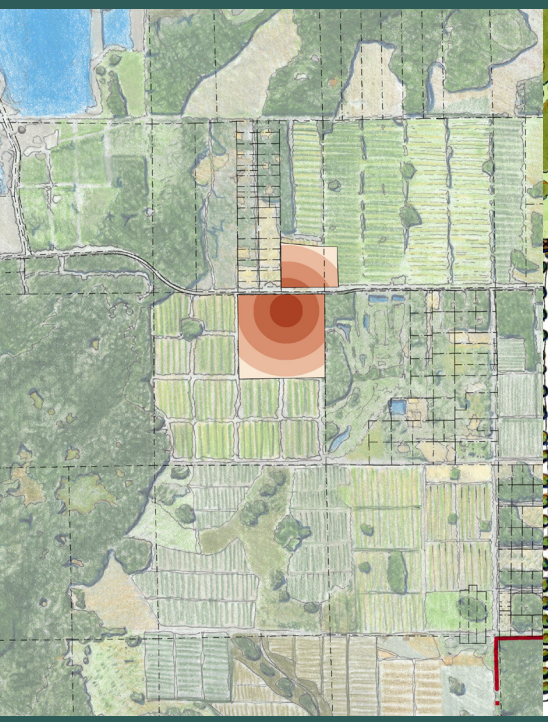
Transferable Development Rights In Southeast Lee County



Planning for the Density Reduction / Groundwater Resource Area (DR/GR)

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town planning

Lee County, Florida
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PREFACE I

General Preface

In 1990, Lee County Commissioners applied a new Density Reduction/Groundwater Resource (DR/GR) designation to most of southeast Lee County to protect the area's shallow aquifers and reduce the county's population capacity. The 82,560 acres of the southeast DR/GR host rural neighborhoods, limerock mines, and active farms. The land also contains valuable ecological and hydrological features including panther habitat and public water supply wells.

Since the designation of the area, the pressure to mine and to expand the urban area outward has been increasing. In the fall of 2007 the Board of County Commissioners initiated a 14-point Action Plan addressing critical mining, traffic, and land use issues in the DR/GR area.

A major planning effort was part of this initiative. Using detailed ecological mapping and a scenario-based land use study, a new *Prospects for Southeast Lee County* plan defined proper balances of uses for the DR/GR's future.

Dover, Kohl & Partners led the project team, with collaboration from Spikowski Planning Associates, Kevin L. Erwin Consulting Ecologist, Inc., Hall Planning & Engineering, Dan Cary, Berger Singerman, David Douglas Associates, Inc., and DHI Water & Environment, Inc.

To provide oversight and additional insight into emerging policy options, the Lee County Commission appointed a 15-member DR/GR Advisory Committee that met throughout 2008 and formulated independent recommendations on future county policy for southeast Lee County.

In September 2008 the Board of County Commissioners directed that implementation of this plan begin immediately. This implementation phase will produce five separate reports:

- ***Proposed Lee Plan Amendments for Southeast Lee County***, which contains detailed amendments to maps and policies in the Lee Plan and a summary of the data and analysis upon which they are based.

- ***Transferable Development Rights in Southeast Lee County***, which analyzes the feasibility of a transferable development rights program and provides detailed designs for potential rural and mixed-use communities.

- ***Comprehensive Hydrological Study of the Lee County Southeastern Density Reduction/Groundwater Resource Area***, which documents the creation of an integrated surface and groundwater model and analyzes land-use alternatives for this area from a hydrological perspective.

- ***Natural Resource Strategies for Southeast Lee County***, which addresses best farming practices, land acquisition and restoration, mine reclamation standards, and innovative mining approaches.

- ***Proposed Land Development Code Amendments for Southeast Lee County***, which contains detailed code amendments to carry out the Lee Plan amendments and other recommendations of these reports.

This current document analyzes the feasibility of a transferable development rights (TDR) program, provides detailed designs for potential rural and mixed-use communities, and proposes a new TDR program for southeast Lee County.

INTRODUCTION

Future residential development in the DR/GR area was carefully considered in *Prospects for Southeast Lee County*. Two of the eleven planning principles presented in that report addressed residential development:

Reallocate Development Rights;
Create Sustainable Settlements

- DR/GR land is too valuable to waste on inefficient land use patterns.
- Keep new residential development away from preferred mining areas to prevent conflicts.
- Compact and connected mixed-use communities should be the standard in the DR/GR.

Live Lightly on the Land

- Adverse human impacts on DR/GR lands should be minimized.
- Encourage cluster development to reduce the cumulative impact of human settlement.

Under current regulations, future residential development in the DR/GR area is limited to 1 dwelling unit per 10 acres. This low density cap could result in an unnecessary loss of agriculture if owners of large tracts choose to create a profusion of 10-acre lots. Large-lot development can fragment natural habitats and require excessive travel for residents who regularly drive to jobs, shopping, and entertainment.

Opportunities exist for development rights within the DR/GR to be used without creating additional large-lot subdivisions.

On large tracts of land, allowable development rights can be shifted and concentrated fairly easily; the same number of units can be constructed in compact form on a fraction of the acreage. When parcels are smaller or non-contiguous tracts are involved, this shifting requires a transferable development rights (TDR) program. Such a program could create mixed-use communities that also provide commercial and employment opportunities to help balance Lehigh Acres' abundance of single-family lots and severe shortage of land for all other purposes.

This report explores the creation of a new TDR program for Lee County's DR/GR area. This program would be a supplement to the current TDR program which applies only to wetlands and which does not allow those development rights to be used anywhere within the DR/GR.

To create a TDR program, Lee County would need to amend the Lee Plan to enable the program and then amend the Land Development Code to provide all the details needed to carry it out. Specific Lee Plan amendments have already been proposed in a companion report, *Proposed Lee Plan Amendments for Southeast Lee County*.

This report is organized into three additional chapters. Chapter 2, prepared by economist James C. Nicholas, Ph. D.[1] explores the history of TDR programs around the country and the economic conditions under which they can function effectively. An analysis is then presented of vacant land sales in and near southeast Lee County over five recent years to project the value of increased development intensity (and thus the economic feasibility of a TDR program). Keys to successful TDR programs are then presented.

Chapter 3 identifies the best locations in the DR/GR for development rights to be concentrated and sets forth basic design principles for traditional walkable neighborhoods. These principles are applied to each location to demonstrate ideal ways for this concentration of development rights to take place.

Chapter 4 proposes a new TDR program that accomplishes the principles and recommendations from *Prospects for Southeast Lee County*. This program would be carried out through amendments to the Lee Plan and the Land Development Code.

1 Emeritus Professor of Urban & Regional Planning and Emeritus Professor of Law, University of Florida

History & Economics of Transferable Development Rights 2

This chapter prepared by:

James C. Nicholas, Ph. D.

Introduction

The Issue

The conversion of lands from one use to another has been a matter of concern in many areas around the country. The economic pressures for converting from one, less intensive use such as agriculture, to another, more intensive use, such as suburban or urban development, are well known.[1] Land in Lee County commonly tends to be more valuable in development than in farming or laying fallow, thus converting from low value to higher value uses tends to be rewarded with profit.

Regulatory measures, such as land use plans and zoning, can retard and even stop such conversions. However, such regulatory measures have their own problems. The most obvious consequence of conversion ending regulatory programs is the inability of developers, speculators, or landowners to profit from the increase in land value when development potential cannot be realized because of the regulatory program.

Thus, land use planning agencies find themselves in the middle of a conflict between two competing interests. On the one hand, there is a desire to protect and preserve agricultural or environmentally sensitive land and to prevent, or at least control, certain environmental and social costs commonly associated with land conversion. On the other hand, development regulatory bodies are faced with vocal protests against any perceived diminution of property rights. These protests are particularly vocal if a new regulation is being imposed which would further restrict land conversion; but they are heard even when a long standing regulation is not lifted during a period of development pressure.

New regulations that eliminate substantially all economically beneficial use of an individual's land may be an unconstitutional taking of private property.[2] Such unconstitutional takings would require the payment of just compensation.[3] In Florida, new regulations that would place "inordinate burdens" on private property may require monetary compensation or other compensatory actions by local government even if they are not unconstitutional takings.[4] Local governments are caught between a duty to protect public health, safety, and welfare and the potential to be ordered to compensate landowners whose property has been taken or inordinately burdened even by regulations that are justified for the protection to public health, safety, or welfare.[5]

There has been a great deal of experimentation around the country with land management techniques that permanently retain lands in existing low intensity uses. In some cases these techniques are applied at the same time new regulations are imposed in an effort to retain low intensity uses without destroying the developmental values of that land. In other cases these techniques are applied independently of new regulations, either to substitute permanent protection for land that had been protected only by regulations, or to encourage landowners to voluntarily exercise their existing development rights in a different manner than allowed by existing regulations.

The most notable of these programs are purchase of development rights (PDR) and transfer of development rights (TDR).[6] Both of these programs share the

1 See Marion Clawson, *Suburban Land Conversion in the United States*, Baltimore: Johns Hopkins, 1971, for the seminal discussion of the process and economics of suburban land conversion.

2 See *Pennsylvania Coal v Mahon*, 260 U.S. 393 (1922), where Justice Holmes wrote that "government hardly could go on if to some extent values incident to property could not be diminished without paying for every such change in the general law. . . . . . **The general rule at least is that while property may be regulated to a certain extent, if regulation goes too far it will be recognized as a taking.**" Emphasis added.

3 The Fifth Amendment to the *United States Constitution* holds that "private property shall [not] be taken for public use without just compensation." The *Florida Constitution*, Article X, Section 6, (a) holds that *"No private property shall be taken except for a public purpose and with full compensation therefore paid to each owner. . . ."*

4 See Chapter 70, *Florida Statutes*, known as the Bert J. Harris Private Property Rights Protection Act. Pursuant to the Harris Act, there are ten means proposed in that are possible means to compensation a property owner for an inordinate burden: 1. An adjustment of land development or permit standards or other provisions controlling the development or use of land; 2. Increases or modifications in the density, intensity, or use of areas of development; 3. The transfer of developmental rights; 4. Land swaps or exchanges; 5. Mitigation, including payments in lieu of on site mitigation; 6. Location on the least sensitive portion of the property; 7. Conditioning the amount of development or use permitted; 8. A requirement that issues be addressed on a more comprehensive basis than a single proposed use or development.; 9. Issuance of the development order, a variance, special exception, or other extraordinary relief; and 10. Purchase of the real property, or an interest therein, by an appropriate governmental entity.

5 Julian Juergensmeyer, J. C. Nicholas and B. D. Leebrick, "Transferable Development Rights and Alternatives After Suitum," *The Urban Lawyer*, Vol 2, Spring, 1998.

6 Mitigation is beginning to receive attention as a complementary means of achieving the preservation of environmentally important areas. See "Market Based Approaches to Environmental Preservation: To Environmental Mitigation Fees and Beyond," *Natural Resources Journal*. 2003, and J. Nicholas, J. Juergensmeyer and E. Basse, "Perspectives Concerning the Use of Environmental Mitigation Fees as Incentives," Environmental Liability, Volume 7:2 and 7:3, 1999.

characteristic of separating development rights from the other use rights associated with the land. For PDR, the development right is purchased and extinguished, i.e., not used. In the case of TDR, the development right is transferred and the development that would have been undertaken on the subject land is undertaken elsewhere. In both instances, the development value of the land slated for preservation is protected.

The things to be called Transferable Development Rights herein go by many different names. In the New Jersey Pinelands they are Pinelands Development Credits (PDC). In Dade County, Florida, they are Severable Use Rights (SUR). In Suffork County, New York, they are known as Pine Barrens Credits (PBC) while in Montgomery County, Maryland, they are just plain old TDR. Regardless of what they are called, these rights share the common characteristic of facilitating the transfer of development from one place to another. This report will use TDR, transfer of development rights, to describe this program.

The possibility of using transferable development rights in the Density Reduction/Groundwater Resource area of southeast Lee County is presently being considered by the County. The study reported herein analyzes the potential for TDR to address matters of agricultural land preservation and conservation of natural lands within the Density Reduction/Groundwater Resource (DR/GR) area of the County. (Another TDR program has been in effect in Lee County since the mid-1980s, but that program applies only to wetlands that will be permanently preserved; it does not apply to uplands in a manner that could help carry out public policy encouraging continued agriculture.)

An additional TDR program may or may not be practical for Lee County. An important step in the process toward answering the policy question is determining whether the anticipated TDR program would be economically feasible. This study inquires into that feasibility and reports on how a TDR program could address the conservation of agricultural and other uplands in Lee County's southeast DR/GR lands.

Experience Elsewhere

TDR programs have enjoyed success, but the rate of success has been, at best, modest. Nevertheless, there are successful TDR programs. These programs have been instrumental in preserving hundreds of thousands of acres of environmentally sensitive while providing economic value to the owners of that land.

Montgomery County, Maryland.

Montgomery County is almost the TDR poster child. No discussion of TDRs omits Montgomery, probably because it was one of the first and one of the more successful. The TDR program was adopted in 1980. Montgomery first down zoned the agricultural and environmental lands that were to be preserved to one dwelling unit per 25 acres. This down zoning was a matter of great controversy and several years of litigation. The program was aimed primary at agricultural land retention, but there were elements of environmental and scenic protection as well. The owners of the land to be retained or preserved were allocated transferable development rights at a ratio of one per 5 acres, even though the minimum lot size was 25 acres. These rights were designed to be sold to those wishing to increase the intensity (density) of development in the designated receiving areas. One of the planning objectives of the County was to increase the intensity (density) of development in the designated areas so that the retention and preservation programs would not lessen the pace of development or reduce the stock of housing that the market would otherwise produce.

The sending area, that is the area to be retained in its present uses, was 91,591 acres. It is called the Rural Density Transfer Zone (RDT). TDRs were available at one for each 5 acres of land in the RDT. Additionally, owners of RDT land continued to have the right to build on their land at one dwelling per 25 acres even if they had severed their development rights and sold them. When owners sought to claim their TDRs, they had to record a restriction against development of the property and such restrictions are permanent. Once claimed, the rights could be sold or otherwise transferred to anyone who wanted them. Most if not all were demanded by people that owned receiving area land, which was in the urbanized area of unincorporated Montgomery County. The receiving areas include areas from single family up to the most dense multifamily. The increased density of use of TDRs is by right and no special approvals or rezoning are needed. There is no option to use the TDRs for non-residential development.

The estimate was that 15,000 TDRs could be created, but that no more than 9,000 of the TDRs would ever be sold. This turned out to be reasonably correct. As with most TDR programs, it is not possible to know exactly how many transfers there have been as minimal public involvement was a goal. The best estimate is approximately 8,000 rights have been sold and used in receiving areas. Additionally, some 1,800 units were built by owners on the retained land (on-site). At present there it would appear that there are no TDRs available for sale.[7] It would appear that everyone that wished to sell TDRs has done so.

When active sales began, after several years of litigation, prices of $7,000 to $10,000 per right were common. By the time that sales dwindled, prices as high as $40,000 were recorded.[8]

Some 40,000 acres have been stripped of their development rights in order to transfer those rights. There are many thousands of acres where the owners have not wished to restrict their property and sell the rights. Again, all indications are that those that could sell rights do not wish to.

Montgomery County did not act alone. The State of Maryland has active programs to preserve agricultural and environmental lands. The Maryland Agricultural Land Preservation Foundation provides fund to purchase development easements. Montgomery County itself has purchased easements, although most of the easement purchases involved environmental or scenic lands rather than agricultural.

One of the key factors in Montgomery County's success with TDRs has been that property owners in receiving areas will not get density increases by means other than TDRs. This is known to all and forces those wishing to develop at higher intensities to seek out TDR owners. The recent lack of available TDRs has created a problem that has not yet been addressed.

It might be noted that Calvert and Queen Anne's County also have successful TDR programs. They, like Montgomery, have leveraged state monies and employed bonuses in receiving areas to enhance the feasibility of their TDR programs.

7 Telephone call with Karl Moritz, Montgomery County Planning Department.

8 *Ibid*.

Figure 1. Montgomery County Sending and Recieving Areas

Collier County, Florida

In 2002 Collier County amended its comprehensive plan to incorporate a 93,600 acre Rural Fringe Mixed Use District (RFMUD). Collier County also adopted the Rural Lands Stewardship Area (RLSA). Both involve the transferring for development from lands deemed to be less suitable for development to more suitable. The two programs use different approaches to the transferring of development. The RFMUD uses a classic Transfer of Development Rights approach.

The RFMUD has thousands of individual property owners. This pattern of ownership limited the approaches that could be taken, such as Rural Land Stewardship, which requires patient landowners with large holdings. The resulting TDR program involved the designation of sending and receiving areas that were both within the RFMUD; with the sending areas being the lands less suitable for development and the receiving areas being those that are more suitable. Neither the sending areas nor the receiving areas were down zoned from their present zoning, which was largely one unit per 5 acres. The sending areas were allocated one TDR for each 5 acres or permitted lot, whichever is greater. The receiving areas would be allowed to increase permitted density from one unit per 5 acres to one unit per 2.5 acres. Additionally, receiving areas could receive bonuses so that one unit per acre could be achieved. It was estimated that each TDR could command up to $25,000, which is $5,000 per sending area acre. A potential total of 10,377 TDR credits were created, assuming that every property owned would seek to record and transfer their development rights.

Litigation slowed implementation. Once the litigation was finished, the TDR program did not receive any success. There were many willing buyers of TDRs, at up to $25,000, but no willing sellers. Discussions with property owners indicated that owners thought that the resulting $5,000 per acre for the development rights was insufficient. Collier County then modified its TDR program. It provided several bonuses:

- An "early entry" bonus of 1 additional TDR per 5 acres for those that would participate in the TDR program within 2 years;
- A bonus of up to 1 TDR per 5 acres for restoring degraded environmental areas on the land; and
- A bonus of up to 1 TDR per 5 acres of dedicating high quality or restored environmental lands to some conservation entity, along with a dedication of funds for the long-term maintenance of the land.

These bonuses appear to have worked. Some 2,327 TDR credits have been recorded.[9] Because the exchange of TDRs is private, the prices at which they are traded are not known.

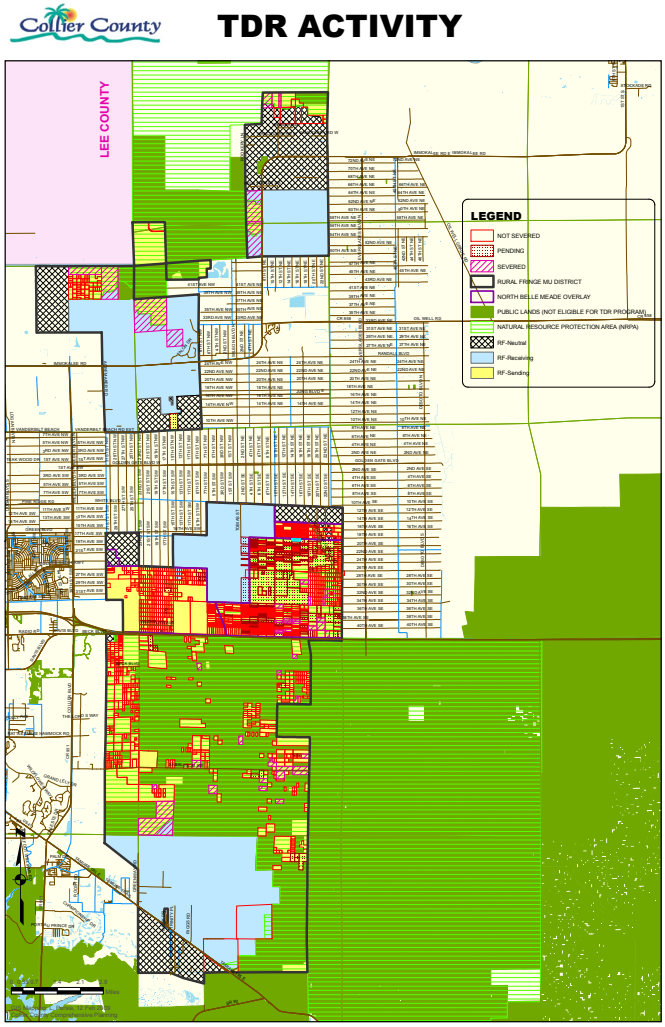

Figure 2. Collier County TDR Activity

9 M. Bosi, P. Van Buskirk, and C. Ryffel, "In Florida: An Anti-Sprawl Strategy," *Planning*, Vol 75, no. 5, March 2009, page 23.

Transferable Development Rights

Background

Many communities have established some type of transferable development rights (TDR) program.[10] Successful TDR programs were exceptions in early programs, but with experience the rate of success has risen to 39%.[11] While the record for TDRs is somewhat disconcerting, those programs that have been successful clearly demonstrate that TDR can address difficult land management problems. Carefully designed TDR programs can "mitigate the impact of regulation,"[12] when a developing community seeks to maintain certain lands in low intensity or low value use while accommodating development in other parts of the community. This report discusses the background of successful TDR programs and, using the lessons learned by successful programs, sets out a TDR program that is responsive to the conditions within the southeast DR/GR area of Lee County.

