding these balances is one of the reasons that the state has experimented with innovative planning solutions.

### **Other planning programs in Florida aimed at sustainable development**

Sector plans have been touted as one way to plan for larger areas, however they have only been used as a limited demonstration project authorized in 1998 by the Florida Legislature to include five plans. Basically, the area designated for a sector plan is treated as a whole even though there may be multiple landowners. A comprehensive plan and detailed area plans to implement the plan are then drawn up and adopted by the local government and approved by DCA. These plans are intended for areas of 5,000 acres or more and are supposed to result in a more cohesive form of development rather than if the area were developed piecemeal or as a Development of Regional Impact (DRI) (F.S.163.3245).

Rural Land Stewardship (RLS) is another state program that designates an area as a RLS area. Previously, there were larger amounts of land that were necessary for a RLS area to exist, but the current draft rule is 10,000 acres. This is a significant dilution of the original intent of the RLS program and is evidence that the RLS program is probably not a very good tool for achieving its original goals.

As enacted in 2001, the statute limited the RLSA approach to five pilot projects and provided that the approach could not be extended until the success of the program had been established through the success of the pilot projects. However, in 2004, the statute was amended to remove these provisions, to exempt RLSA plan amendments from the twice a year limitation on plan amendments, and to lower the threshold size requirement from 50,000 acres to 10,000 acres. Then in 2005, the statute was again amended to partially exempt development in an RLSA from the DRI process (Pelham 2007, p.2).

These lowered standards have eroded the effectiveness of this program and, unfortunately, kept it from being something that could gain wider support and implementation.

## **Responsible Energy Use**

### **Electricity Generation**

Renewable energy is the main focus of proposals to cut GHG emissions in the state, and these offer benefits that can extend far beyond the actual generator of power. Solar generation for instance, is usually small scale, potentially creating a market for marketers and installers of solar technology. If manufacturing is also brought to the state, it could potentially create larger pools of employment in a sector that can be considered green manufacturing, a staple of the sustainable economy thinkers. It can be argued that the winners from expanding traditional power sources are largely utilities and their shareholders. By investing in alternatives, a wider range of benefits may exist for the state. The state's coming Renewable Portfolio Standard (RPS) aims to mandate that certain percentages of electricity come from renewable energy sources.

This view was reinforced by the Florida Alliance for Renewable Energy (FARE) and the Environmental Defense Fund who stated that the Public Service Commission (PSC) had failed to live up to the Governor's executive order to reduce GHG emissions and achieve a larger percentage of renewable energy (FARE 2009). State Representative Seth McKeel echoed this and stated that the PSC had basically returned with the same proposal as the year before to the Energy and Utilities Policy Committee and that the committee was frustrated by the commission's lack of response in developing guidelines for renewable energy development. Additionally, he voiced concern that the PSC's entire plan for reducing GHG emissions was based on switching coal fired plants to natural gas, resulting in a dependence on one fuel source.

Finally, Representative Mckeel pointed to the advance cost recovery program for new nuclear generation that has added \$11 per month to the bills of some customers and pointed out that this program had no way to ensure that a new nuclear plant would ever actually be built. All of these pointed to FARE's proposals as being a more cost effective way of promoting renewable energy in the state (FARE 2009). They proposed a Feed in Tariff (FIT) or Renewable Energy Dividend (RED) of \$2.25/mo applied to electricity bills that would help solar power producers achieve price parity with conventional power sources. It commits utilities to sign 20 year contracts with solar producers at a set price, enabling the producer to secure long-term financing for the initial cost of installation. This policy, widely used in Germany and other countries and recently passed in Gainesville, FL, has been shown as the most cost effective way to increase solar generating capacity at the lowest cost (IEA 2007). The policy was also supported by Brett Hutchins, CEO of Casto Lifestyle Properties, a large developer of residential and commercial properties. He pointed out that since his company has a model of long term ownership of their property, that finding additional sources of revenue was always important to them, particularly when they are seeing reduced income from tenants as is occurring with the current economic crisis. (FARE 2009)

Overall, a FIT policy can be developed to work in concert with an RPS [Renewable Portfolio Standard] policy, which sets a goal or mandate of *how much* customer demand should be provided by renewables. A properly structured FIT policy attempts to provide investor certainty to help support new supply development. FIT policies generally provide preapproved guarantees of payments to the developer and investors, whereas RPS policies leave the compliance and investment up to the market. For states that want to provide assurance to investors, drive more capital to the market, and get more projects built, a FIT can be a useful, complementary policy to an RPS (National Renewable Energy Laboratory 2009, p.10).

At FARE's conference, Jerry Carnes of the Environmental Defense Fund pointed out that after the implementation of a Feed in Tariff (FIT), Germany was able to move from 3% renewable energy to 18%, create 250,000 jobs in solar manufacturing and installation, and

become the major world manufacturer of solar equipment with 80% of the total (FARE 2008). This was done in less than 10 years making it an excellent model for the US. One reason that the German connection is so important in Florida is the Governor's climate partnership with Germany, which pushes the state toward the German model for increasing renewable energy (Partnership on Global Climate Change Action Between Florida and The Republic of Germany 2007).

### **Buildings**

While there have been some major commitments to improving the environmental performance of buildings in the state there is much work to be done. The major component of attempting to promote green buildings in Florida has been the commitment, by local and state government, to require green buildings for all new government buildings and major renovations. This is an excellent first step and should result in significant savings for state and local governments over time. If the requirements of State Bill 697 are implemented, they would result in strict energy efficiency improvements in the efficiency of all new buildings in the State. This is only one aspect of what defines a green building though, and additional improvements in siting, water use, and indoor air quality will be necessary to improve the overall quality of the built environment in Florida. Additionally, state assistance in weatherizing homes and investing in efficiency improvements for low income housing will satisfy social and economic goals of sustainable development policies as well as environmental considerations.

## **Environmental Protection**

### **Water Use and Reuse**

Florida's action on water issues has been the primary focus of the State and the regional Water Management Districts. This is due in large part to the drought conditions experienced in recent years and disagreements among the water management districts about sharing between

regions of high- and low-growth. In their January 2009 report to the governor, the Century Commission recommended that the ideas brought forth in the water summit be adopted as state policy. The recommendations included reinstating annual funding for alternative water supply development, support for regional partnership and the establishment of multi-jurisdictional utilities, setting per capita targets for water use and the establishment of best management practices for water supply and use. Additionally, the Water Congress recommended the amendment of state statutes and rules so that conservation practices may be considered as ‘alternative water supplies’. Finally, the Congress set a goal of 100% beneficial reuse of reclaimed water from publicly owned utilities (Century Commission 2008).

The WMDs are charged with taking “into account cumulative impacts on water resources and manage those resources in a manner to ensure their sustainability” (FS 373.016(2)). The Districts are further charged:

- (a) To provide for the management of water and related land resources;
- (b) To promote the conservation, replenishment, recapture, enhancement, development, and proper utilization of surface and ground water;
- (c) To develop and regulate dams, impoundments, reservoirs, and other works and to provide water storage for beneficial purposes;
- (d) To promote the availability of sufficient water for all existing and future reasonable-beneficial uses and natural systems;
- (e) To prevent damage from floods, soil erosion, and excessive drainage;
- (f) To minimize degradation of water resources caused by the discharge of stormwater;
- (g) To preserve natural resources, fish, and wildlife;
- (i) To promote recreational development, protect public lands, and assist in maintaining the navigability of rivers and harbors; and
- (j) Otherwise to promote the health, safety, and general welfare of the people of this state (FS 373.016(2)).

This mission gives the WMDs extensive powers in regulating water and land use activities throughout the state, arguably in a stronger way than is currently practiced. One part of the mission that the districts have made large strides in is the reduction of groundwater pumping in areas that had been degraded by excessive use. For the Southwest Florida Water Management

District (SWFWMD), this had been achieved through increased surface water use during times of high flow and use of desalinated water. This has enabled the district to reduce pumping and begin to implement plans for restoration of the aquifer. The use of nontraditional sources has been successful in reducing the incidence of new sinkholes and ground subsidence (SWFWMD 2006). The districts have also been responsible for spending the funds in the Florida Forever program and are responsible for the conservation of large portions of land, mostly in areas that also protect water resources and aquifer recharge areas. The South Florida Water Management District (SFWMD) for example, is responsible along with the Army Corps of Engineers for restoring the Everglades. These programs are extremely important from a land use perspective because they perform the opposite duty of high-density city cores, protecting land on the fringes of urbanized areas. Both approaches, higher density and mixed use cities and rural conservation are necessary to achieve sustainability goals in the state and these projects provide examples of what is necessary going forward.

The Districts are also responsible for implementing stormwater regulations, which are currently being redrafted by the DEP. The new stormwater rules, although still being drafted, include guidelines that far exceed the previous set. The guidelines include much more stringent rules for new development requiring that the discharge from a new site be equal or less than it would be in its 'natural' state, i.e. if it is currently pasture but was originally forested the discharge would have to equal that of the forested land, not the pasture. This requirement is an important step considering that stormwater runoff is one of the major pollutants that are discharged into state waterbodies (DEP 2009). Instituting Low Impact Development (LID) strategies that reduce runoff from new development and minimize impacts on surrounding

ecosystems by incorporating landscaping and design elements into their development plans is necessary to protect water bodies in the state (Clark 2009).

Enforcement of growth management requirements for ten year water resource plans and how specific projects affect those plans is an important part of planning for water use. This should be used more widely in communities experiencing water resource shortages to better manage how new growth is permitted.

### **Land Use**

In Florida, TOD standards are currently being developed for the urban core, general urban areas, suburban, and rural areas. These include minimum densities and/or FARs, maximum parking requirements, jobs/housing ratio requirements, average block sizes, mixed-use requirements, and other measures designed to promote efficient land-use. These can be seen as highly progressive guidelines and make use of concepts that are nearly opposite of traditional zoning. For example, the shift from segregated uses and minimum parking to mixed uses and maximum parking are both designed to minimize auto dependence and encourage walkability. Previously, if a development was on or near a proposed or existing transit line, owners and developers could claim to be transit oriented. These guidelines would provide a good model for TOD in the state and would help to standardize what kind of development can be considered 'transit oriented' (Florida DOT 2009). It is important to note that the densities proposed for TODs in Florida are significantly higher than what has been built by new urbanists and higher than what is routinely built even in urban areas of the state. In general, Florida needs to change its future development patterns to be mixed-use, high density, and have the lowest possible impacts on surrounding areas and transportation systems.

## **Ecosystem Conservation and Restoration**

Florida has begun to take on habitat restoration in a few important ways. First, the everglades restoration project, along with its sister project, the restoration of the Kissimmee River system have been groundbreaking, if expensive, experiments in ecosystem restoration. The Florida Forever program, which buys environmentally sensitive land for conservation purposes, has been a huge success and is popular with residents in the state, if their willingness to tax themselves for it is any measure. However, the \$300 million approved by voters has not increased over time and falls far short of the \$5.5 billion recently approved by Minnesota voters for land preservation, water source protection and the arts (Jacobson 2009). The recent deal with U.S. Sugar Corporation to sell some of its land holdings to the state to be used for Everglades conservation appeared promising, but has been downsized twice and now appears to cover less than half of the original proposal with options to buy the rest if funds become available.

Counties have also made significant progress in their own conservation initiatives. Hillsborough County for instance, has approved the Environmental Lands Acquisition and Protection Program (ELAPP) through local bond measures to buy land for conservation purposes (Hillsborough County 2009). This has succeeded in preserving nearly 45,000 acres.

Although these policies are a step in the right direction, Florida needs to work more aggressively with private landowners to achieve conservation goals. This could take the form of conservation easements, transfer of development rights, or outright purchase. Additionally, land use and transportation policy that is more closely linked is needed to build more sustainable communities.

## **Transportation**

Florida currently has a transportation model primarily centered around automobiles. While this has enabled convenience of travel within the state and access for tourists, it has also

led to inefficient patterns of development and a decreasing level of service on roads as capacity has failed to meet the demand for service. It is unlikely that depending solely on roads in the future will meet the sustainability goals defined by the Century Commission and the GHG reductions called for by the Governor. That said, there is a large existing road infrastructure that is not going anywhere and it is important to use the investments made in transportation as the state moves toward a more diverse supply of transportation options.