The concept behind transferable development rights is simple. Title to real estate or property ownership, under the bundle of rights (sticks) theory, consists of numerous components that may be individually severed and marketed, such as the sale of air, mineral, or oil rights. The right to develop property to its fullest potential is one of these sticks.[13] The TDR system simply takes the development stick for a piece of property and allows it to be severed and transferred or relocated to another piece of property.[14] Typically selling some defined development potential of one piece of property, referred to as the sending site, to some other entity for use at some other piece of property, referred to as the receiving site, accomplishes the transfer.[15] The transferred development potential may be measured in any one of a number of ways, such as floor area ratio, residential dwelling units, or square feet or floor area. Once the transfer has occurred most TDR systems require a legal restriction on the sending site,[16] prohibiting any future use of the transferred development potential.[17] The receiving site is then allowed to increase its allowed development potential by the additional number of dwelling units or floor area to which it is entitled as a result of the TDR transaction.

TDRs will derive their value from what can be built and sold at the receiving sites. The receiving areas are where the transferred units will be used, and the value of that unit will be based upon prevailing values within the receiving areas. If development is valuable in receiving areas, the right to transfer development to such areas also will be valuable. Likewise, if development is not valuable in receiving areas, the right to transfer development to such areas will have little to no value.

The goal of transferring development rights is to use private market forces to maintain the economic value of lands being regulated (sending area) by capturing a portion of the incremental increase in development value of land in the receiving areas resulting from an increase in the intensity of development The value of developed lands is largely due to the desirability of the community. A community that is a desirable place will result in high land and developmental values. Likewise, undesirable communities result in low or even no land values. Buyers' perceptions create the conditions for high values, while the market forces of supply and demand implement those values.

10 Pruetz identified 130 TDR programs, Saved by Development, Preserving Environmental Areas, Farmland, and Historic Landmarks with Transfer of Development Rights, Burbank: Arje Press, 1997. Since then another 15 to 20 may have been added, for total of some 145 to 150 programs in existence.

11 Depending on what type of TDR is being considered, there are more than one hundred TDR programs in existence. See Michael D. Kaplowitz, Patricia Machemer, and Rick Pruetz Planners' Experiences In Managing Growth Using Transferable Development Rights (TDR) In The United States," *Land Use Policy*, Volume 25, No. 3, July 2008, Pages 378-387. Also see Richard Roddewig and Cheryl Ingram, *Transferable Development Rights Programs: TDRs and the Real Estate Marketplace*, 401 American Planning Ass'n Advisory Report (1987). Also see Robt. Coughlin, "The Protection of Farmland: A Reference Guidebook for State and Local Governments," (1981), Rick Pruetz, "Saved by Development," (1997) and American Farmland Trust, "Survey of Agricultural Preservation TDR Programs," (1998).

12 Justice Brennan used this terminology when describing a TDR in *Pennsylvania Central Transportation Co. v. City of New York*, 438 U.S. 104, 98 S.Ct. 2646. In *Suitum v Tahoe Regional Planning Agency*, 520 U. S. 725, 738 (1997), Justice Scalia wrote, "TDRs can serve a commendable purpose in mitigating the economic loss suffered by an individual whose property use is restricted, and property value diminished, but not so substantially as to produce a compensable taking."

13 See Carmichael, Donald M., "Transferable Development Rights as a Basis for Land Use Control," 2 Florida State University Law Review 35 (1974), page 37.

14 Roddewig & Ingram, *Supra*.

15 There is no need to actually transfer ownership of the rights. However, the concept is discussed in this manner to make sure that third party transfers are facilitated.

16 Usually by the recordation of a conservation easement.

17 Costonis, John J., "Development Rights Transfer: An Exploratory Essay," 83 Yale Law Journal 75 (1973) at 85. The practice is to differentiate "development" from other uses of land, such as agriculture. While "development" is no longer permissible, all uses not so restricted remain.

The demand for a Lee County location is a direct result of the quality of the community and the supply of units or space. At this time there is a national, state, and local economic recession. This recession has been aggravated by an excess supply of residential dwelling units. This excess supply together with a decline in demand due to the recession has created a situation of declining market values. In the Lee County market area, the resale prices of single family homes went from a high of $281,900 in 2005 to $158,200 in 2008.[18] This is a reduction of 44% in the median sales price of a Lee County single family home. By contrast, the State of Florida experienced a decline from $247,200 in 2006 to $187,800 in 2008, a decline of 24%. Note may be taken of the fact that Lee County prices had escalated much more that statewide prices. Lee County prices when from a median of $112,300 in 2000 to $281,900; and increase of 151%. Statewide the median price when from $119,900 to $247,100; and increase of 113%. However painful the present recession, the history of Florida and Lee County real estate show that recovery will follow. How long it will take to absorb the existing excess inventory and begin recovery is not known. All of the discussion herein relates to Lee County development that can be expected after the recession had ended, the excess inventory absorbed, and recovery begun.

There are a number of variations on the basic theme of development rights acquisition. An example is the dedication of development rights to a land trust or similar organization with the owners realizing a tax deduction for the donation. While there are a number of precise means, the common characteristic is that some or all of the development or use rights are severed from the land. The land will retain all rights not specifically removed by a conservation easement. In the case of agricultural preservation easements, land will retain all rights to farm. The conservation easements that sever the development rights can be structured so that economically viable uses, such as agriculture, may be left after the development rights have been severed, or, alternatively, most or even all economically beneficial uses of the land could be removed, essentially reserving the land for uses such as water storage, wildlife refuges, or nature preserves. The retention of uses can be an important factor in the ultimate success or failure of a TDR program. If all economically viable uses are removed, there may be a problem of maintaining the now fallow land. Alternatively, leaving too many uses may defeat the conservation objective sought.

18 Florida Association of Realtors, Existing Home Sales, http://media.living.net/ statistics/statisticsfull.htm, accessed March 28, 2009.

A program of TDR is an economic policy. It is a policy that attributes severable development rights to certain properties, the Sending Areas, and modifies development regulations so that the severed development rights may be used in Receiving Areas. As a precondition for success, this economic policy must be feasible. Within the context of this study, feasibility will have a working definition as having the potential of profit from transferring development from sending to receiving areas.

The Economics of Land Value

Land has two fundamental values. The first is value in use and the second is value in exchange.[19] The value in use is that value returned to the owner from the existing uses of the land. This value can be both economic and non-economic. The value in exchange is what someone else would pay for the land. Generally, when the value in exchange exceeds the value in use, the property will be sold.[20] The primary determinant of the value in use is the economic return received by the owner.[21] However, many properties also provide non-economic returns, especially when those lands are environmentally sensitive. These non-economic returns are typically in the form of an enhanced "quality of life," enjoyed by all.[22] When environmentally sensitive land is converted from its natural state, the owner benefits from an economic gain but also must bear any costs associated with the sale, both economic and non-economic. In many communities, the conversion of land involves a cost to be borne by the community as a whole. This cost is felt as a loss in the "quality of life."

Owners will place a value on their land. They may do this subjectively or those values may result from appraisals or similar objective data. Regardless of how, owners have a sense of the worth of their land. When market values exceed owners' sense of worth, the land may be sold. Whether the land is actually sold is not as much a matter of the price offered as it is the owners' sense

19 This dichotomy was first explored by Aristotle in *Ethics*.

20 Speculative motives notwithstanding.

21 The economic return can in a monetary return or an in-kind return such as the rental value of a person's own home.

22 This is known as an *externality*. In this instance, it is an external benefit. This benefit is characterized as external because it is a benefit received by others and it results from no intention of the landowner. The other type of externality is an external cost. This is a cost borne by others that was not the intention of the owner. The characteristic that makes such benefits or costs "external" is that the values of such benefits or costs are not capitalized into the price of land.

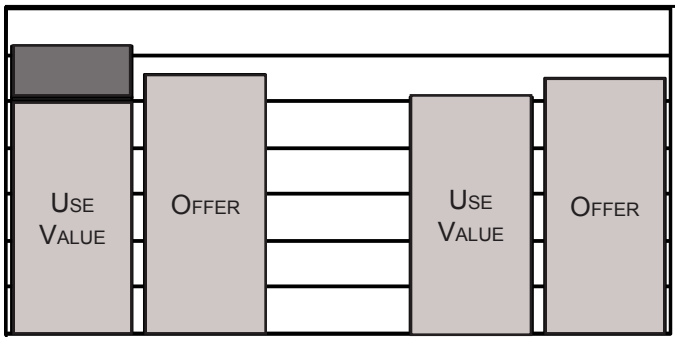

Figure 3

of the worth of the land. Two different situations are shown in Figure 3. In the first, the owner attaches some non-economic value to the land with the result that a sale does not happen even though the offer is higher than that justified by the existing economic use. In the second instance the sale would occur because the owner did not attach any non-economic value to the property. The point is that the offer – the value in exchange – was not the sole determinant of the sale. The opposite is also true. Bidders may go beyond the economic value of property for non-economic reasons. In both instances prices – the values in exchange – will appear to be beyond the underlying use value of the land. Of necessity, buyers will have to buy-out both the economic and non-economic values if they are to acquire that land. It would follow that only those buyers who attached the same or higher non-economic values to that land would acquire the property. In this manner subjective values are capitalized into market prices of land.

The discussion to this point has ignored speculative expectations. An owner with speculative expectations will tend to hold land even when offers to purchase meet or exceed the value in exchange. Likewise, buyers will tend to exceed values in exchange when they have speculative expectations. So much of the dramatic rise in Lee County prices can be attributed to speculative expectations and a great deal, if not all, of the decline can be attributed to the loss of those expectations. While many have "learned their lesson," Florida has experienced several speculative land bubbles in the past. The only difference is who learned the lesson. Nevertheless, speculative motives and expectation can be expected to exist and will be a factor.

This market process creates a problem. Buyers pay prices that reflect all factors relating to the land. Any potential buyer who places little or no value on non-economic or speculative qualities will lose out in the bidding process to those that do value such qualities. The resulting capitalization of those qualities into market values means that if those qualities were to be lost, buyers would suffer a loss both in the subjective and objective values of their land. A simple example makes the point. A parcel that offered a view of some spectacular scenery would have the value of that view capitalized into the price of the land. If that view were subsequently lost, the landowner would incur both economic and non-economic losses.

The Economics of Density

When asked what determines the value of land, "location, location and location" is the standard, almost knee-jerk, response. Of course location is critical to the value of a parcel of land, but once location is fixed, other factors come into play. The most important of these other factors is the productivity of the land. All other things being equal, i.e., location, the more productive land will command higher prices than the less productive. The precise value of a parcel of land would be a function of the land's yield per unit of land, usually an acre. For agricultural land this is commonly measured in bushels per acre, or some other recognized measure of output. The more goods that can be produced on a parcel of land, the more valuable that land. The same economic forces apply to urban land.

The productivity of urban land is basically the same as agricultural – yield per acre. Of course the units yielded from urban land are different than agricultural and are measured in dwelling units or square footage of floor area rather than bushels per acre. But the basic point that the more than can be produced on a parcel of land the greater the expected value of a unit of land remains true for both agricultural and urban land. Unlike agriculture, the production of more urban product per unit of land tends to change the nature and value of the product. In agriculture the 100th bushel produced on an acre would have the same market value as the first or the fiftieth. The same is not true for urban products such as residences. The market tendency is for unit value to decline with density.[23] Thus, in an urban market the productiv-

23 See Arthur O'Sullivan, *Urban Economics*, 7th Edition, Chicago: Irwin, 2008, p. 238. This commonly accepted principle is demonstrated for DR/GR area of Lee County in the following section.

ity of the land must be viewed together with the market for the various types of units capable of being produced on the land. Land capability is a function of the physical characteristics of the land and the legal restrictions placed on the land. Thus either physical limitations or legal restrictions will work in conjunction with market forces to determine the productivity of land in terms of production per acre – density.

In those circumstances where the market demands less density than both the physical limitations on the land and the legal restrictions could allow, the market is the sole determinant of density. When the market demands and legal restrictions would allow higher density than the physical limitations will allow, attempts to modify those physical limitations will occur until either the market or legal limits became the upper limit. When legal restrictions allow less density than the market demands and physical limitations would allow, requests for rezonings and similar types of regulation changes will follow.

In a residential land market the general tendency is for value to increase per land unit (hereafter simply an acre) with density but at a decreasing rate. That is, each additional unit of density will add less to total value as density is increased. In economics this is known as the *Law of Diminishing Returns*.[24] A typical per acre value with respect to residential density would be as shown in figure 4. In this figure value per acre is increasing with additional units of density, but it is clearly increasing at a decreasing rate. If this process of increasing density on a given unit of land is allowed to continue, it will eventually lead to a declining total value as shown in figure 5. This situation would occur because each additional unit of density was of negative value, thus detracting from parcel value. This type of negative value would occur because the development would be so dense that buyers would offer less to buy or rent because of excessive density. Of course, no rational person would knowingly increase density to such a level. Rather, they would cease density increases at levels that maximized total values.

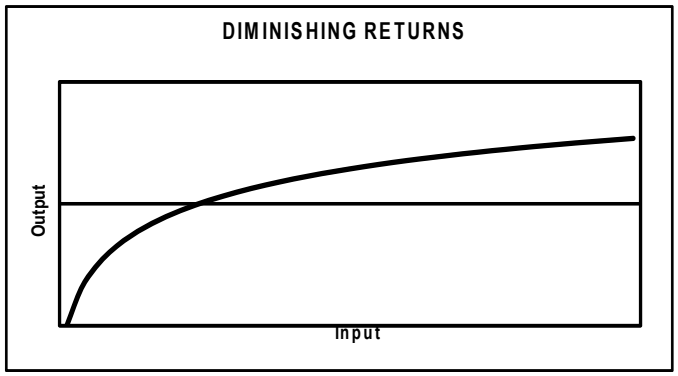

Figure 4

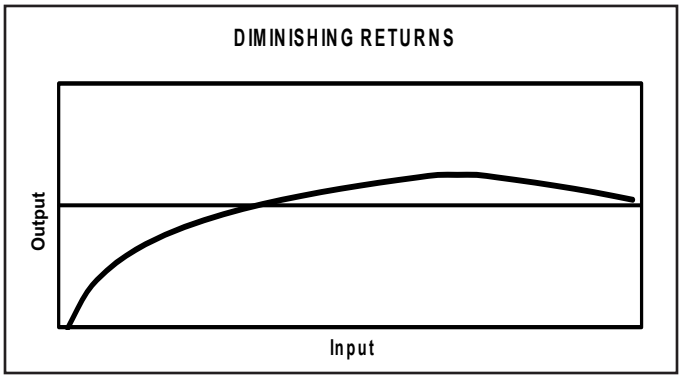

Figure 5

24 See any edition of Paul A. Samuelson, *Economics*, New York: McGraw-Hill, numerous years, for a full and in depth discussion of the law of diminishing returns.

Figure 6 shows a limiting factor. A limiting factor is introduced that results in less than market density and thereby limiting value and returns. Of course, if the limit could be eliminated or raised, density of development would rise and so also property values and returns. If this limitation were physical, such as being flood prone, modifying the land by providing drainage could result in increased value. Likewise, values could be increased by relaxation of any regulatory constraints that limited density below what the market would set. In the situation depicted in figure 6, it would be very much to the advantage of the property owner to attempt to increase the density of development. This is the prime situation for TDRs. It is a fact of current suburban conditions that the market will tend to accept more density than most communities or neighbors will accept. Communities, thus, enact various regulatory programs that limit development densities to less than what the market would accept and reward. Various petitions result with the goal being to increase permissible density up to what the market would accept. TDR presents a way to increase densities and also economic returns in those situations where allowable densities are less than market densities. In situations where market densities are at or below permitted densities, TDRs will have no economic feasibility and thus no ability to achieve land preservation.

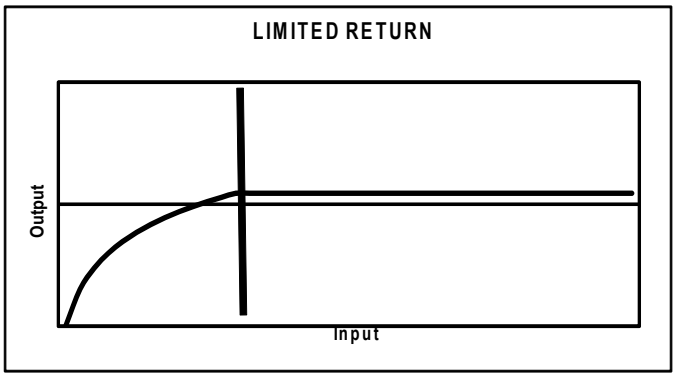

Figure 6

The material presented and the points made here are commonly known. This review is presented in order to set the stage of an analysis of the role of density in the DR/GR area of Lee County land market. The general theory of land economics would suggest that density of development would be a significant factor in the setting of DR/GR area of Lee County land values. Furthermore, theory would suggest that the incremental or marginal value would decline with density. This chapter will now examine the DR/GR area of the Lee County land market to discover the precise land economic relationships within this area.

Empirical Results

Recent Lee County real estate sales in and near the DR/GR area were analyzed to create a sample for detailed analysis. The sample is made up of recent sales of unbuilt upon properties within the study area. The study area includes properties within and in approximate location to the southeast DR/GR area, excluding properties north of SR 82 and west of Interstate 75. For purposes of this study, retail lot sales are those sales containing a single buildable lot or rural tract and bulk lot sales are those with two or more buildable lots within a single sale. The components of the sample are summarized in figures 7 and 8.

All of the sales utilized are taken from Lee County public records. The affected parcels are mapped in figure 9. These sales occurred between January 1, 2004 and September October 30, 2008. Note may be taken of the dramatic lot size difference between sales inside and outside the DR/GR and between those within a PUD and not within a PUD.

All markets tend to be rational. The problem confronting the analyst is to comprehend the rationale of a particular market. The market of concern is the DR/GR area land market. The particular market is the non-Gulf influence area in southeast Lee County. The goal of this inquiry is to project the value of increasing the intensity of land use within what may be certain receiving area parcels. This value will be a function of the market valuation of the resulting increased land use intensity. These valuations will have to be imputed from sales within the DR/GR and from the surrounding area.Thus, sales of buildable properties in surrounding areas are analyzed along with those within in order to project the economic value of increased intensity on receiving area properties.

The sales data for the study area are reported for Retail and Bulk sales (Figure 10). Retail sales are single subdivision lots that are ready to be built upon and vacant rural tracts. Bulk sales are sales of two or more lots within a parent tract that has been subdivided. These results are most interesting. Note that the sales prices per acre are remarkably similar, with the resulting final price being determined by the number of acres in the lot.

The various sales are analyzed with multiple regression. This is a statistical technique that correlates one set of data, known as the dependent variable, with one or more independent variables. The objective is to test whether there is significant correlation between the dependent variable and the independent variables. The reliability of the model is measured by a statistic known as the

ALL SALES IN STUDY AREA	
Sales Inside DR/GR	385
Sales Outside DR/GR	606
Total Sales	991
Data removed:	
02 Multiple parcels/Sales[25]	464
03 Disqualified Parcels	12
04 Disqualified sales price	35
08 Disqualified sales price	131
Total Disqualified Sales	642
Also Removed:	
Vacant Commercial Lots	2
Vacant Industrial Lots	2
Wetlands	1
Outliers removed:	
Low sales price per acre – Under $10,000	32
High Sales price per acre – Over $2.5 million	32
Remaining Sample:	280
Inside DR/GR	104
Outside DR/GR	176

Figure 7

SALES INCLUDED IN SAMPLE					
	Parcels	**Lots**	**Acres**	**Ave Parcel Size (Acres)**	**Price per Acre**
All Parcels	280	831	995	3.55	$137,203
Inside DR/GR	104	114	673	6.47	$31,504
Outside DR/GR	176	717	322	1.83	$358,066
In PUD	175	726	491	2.81	$247,993
Not PUD	105	105	504	4.80	$29,289
With Golf	49	600	444	9.06	$179,958
On Golf Course	49	600	444	9.06	$179,958
On Water	128	679	475	3.71	$220,530
With Gate	99	650	470	4.75	$211,891

Figure 8

25 The multiple parcel sales that were excluded are those when a single sale included multiple parcels, with the distinction being that the individual parcels have separate strap numbers. The problem created is that each individual parcel (strap number) is recorded with the total sales price, thus providing no ability to determine the value of individual parcels.