The contribution of GHG emissions from the transportation sector is nearly 40% (Century Commission 2008), and this will have to drop along with emissions from electricity generation if emissions reductions goals are to be met. Considering that Florida does not produce cars or have significant influence on the technology that could limit their emissions, the state needs to adopt land use policies that require fewer and shorter trips by automobiles.

The major components of transportation policy options available to meet state goals include changes in land-use patterns, use of existing rail lines for commuter rail, establishment of new commuter rail lines, new local fixed rail or bus transit routes, and large improvements in fuel economy for passenger vehicles. These solutions need to take place in the context of greater cooperation between government levels and different agencies.

### **Coordination among Agencies**

Overall, Florida has made important strides in shifting land use, transportation, and water priorities toward a course that lessens impacts on the state's natural resources. However, greater coordination between agencies and stronger leadership from elected officials is needed to implement the steps necessary to achieve greater environmental sustainability.

One measure studied by the Office of Program Policy Analysis & Government Accountability (OPPAGA) is a redrawing of boundaries for the RPCs, WMDs, and DOT districts (OPPAGA 2006). This report produced three options for boundary changes that, it was

hoped, would integrate the actions of these government bodies and their missions. These included minimal, moderate, and substantial changes to the boundaries of these entities, and solicited comments from the agencies and other stakeholders to evaluate the implications of these boundary changes. Comments from the DOT were negative to the proposed changes because of the changes this might cause in transportation funding priorities based on growth projections for different parts of the state. The WMDs indicated that their boundaries should not be changed because of their alignment with natural systems. These comments are well founded, and planning along ecological lines for water use is highly desirable. The RPCs that submitted comments also stated that their boundaries should remain unchanged unless evidence is presented “that this configuration is inappropriate and inefficient in providing services to our counties” (OPPAGA 2006). These concerns over boundary changes are valid, but greater coordination between these agencies is needed to provide the level of management necessary to achieve the state’s goals.

### **Interviews**

Three interviews were conducted in April and May of 2009. These included Evan Johnson of Tampa, Mariah Schwartz of Sarasota, and Erik Bredfeldt of Gainesville. The people interviewed were selected for their knowledge of local planning efforts and experience in the State of Florida (Bredfeldt, Johnson, Schwartz 2009).

The interviews with planners indicated that involvement at the neighborhood and community level was necessary to achieve many sustainability goals. Starting at the local level and getting community support for sustainable policies helps their passage, and implementation of policies can be better explained to communities when problems arise. For example, many neighborhoods resist density increases but are opposed to sprawl. Finding these balances is one of the reasons that the state has experimented with innovative planning solutions.

The existing plans for many counties have resulted in the allocation of development rights that may not resemble efficient land use patterns when fully developed. The planners interviewed agreed that changes to comprehensive plans encouraging higher densities, public transit, and greener buildings were needed but there were differences in how best to implement policies to encourage those goals. Specifically, the use of Transfer of Development Rights (TDR) was not particularly popular because of the difficulty in finding buyers wanting to increase their density. Local governments routinely give away density increases at the request of developers, and creating a disincentive to build at higher densities is viewed as a potential problem.

An interview with Mariah Schwartz, a LEED certified building construction professional, revealed that there is a considerable knowledge base in the state for green building. Mrs. Schwartz was confident that if requirements for green buildings were implemented, there would be no problem from a building technology standpoint to achieving higher levels of green certification. Evan Johnson, a planner in the Tampa Bay area, agreed with this sentiment, but stressed that there could be negative aspects associated with greener buildings in the form of higher housing costs.

When asked about Gainesville's recent passage of a FIT, Mr. Bredfeldt voiced his support for the policy but raised concerns about a statewide FIT because of its cost to consumers. The unique position of Gainesville Regional Utilities being a government owned utility makes it a policy that will be difficult to talk private utilities into. Additionally, he pointed out that this is a challenging time for local governments and that additional planning mandates might be hard to coordinate. The difficulties of local governments were seen as partly because of a lack of

funding from declining tax revenues and partly because of how far behind on infrastructure improvements the state already was.

### **Summary**

Overall, a number of initiatives exist in the areas of growth management, energy use, environmental protection and transportation. The state has undertaken many growth management experiments including RLS, and sector planning. Additionally, the growth management structure of the state and its division between local, regional and state bodies is both necessary and desirable if practiced properly. In the area of GHG reduction strategies and energy use, the state has several initiatives aimed at reducing these emissions, but some groups in the state believe that not enough is being done to implement these strategies. A transportation program focusing mainly on automobiles has dominated, and finding ways to lessen reliance on automobiles and reduce emissions will be a necessary part of any plan to achieve a sustainable Florida. In addition, based on the proposed state indicators, plans do not yet exist to move in a more sustainable direction. Alternatives to current policies and analysis of these findings are discussed in the next chapter.

Table 4-1. JCCI Indicators

**Sustainable Economy**

Economic Prosperity	Educational Opportunity	Housing Accessibility
Employment Growth	School Readiness	Housing Affordability
Average Annual Wage	High School Graduation Rate	Homeownership Rate
Per Capita Income	College Continuation Rates	Homeless Count
Unemployment Rate	Educational Attainment	Additional Measures
Poverty Rate	Additional Measures	
Additional Measures		

**Sustainable Environment**

Environmental Protection	Growth Management	Responsible Energy Use	Transportation Efficiency
Water Use	Percent of Florida Land Area in Conservation	CO2 Emissions From Fossil Fuel Combustion	Commute Times
Water Reuse	New Housing Starts	Sources of Energy Production	Daily VMT
Recycling	Acres of Farmland	Gallons of Motor Fuel Sold per Person	Transit Ridership
Additional Measures	Additional Measures	Additional Measures	Peak Hour Travel Congestion

**Sustainable Society**

Community Health	Safety and Security	Arts, Culture and Recreation	Civic Engagement	Social Strength
Infant Mortality	Crime Rate	Library Use (Materials Circulation per Person)	Voter Registration	Teen Birth Rate
Years of Potential Life Lost	Child Abuse	State Grants for Culture and the Arts	Voter Turnout	Discrimination Cases Filed
Health Insurance	Juvenile Delinquency	Employment in Arts, Entertainment and Recreation	Charitable Contributions	Employment of People with Disabilities