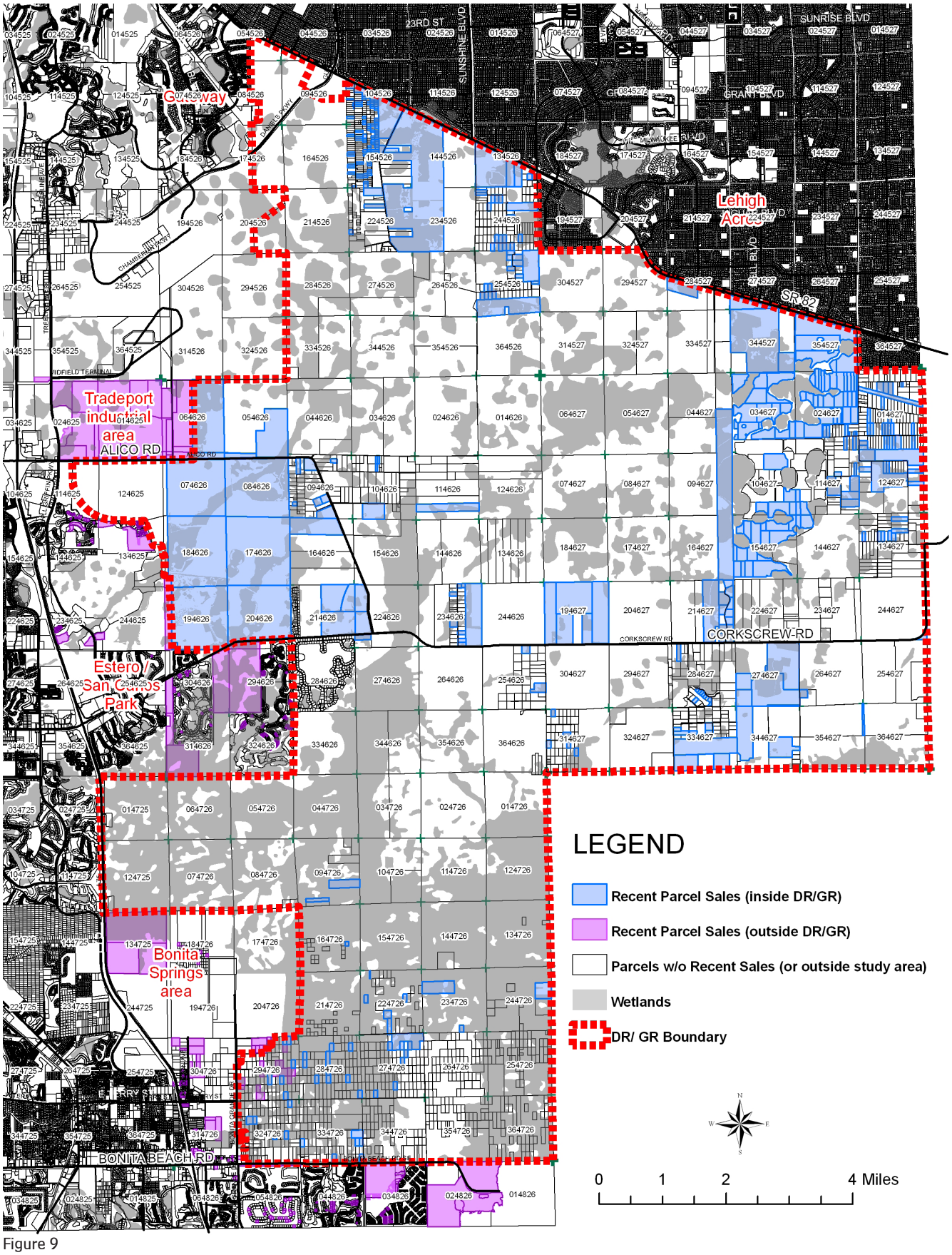
Gateway
Lehigh Acres
Tradeport industrial area
ALICO RD
Estero/ San Carlos Park
Bonita Springs area
BONITA BEACH RD
CORKSCREW-RD
SR 82
SUNRISE BLVD
23RD ST
LEGEND
Recent Parcel Sales (inside DR/GR)
Recent Parcel Sales (outside DR/GR)
Parcels w/o Recent Sales (or outside study area)
Wetlands
DR/ GR Boundary
0
1
2
4 Miles

Figure 9

Correlation Coefficient (or Coefficient of Multiple Determination) – R^2. This is a percentage measure, although statistical convention does not convert it to an actual percentage but leaves it in decimal form. The Correlation Coefficient is calculated by contrasting the predicted (or estimated) value of dependent variables against the actual value of those variables. The extent to which the predicted values are consistent with the actual values, measured as a percent, is the R^2. For this reason, this statistic is commonly known as "goodness of fit," meaning the extent to which the statistical explanation offered "fits" with the actual values observed. The higher the value of R^2, the better the fit. The R^2 reported herein are adjusted for sample size and thus the notation is shown as "R^2 Adj."

Two other statistical measures are employed herein. The first is the t-Statistic.[26] This statistic measures whether the coefficient of an individual independent variable is significantly different from zero. If the coefficient is significantly different from zero, then it is accepted that the independent variable affects the dependent variable in proportion to the magnitude of the coefficient. The correlation coefficient, R^2, assesses the explanatory power of all independent variables collectively while the t Statistic is relevant to each individual variable. For samples of the type analyzed, t Statistics between 1.796 and 2.624 are required. The lower t Statistic is associated with the 95% level of significance and the higher is 99%. A quick rule-of-thumb is that a t Statistic must be approximately 2 before it can be accepted.

Another measure is the F Statistic. The F Statistic assesses the degree of co-variation between the dependent and independent variables. For the type of data analyzed, F Statistics of 3.09 at 95% and 5.07 at 99% are required. The F Statistic is an overall test of the multiple regression model.

A total of three statistics are used: (1) R^2 which measures the percent of variation in the dependent variable explained by the variation in the dependent variable(s); (2) t Statistic which measures whether an individual independent variable contributes to the explanation of the variation in the dependent variable; and (3) F Statistic which measures the degree of co-variation. Commonly the significance of the F Statistics is expressed as a level of significance. This level is an expression of the probability that a conclusion of covariation is not supported by the data. A 0% does not actually mean that there is no probability. Rather, that the probability is so low that when rounding is employed, it rounds to zero.

	Retail	Bulk	All
Total Sales - Parcels	268	12	280
Total Sales - Lots	268	563	831
Total Sales - Acres	597	398	995
Average Lot Size in Acres	2.23	0.71	1.20
Sales Price per Acre	$131,811	$145,319	$137,203
Sales Price per Lot	$293,624	$102,730	$164,294

Figure 10

Multiple regression is used to assess the factors that influence the value of land sales prices. The items presumed to influence parcel sales price are: the number of acres within the parcel; the number of dwelling units authorized by existing zoning; the amenities available to the parcel, and whether the parcel is within the DR/GR area. No other factors are given consideration.

In the following sections the parcel sales within the DR/GR area of Lee County are analyzed. The objective is to estimate the value of an additional unit of (residential) development. This value will be used as a basis for projecting the consequences of permitted density reallocations.

To readers unfamiliar with statistical and multiple regression analysis this may be difficult. Rather than working through the individual equations, a reader may wish to simply employ the t Statistic rule of thumb (it should be approximately 2) and an F-Ratio rule of 5 or higher. There is no set minimum value for R^2 Adj. Rather, the closer to 1 the better. But for the type of analyses undertaken herein, values of R^2 Adj. of 50% (.5) are acceptable.

This analysis is concerned with the incremental or marginal value of allowable residential density (measured in dwelling units per acre). In order to establish a basis for this estimation, 280 land sales discussed above were analyzed. The expectation is that per acre values will increase with allowable density and per dwelling unit values will decrease with allowable density. Of course, it is expected that both per acre and per parcel values vary

26 Sometimes called the t-Ratio. Please note that the lower case "t" is not a typo.

given the presence or lack of amenities. The amenities included herein are; being within a PUD, having frontage on a golf course, having water frontage (non-gulf), and being within a gated community. Because most of these amenities co-exist,[27] the presence of such amenities is aggregated into a single variable labeled "Amenity." Given the nature of the land market, it is expected that the interactions among these variables will be logarithmic[28] rather than linear.

In this analysis it is not possible to directly measure the value of amenities. In this analysis each amenity is measured simply on the basis of whether or not it exists for each particular parcel. The regression model will then estimate the contribution of such amenities to the sales price of the lot. The objective is not to estimate amenity values but to adjust for amenities so that the fundamental land economics may be assessed. The binary (1 or 0) inclusion of a characteristic is known as a "dummy variable." It is "dumb" in that the value 1 indicates that the characteristic exists and the value 0 indicates that it does not exist. So if a property was in a development that offered a golf course, had golf course frontage, and has water frontage, the value for each of those dummy variables would be 1. The same approach is used to incorporate whether the parcel is within the DR/GR or not. For a parcel of land outside the DR/GR, the value of the In DR/GR variable would be zero, indicating the absence of that quality (being within the DR/GR). By contrast, for a parcel within the DR/GR, the In DR/GR variable would have a value of 1, indicating that the qualities of the DR/GR would be reflected in the price of the parcel.

The general model used to explain variations in parcel prices is:

ParcelPrice = f(Acres, Units, Time, InDR-GR, Amenities)

This equation incorporates an hypothesis that the sales price of a parcel of land within the study area will be a function of the size of the parcel (measured in acres), the allowable density (measured in maximum allowable number of dwelling units permitted by current regulations), the amenities available (PUD, golf, golf course frontage, water frontage, and gated community), whether the property has development approvals, the location of the parcel within the DR/GR, and the date the parcel was sold. No sales were for Gulf coastal properties so the effect of such locations on price should not be present.

The hypothesis will be tested by subjecting 280 property sales within the study area of Lee County to statistical analysis. The goal of this testing is to estimate the economic value of increasing units (or density) to a given parcel of land. Increasing units to a given parcel should increase the value of that parcel. The resulting value increase would be the incremental or marginal revenue product of increased units. This product would be the value of transferred development.

The Total Sample

It is postulated, and soon will be demonstrated, that there are significant economic differences within the study area. The observed differences, it will be shown, are due to the different characteristics or situations of the properties, such as the amenities offered and the size of the lots. Whether it is a causal factor or not, properties within the DR/GR sell for significantly less than other properties. This is demonstrated by the negative sign of the coefficient of the In DR/GR variable.[29]

The model used in this multiple regression analysis is:[30]

$$\text{LogPrice} = A + ((b_1 * \text{LogAcres}) + (b_2 * \text{LogUnits}) + (b_3 * \text{LogTime}) - (b_4 * \text{InDR/GR}) + (b_5 * \text{Amenity}))$$

The regression results for the total sample are shown in figure 11.

The regression equation was able to explain 69%[31] of the variation in parcel price. All of the variables are highly significant (95% or higher).

The regression statistics for the Total Sample shown above may be entered into the general equation to look like:

LogPrice = 12.347 + ((0.502*LogAcres) + (0.297*LogUnits) + (0.236*LogTime) -

27 For example, all golf course are within PUD as are all gated communities. Thus, it is not possible to differentiate among the amenities, so the analysis is done by simply differentiating between those parcels that have one of the listed amenities and those that do not have any of those amenities.

28 Natural logs are used rather than the base 10 logs. Natural logs are used because natural logs (base 2.72) are more applicable to financial data than are logs base 10.

29 Which is significant at the 99% level.

30 Recall that the logs are natural logs.

31 The Adjusted R Square of 0.6885 equated to 69%.

(1.302*InDR/GR) + (1.052*Amenity))

The regression equation is in the natural log form.[32] Converting from logs back to a linear form, the following form results:

$$\text{ParcelPrice} = M\ \text{Acres}^{\alpha}\ \text{Units}^{\beta}$$

To the extent that any of the dummy variables are involved, they are simple multipliers, similar to the Intercept, M. The regression equation for a parcel located outside of the DR/GR that offers some amenity is:

$$\text{ParcelPrice} = \text{Acres}^{\alpha} * \text{Units}^{\beta} * M * \text{Amenity}$$

Because these dummy variables are simple multipliers, they need not be discussed here.

The exponent for Acres is equal to 0.502[33] and the exponent for Units 0.297.[34] The fact that they are each less than one means that parcel price will increase with additions of either acres or units, but at a diminishing rate. The fact that the total of the two exponents is less than one means that the parcel price will grow at a diminishing rate with the expansion of both acres and units.[35] Mathematically:

$$\delta\text{ParcelPrice}/_{\delta\text{Acres}} = M\ \text{Acres}^{\alpha-1}\ \text{Units}^{\beta}$$

Given that $\alpha < 1$, then $\alpha - 1 < 0$ and

$$\delta\text{ParcelPrice}/_{\delta\text{Acres}} < 1$$

and

$$\delta\text{ParcelPrice}/_{\delta\text{Acres}} = \beta M\ \text{Acres}^{\alpha}\ \text{Units}^{\beta-1}$$

Given that $\beta < 1$, then $\beta - 1 < 0$ and

$$\delta\text{ParcelPrice}/_{\delta\text{Acres}} < 1$$

This latter expression is the one that estimates the value of increased intensity (additional units) and thus is the basis for projecting the value of a transferred development right. Note may be taken of the fact that acres add more to price (0.502) than additional units (0.297), indicating that there appears to be a market preference for large lots within this market area, at least within the common density ranges of the study area. Before dealing with TDR values, it would be advisable to more fully explore the sub-components of the subject land market and to support the presumptions set out above.

Regression Statistics	
Multiple R	0.8331
R Square	0.6941
Adjusted R Square	0.6885
Standard Error	0.5651
Observations	280

ANOVA					
	Df	*SS*	*MS*	*F*	*Significance F*
Regression	5	198.57	39.71	124.36	0.00
Residual	274	87.50	0.32		
Total	279	286.07			
	Coefficients	*Standard Error*	*t Stat*[36]		
Intercept	12.347	0.143	86.422		
Ln(Acres)	0.502	0.044	11.462		
Ln(Units)	0.297	0.087	3.412		
Ln(Time)[37]	-0.236	0.063	-3.750		
In DR/GR	-1.302	0.140	-9.277		
Amenity	1.052	0.124	8.498		

Figure 11

The sales within the study area were subdivided into Retail and Bulk sales. The number and averages for these sub-markets are set out above. The standard regression model was run for each of the sub-markets. These results are set out in figures 12 and 13.

32 Meaning that the magnitudes of the variables had been converted to natural logs before the regression model was run.

33 The coefficient of Ln(Acres) in the regression equation.

34 The coefficient of Ln(Units) in the regression equations.

35 This is the demonstration of diminishing returns.

36 The fact that the t Statistics for time is negative is not important. The significance of the t Statistic is not dependent on the sign, which can be ignored. t-Ratios that are shown are significant to the 95% level or greater.

37 The role of time will not receive discussion. The base for time in this analysis is July 1, 2009. All times are expressed relative to that data. The data show that land prices have been increasing during the 2004 – 2008 period. The model is structured so that all conclusions are time adjusted to July 1, 2009.

Bulk - Retail

Analysis of bulk and retail land sales shows important differences between these two sub-markets. As would be expected, the prices realized for retail home site sales are more individualistic, responding more to the existence of amenities and less on the size of the parcel. This is not to say that the size of a retail parcel/lot is not significant, for it is. Rather, amenities are more important in explaining the sales price. For bulk sales the more important determinant of sales price was simply the number of residential units that would be allowed by regulations. Thus the R2 for bulk sales drops to 64% whereas it is 70% for retail sales. The significant factors explaining retail sales prices are lot size, the existence or absence of suburban amenities, and location within or outside the DR/GR area.[38] For bulk sales, the most important factor in determining prices is the number of lots approved for construction of a dwelling unit. Both of these sets of determinants are easily understood and all are incorporated into the total sample either as explanatory or dummy variables.

The bulk sales sample size is only 12, so conclusions have to be considered in light of this small number. The analysis shows that the only significant variable in parcel price is the number of buildable subdivision lots. This result would have been expected. The dummy variable amenity was not included because all of parcels offered some amenity so there was no variation.

The analysis of the retail market shows that the size of the lot and the existence of suburban amenities are the most important determinants of prices. Note that the number of units is not included in the analysis of retail land sales because all of the retail parcels were of a single unit (one lot or one rural tract).

These analyses suggest that there is substantial market pressure to add allowable dwelling units to larger parcels of land and then to add amenities to those lots. Significant increments to value will result from both.

Regression Output - Retail Market	
Regression Statistics	
Multiple R	0.8408
R Square	0.7070
Adjusted R Square	0.7026
Standard Error	0.4894
Observations	268

ANOVA					
	Df	*SS*	*MS*	*F*	*Significance F*
Regression	4	152.01	38.00	158.66	0.00
Residual	263	62.99	0.24		
Total	267	215.01			
	Coefficients	*Standard Error*	*t Stat*		
Intercept	12.338	0.127	97.492		
Ln(Acres)	0.619	0.043	14.520		
Ln(Years)	-0.214	0.056	-3.823		
Amenity	1.240	0.116	10.651		
In DR/GR	-1.481	0.127	-11.629		

Figure 12

Regression Output - Retail Sales	
Regression Statistics	
Multiple R	0.8813
R Square	0.7767
Adjusted R Square	0.6490
Standard Error	1.1813
Observations	12

ANOVA					
	Df	*SS*	*MS*	*F*	*Significance F*
Regression	4	33.97	8.49	6.09	0.02
Residual	7	9.77	1.40		
Total	11	43.74			
	Coefficients	*Standard Error*	*t Stat*		
Intercept	12.564	1.787	7.03		
Ln(Acres)	0.469	0.449	1.05		
Ln(Units)	0.631	0.329	1.92		
Ln(Years)	-0.626	1.046	-0.60		
In DR/GR	-0.624	1.352	-0.46		

Figure 13

38 The number of units does not appear because in every instance the number of units is 1, so there is no variation in the number of units.

Prices per Acre & per Buildable Unit

It is often noted that parcel prices per acre will decline as parcel size goes from smaller to larger. The same is true for prices per buildable unit as the number of buildable units on a given parcel goes from fewer to greater. This gain is a demonstration of the Law of Diminishing Returns. Both of these tendencies were tested for in the Total Sample and were found to exist.

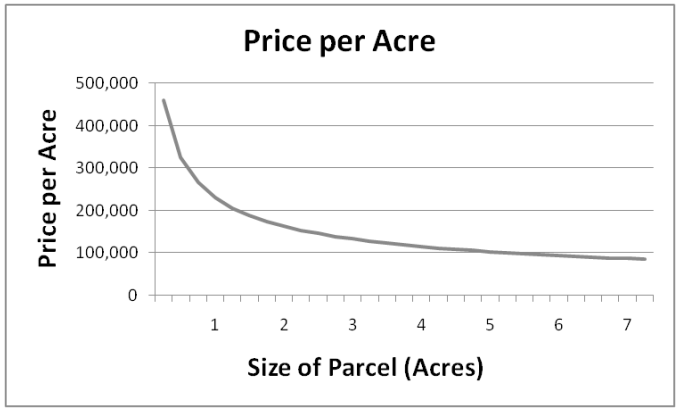

Figure 14

Price per acre within study area sales declines precipitously with the number of acres, with all other variables behaving as before. Figures 14 and 15, plotting the study area sales, shows the rapid decline in price per acre with parcel size. It is always comforting when generally accepted principles of land economics are found to exist in a sample, as they do here. Additionally, price per acre is positively associated with the number of dwelling units authorized and the presence of an amenity. Prices per acre were rising during the study period, thus the negative size of the Time variable, and are negatively associated with being within the DR/GR. The positive time trend is most like associated with the earlier portion of the period, as the number of sales dropped dramatically in the later portion of the period when the hot real estate market ended.

Like price per acre, price per buildable unit declines with the number of residential units allowed within a given parcel (Figures 16 and 17). It is interesting to note that price per unit declines more rapidly with increased units that does price per acre decline with increasing number of acres. This suggests a market preference for larger lots within the study area. However, this apparent preference for larger lots could be a result of existing Lee County development regulations that have not allowed smaller lots rather than a true market preference. Nevertheless, these data are optimistic for the viability of a TDR program in that adding additional residential units will tend to increase land prices and the result should be an increase in total revenue, thereby constituting an economic incentive to increase intensity of land use at specified receiving areas.

Regression Statistics	
Multiple R	0.9563
R Square	0.9144
Adjusted R Square	0.9129
Standard Error	0.5651
Observations	280

ANOVA				
	Df	*MS*	*F*	*Significance F*
Regression	5	935.05	187.01	585.61
Residual	274	87.50	0.32	
Total	279	1,022.55		
	Coefficients	*t Stat*		
Intercept	12.3466	86.42		
Ln(Acres)	-0.4976	-11.35		
Ln(Units)	0.2966	3.41		
Ln(Years)	-0.2361	-3.75		
In DR/GR	-1.3019	-9.28		
Amenity	1.0518	8.50		

Figure 15

Density

The DR/GR area has always been a low-density market. This pattern was reinforced by the imposition of agricultural zoning in 1962 and a new 1 DU/10 acre density cap in 1990. While there is always the possibility that this observation is simply the result of the densities permitted by Lee County land development regulations, market values appear to be clear, showing a sharp de-

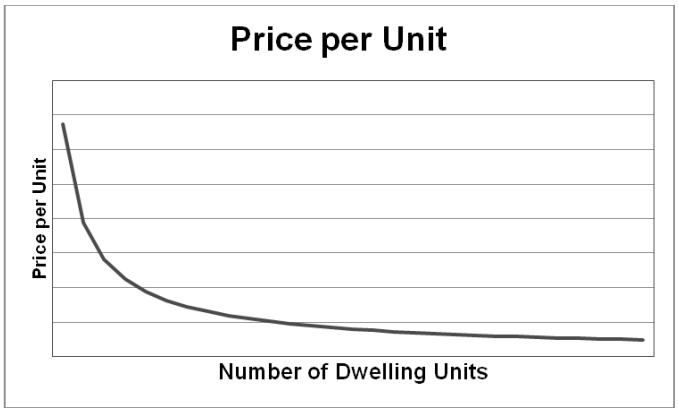

Figure 16

cline in lot price with density. These data would suggest that higher densities may be generally uneconomic in much of this market area, particularly the portions most remote from jobs, services, and urban infrastructure. Note may be taken of the fact that this analysis does not consider how amenities may alter the density price pattern. These further data suggest that the densities that would maximize value would be in the 2 per acre range (Figure 18). Additionally, these data suggest that there will be the highest value for TDRs used in the lower density zoning classifications.

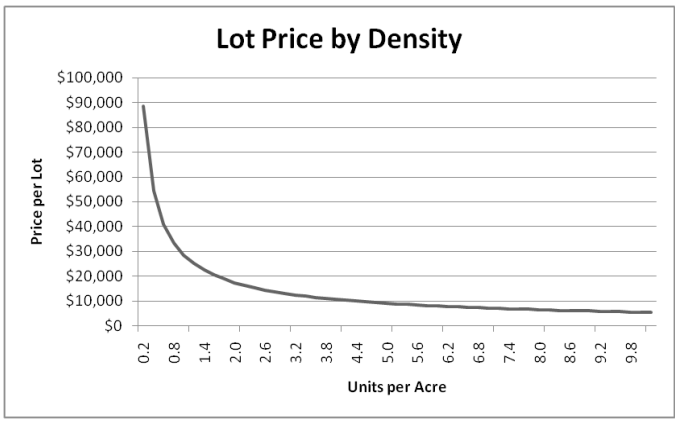

Figure 18

Regression Statistics	
Multiple R	0.8289
R Square	0.6870
Adjusted R Square	0.6812
Standard Error	0.51
Observations	276

ANOVA					
	Df	*SS*	*MS*	*F*	*Significance F*
Regression	5	153.70	30.74	118.53	0.00
Residual	270	70.02	0.26		
Total	275	223.72			
	Coefficients	*Standard Error*	*t Stat*		
Intercept	12.317	0.130	94.61		
Ln(Acres)	0.564	0.040	13.94		
Ln(Units)	-0.798	0.079	-10.04		
Ln(Years)	-0.191	0.057	-3.35		
In DR/GR	-1.416	0.129	-11.01		
Amenity	1.176	0.115	10.26		

Figure 17

All of the sales data analyzed are of parcels that were sold under the then existing regulations. The land market capitalized those regulations into prices as well as other attributes of the land and area. The evolving DR/GR program is seeking to introduce a different kind of development than the ranchette type of development presently permitted, which is generally known as Traditional Neighborhood Development (TND). While this type of development has been undertaken for centuries, it fell out of favor with real estate developers after World War II and didn't begin to reappear on a large scale until the 1980s. The essence of TND is designing structures and places so that everything tends to be closer together. One aspect of this design is development at densities higher than that of a typical post-war single family development. There are no TNDs within the area studied and thus no indications of local market values, but there are a number of TNDs in Florida. At last count, there were 120 TNDs or New Urbanist developments in Florida and over 300 in the United States. Some of these Florida developments are listed in figure 19.

Development	County	Acres	Dwellings	Non-Res (Sq Ft)	Began
Abacoa	Palm Beach	2,055	6,000	2,900,000	1997
Avalon Park	Orange	1,860	4,223	400,000	1999
Baldwin Park	Orange	776	3,500	1,200,000	2002
Cagan Crossings	Lake	650	8,000	500,000	2002
Celebration	Osceola	4,900	2,600		1994
Eagle Creek Village	Orange	146	849	200,000	2001
Haile Village	Alachua	50		160,000	1990
Longleaf	Pasco	570	1,450		
Pointe West	Indian River	600	1,199	170,000	2000
Rosemary Beach	Walton	107	405		1995
Seaside	Walton	80	681	58,530	1981
Town of Tioga	Alachua	500	1,000		2002
Bridgewater	Orange	697	7,300	287,000	1999

SOURCE: Congress for the New Urbanism, Florida Chapter, website http://www.cnuflorida.org/projects/project_list.asp

Figure 19

The sales experiences of these and other new TND developments are largely anecdotal, but the success of Seaside, Celebration, Baldwin Park, and Haile Village are well known. *Realtor*[39] reported that homes in such communities have experienced greater appreciation rates than comparable traditional homes. However, while there is a clear and demonstrated market for TND development, the extent of that market is as yet unclear. What is clear are the many community benefits of these developments; such as walkability, energy conservation, and lower infrastructure costs. The success a TND development might have in the DR/GR area is, of course, not known. However, the successes of such developments elsewhere demonstrate that higher density developments can achieve success, with design and location being major caveats. Therefore, it must be concluded that higher densities could prove more valuable than past sales would indicate. If this were to be the case, then the density gradient would not be as steep as shown above and additional or marginal dwelling units would have greater value than that shown.

Several areas have been identified where TND development may be suitable and preferable to additional ranchette development in the DR/GR area:

1. Approximately 350 upland acres at major intersections along State Road 82 that appear to be suitable for more intense mixed-use development of 7 or more units per acre or more which could be developed with TND design to complement the existing surplus of standard subdivision lots in that immediate area. These developments could also incorporate commercial and employment components that could benefit residents of nearby Lehigh Acres and, due to their compactness and location, would be suitable for express bus connections to other parts of Lee County;

2. Approximately 500 acres mostly along Corkscrew Road that could accommodate the existing development rights from several major rural tracts, and which also could employ TND design and thus achieve higher densities on a small fraction of the overall tract, allowing agricultural activities to continue rather than being displaced by residential development.

DR/GR LAND AREA		
Existing Ranchettes	10,000	12.1%
Mixed-Use Communities	350	0.4%
Rural Communities	500	0.6%
Wetlands	42,540	51.5%
Other	29,250	35.4%
Total	82,640	100.0%

Figure 20

39 "New Urbanism: Show My Home Please," Realtor, September 2001.

Area	Acres	Acres per TDR	Potential TDRs
Existing Ranchettes	7,365	na	0
Mixed-Use Communities	350	Receiving	0
Rural Communities	500	Receiving	0
Wetlands	42,540	20	2,127
Other Uplands	31,805	10	3,180
Total	82,560		5,307

Figure 21

MODEL COEFFICIENTS	
	Coefficients
Intercept	12.347
Ln(Acres)	0.502
Ln(Units)	0.297
Ln(Years)	-0.236
DR/GR	-1.302
Amenity	1.052

Figure 22

In general terms, about 31,805 acres of uplands would be potential TDR sending properties, along with 42,540 acres of wetlands. However, it is expected that a significant portion of these TDR rights would never be transferred because the landowners are public or nonprofit agencies. Setting that factor aside, and assuming for the moment that TDRs were created at existing density levels without bonuses, 5,307 TDRs could be created (Figure 21). This total would double if the typical TDR was created with a bonus that doubled its value to prospective purchasers.

DR/GR property owners are presently allowed to develop at one unit per ten acres, in what are called ranchettes. This density level will be retained but the default development option for larger tracts would be clustered development rather than subdivision into ranchettes (major ranchette developments would require a special approval process). Clustering is allowed under current regulations, but individual lots must still be at least one acre each.

For the owners of designated TDR receiving areas, a new option would allow the development of additional land at urban densities, provided that the additional units are achieved by transferring rights from other DR/GR properties. The owners of sending area properties, in exchange for their right to develop at one unit per ten acres, will be able to transfer their development rights to receiving area properties. This analysis suggests that it would be profitable for some of the sending area property owners to sever their rights and sell them so that they could be used in the receiving areas. Of course, sending area property owners are completely free not to sever their developments and instead simply retain those rights for future use or investment.

Value of Increased Intensity

The objective here is to estimate the value of a TDR within the market area. This value will be estimated using the Total Sample Model, which was set out above.

Figure 22 provides the Model Coefficients. Upland property located in the DR/GR is generally allowed one unit per 10 acres. Assume a hypothetical 50-acre tract at a major intersection along SR 82 that has been designated as a potential mixed-use community. With TDR, lots sizes could go from 1 unit per 10 acres to perhaps as much as 10 units per acre. The model tells us that a typical 10-acre tract deep inside the DR/GR would sell for $144,068.[40] If this land were outside the DR/GR, in Estero or Bonita Springs, the price would be $529,655 for a tract of this same size due to its higher development potential from both a market and regulatory standpoint.[41]

Going from a 10-acre to a 5-acre configuration adds additional, incremental or marginal revenue of $32,880 per tract. Assuming away additional development and transactions costs, this would be the value of adding additional density to a defined parcel. Taking this hypothetical parcel through a reasonable range of densities yields the results in Figure 23.[42]

Note that the incremental value declines with the decrease in lot sizes, again demonstrating the Law of Diminishing Returns. However, parcel value increases throughout the density ranges. The assumption incorporated into the above calculations is that the type of development will be conventional, as distinct from Traditional Neighborhood Development.

40 The model yielding this result in shown in Figure 12.

41 This is derived from the same model. However, there were no 10-acre tracts outside the DR/GR lots in the sample, so this is a theoretical number.

42 The values shown assume that there is not an amenity offered.

Acres	Units	Units per Acre	In DR/GR	Parcel Value	per Lot	Incremental Value per Lot
50	5	0.1	Yes	$720,342	$144,068	
50	10	0.2	Yes	$884,743	$88,474	$32,880
50	20	0.4	Yes	$1,086,665	$54,333	$20,192
50	50	1.0	Yes	$1,425,987	$28,520	$11,311
50	100	2.0	Yes	$1,751,435	$17,514	$6,509
50	150	3.0	Yes	$1,975,235	$13,168	$4,476
50	200	4.0	Yes	$2,151,160	$10,756	$3,518
50	250	5.0	Yes	$2,298,338	$9,193	$2,944
50	300	6.0	Yes	$2,426,036	$8,087	$2,554
50	350	7.0	Yes	$2,539,523	$7,256	$2,270

Figure 23

Acres	Units	Units per Acre	In DR/GR	Parcel Value	per Lot	Incremental Value per Lot
50	5	0.1	No	**$2,648,276**	**$529,655**	
50	10	0.2	No	**$3,252,683**	**$325,268**	**$120,881**
50	20	0.4	No	**$3,995,031**	**$199,752**	**$74,235**
50	50	1.0	No	**$5,242,518**	**$104,850**	**$41,583**
50	100	2.0	No	**$6,439,000**	**$64,390**	**$23,930**
50	150	3.0	No	**$7,261,779**	**$48,412**	**$16,456**
50	200	4.0	No	**$7,908,552**	**$39,543**	**$12,935**
50	250	5.0	No	**$8,449,640**	**$33,799**	**$10,822**
50	300	6.0	No	**$8,919,110**	**$29,730**	**$9,389**
50	350	7.0	No	**$9,336,334**	**$26,675**	**$8,344**

Figure 24

If this parcel were outside of the DR/GR all values would be substantially higher (Figures 24 and 25).

Taking this 50-acre parcel from one unit per 10 acres to 6 units per acre would increase parcel value by $1.8 million if this parcel was in the DR/GR and by $6.7 million outside the DR/GR. Obviously the DR/GR designation is a substantial factor in value. However, it may be that this difference is due more to the inherent differences between the development regulations than to any other factor. Nonetheless, shifting property from the DR/GR to not DR/GR would appear to result in a substantial increase in values (Figure 26). These incremental values reach $20,000 per right or higher, depending on the density range involved.

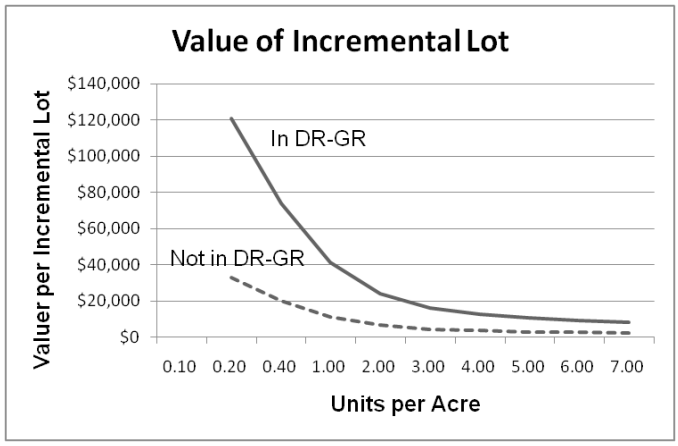

Figure 25

Acres	Units	Units per Acre	In DR/GR	Parcel Value	per Lot	Incremental Value per Lot
50	5	0.1	Yes	$720,342	$144,068	
50	300	6.0	Yes	$2,426,036	$8,087	$5,782
50	5	0.1	No	$2,648,276	$529,655	
50	300	6.0	No	$8,919,110	$29,730	$21,257

Figure 26

The incremental values shown above are calculated by estimating total parcel values using the model in figure 12 for all four configurations, and then dividing the total change in parcel value by the number of increased lots.[43]

There are costs associated with increasing the number of lots within a parcel and with transferring development from one parcel to another. These costs would include:

- Additional infrastructure costs,
- The cost of acquiring development rights,
- Closing costs associated with that acquisition,[44] and
- Foregone interest while awaiting the sale of transferred units.

The offer price of a TDR would be the incremental revenue less these transaction costs.[45] Studies undertaken for the New Jersey Pinelands Commission suggested a reduction of as much as 50% from the incremental value to the TDR price.[46] If this discount were to prevail from an incremental value of $20,000, DR/GR TDRs should achieve market selling values of approximately $10,000 per right. In the case of the Long Island Central Pine Barrens, the discount from incremental value to TDR market price appears to be less than 25%.[47] Using a discount of 20%, the projected sales value of a TDR would be $16,000.

Given the data analyzed, a TDR value for as much as $16,000 is warranted for conventional development. Such an amount is based on the assumption that the development regulations of such DR/GR parcels would be relaxed and be similar to near non-DR/GR properties. The analysis above was restricted to the sale of land within the study area. As such, the various qualities and aspects of the properties and area are capitalized into the prices. It is proposed that constructing Traditional Neighborhood Development (TND) at locations specified in the comprehensive plan amendments through the use of TDRs would be allowable, encouraged by public policy, and eased through suitable implementing regulations. Such developments would be allowed at 7 dwelling units per acre or higher. The analysis of existing sales during the study period suggests that there would be little value for units offered at such densities, at least within this study area. But the TND type of development at desirable locations has never been an option, so marginal values with respect to densities of TNDs cannot be estimated. Suffice it to say that:

1. There is demand for densities higher than that presently allowed by Lee County;

2. There is a positive return from increasing densities in the market area;

3. The existence of amenities results in a substantial increment to value;

4. A program of transferable development rights would appear to be economically viable at the point that the residential development market in Lee County itself returns to viability; and

5. Traditional Neighborhood Development could result in even higher values for transferred development than that shown here.

43 For the 50-acre parcel in the DR/GR, the parcel price with 5 lots at 10 acres each would be $720,342, or $144,068 per lot. That same parcel with 300 lots (or units) would command $2,426,068. The incremental value of $1,705,694 divided by the 295 increased units equals the $5,782 incremental value per lot.

44 In some instances there are commissions to be paid since realtors actively broker TDRs where there are successful TDR programs.

45 While foregone interest is not actually a transaction cost, it will be lumped together with actual transaction costs as a net deduction.

46 J. Nicholas, "The Value of Pinelands Development Credits," New Jersey Pinelands Commission, 1986.

47 J. Nicholas, "The Economic Value of Development Rights in Brookhaven, Riverhead and Southampton," a report prepared for the Central Pine Barrens Credit Clearinghouse, January 1998.

THE UNDEVELOPABLE LANDS

Much of the land within the DR/GR is considered to be non-developable due to extensive wetlands on site. The price model would suggest that wetlands alone would sell $3,500 or more per acre, depending on the size of the parcel. There have been a number of sales of land classified as Resource Protection, Wetland Preserve, or Cypress Head within the DR/GR that can be used to confirm this estimate. There were 29 sales involving 308 acres of such property (Figure 27). The average price per acre was $10,545, with the highest being $29,600 per acre. However, the median price per acre is only $3,465.[48] There are a few large sized and high value sales that greatly influence the averages. Using the median size of the sales of 5 acres, the model would indicate a value of $3,623 per acre. This is quite close to the observed median sales value of $3,465 per acre. Based on these data and the model output, a residual value of $4,000 per acre for non-developable land will be used herein.

SALES OF RESOURCE PROTECTION, CONSERVATION, OR CYPRESS HEAD LAND IN DR/GR	
Parcels	29
Acres	308
Average Size (Acres)	10.6
Median Size (Acres)	5.0
Gross Proceeds	$3,246,400
per Acre	$10,545
Highest per Acre	$29,600
Lowest per Acre	$799
Median per Acre	$3,465

Figure 27

A hypothetical 50-acre wetland parcel can be used to summarize relevant values. This 50 acre parcel at one unit per 20 acres would have a model estimated value of $586,490, or $11,730 per acre. The above would indicate that as much as $4,000 of the $11,730 per acre is residual value, leaving $7,730 per acre in development value or $386,490 for the total site and $154,596 for each of the developable lots (Figure 28).

50-ACRE PARCEL IN THE DR/GR		
	Site	**per Acre**
Developable Lots	2.5	.05
Estimated Market Value	$586,490	$11,730
Estimated Residual Value	$200,000	$4,000
Estimated Development Value	$386,490	$7,730

Figure 28

THE RECEIVING AREAS

There are a number of possible transfer or receiving areas that could absorb up to 6,000 or more development rights. These receiving areas could be developed as Traditional Neighborhood Developments to minimize land consumption and avoid further development of lot types that are already in oversupply. Densities higher than 7 units per acre may be achievable in the designated receiving areas with TND; higher densities would simply require more TDRs (Figure 29).

	Acres	**DUs per Acres**	**Potential TDRs Absorption**
Receiving Areas Along SR 82			
Conventional Development	350	4:1	1,400
Mixed-Use Communities	350	7:1	2,450
Receiving Areas Further South			
Conventional Development	500	4:1	2,000
Rural Communities	500	7:1	3,500
TOTALS			
Conventional Development			3,400
Rural & Mixed-Use Communities			5,950

Figure 29

An estimated 14,358 TDRs could be created; presently identified receiving areas could absorb up to 6,000 rights. It would appear that there would be a need for additional receiving areas if all DR/GR property owners wish to create TDRs. However, as pointed out above, there is a tendency for a substantial portion of sending area property owners not to participate in transferring their development rights; the same situation could occur in the DR/GR. Nevertheless, seeking additional receiving areas could strengthen the economic viability of any TDR program adopted for this area.

48 The median value is the one in the middle, with 50% higher and 50% lower.

Keys to a Successful TDR Program

There are several keys to TDR success. Following these guidelines will not guarantee success. However, a failure to follow these guidelines almost assures failure.

Authority

There is no question about Lee County's authority to enact a transfer of development rights program. First, the County Powers Act, Chapter 25, *Florida Statutes*, authorizes counties to "prepare and enforce comprehensive plans for the development of the county."[49] Additionally, the Growth Management Act "encourages" the use of innovative land development regulations including . . . transferable development rights."[50] While further authority may not be needed, The Bert J. Harris, Jr., Private Property Rights Protection Act authorizes or recognizes TDRs as a means to deal with the economic consequences of certain land development regulations.[51]

Clarity of Purpose

A TDR program must have clearly defined and attainable goals. In this way, movement toward those goals can be managed and attainment can also be measured. Lee County must resist the temptation to add other goals to its TDR program.

Resources

Lee County will have to commit some fiscal and staff resources to the on-going administration of a TDR program. Experience elsewhere has shown that the fiscal and personnel costs are not extensive; experience has also shown that if staff and fiscal resources are not made available the program will dwindle away.

Evasion Proof

The most frequent reason for failure of TDR programs is the lack of economically feasible receiving areas. The second most common reason is evasion. Developers in receiving areas are expected to purchase TDRs from sending area property owners. This analysis suggests a price as much as $16,000. The result of this purchase should be that the developer could increase development within the receiving area. If the same increase can be had by other and cheaper means, TDRs will be eschewed in favor of the cheaper route. In designated receiving areas there must be no alternate way of increasing density other than TDR.

Economic Feasibility

Development rights will be traded and transferred if and only if it is economically feasible for both buyers and sellers to trade. Any TDR program must begin with economic feasibility and feasibility must be retained. The County will have to monitor the program and, where necessary, make appropriate corrections and adjustments so that the program remains viable.

Use By Right

A defining difference between successful and unsuccessful TDR programs is whether the increased development in the receiving areas is by right. The alternative to use by right is to require some type of discretionary approval.[52] The requirement for discretionary approvals removes the certainty that is the basis for economic feasibility. Additionally, requiring discretionary approvals can put the program in legal jeopardy. In *French v New York*,[53] the court expressed a view of TDR, saying that:

> *[I]t is a tolerable abstraction to consider development rights apart from the solid land from which as a matter of zoning law they derive. But severed, the development rights are a double abstraction until they are actually attached to a receiving parcel, yet to be identified, acquired, and subject to the contingent future approvals of administrative agencies, events which may never happen because of the exigencies of the market and the contingencies and exigencies of administrative action.*

This was preparatory to ruling against the City of New York. For economic and legal reasons, increased density by TDR must be by right in the receiving areas. If Lee County cannot make this commitment, then a TDR program may be ill advised at this time.