Table 4-2. Sustainable Environment Indicators With Goals and Policy Actions

<b>Sustainable Environment:</b>	<b>Indicator</b>	<b>Goal</b>	<b>Date</b>	<b>Current Policy Actions</b>	<b>Needed Policy Actions</b>
<b>Environmental Protection</b>	Water Use			Water congress, ongoing projects and management by WMDs	Long term planning for water sources and consumption
	Water Reuse	100% beneficial reuse	2030	Highly treated reclaimed water is mainly disposed of	Integration into to irrigation or industrial uses for full beneficial reuse
	Recycling			Most cities have recycling programs	Higher levels and wider coverage of programs, markets for recycled products
<b>Growth Management</b>	Percent of Florida Land Area in Conservation			Florida Forever, Everglades purchase, ELAPP, CLIP	Additional funding, private partnerships and incentives
	New Housing Starts				
	Acres of Farmland			HB 697,	State Comp. Plan, Complete Streets Policy, Sector Planning, RLS
<b>Responsible Energy Use</b>	CO2 Emissions From Fossil Fuel Combustion	80% reduction from 1990 levels	2050	Renewable Portfolio Standard	RPS that is likely to meet goals
	Sources of Energy Production		20% by 2020	PSC RPS for renewable energy, RED in Gainesville	Statewide Renewable energy Dividend (RED)
	Gallons of Motor Fuel Sold per Person				Additional support for biofuels, incentives for vehicles with greater fuel economy
	Additional Measures			HB 697	
<b>Transportation Efficiency</b>	Commute Times			Local comprehensive plans	Housing near employment centers
	Daily VMT				Adopt and sub-allocate VMT reduction targets
	Transit Ridership			TOD draft guidelines	Funding parity between transit and road projects

## CHAPTER 5 ANALYSIS

Based on the existing literature and the research contained here, it will be extremely difficult for Florida to achieve the goals sought by the Century Commission for a Sustainable Florida. To begin, these goals require drastic and immediate steps to change the way residents of the state live in many different ways. Changes in the state's power, water and transportation systems may be the most expensive from an infrastructure perspective, but the changes in other measures of sustainability may be even more difficult to achieve, particularly without strong stakeholder support. In addition, impacts from climate change may make many of these efforts moot as more frequent flood events and increasing sea levels impact the state's coastline. While experts from many fields continue to examine solutions for a sustainable Florida, there is a sense among some that the battle is already lost. This apathy is unfortunate, but the inevitable result of a culture built on growth at any cost. If the state is to achieve a sustainable future, immediate action to implement the recommendations of the Century Commission and other bodies in Florida is needed.

One possibility for measuring progress in sustainable development is to use a system similar to the LOS standard for roads, schools, etc. This would allow local governments to monitor progress on a number of indicators. One potential problem with this approach is that in the case of roads, LOS actually declines over time as more traffic reduces the capacity of the road to function effectively. Having a plan to improve long-term LOS is more important than the short term measurement of these indicators. However, both goals and monitoring are necessary to measure progress on a certain indicator based on a timetable.

When considering timetables for reducing VMT, air pollution, or other indicators of sustainability mentioned above, it is important to consider the role of technology in the

performance improvements of urban communities. This improvement will not happen by itself however, and fostering the type of ‘green collar’ economy that produces innovation in these sectors is needed if it is to take place.

## **Growth Management**

### **Chapter 163 and Rule 9J-5**

Although this chapter and rule appear on paper to have a significant amount of power, their reach is actually limited by a number of factors. To begin, rule 9J-5 is only a minimum standard, and some cities and counties have chosen to go much further in developing their plans. Having a plan though, does not necessarily mean that it is implemented at any meaningful level. Often plans may be amended frequently, and only large-scale amendments are subject to review by DCA. This creates a situation that allows many proposals that are not consistent with comprehensive plans to simply apply for a plan amendment that would suit the project that they have proposed. This situation erodes confidence in the credibility of the comprehensive plan as the guiding document for future growth and makes it merely a hurdle for a developer to clear rather than an enforceable document for growth management. This is despite the fact that nearly every section of the rule mentions the prevention of urban sprawl and the rule clearly defines what urban sprawl means:

‘Urban Sprawl’ means urban development or uses which are located in predominately rural areas, or rural areas interspersed with generally low-intensity or low-density urban uses, and which are characterized by one or more of the following conditions: (a) the premature or poorly planned conversion of rural land to other uses; (b) the creation of areas of urban development or uses which are not functionally related to land-uses which predominate the adjacent area; or (c) The creation of areas of urban development or uses which fail to maximize the use of existing facilities or the use of areas within which public services are currently provided. Urban sprawl is typically manifested in one or more of the following land use or development patterns: Leapfrog or scattered development; ribbon or strip commercial or other development; or large expanses of predominately low-intensity, low-density, or single-use development (Rule 9J-5.003 (134)).

This definition appears very thorough, and seems to define sprawl very well. Anyone can see however, that the type of development described above has been built all over the state. This indicates that the rule has very few teeth when actually applied, and that major revisions are needed if it is to continue to function as the guiding force for future growth. Some changes that might be useful would be to limit or eliminate amendments from comprehensive plans except during the Evaluation and Appraisal Report (EAR) process every seven years. This would limit the number, type, and frequency of plan amendments and ensure that plans were more static documents, rather than being amorphous and subject to the whims of deep pockets.

Additionally, one of the minimum requirements for comprehensive plans should be that every urban area of a certain population develop an urban growth boundary and clearly define what uses are permitted inside and out. This could include the extension of services to this area (or not), and would hopefully be a strong line rather than one that is pushed further out as adjacent parcels request inclusion. Also, as DCA evaluates how to comply with the provisions of the bill 697, transportation and land use requirements that take into account increased emissions from new development and require a higher level of scrutiny for large projects could be implemented.

### **House Bill 697**

This bill provides significant force in directing local authorities to address the efficiency of land use patterns in their comprehensive plans, however in many ways it does not go far enough in terms of how these changes should be implemented. In the case of the Florida Building Code, it requires that energy efficiency be improved in buildings by certain amounts but does not indicate how these will be monitored. Energy use in buildings can be assumed based on materials used and their known properties of insulation and other factors, however building energy use can only be determined after a building is occupied and has already received a certificate of occupancy by the inspector. In this case, one wonders if inspectors will have to

return to inspect energy use, and if it does not meet the standard, what then? Will the builder be liable to the tenant and possibly to the state for failing to meet code? The questions of enforcement here are important and do not appear to have been fully considered.