Simplicity

Any land development regulatory program tends to become complex. TDRs are perhaps more conducive to complexity than other types of development regulations. Strong efforts should be exerted to keep a TDR program as simple as possible and any effort to add requirements should be resisted as constituting a fundamental threat to the viability of the program.

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49 Chapter 125.01(1)(g), *Florida Statutes*.

50 Chapter 163.3202(3), *Florida Statutes*.

51 Chapter 70.01(4)(c)(3), *Florida Statutes*.

52 Use by right does not waive or alter any land development regulation other than the number of dwelling units that will be allowed. All environmental, safety and design requirements will remain in force.

53 350 N.E.2d 381

Transactions Costs

All efforts should be undertaken to keep transaction costs to a minimum. The greater the administrative or public "hassle" confronting a prospective buyer or seller of rights, the less economic value the rights have and the less effective the program will be. Restrictions on the use of rights by buyers or uncertainty about the ability of sellers to sell rights inhibit participation in a rights transfer program.

Establishing a Market

Two of the more successful TDR programs have established programs that supported TDRs by offering to purchase the rights at a stated but heavily discounted price.

The New Jersey Pinelands. The New Jersey Pinelands Commission is a state agency. As such, it has only those resources allocated to it by the state of New Jersey. When the Pinelands Plan was adopted, it was recognized that the TDR program incorporated within the plan would require extraordinary efforts before it would be viable. A total of 33,200 TDRs[54] were created, covering 840,100 acres to be preserved.[55] Additionally, there were nine counties and 52 municipalities within the area managed by the Pinelands Plan.

Burlington County, having much of its area in the Pinelands, established the Burlington County Conservation Easement and Pinelands Development Credit Exchange" that would purchase TDRs from property within Burlington County. They began with $1 million and later saw the amount go to $5 million.[56]

The State of New Jersey had an on-going "Green Acres" program where the state would purchase conservation easements on farmland to assure the retention of those lands in farming.[57] The State authorized the use of "Green Acres" monies and created Pinelands Development Credit Bank that would buy and sell PDCs as well as guarantee loans secured by PDCs. The state purchase programs paid an average of $3,239 for PDCs, ranging from a low of $1,750 to a high of 5,650.[58] The objective of the bank was to support and not to displace the PDC program. It did this by offering minimal prices for PDCs and later auctioning off those rights. The bank made a "profit" and is returning that profit to the people of New Jersey.

Central Pine Barrens of Long Island. The plan adopted to preserve the 52,500 acres of the central Pine Barrens contained a TDR program – called Pine Barrens Credits (PBC).[59] The 52,500 acre preservation area is within three municipalities, Brookhaven, Riverhead and Southampton. There are three separate PBCs, one for each municipality. The Commission created the Pine Barrens Credit Clearinghouse. The Clearinghouse was given an $8 million grant/loan from the New York General Assembly. These funds were used to offer to buy PBCs at $12,000. Fourteen rights were sold to the Clearinghouse. When offered at public auction, the PBCs went for prices as high as $37,000.[60] Now that the market price is established, the Clearinghouse is withdrawing from the market. The "profit" will be divided among those selling PBCs to the Clearinghouse in the belief that it is unfair to economically punish people for selling their PBCs early.

In both instances funds were made available to support the program by offering minimal purchase prices. Both banks offered prices that were claimed to be below the true worth of the rights. Nevertheless, many elected to take a "sure thing" and thus a floor was established. These floors added some degree of certainty to a very uncertain and unknown program. Additionally, these banks were entities that developers could approach to purchase development rights.[61] The existence of these banks added greatly to the acceptance of the TDR programs and their eventual successes. There certainly are TDR programs that are successful that did not have a

54 These TDRs and known as Pinelands Development Credits – PDC.

55 New Jersey Pinelands Commission, "Pinelands Development Credits, Summary Report Through December 31, 1995," (1996).

56 See Juergensmeyer, Nicholas & Leebrick, note 3, page 449 ff.

57 *Supra*.

58 Amicus brief of James C. Nicholas et al., 1997 WL 9053 at *Suitum v Tahoe Regional Planning Agency*, 117 S.Ct 1659 (1997) (No. 96-243).

59 Here known as Pine Barrens Credits – PBC.

60 Central Pine Barrens Planning Commission, press release, "First Ever Auction of Pine Barrens Credits Successfully Completed today," August 26, 1999. PBCs in Brookhaven sold for $37,000 and 10 PBCs in Riverhead sold for $17,000.

61 It appears that developers may prefer to purchase rights from banks.

bank, so a bank is not a requirement.[62] But it sure is a good idea.

Successful TDR programs have the active support of the public and of public officials. This support assures that the original commitments remain respected. It also assures continuing interest in the program so that adjustments and corrections can be made as problems arise. The fundamental commitment made is that if property owners will sever and transfer their development rights, they can use those rights in economically feasible receiving areas. As long as this remains true, a TDR program should be successful.

A final point. What if TDRs are not available at economically feasible prices? This problem has not been a serious problem, at least not yet. However, unavailability of TDRs has to be given as much concern as the value of TDRs to sending area property owners. If TDRs are not available at economically feasible prices, this should trigger a reconsideration of the program. Such reconsideration could include:

- Adding more sending areas;
- Providing bonuses so that more TDRs are allocated to property owners;
- Making TDRs worth more than one dwelling unit;
- Selling TDRs from a bank before rights are acquired from sending area properties (TDR futures); and
- Abandonment of the program.

It would appear that transferable development rights are economically feasible for use within the DR/GR. However, a successful TDR program requires diligence as well as economic feasibility for it to create economic value to both sellers and buyers of TDRs.

There is every reason to expect that there will be demand in the potential receiving areas for the units resulting from a transfer once the economy has recovered. Such values would be greatly increased if amenities of comparable value to those found in PUDs were provided. Traditional Neighborhood Developments have achieved market success in many places in Florida by providing amenities of significant value such as sidewalks, street trees, neighborhood parks and greens, transit stops, varied housing types, and some shopping within a walkable distance of all residences. There appears to be no reason why this form of development would not be successful in this area as it has in others around the state and country.

62 Montgomery County, Maryland, is an example of a TDR program that has been successful and does not have a bank. Montgomery County's TDR program allows the use of TDRs by right and there is no way to evade the program.

New Communities 3

Planning Foundations

The planning foundations that follow were created during the DR/GR planning process and are summarized in the *Prospects for Southeast Lee County* Plan. The specific community plans presented in this chapter are an elaboration on goals and principles contained in the Plan.

1. Relocate Development Rights to Reduce the Cumulative Impact of Settlement

Land in the DR/GR is too valuable to be consumed by inefficient land-use patterns. The DR/GR has been subject to a residential density cap of one unit per ten acres since 1990, with the intention of stopping sprawl at typical suburban densities of one to three units per acre. New development requires significant clearing and draining, new roads, and new utilities. When spread across the landscape, these activities lead to major disruptions to the ecological systems. Concentrating development rights into compact neighborhoods along existing roads and utility lines would reduce the environmental footprint of growth.

2. Use Environmentally-Sensitive Design to Maintain and Restore Ecosystem Integrity

Where clustered developments are proposed they must be designed to preserve and reconnect existing flowways, wetlands, wildlife corridors, and conservation areas. The geographic boundaries of new development should be derived from watersheds, farmlands, wildlife corridors and flowways. As isolated systems are reconnected their hydrological productivity and habitat value increase. The carbon footprint of new development can be reduced by use of green-building principles. Water quality can be improved and energy consumption reduced by use of sustainable infrastructure.

3. Create Liveable Communities

Compact, complete and connected mixed-use communities should be the standard in the DR/GR. Each community should have its own identity and an identifiable center and edge. Walkable and bikeable networks of interconnected streets facilitate exercise and reduce the risk of health problems such as obesity and heart disease. Appealing and comfortable open spaces encourage time spent outdoors and casual interaction with neighbors. Workplaces located within short distances of homes would reduce commute times for some residents and increase the amount of time that can be devoted to recreation, community involvement and family. Communities are strengthened by local economies and sense of place. Community-supported agriculture can provide a social and environmental amenity for the area in addition to locally produced food.

Existing Conditions: The landscape is composed of farms and wetlands.

Development Under Current Regulations: 10-acre ranchettes are the default pattern for new residential development.

Development Under Proposed Regulations: Mixed-use communities with preserved farm fields and restored wetlands could redefine the future character of southeast Lee County.

The Neighborhood Defined

The building block of a community is the neighborhood. A genuine neighborhood is not the disconnected, single-use development that characterizes sprawl. Complete neighborhoods, unlike the stand-alone apartment complex or the subdivision tract, provides housing, workplaces, shopping, civic functions, and more. Pedestrian-friendly and mixed-use, these communities are designed to be compact, complete, connected, and ultimately more sustainable.

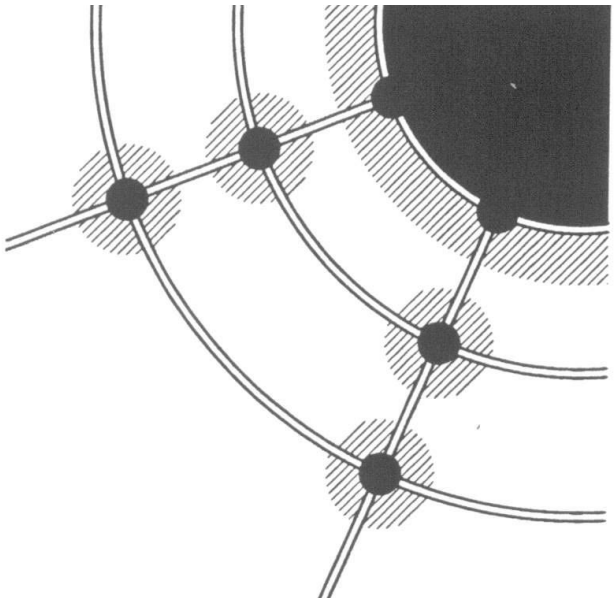
Although the parameters of an ideal neighborhood vary in terms of size, density, and mix of dwelling types; there are five basic design conventions that provide a common thread linking great neighborhoods.

1. Identifiable Center and Edge to the Neighborhood
One should be able to tell when one has arrived in the neighborhood and when one has reached its center. A proper center has places where the public feels welcome and encouraged to congregate. Typically, at least one outdoor public environment exists at the center that spatially acts as the most well-defined outdoor room in the neighborhood. While it most often takes the form of a square or plaza, it is also possible to give shape to the neighborhood center with just a special "four corners" intersection of important streets that include shade and other protection from the elements.

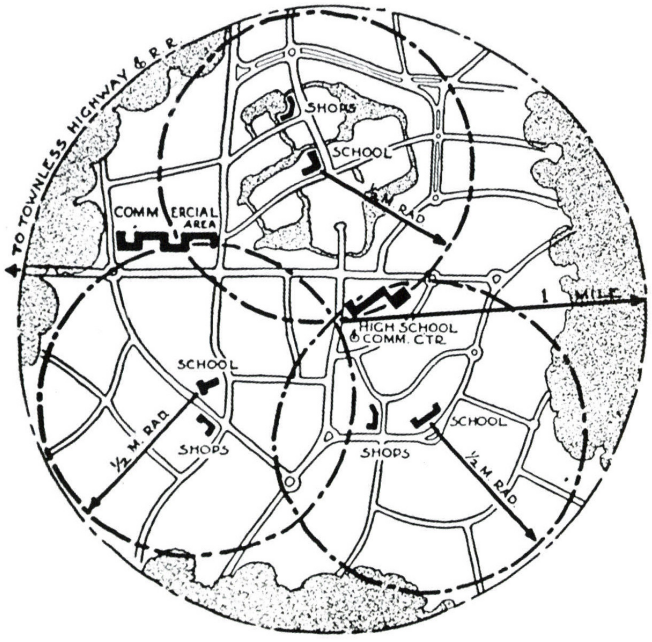
The best centers are within walking distance of surrounding residential areas, possess a mix of uses and include higher-density buildings at a pedestrian scale. Discernible centers are important because they provide some of people's daily needs and foster social connections.

2. Walkable Size
The overall size of the neighborhood, which typically ranges from 40 to 200 acres, should be suitable for walking. Most people will walk approximately one-quarter mile before turning back or opting to drive or ride a bike. Most neighborhoods built before World War II were approximately one-quarter mile from center to edge.

Neighborhoods of many shapes and sizes can satisfy the quarter-mile radius test. Civic spaces requiring a great deal of acreage such as schools with play fields can be situated where they are shared by more than one neighborhood. Larger planned communities can satisfy the quarter-mile radius test by establishing several distinct neighborhoods within the community, being sure to place different neighborhood centers one-half mile apart or less.



Interconnected satellite communities with an identifiable center and edge can coexist with unspoiled and productive landscapes.
From *The Lexicon of the New Urbanism*



Implicit within the circular symbol used traditionally to represent communities are multiple neighborhoods. Each neighborhood is designed as a 1/4 mile radius from center to edge.
From *The Lexicon of the New Urbanism*

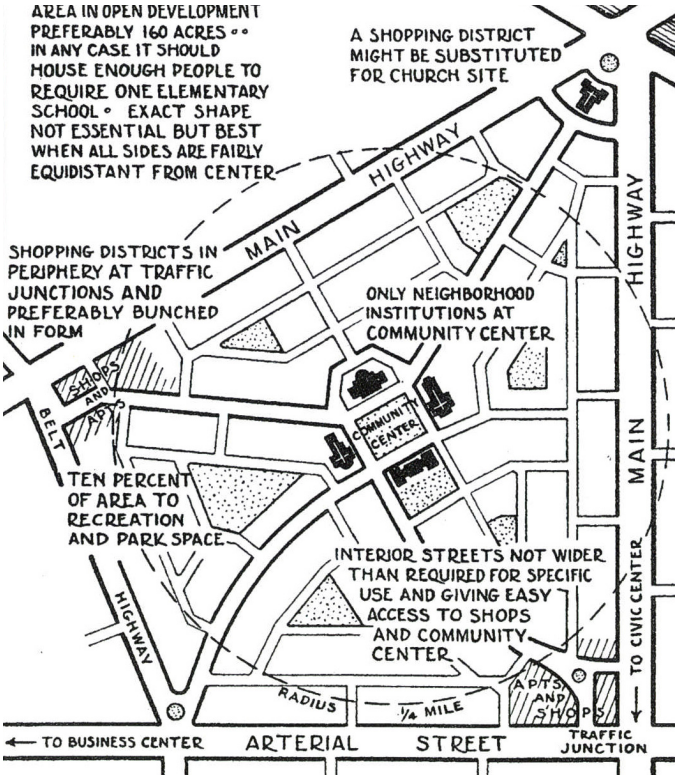
3. Mix of Land Uses and Housing Types with Opportunities for Shopping and Workplaces Close to Home
Great neighborhoods have a fine-grained mix of land uses and housing types. This condition enables residents to dwell, work, socialize, exercise, shop and find some daily needs and services within walking distance. Variety-rich neighborhoods, in comparison with the single-use, single "pod" developments, have multiple benefits.

Mixing uses is a powerful way to alleviate traffic congestion, as it reduces the number of car trips needed throughout the day. A mix of housing is better socially, allowing people with diverse lifestyles and incomes to live in the same neighborhood. Residents have the choice to move elsewhere within their community as their housing needs change over time, while families of modest means are no longer forced into segregated concentrations. In addition, households with varied schedules and interests will activate the neighborhood at different times of day, adding both to the vibrancy and security of a place.

4. Integrated Network of Walkable Streets
A network of streets allows pedestrians, cyclists, and motorists to move safely and comfortably through a neighborhood. The maximum average block perimeter to achieve an integrated network is 1,500 feet with a maximum uninterrupted block face of ideally 450 feet, with streets at intervals no greater than 600 feet apart along any one single stretch.

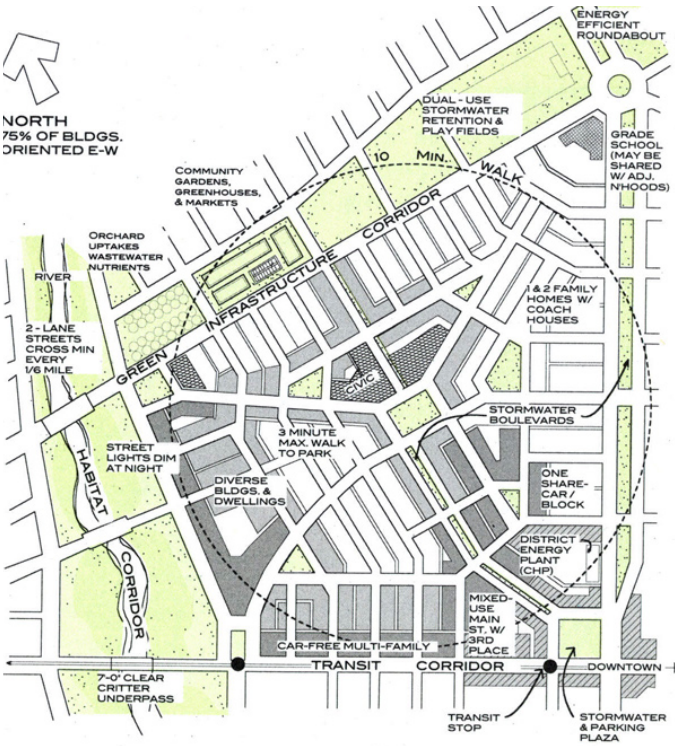
A street network forms blocks that set up logical sites for private development, provides routes for multiple modes of transportation, and provides non-motorized alternatives to those under the driving age as well as for senior citizens. Streets should be designed to be walkable first while also serving cars and emergency vehicles. Slow traffic speeds, coupled with features such as narrow curb-to-curb cross sections, street trees, on-street parking, architecture close to the street edge, and tight radii at the street corners, work together to create highly walkable environments. A connected web of streets then allows for numerous driving patterns and the orderly management of traffic.

5. Special Sites Are Reserved for Civic Purposes
In complete neighborhoods, some of the best real estate is set aside for community purposes. These locations are made significant by the geometry of the town plan. Unique settings such as terminated vistas or locations with greater activity should be reserved for landmark buildings that will act as permanent anchors for community pride. Similarly, special sites should be set aside for parks, greens, squares, plazas, and playgrounds (each of which has its own distinct character). Each neighborhood should have one special gathering place at its center, such as a village green.



Clarence Perry's neighborhood diagram from 1929 organizes all community functions within an area of a five-minute walk, or a quarter-mile radius.

From *The Lexicon of the New Urbanism*



This Sustainable Neighborhood diagram, which is an adaptation of Clarence Perry's 1929 illustration, shows how the traditional neighborhood block, coupled with new infrastucture, added mix and density of housing, and new transit modes can serve our modern needs.

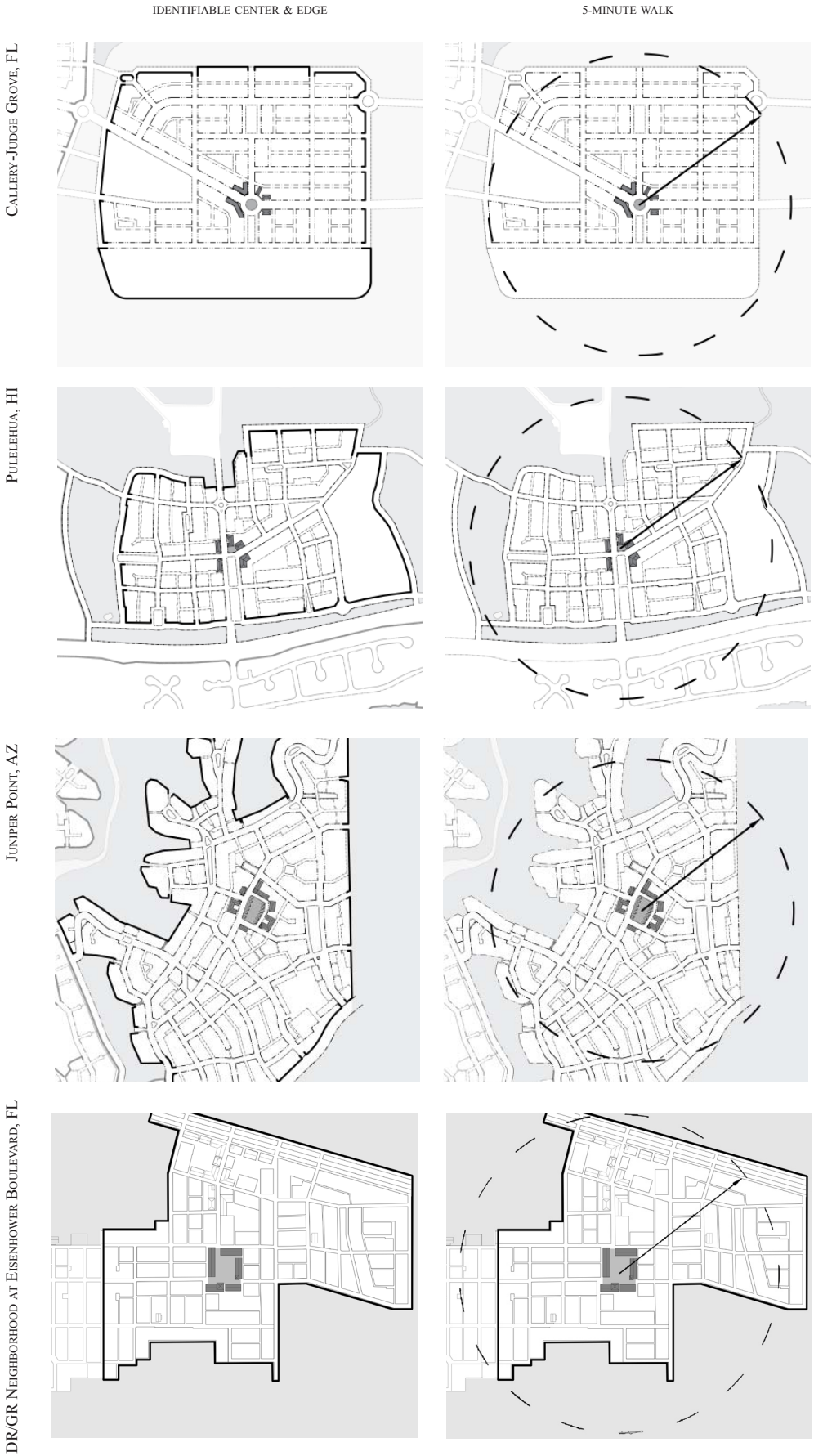
From *Sustainable Urbanism: Urban Design with Nature*

These diagrams illustrate neighborhoods of different sizes and shapes but that meet all of the criteria for a definable neighborhood.

Many of the neighborhoods shown have distinct boundaries, creating a clear town/country distinction though they are located on major roadways. Lewis Mumford and Bentyn MacKaye advocated "Townless Highways" in the 1920s to connect neighborhoods and towns in the manner of railroad lines. By ordinance, development was intended to occur at major intersections only – like at the "stops" of railroad lines – and not allowed in between. This concept has usually been ignored in modern times where new roads are assumed to be fronted by continuous commercial strips. However, with development rights limited in the DR/GR, those rights can be concentrated at several locations to create a 21st century alternative: dispersed rural neighborhoods linked by existing roads.

"The Townless Highway begets the Highwayless Town in which the needs of close and continuous human associations on all levels will be the uppermost... For the Highwayless Town is based upon the notion of effective zoning functions through initial public design, rather than by blind legal ordinances."

-Lewis Mumford, What is a City, 1937



MIX OF LAND USES & LOT SIZES

INTERCONNECTED STREET NETWORK

SPECIAL CIVIC SPACES

The Rural Neighborhood as a Perennial Philosophy

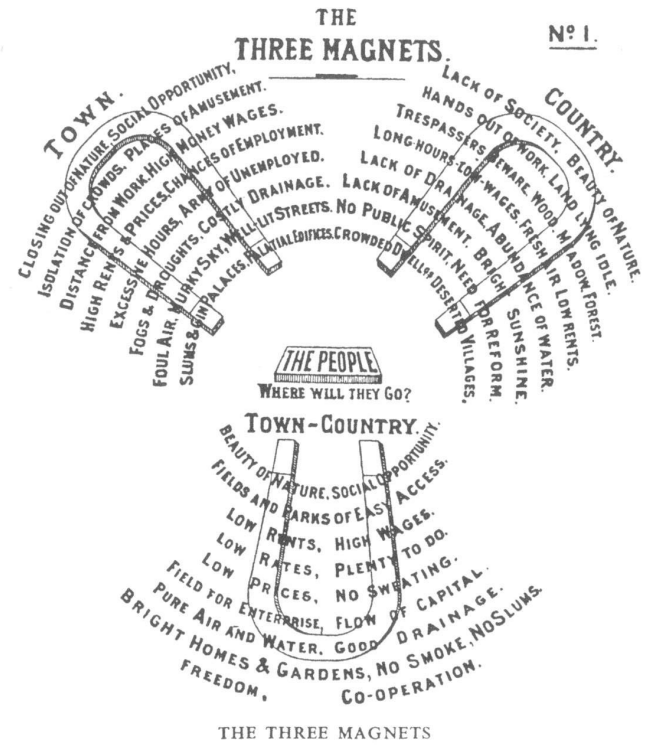
In 1898, prominent British urban planner and social thinker Ebenezier Howard published T*o-Morrow: A Peaceful Path to Real Reform,* which offered a new vision for the cities of the 20th century. Written in reaction to the poor living conditions born out of the Industrial Revolution, Howard's seminal work proposed the first "suburbs" – new garden cities that combined the best qualities of both town (opportunity, amusement and high wages) and country (beauty, fresh air and low rents). This idea was illustrated in the famous diagram at right, called the Three Magnets, which attempted to answer the question "Where will people go?"

His solution, the "Town Country," was conceived as a carefully balanced community of residences, industry and agriculture, which was limited in size, self contaained, and surrounded by greenbelts. Known best as the Garden City, Howard's new vision widely influenced the planning of many of America's most beautiful early 20th century towns.

Since then, planners have proposed new visions for our towns and cities, including zoning laws that attempt to segregate uses thought to be incompatible, and additional and widened roads to better accommodate ever increasing traffic congestion. Though well-intentioned, these efforts have resulted in the devastating urban renewal programs of the 1960's and suburban sprawl.

The New Urbanism, which is rooted in the planning tradition of Howard's garden city suburb, seeks to rebuild connected, pedestrian-friendly, self-sustaining neighborhoods. Like the garden city, these complete neighborhoods include a mix of residences and green space, as well as economic and recreational opportunities, that can be appropriately designed to enhance the character of both town and country alike.

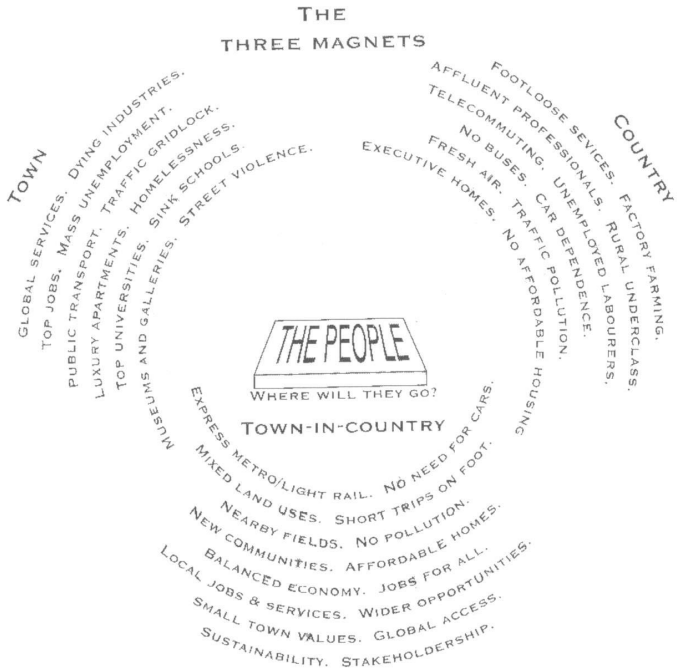
Understanding Americans' inherent desire to live amongst nature and escape from the chaos of the city, traditionally planned communities seek to offer a more sustainable alternative to conventional suburbs. Rural urbanism allows people to enjoy the idyllic conditions of the country, while still protecting those natural assets and preparing intelligently for future growth. Even in the country, one can still enjoy the benefits of city life, including social opportunities, fields for enterprise, proximity to work, and more as Howard defined at the turn of the century.



THE THREE MAGNETS

"Town and County must be married, and out of this joyous union will spring a new hope, a new life, a new civilization."

-Ebenezer Howard



Ebenezer Howard's Three Magnets Diagram (top of page) has since been updated to include modern considerations, yet the point remains relevant today: many people seek town-in-country living.

From *The New Civic Art*

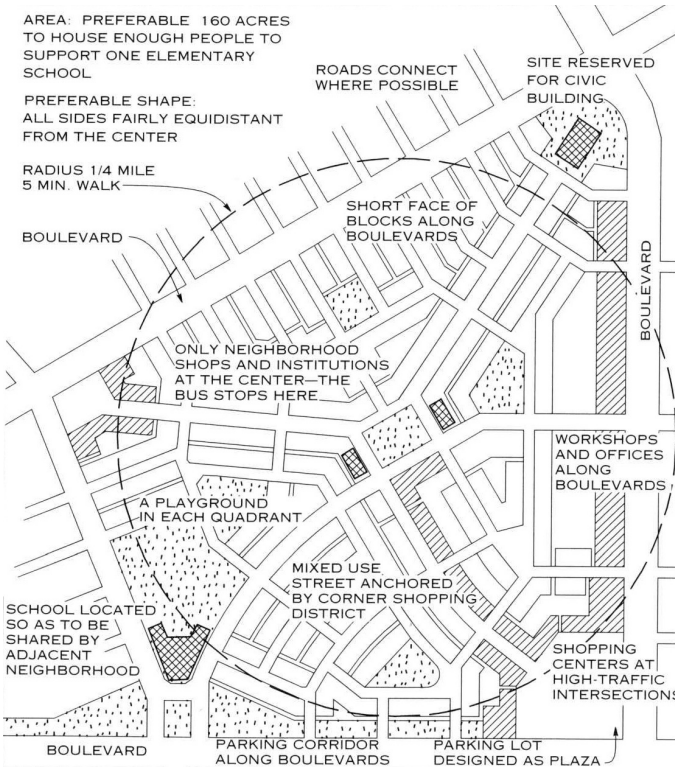
Ideal Mixed-Use and Rural Communities

New neighborhoods in the DR/GR would form mixed-use communities along State Road 82 and rural communities mostly along Corkscrew Road. They would range in character and size based on the area's surrounding needs and context.

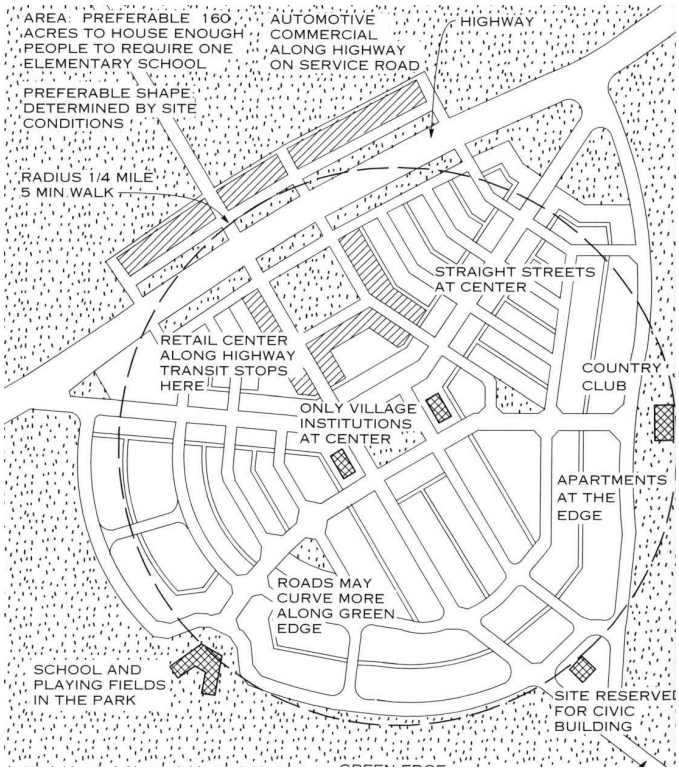
State Road 82's proximity to Lehigh Acres makes it the obvious location for the DR/GR's more urban neighborhoods. The Mixed-Use Communities at Daniels Parkway, Sunshine Boulevard, Homestead Road and Eisenhower Boulevard are spaced along nine miles of this corridor, providing a series of neighborhood centers for the largely residential and auto-dependent suburb of Lehigh Acres. With substantial numbers of residents in and around these communities, the neighborhood centers are capable of economically supporting a range of commercial uses and institutions. Hardscaped market plazas, multi-story buildings, wide sidewalks, structured parking (at times) and street lighting define the core. Mixed-use streets anchored by corner shopping districts are located at major intersections. Neighborhood streets are directly accessible from State Road 82 and connecting boulevards. Express bus service or other form of public transit could also be provided when warranted by actual demand.

The neighborhoods further south are intended to be more rural in character. These neighborhoods include between one to four pedestrian sheds (neighborhoods designed as a 5-minute walk from center to edge) and are generally surrounded by farmland along the edges. Access into the neighborhood is through main streets, with neighborhood blocks separated from the main road's frontage by a swath of green space. Commercial buildings, placed close to the main road, are defined in the way of a small country store or farmer's market, and may reach a maximum of two stories in height. On-street and off-street parking is available but structured parking is unlikely, and light is provided by the night sky rather than by street lamps. Amenities are likely to include country clubs, trailheads and equestrian centers in addition to pools and recreational fields. Green wedges enter into the neighborhoods and narrow as they approach the neighborhood centers.

By providing two "community types" in the DR/GR, the more rural areas can stay rural while the more urban areas can accommodate a greater mix of uses and can also accept development rights transferred from more rural areas.



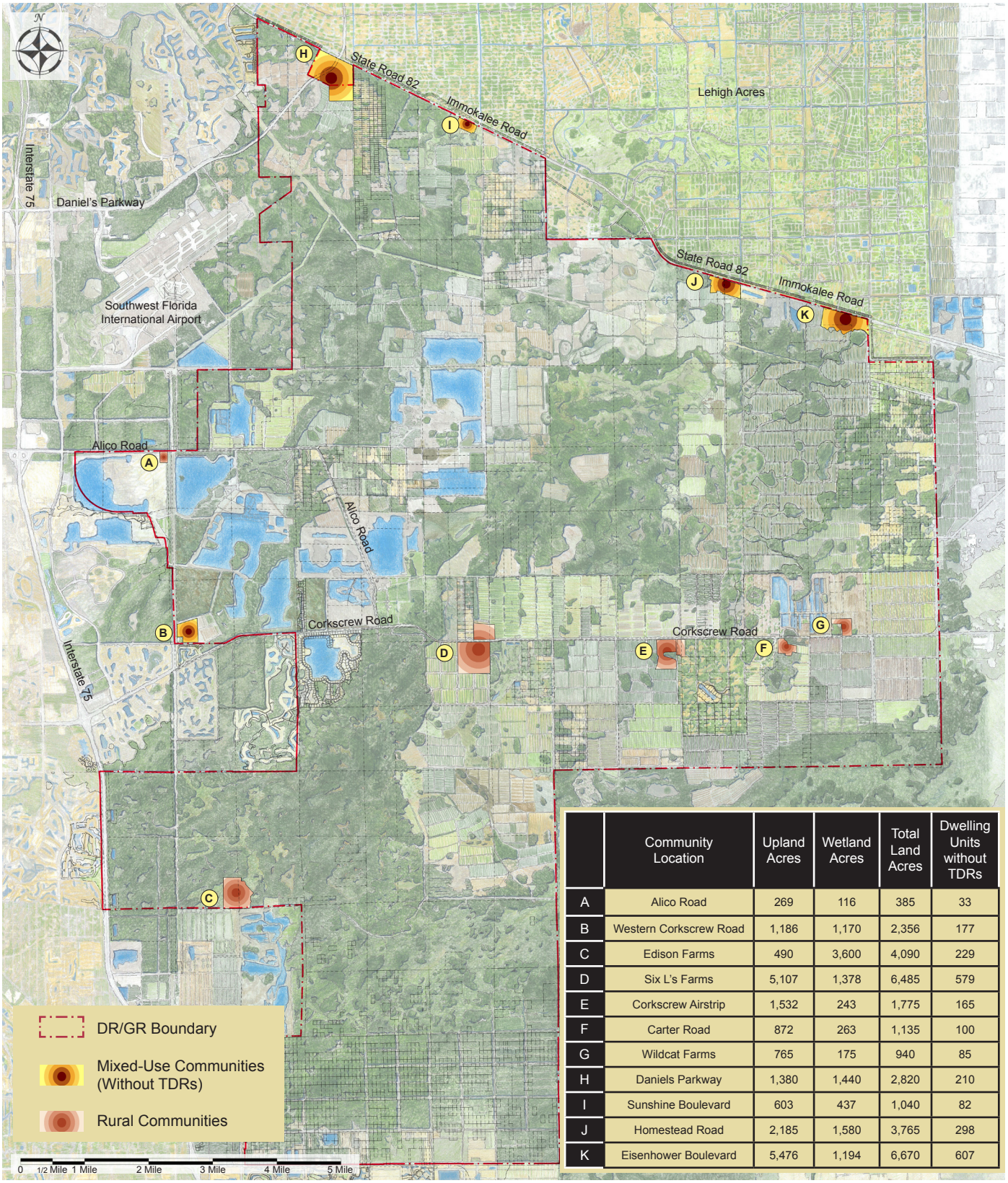
A mixed-use neighborhood unit.
From *The Lexicon of the New Urbanism*



A rural neighborhood unit.
From *The Lexicon of the New Urbanism*

Rural Communities & Mixed-Use Communities without TDRs

One strategy involves clustering the development rights of the largest, single-owner, tracts on major roads*.

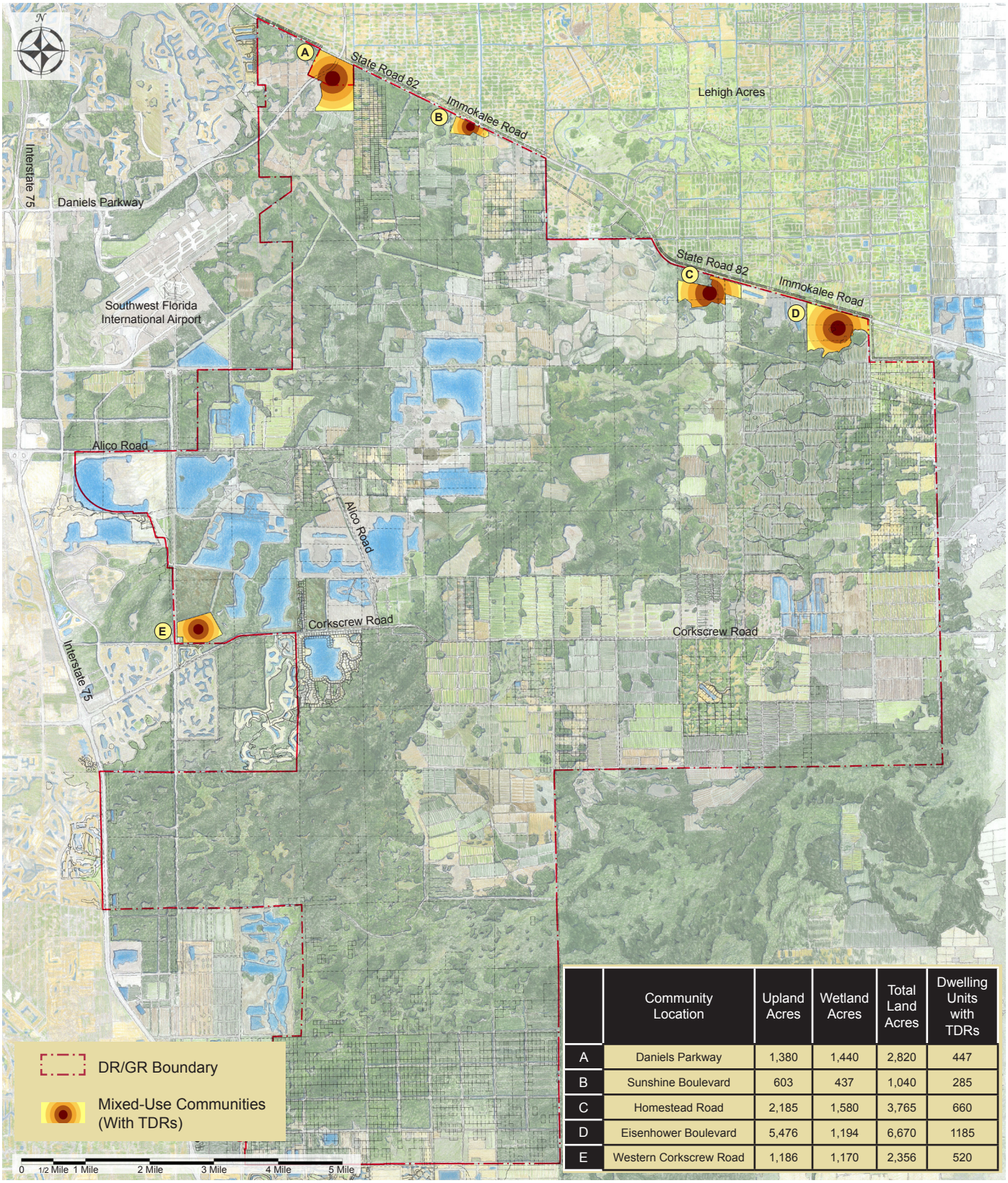


	Community Location	Upland Acres	Wetland Acres	Total Land Acres	Dwelling Units without TDRs
A	Alico Road	269	116	385	33
B	Western Corkscrew Road	1,186	1,170	2,356	177
C	Edison Farms	490	3,600	4,090	229
D	Six L's Farms	5,107	1,378	6,485	579
E	Corkscrew Airstrip	1,532	243	1,775	165
F	Carter Road	872	263	1,135	100
G	Wildcat Farms	765	175	940	85
H	Daniels Parkway	1,380	1,440	2,820	210
I	Sunshine Boulevard	603	437	1,040	82
J	Homestead Road	2,185	1,580	3,765	298
K	Eisenhower Boulevard	5,476	1,194	6,670	607

* See Chapter 4 for tract outlines.