As for the consideration of greenhouse gas emissions in comprehensive plans, the bill requires that local governments consider this but provides no guide for their reduction. Just because a government has taken something into consideration means very little when a GHG reduction strategy is what is actually needed.

Legislative initiatives like those introduced this year, and last year's HB 697 requiring local governments to incorporate greenhouse gas reduction strategies into comprehensive plans, further muddles the picture. After 30 years, Florida is still searching for a coherent and strategic approach toward improving mobility and livability, enhancing economic competitiveness and providing sufficient funding for needed transportation improvements (Blanton 2009 p.1).

This statement is true of the piecemeal state of Florida's growth management law and is a further example of the need to streamline and consolidate the process.

### **Florida and Sustainable Growth**

If there is one thing to be taken from the recent real estate crash in Florida, it is that market forces alone do not provide a reasonable method of accounting for supply and demand of new development. While the market players pushing for more new housing developments on the fringes of cities pointed to population projections that required this development, we are now faced with a supply of housing that could take years to be absorbed into the market. At the same time, this development pattern has burdened transportation systems and had a negative effect on the ecosystems of the state. In the future, strict urban growth boundaries, greater authority for permitting departments and more stringent growth management controls are needed to have a steady and sustainable land development industry in the state. If the history of boom and bust

cycles in Florida has taught us anything, it should be that limits in a high-growth period are not an unreasonable restraint on business.

### **Barriers to Sustainable Development**

One problem with the implementation of sustainability measures in the State is the current economic downturn. In addition to reducing state revenues, it has also led to calls by lawmakers for relaxing growth management laws to spur land development. One example of this is Senate Bill 360. Changes to SB 360 could eliminate most state review of large developments in Florida's largest metropolitan areas by creating a large number of additional transportation concurrency exemption areas (Pittman 2009). These and other proposals by state lawmakers for reducing accountability in new development extend to water regulation as well with some pushing for relaxed permitting standards for new water use permits. These proposals for less stringent oversight come at a time when the state is in the middle of a drought and immediately following recommendations by the Water Congress that run counter to the suggested changes in water regulation. Ironically, the proposals to gut regulations for new development come at a time when there is a glut of new development on the market and credit both for the construction and eventual purchase of new homes and other buildings is difficult to find. These proposals weaken existing laws related to Florida's environmental and growth management regimes and run counter to most of the solutions discussed in this paper.

### **Regional Planning**

Although the function of Florida's eleven RPCs is to adopt and implement Strategic Regional Policy Plans that include natural resources, transportation, housing, economic development, and emergency preparedness, their scope should be broadened and their powers increased. These existing bodies are much closer to the areas they serve than the DCA and could be a force for the implementation of sustainability programs. Particularly in the realm of natural

resources and transportation, these bodies have the potential to coordinate efforts between the cities and counties that they serve and set wide policy goals that are regionally important. Their function of providing technical assistance to smaller communities however, is extremely important and should be continued. One possibility for better management with the RPCs would be to have their functions administered under the WMDs which have greater powers, including taxing authority. This would enable water and planning regions to be under the same umbrella and would put permitting authority in one place rather than having it spread among multiple agencies. Development interests might enjoy this because it is one less layer of permitting and it could provide benefits to the state in the form of lower administration costs and better results. It would also embrace a concept more related to bioregional planning that encourages planning from a resource point of view, in this case water. At the least, combining and readjusting boundaries of RPCs to align with those of the WMDs might provide a more consistent management of natural resources. This fact is also true of the DOT districts, the seven of which have a third set of boundaries that align poorly with the RPCs and WMDs. This view was supported in interviews conducted with planning professionals who felt that the overlap, or lack thereof, of planning districts for transportation, water, and land-use decisions should be consistent with each other to support a more resource based approach.

### **Local Planning**

The local planning process in Florida, although flawed, is still far beyond what most states require, and changes may be difficult to achieve because of that changes might not produce a better outcome. Although the state imposes many requirements on local governments, few of them seem to actually alleviate sprawl, reduce transportation congestion, or promote the kind of development that is required to achieve sustainable development goals. HB 697 imposes necessary requirements on local governments to evaluate their plans for efficiency, but it is well

known that the current pattern of development is inefficient. To actually achieve the necessary efficiency desired, redevelopment of city cores and suburbs to achieve a better mix of land uses and the discouragement of single use developments where possible are both necessary for this goal. Additionally, state financial support is needed to increase public transportation facilities and ensure that they have a high level of service. A complete streets policy could be mandated for all new development, and again, state financial support for this in the redevelopment of built areas could improve the rate and scale at which redevelopment is implemented. This would help to make streets safer for pedestrians and bicyclists and in the process, reduce VMT.

### **Land-Use**

Land-use decisions are a major aspect of environmental sustainability, and as discussed above, Florida has lacked both cohesive policy on land-use decisions and has a perceived lack of regulatory authority or political will to deal with inefficient land-use patterns. A number of actions are necessary for the state to achieve sustainable growth patterns. First, Urban Growth Boundaries (UGBs) need to be mandated for the state's large metropolitan areas. These would help to contain sprawl and preserve agricultural land. Within these boundaries, zoning densities must be increased to accommodate growth and outside of the boundary, density and uses must be changed to preserve agricultural lands and environmental resources. The Critical Lands Identification Project (CLIP) provide a good criteria for targeting lands in need of protection, and their methods focus on a range of issues including protection of biodiversity, water resources and rare ecological communities in the state.

The Urban Land Institute has a number of strategies for new, compact development that, when coupled with transportation strategies can reduce VMT and result in more efficient models of development. These strategies, such as creating nodes and corridors with dense, mixed-use development around transit stations offer a more compact form of development that is less

dependent on automobiles. These would then be connected to surrounding areas through walkable and bikeable streets. This process can also be used for infill and redevelopment projects and change the existing development pattern to a more efficient form. The success of these regulations will lie in whether these densities are required around transit hubs. Developing similar regulations for new neighborhoods such as those contained in the LEED-ND (Neighborhood Development) standards or the FGBC new development standard for all new development in the state could help discourage sprawl and provide more livable communities. Coupling these with LID strategies could have beneficial effects for general land use patterns and water quality through reductions in urban runoff (UF Water Institute 2009).

In interviews with planners in the state, one recurring theme was that the vested rights of many landowners are a difficult obstacle to overcome when trying to change the traditional development pattern in rural areas. This is land that is currently used for agriculture but is zoned at a low density allowing for the development of residential lots or other forms of low density development. Adopting a comprehensive strategy to change this pattern of piecemeal development that does not conform to future land-use goals is an important step in making future development in the state more efficient.

### **Other planning programs in Florida aimed at sustainable development**

As discussed in the Findings section of this paper, Sector Plans and Rural Land Stewardship areas have been proposed as alternatives to the traditional comprehensive planning structure. These ideas, while promising have been watered down from their original forms. The two examples discussed here are Bay County and Collier County, and these provide good examples of the implementation of these programs.

The West Bay Sector Plan for example, covers 72,500 acres and includes a mix of residential, commercial, and industrial uses. It also led to the preservation of about half of the

acreage including some of the most sensitive areas. In some ways this seems like a win for conservation advocates, and the Sierra Club partnered with the authors of the plan and eventually signed off on it, but there are other considerations as well. The sector plan was centered around a large new international airport, which was the impetus for the plan. The land around it was owned by the St. Joe Company, a powerful timber and development interest in Florida, and detractors of the project claim that most of the land to be preserved was undevelopable anyway and would have been difficult to develop at all if not for the sector planning process (West Florida Regional Planning Council 2001). The scale of the plan makes it an excellent example of what can be accomplished through non-traditional planning mechanisms, however, as for the contribution to sustainable development in Florida, the destruction of wetlands, fragmentation of ecosystems, and building of a large new airport make it a poor example of what should be taking place in terms of progress toward a sustainable state.

Collier County has the most significant RLS program and designated a large portion of land in the Eastern section of the county as a RLS area. The designation was a direct consequence of its comprehensive plan being rejected by the DCA in 1998 because of its promotion of a sprawl pattern of development (Bosi 2009 p.22). The Collier County program, which has led to the conservation of significant portions of land, has also allowed for the development of large projects such as Ave Maria, a Catholic university and town in the new urbanist style. Overall, the RLS program has been diluted to the extent where traditional planning mechanisms might have a more desirable outcome.

This focus on large areas is an important strategy in finding sustainable planning solutions for the State of Florida. While these programs have changed, they offer valuable lessons on how innovative solutions can be used to preserve large portions of land and have high

quality development in other areas. Larger scale sector plans and Rural Land Stewardship projects may have the potential to satisfy planning goals related to sustainable development, but only if the programs are significantly changed and strengthened in their approach toward conservation and development.

## **Responsible Energy Use**

### **Electricity Generation**

In considering how to reduce the state's GHG emissions, the issue of how we generate electricity is a major consideration for planners. First, permitting issues for renewable energy generating capacity involve planners, particularly in removing barriers to solar energy production. Currently, proposals for new electricity sources include nuclear, natural gas, coal and renewable sources. Planning for energy capacity is central to planning for sustainable development, and this must become a central part of state policy in the future.

One problem is the apparent disconnect between lawmakers and those implementing their decisions. In the case of electricity, let us examine the different proposals for renewable energy generation in Florida. Though the governor's climate action plan calls for an 80% reduction in greenhouse gas emissions by 2050 (Executive Order 07-127), the Florida Public Service Commission (PSC) is currently drafting rules for electricity generators requiring 20% of power to be generated from renewable sources by 2050 (PSC 2008). While electricity generation is not completely correlated to emissions, this standard falls far short of the goal set by the governor for GHG reductions.

Considering that the current level of renewable energy use in Florida is 3% of the total, achieving the more ambitious goals for GHG emissions will take a number of steps. Coal, natural gas, and petroleum account for approximately 84% of the electrical generating capacity

in Florida (US DOE 2005). If one considers the needs of future population growth combined with the emissions reduction targets, there are a few possible solutions available.

1. Carbon capture and storage technology to capture CO<sub>2</sub> from power plants.
2. Repowering of coal and petroleum plants with natural gas and large scale investments in renewable energy sources.
3. Large investments in nuclear and renewable energy.

These possibilities, or a mix of them offer significant reductions in GHG emissions, although each has its costs and political considerations. Carbon capture and storage technology, while possible, is currently in early testing phases and may not be available for some time, if ever, and the costs and risks associated with it are unknown. Repowering of older plants is already underway in Florida and switching from coal to natural gas can reduce carbon emissions by approximately 50% depending on the type of coal being replaced and the efficiency of the plant (Naturalgas.org 2008). Ultimately, the answer should be a mix of these three alternatives, but that mix is subject to a number of considerations, mostly economic at this point. If all of the petroleum and coal electricity generation in the state were switched to natural gas, carbon savings could be expected to be 21% below current emissions (Naturalgas.org 2008). However, the investments required for repowering these plants might be better spent investing in renewable fuels if carbon savings is the goal. With a forty year horizon, it is obvious that an 80% reduction in GHG by 2050 is not possible with natural gas alone. Nuclear energy is carbon free, but in a state that is regularly hit by hurricanes, may not be entirely safe and is a major user of water (Pittman 5/2009). Large investments in renewable energy should be considered as a way to reduce resource consumption and stimulate a green economy in the state.

## **Buildings**

Considering the role of buildings in energy consumption and materials use, Florida should adopt building standards that are both resistant to wind damage and that achieve a high level of energy efficiency. Adopting LEED standards into the Florida Building Code along with hurricane standards would go a long way toward achieving both climate change and sustainability goals. LEED standards have the benefit of taking site selection, indoor air quality, and energy and water efficiency into account so this would meet multiple goals for improving performance on many of the state's sustainability indicators. Improved indoor air quality potentially improves the health of building occupants promoting public health, while sustainable site selection achieves some of the land use goals needed for the state to have a sustainable pattern of land development. Improved energy and water efficiency, potentially resulting in carbon neutral buildings, satisfy two of the other major concerns for the state in meeting carbon reduction targets and decreasing water usage. One consideration here is which standard to use. I propose the highest levels of LEED certification because they offer the most savings. LEED Silver gives only modest energy savings over conventional buildings, and the Florida Green Building Coalition's standards are not nationally recognized. Therefore, LEED Platinum or equivalent is important to achieve from a single building perspective. Using these standards would be an excellent way to implement the requirements of HB 697. Because Florida's development pattern traditionally incorporates residential subdivisions as its major component, adopting LEED Neighborhood Development standards for new subdivisions should be a goal of state regulators. The TOD standards now being evaluated by the DOT are an excellent example of what is needed to provide a more efficient land-use pattern for the future. In consideration of all of these standards however, housing affordability and the effects of green building programs must be considered.