Mixed-Use Communities with Transferred Development Rights

A second strategy involves transferring development rights to State Road 82 and western Corkscrew Road.

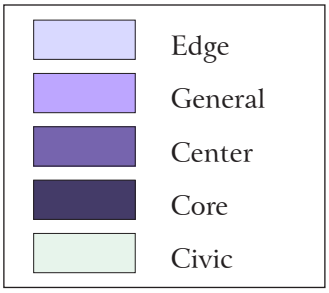


	Community Location	Upland Acres	Wetland Acres	Total Land Acres	Dwelling Units with TDRs
A	Daniels Parkway	1,380	1,440	2,820	447
B	Sunshine Boulevard	603	437	1,040	285
C	Homestead Road	2,185	1,580	3,765	660
D	Eisenhower Boulevard	5,476	1,194	6,670	1185
E	Western Corkscrew Road	1,186	1,170	2,356	520

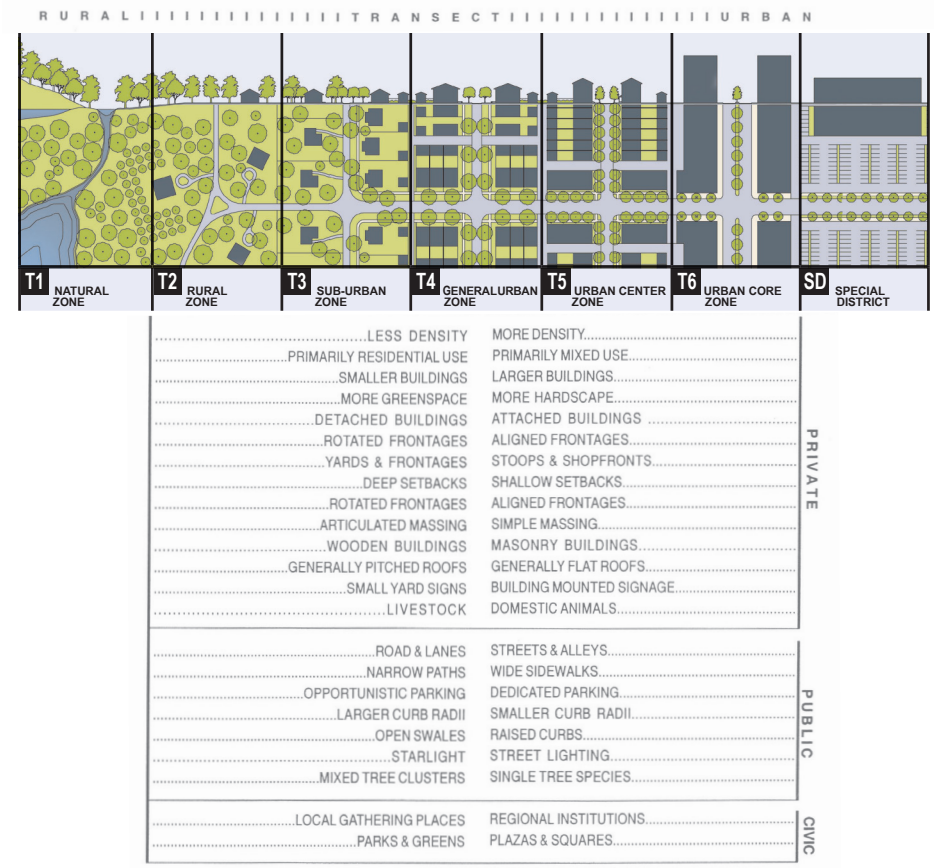
TRANSECT ZONES

Along with the ability to transfer development rights, improved zoning and development regulations will be one of the primary methods for implementing smart, compact development within the DR/GR. Development regulations work like "DNA"; they are the genetic code for growing a town or neighborhood. Development regulations with large-lot requirements create disconnected, auto-dependent places.

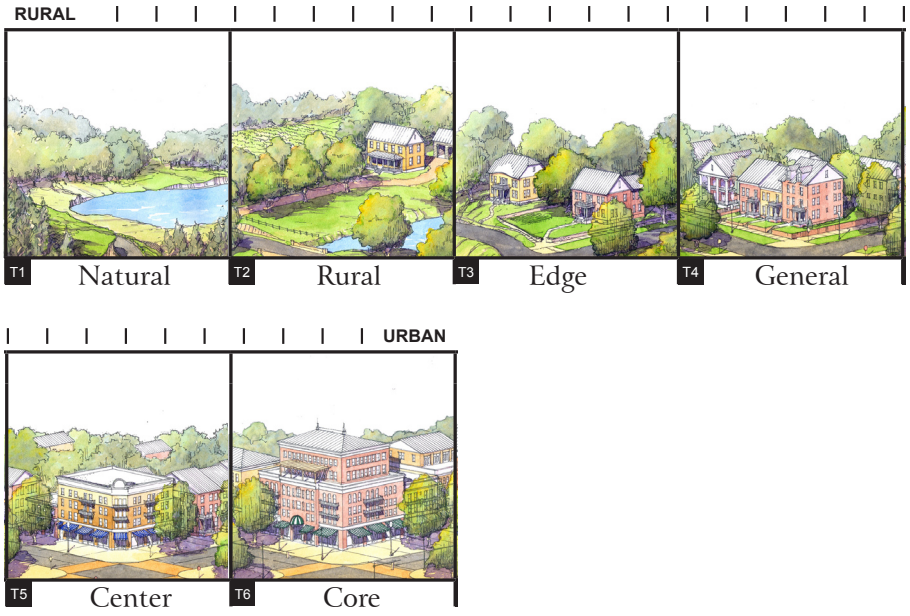
A concept for revised development regulations is presented in Chapter 4 of this report. A fundamental technique would be the identification of intensity levels within each new community using "transect zones," which would regulate place along a spectrum of rural to urban contexts. Characteristics of successful places such as squares and greens, the "outdoor room" framed by Main Street or the wide-open expanses of farm fields are catalogued and assigned to their respective places within the spectrum. This is representative of the DNA of the best American towns and creates places that possess order while still being stimulating and diverse.



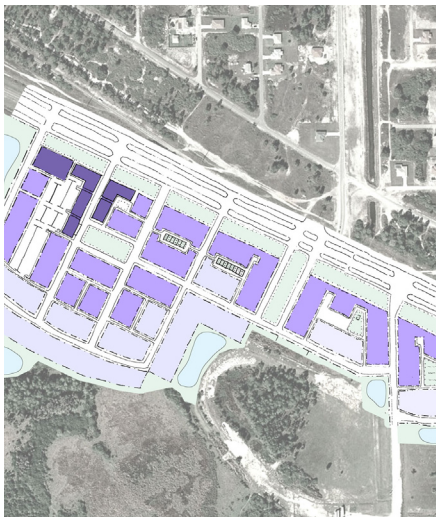
The intensity of transect zones is locally calibrated. The DR/GR community plans use the terms Edge, General, Center, Core and Civic. The chart to the right illustrates the intended intensity of each zone. Throughout all of the communities, only a very limited amount of the Core zone is proposed.



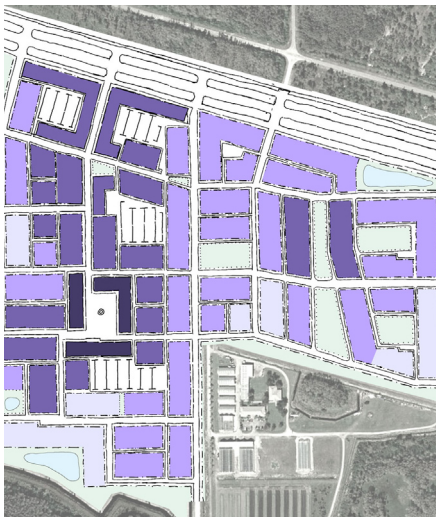
Conceptual model for categorization of development that can accommodate a range of housing types that complement one another.
From *The Lexicon of the New Urbanism and SmartCode Version 9.2*



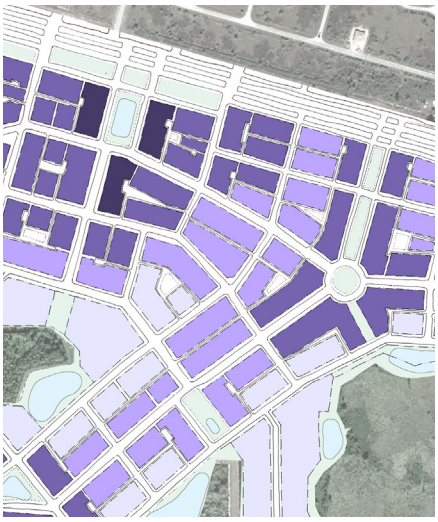
Transect Plan Examples



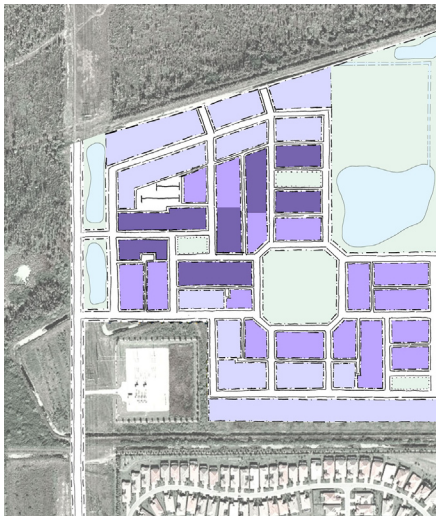
Mixed-Use Community at Sunshine Boulevard



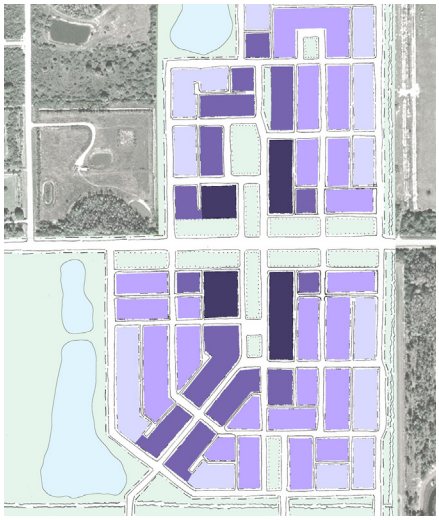
Mixed-Use Community at Homestead Road



Mixed-Use Community at Eisenhower Boulevard

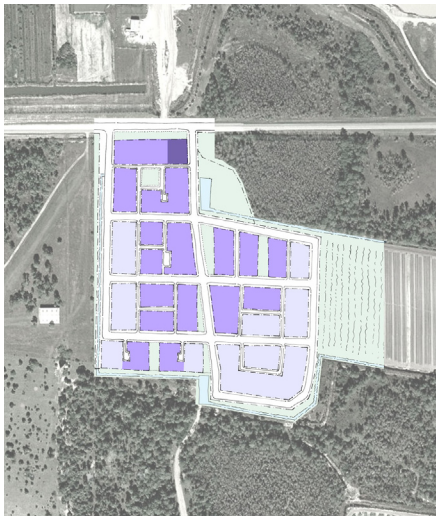


Mixed-Use Community on Western Corkscrew



Rural Community near Six L's Farms

Rural Community West of the Corkscrew Airstrip



Rural Community East of Carter Road

Rural Community South of Wildcat Farms

Rural Community at Edison Farms

Mixed-Use Community on Western Corkscrew Road

Within this small community is a range of green spaces, from playground lots to vast gardens, which connect the neighborhood physically and socially.

The 160 acre community proposed at the future intersection of Estero Parkway and County Road 951 near Corkscrew Road's western edge would be considerably different from neighboring conventional subdivisions to the west and south.

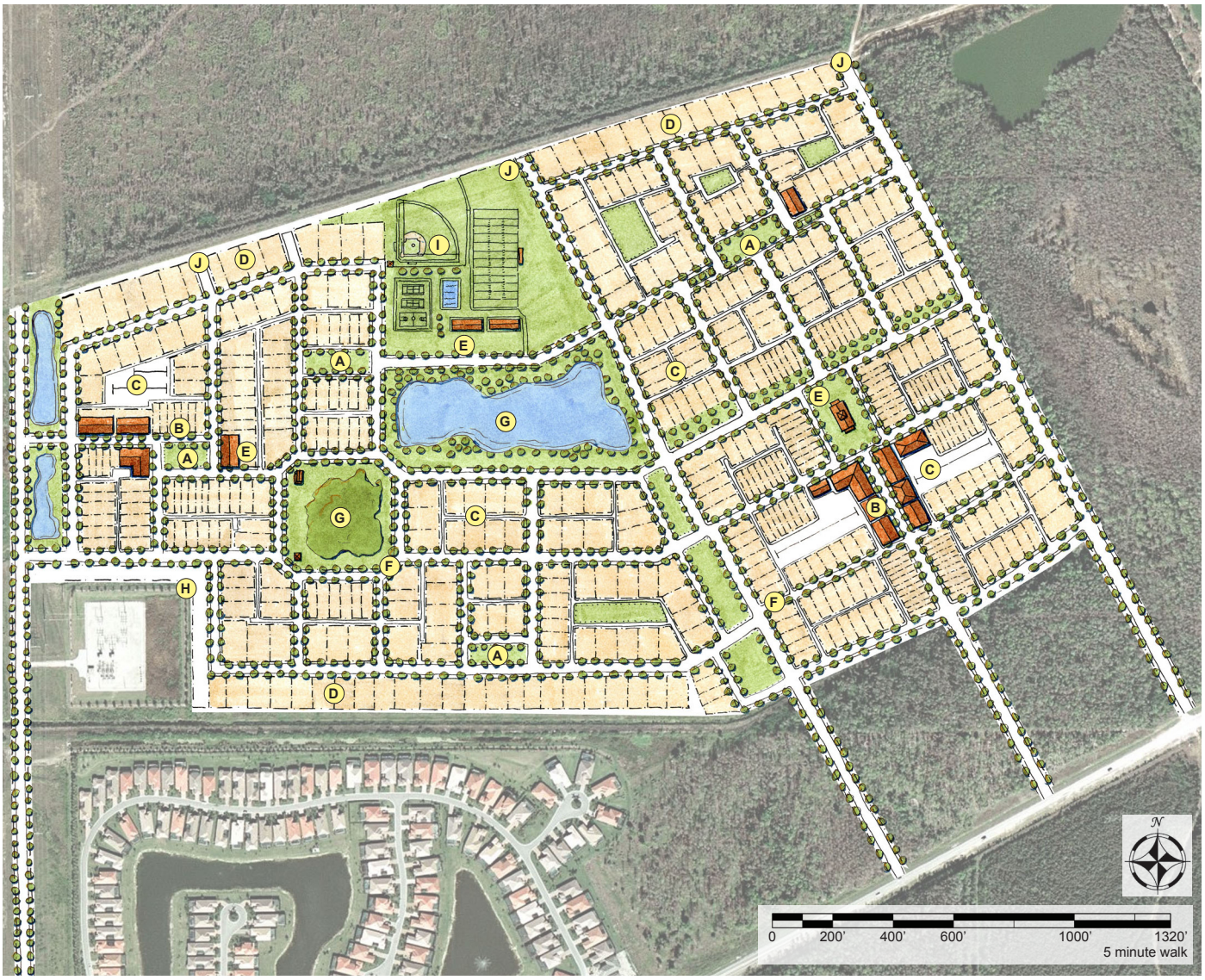
The typical pattern of development provides spacious homes and a luxurious "private realm" but give little thought to the public realm: large retention ponds potentially create long views from one's back porch but leave no where to walk to. Short cul-de-sac roads can become tedious to walk repeatedly. Even basic shopping requires driving for many miles.

The traditional neighborhood often allows contact with a square, village green, playground, park, recreational field and community garden all within a five-minute walk from its center. Informal gathering spots from coffee houses to community centers allow for social interaction outside the home.

Although every unit would have ample private space, including mid-sized backyards, the value of traditional neighborhood design is to be found in the quality of the shared spaces. Community gardens provide an alternative to chemical- and water-use intensive golf courses. Vital communities are designed for casual contact with nature and neighbors and community gardens serve both those purposes effectively.

> *"Americans put almost as much fossil fuel into our refrigerators as our cars. The lion's share [of oil] is consumed during the trip from the farm to your plate. Each food item in a typical U.S. meal has traveled an average of 1,500 miles. If every U.S. citizen ate just one meal a week (any meal) composed of locally and organically raised meats and produce, we would reduce our country's oil consumption by over 1.1 million barrels of oil every week."*
>
> *-Steven Hopp, Animal Vegetable Miracle*

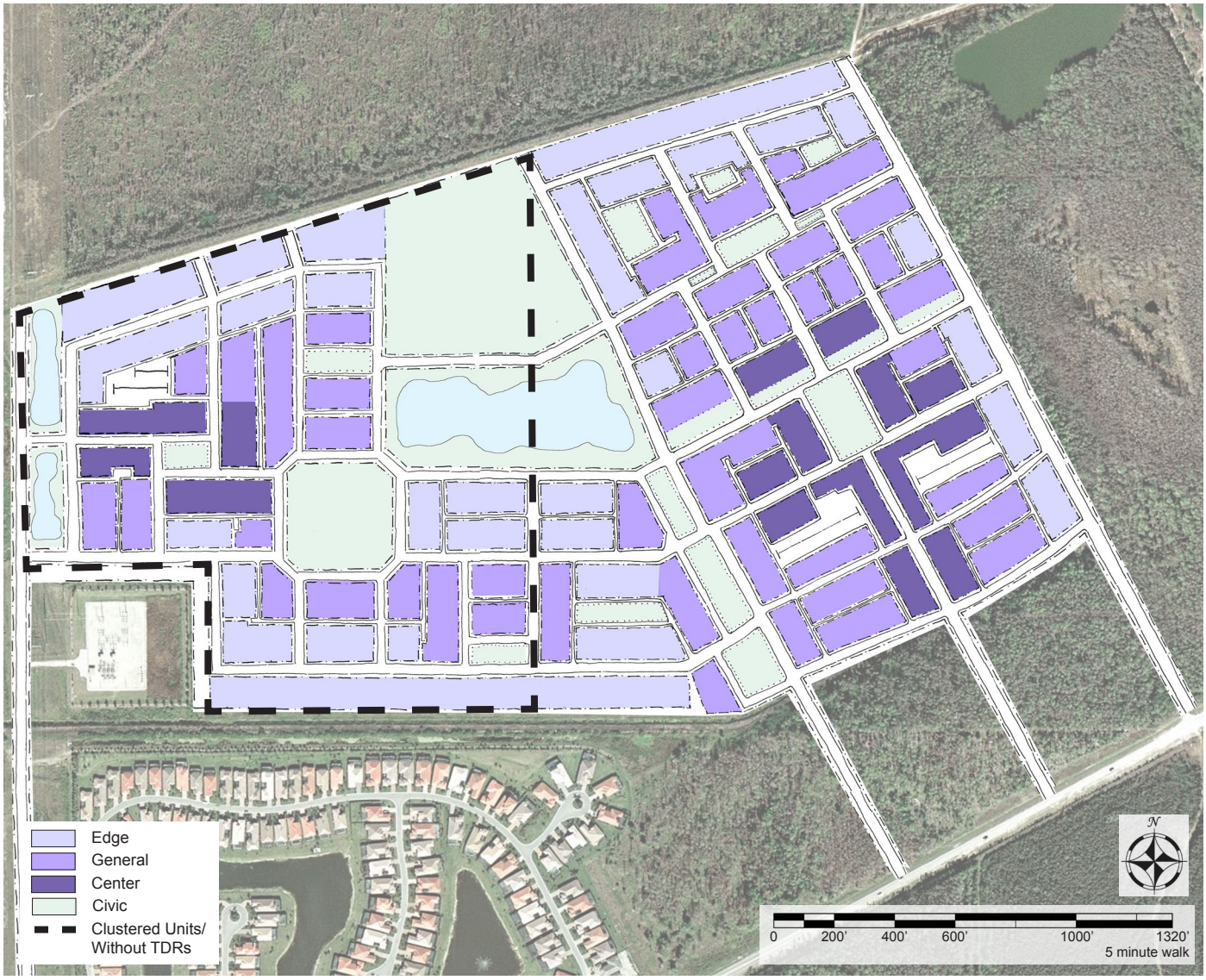
Illustrative Plan



Design Features

- **A** Green spaces serve the surrounding residences. As a general rule the tighter the ratio of the width of greens and streets to the height of surrounding buildings the stronger the sense of place.
- **B** Buildings facades should be aligned, as walls form a room.
- **C** In Center and General transects parking is mid-block with garages on alleys.
- **D** In Edge lots parking is allowed from driveways on the sides of lots. Parking garages, however, are always located at the rear of the lot.
- **E** Civic buildings front or are located within greens. Civic buildings typically include churches, schools or government offices, however in smaller developments this may include community centers or club houses.
- **F** Traffic calming measures include street segments that end, curve or shift at intervals of less than 1,000 feet.
- **G** Wetlands are preserved and new wetlands or retention ponds are sited adjacent to existing wetlands to reconnect larger systems.
- **H** A buffer is retained around an existing electrical facility.
- **I** Recreational fields are located at the periphery of the site so that the large blocks required have limited disruption to neighborhood connectivity.
- **J** Rights-of-way that could allow connections with future neighborhoods are reserved.