## **Environmental Protection**

### **Water Use and Reuse**

The Water Congress held in 2008 in Orlando produced no concrete proposals, and since then, no major changes have been announced as to how the state might change its patterns of consumption. This congress, like many other state actions, is only a long term planning meeting and has raised alarms with many different groups. If this is any example of how sustainability planning is going to continue in Florida, success will be elusive. This view of the Century Commission and its Water Congress was confirmed in interviews with planners. The lack of an actual plan to get to the goals envisioned by these groups is unfortunate and would be better served by a set of proposed legislative actions rather than by recommended goals. Additionally, those interviewed pointed to the fact that for all of the money spent on the Century Commission, there have been few results quantified in changes to the way water and other resources are permitted in the state.

The continuing divide between North and South Florida is a major sticking point on water issues, but transfers from rural northern counties to developed southern ones should be avoided. This will only lead to continuing unsustainable patterns of water use in South Florida, and may hurt ecosystems, agriculture, and development interests in North Florida. Instead, the WMDs should pursue policies to reduce potable water consumption and pursue the Century Commission's goal of 100% beneficial reuse of reclaimed water.

### **Ecosystem Conservation and Restoration**

Although the Florida Forever program, Everglades restoration, and other programs are a step in the right direction, Florida's ecosystems are threatened by fragmentation and degradation from human activities. There is an emerging consensus however, that land preservation is something that voters will approve as evidenced by Minnesota's recent approval of \$5.5 billion

for preservation and Ohio's approval of \$400 million (Jacobson 2009). These two states have fewer resources in their budgets than Florida yet have managed to pass expenditures that are significantly greater (NASBO 2007).

The Environmental Land and Water Management Act of 1972 took the important step of establishing Areas of Critical State Concern to be targeted for conservation. These included the Florida Keys, Big Cypress Swamp, Green Swamp, and the Cities of Key West and Apalachicola. Although this program was meant to identify and protect areas critical to the environmental health of the state's ecosystems, these are the only places that were ever designated and the program basically disappeared. If something similar could be revived through the Critical Lands and Waters Identification (CLIP) it would aid efforts to prioritize conservation programs and help local communities that may not have the resources to protect these lands on their own. Many communities in Florida depend on these ecosystems to draw tourists and residents, but this pressure may make these areas less desirable as ecotourism destinations. Identification of vital ecosystems and their conservation is vital for the state and is the necessary partner of growth management. Planning for the conservation of ecosystems is equally important to planning for high density mixed use growth, and both are necessary for a sustainable environment.

### **Agriculture**

One area of Florida's economy that could potentially see large gains from the encouragement of sustainable development is the agricultural sector. Florida's farmers could convert large areas of land and use current waste products for biofuel production. Conversion would simultaneously reduce emissions, stimulate new areas of the agricultural economy, and provide 'green collar' jobs in refinement and distribution of these fuels. Additionally, the transport of food is increasingly seen as a negative environmental impact. Creating and fostering local sources of production and distribution provides large savings over nationwide collection

and distribution networks and provides local benefits to producers and consumers. Finally, Florida's silvicultural industry could benefit from GHG reduction strategies as carbon sinks. In any federal carbon trading scheme, these areas could be valuable for more than just timber value, and could receive payments for carbon storage.

### **Sustainable Society**

The many indicators proposed to the Century Commission to measure a sustainable society offer a number of interesting points but little in the way of concrete plans. The five subcategories give a number of indicators that give an idea of what a more sustainable society might look like, but no actual goals have been set for these measures. For most sustainable society indicators mentioned here, establishing a baseline and then measuring improvements or declines in rates would be a clear method of measuring performance. Considering that these are only recommended indicators and not a final list, it is acceptable that there is not a benchmark set and a plan to achieve that goal, however there should be goals and a plan to meet them. One thing to consider is whether some of the indicators mentioned here are good measures of a sustainable society. For example, there may be a certain number of eligible voters who will never vote, making a certain maximum to the level of voter turnout. On the other hand, there are ways to improve voter turnout significantly with cost savings for the state. Oregon for instance, requires everyone to vote by absentee ballot, making it more convenient and potentially boosting turnout. The example of voter turnout is chosen here because of its dubious relation to what a sustainable society might look like. Turnout has been included on the list of indicators, and might represent a more informed and active electorate, but an informed voting public does not necessarily represent a sustainable society.

Like the crime rate and juvenile delinquency, employment in the arts and state grants for the arts are heavily dependent on the state of the economy. Crime rates drop when the economy

is doing well. Accordingly, state revenues rise when the economy is strong and more money is available for grants. This change in economic fortunes is partly a recognition of the connection between economic and social sustainability, and that without a strong economy it is unlikely that we will have a sustainable society. Addressing some of these problems together then is something that may be necessary. To lower crime rates it may be necessary to retrain offenders upon release, something that is unpopular with taxpayers. Developing benchmarks and action plans is an important step, but ensuring that they address the problems holistically is even more important. We have focused here on the environmental factors that can help to foster a sustainable society such as providing for clean air and water. Improving environmental quality can result in personal and societal benefits that draw communities together and improve relationships through shared values and resources.

### **Sustainable Economy**

The proposed indicators for a sustainable society are a mix of traditional measures of the economy and of social indicators measuring education and housing. Measures such as the poverty rate, employment growth, average annual wage etc., are good for measuring the overall health of the economy, but have little to say about how sustainable it actually is. The use of educational opportunity as a measure of a healthy economy is a less traditional method, but is important considering that the current student will eventually be a part of the workforce, and higher educational attainment translates into better jobs in the state. Also, the use of housing affordability and availability as recognizes that the cost of living in a sustainable society may be higher than current costs. Housing alone however, does not make a sustainable economy.

The proposed economic indicators might also address green business in Florida and focus on supporting 'green collar' jobs as a way of improving Florida's economy. In their list of additional measures to indicate prosperity, JCCI suggests job growth by industry type as an

additional indicator. Creating a category for ‘green industry’ might better show how the state’s economy is becoming more sustainable. In addition, state support for green industries could be an important catalyst for growth in this area. This is especially true considering the potential of ‘green jobs’ creation in the future and the state’s potential to capture these in areas such as solar energy, biofuels production, and other energy related sectors that will be necessary to achieve the efficiency improvements in water and energy use in the state.

Measuring only traditional indicators of growth ignores that some industries are extractive or inherently unsustainable. Drilling and mining for instance, might cause short term increases in these measurements but ultimately declines are inevitable as reserves of minerals are exhausted.

While the state has made significant progress in developing sustainability goals for the major environmental indicators, much work remains to be done. Serious problems remain with existing land use patterns in many parts of the state, and existing zoning and future land use designations are not adequate to address the problems that exist. While the state has set ambitious goals for reducing emissions from electricity producers and customers, it has failed to do the same for transportation emissions and will need to deal with this problem in the future. Land conservation strategies have been successful in Florida and have widespread public support, but these must be broadened if they are to achieve the goal of conserving significant portions of the state’s remaining ecosystems. Finally, instituting transportation strategies that reduce automobile dependence and urban sprawl are sorely needed, and developing public support for these policies is needed to change land development patterns and the transportation systems that serve them.

## CHAPTER 6 CONCLUSIONS AND RECOMMENDATIONS

There are a number of possible solutions for the state to achieve a higher level of environmental sustainability. These include revision and implementation of the State's comprehensive plan, implementation of the recommendations of the Century Commission, revision of Chapter 163 and rule 9J-5 governing planning activities, and other legislative actions. Each of these has its benefits and problems, but a combination of the above proposals focused on environmental sustainability is possible and could actually lead to significant savings and benefits for the state.

Florida's Comprehensive Plan, which was mandated under the growth management act, was never implemented at any meaningful level. Requiring a new state comprehensive plan that pulls together all of the local plans as a baseline for revisions is an important first step in determining many of the planning needs to achieve a more sustainable future for the state. Currently, counties and cities create their own comprehensive plans with little attention to what goes on in neighboring municipalities. Thinking at a regional and statewide level is mandatory if any serious actions are going to be taken on land-use and transportation issues in particular.

Considering that many of the intentions of the state's Growth Management Act have never been implemented, a rewriting of growth management legislation combined with other environmental legislation in the state may be more beneficial for achieving sustainability goals. While the scope of new legislation would ideally be broader than simply a combination of existing law, a good starting point would include both chapter 163 and 180, the major land and water use sections of Florida Code. Implementation could take the form of an office of sustainability, as has been done in Oregon, or a single department with oversight of land- and water-use policy throughout the state. This consolidation would benefit land-use policy in a

number of ways. First, land and water use decisions would be coupled. Second, land-use and transportation policy could be managed from the same body rather than the current decentralized model for land-use planning and centralized DOT structure. This model should include conservation, land-use and transportation issues as a whole instead of piecemeal evaluation of projects.

For electricity generation, major efforts need to be undertaken to increase the supply of renewable sources. Policies to encourage renewable energy should include a statewide feed in tariff to promote and subsidize solar energy. This method is broadly favored as the most effective way to support renewable energy and can be applied to other sources of renewable electricity as they become available. While nuclear energy is still costly and difficult from a permitting perspective, it does offer the possibility of significantly offsetting GHG emissions in the near-term. With a growing population, Florida must consider the costs and benefits associated with nuclear power and determine how best to integrate this resource.

Although there have been myriad efforts to find solutions for Florida's environmental problems, solutions are few. The Century Commission consists of a wide variety of people who should and have been able to provide a path toward environmental sustainability. However this group, like other exercises in Florida's growth management history will likely be ignored and their recommendations, if implemented at all, will likely be watered down. Additionally, the commission consists of experts but has little input from citizens, other than as represented by the commission's membership. The lack of significant public input could give the impression of a lack of support from the public as recommendations are given to the state and result in drawn out compromises that do not achieve the goals that they were designed to. One of the reasons that planners spend so much time on stakeholder meetings and attempting to gauge support for

certain policies is because it gives legitimacy to the plans that are being promoted. Grassroots support is particularly important in building political momentum for programs such as these and the commission has so far failed in that role.

A number of opportunities exist for future research. First, the implementation of the Century Commission's recommendations will take time, and this will provide an opportunity for planners and others to measure progress on the state's goals as well as analyzing the benefits or failures of programs. There is some evidence that a healthy environment will help support a healthy economy and society, and this is one of the pillars of the sustainable development movement. As we move toward a more sustainable environment, evaluating the effects on the economy and the welfare of people will be important. Research on the various measures of a sustainable environment and progress on improving traditional environmental measures continues to be necessary, and measurement of factors such as agricultural runoff, endangered species monitoring, and conservation research all have roles to play in determining the amounts of land needed for conservation purposes and other uses. Additionally, research on transportation concurrency and the changes to how it is implemented in the state are important to understand as the state's growth management framework shifts.

Florida has long been a leader in efforts to manage growth. The expertise and structure is there to implement most of the programs discussed above, but it will take concerted efforts on the part of planners, elected officials, and others to see them through.

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## BIOGRAPHICAL SKETCH

After high school, Wade Reynolds attended the University of the South in Sewanee, TN becoming one of the first Environmental Policy majors in their Environmental Studies program. He has studied abroad at James Cook University in Townsville, Australia and through Virginia Tech in Sikkim, India. Following his graduation from college Wade interned with The Nature Conservancy in Telluride, CO mapping and conducting the removal of invasive species from the San Miguel River and maintaining the three preserves owned by the Conservancy. After some indecision, he decided to return to graduate school for Urban Planning, and found a job with the Hillsborough County City-County Planning Commission that allowed him to get an idea of what the profession would be like. Three years later he has finished with his degree and is looking for opportunities throughout the country.