Transect Plan



Plan Essentials: Development Options

The Western Corkscrew Road tract consists of 1,186 acres of uplands and 1,170 acres of wetlands for a total of 2,356 acres. Three options are available to a potential residential developer of this tract:

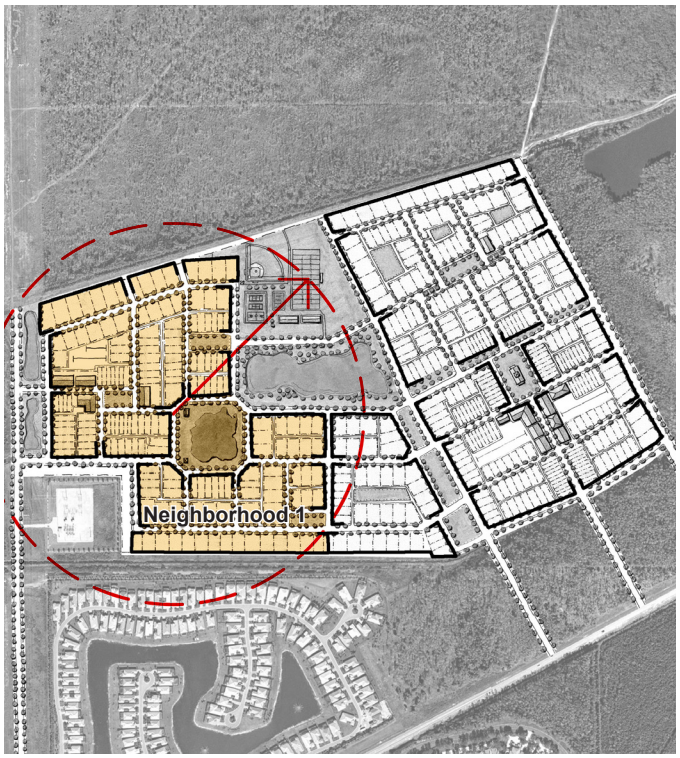
Large-lot Zoning Option: Under today's rules, the development rights contained on the Western Corkscrew Road tract would permit approximately 177 residential units to be built "by right" given that every ten acres of upland allow 1 residential unit and every 20 units of wetland allow 1 residential unit. Under current options units must be placed on lots of at least 1 acre each. The maximum development footprint would be 1,770 acres.

Clustering Option: Under the proposed clustering option the 177 "by right" units could be used to create one complete neighborhood composed of lots between 2,750 square feet and 10,000 square feet and roughly 15% open space, with a total development footprint of 75 acres.

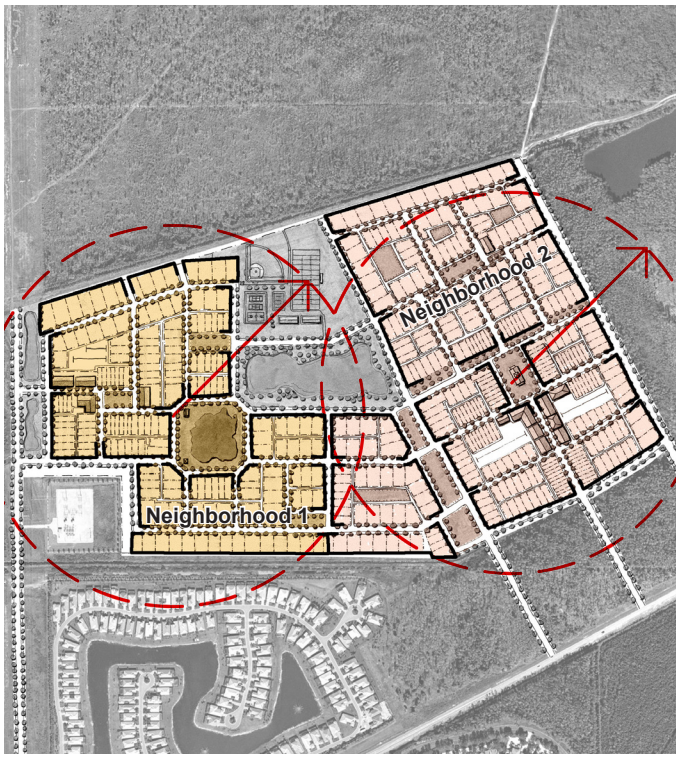
Transfer of Development Option: In addition to the neighborhood on 75 acres described in the clustering option, development rights for an additional 343 units could be purchased to construct an additional neighborhoods on 88 acres. The total development footprint of the mixed-use community at Western Corkscrew Road would then be 163 acres in total. Under this scenario, over 3,100 acres would be preserved as agricultural lands.

Using the TDR option a new community is created on the periphery of the DR/GR on former farm fields adjacent to existing residences. The new community is less than two miles from the I-75 interchange along Corkscrew Road. Development rights from agriculture or environmentally sensitive areas in the interior of the DR/GR are thus retired and land is preserved.

The community is bounded by wetlands, with a green wedge between the two neighborhoods which reconnects the wetlands while providing water retention areas for the development. Small-scale office, retail and civic uses are located at the center of the neighborhoods which are connected by a network of east/west streets.



Neighborhood 1 contains all of the development rights on the site of the Western Corkscrew Road tract.



Neighborhood 2 can be developed with transfered development rights from the properties along Corkscrew Road.

Rural Community on Alico Road

Located along Alico Road this tract had been used for mining and has been stripped of vegetation. The property could accommodate 33 residential units.

Once a property has been mined, the edges of the mine pits are sometimes reengineered to create waterfront lots for homes. However, the mines on the Alico Road property are located deep within the property, and the residential units are better placed closer to Alico Road.

Although an entire community cannot be created utilizing only 33 units, a small hamlet may be formed. Large lots can be used to create enclosure around a civic park space terminated with a small civic building or community hall.

Until recent years, parts of this site have undergone extensive mining and other parts have been used for rock crushing and processing. Post-mining restoration has not yet begun, but once completed it would allow the small hamlet to be nestled in an envelope of green, buffered from the surrounding roadways and ongoing mining operations north of Alico Road.

The Transect Plan establishes the basic street and block network.

Block segments are divided into lots. A community building is sited prominently.

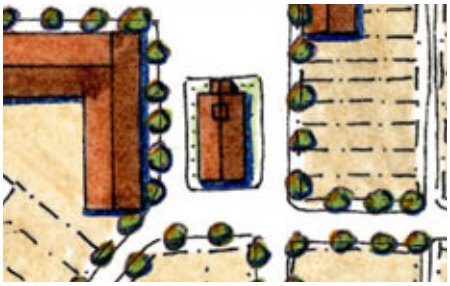
New residences address the street and frame the green.

Plan Essentials: Mix of Unit Types

Within every neighborhood a range of uses and housing types are essential to create an authentic community. A mix of uses keeps residences, shopping and workplaces within walking distance. A mix of residential unit types brings people of different backgrounds together. This mix of unit types is represented on the plans for the DR/GR communities by use of lots with a range of dimensions and buildings of varying size and massing.

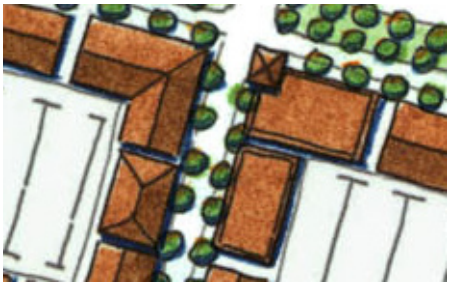
Civic Buildings:

The scale of civic buildings should be larger than surrounding buildings in order to be more visible. Prominent roof forms and additive elements such as towers or cupolas exceed designated height limits. Lot widths vary.



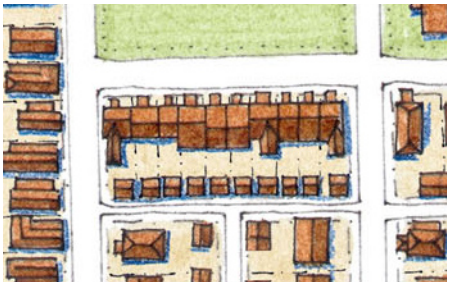
Mixed-Use Buildings:

Commercial on the first floor and either residential or offices on upper floors. Floorplates and lots are deeper than residential buildings. The main entrance is accessed from the street.



Rowhouses:

A single-family dwelling with common walls on lot lines. The facades form a continuous frontage. Lot widths are typically 25' but range between 18' and 32'.



Neighborhood Houses:

A dwelling on small to mid-size lot, usually single-family, typically with an accessory building in the backyard containing a garage, an additional residence, or a studio. Lot widths are typically 40' but range between 32' and 60'.

Estate Houses:

A dwelling on a larger lot, usually single-family, typically with an accessory building, occasionally including multiple accessory units. Lot widths are typically 75' but range from 60' to 100'.

Rural Community at Edison Farms

Unlike the other mixed-use and rural communities of the DR/GR Edison Farms is not located on either Corkscrew Road or State Road 82, but on the southwest edge of the DR/GR boundary, bordering Bonita Springs.

A northern extension of Collier Boulevard (CR 951) into Lee County may follow the southern and western boundaries of Edison Farms, thus greatly increasing the visibility, access and economic attractiveness of the parcel. This community could also be constructed without any extension of Collier Boulevard; it would be accessed by a short northerly extension of Bonita Grande Drive.

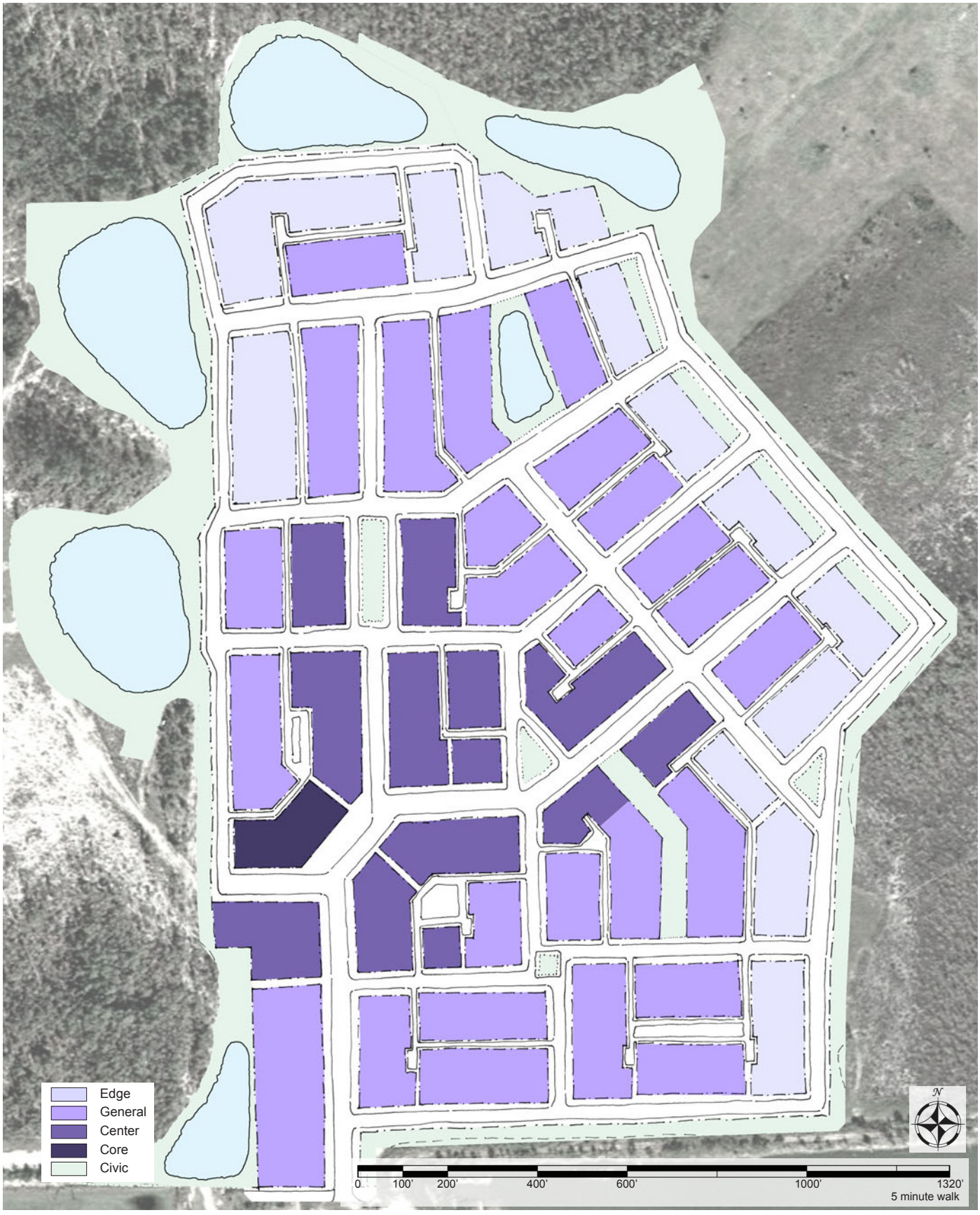
However, the majority of the parcel is ill-suited for development. While Edison Farms represents over 4,000 acres almost 90% of the property consists of wetlands. From the perspective of the larger ecosystem Edison Farms is the last undeveloped area that provides the key link to convey water resources from the DR/GR through Flint Pen to the rivers and creeks west of I-75 that ultimately feed into the Estero Bay Aquatic Preserve. Maintaining and restoring this connection is of critical ecological importance not only to the DR/GR but to the Estero Bay system.

> *"When you find a people who believe that man and nature are indivisible, and that survival and health are contingent upon an understanding of human nature and her processesses, these societies will be very different from ours, as will their towns, cities and landscapes. The hydraulic civilizations, the good farmer through time, the vernacular city builders, have all displayed this acuity ."*
>
> *-Ian McHarg, Design with Nature*

Edison Farms is a prime candidate for transferring its development rights, allowing the entire tract to remain undeveloped in perpetuity. The existing development potential for the site is 229 homes; at a minimum, the clustering and at a minimum a clustering of development rights would be far preferable to 10- and 20- acre home sites. If the property rights were condensed to a portion of the upland, the majority of the wetlands and important flowways could be preserved.

Illustrative Plan

Transect Plan



Plan Essentials: Elements of the Plan

The Edison Farms community would be surrounded by a natural greenbelt of preserved lands. A greenbelt will give access to natural areas from all neighborhoods and provide opportunities for future neighbors to interact with nature. The greenbelt could be used for reforestation and improvements to wetland systems.

Green elements weave in and through the community, cleansing water, softening neighborhood edges, lengthening views and creating an awareness of nature. Central greens, pedestrian paths, retention ponds and boulevard streets tie the community to the natural system.

Design Features

- (A) An outdoor plaza at the community center creates a unique space for neighbors to meet. Buildings around the plaza should be built up to the Right-of-Way in order to frame the plaza.
- (B) A corner store and/or civic building at the heart of the community allows residents to walk to the market instead of having to drive out of the neighborhood.
- (C) A central neighborhood green allows children to play.
- (D) Community gardens create a different way to socialize with neighbors while growing vegetables and flowers.
- (E) A turbine plaza creates an intimate neighborhood setting while calming traffic.
- (F) Within residential areas, a few homes may front on pedestrian paths or civic spaces, rather than directly onto streets. Vehicular access to these homes is along the alley. These small civic spaces can be designed to provide a place for relaxation or for neighborhood children to play, and may also be designed to be used for stormwater retention purposes.
- (G) Wetlands are preserved and retention areas are sited adjacent to existing wetlands to reconnect larger systems.

Rural Community Near Six L's Farms

Located at the geographic center of the DR/GR the rural community near six L's would provide a social and economic center for the area.

The plan proposes four new neighborhoods, each with a green and public building located at its center. Amenities include tree-lined streets, recreational fields and farm fields for small-scale agriculture.

Wetlands are restored and in some cases, drainage canals preserved to allow the continuation of farming on the roughly 5,000 acres of farmland that surround the community. Of course, a detailed site evaluation would be necessary for actual design of any water storage, water conveyance, and wetland preservation or restoration. Water and wetland features are important components of any future development in the DR/GR, as is the continuation of well managed farmland.

The clustering of existing residential development rights would allow a complete, coherent community surrounded by a working farm – an alternative to the current regulations, which allow very large residential lots to replace entire tracts of productive farmland.

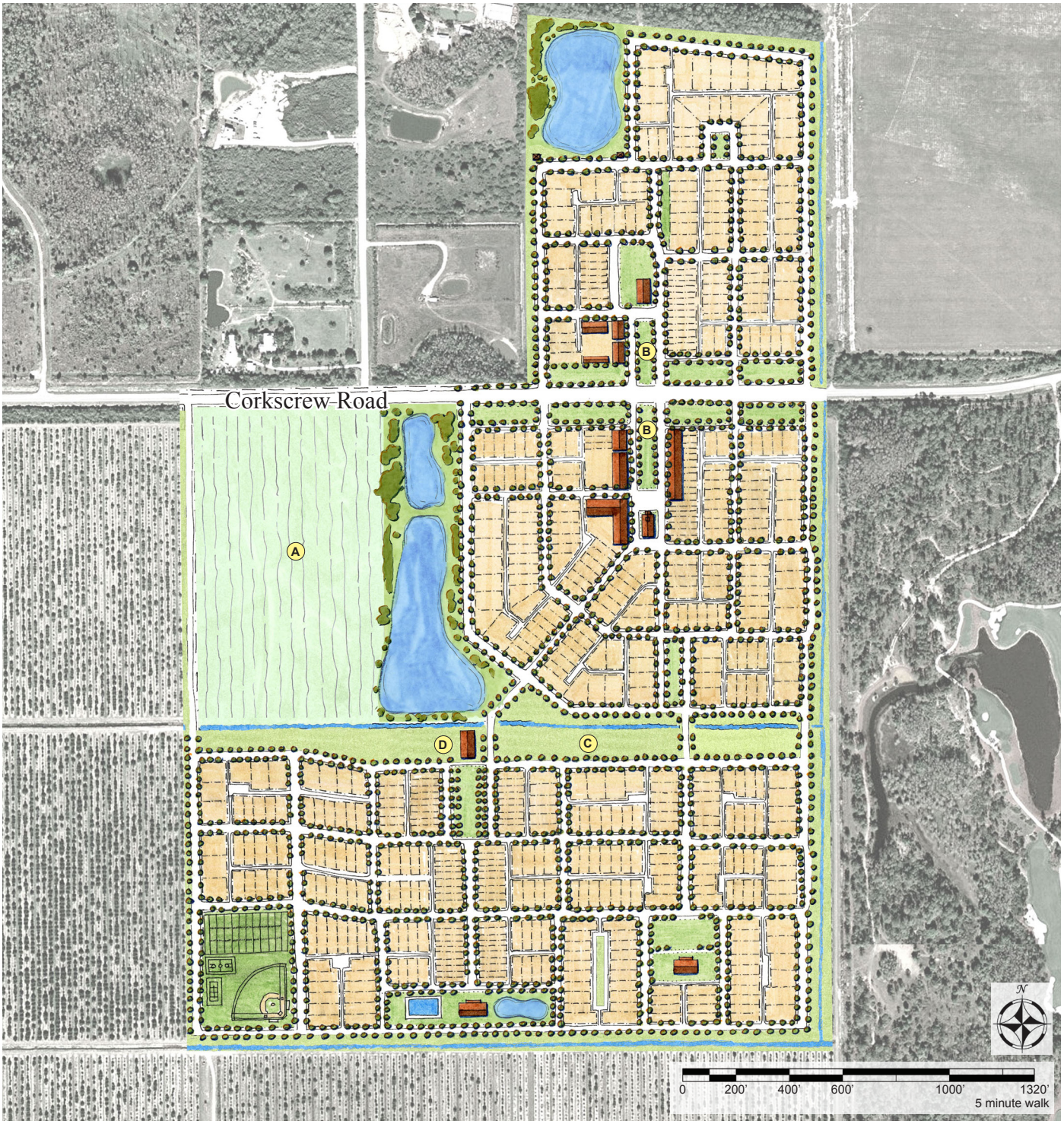
The core of the community spans across Corkscrew Road. Upon approach, the farmfields and wetlands of Corkscrew transition to manicured greens fronted by homes. At the heart of the community a central green with civic buildings at both ends changes one's orientation from east/west trajectory of Corkscrew Road to finite avenues and streets which terminate on front doors and porches.

Tightly spaced homes, storefronts, and landmark civic buildings form "outdoor rooms" which contrast with the area's long views across farmfields and big, open sky – elements which the Six L's community would help protect by virtue of its compactness.

"The two main divisions of city planning are: first, cities and towns planned in advance of the settlement of population; and secondly, existing cities and towns replanned or remodeled to meet new requirements. Planning a town or city before settlement is made has great advantages."

-John Nolen, Planner, 1919

Illustrative Plan



Design Features

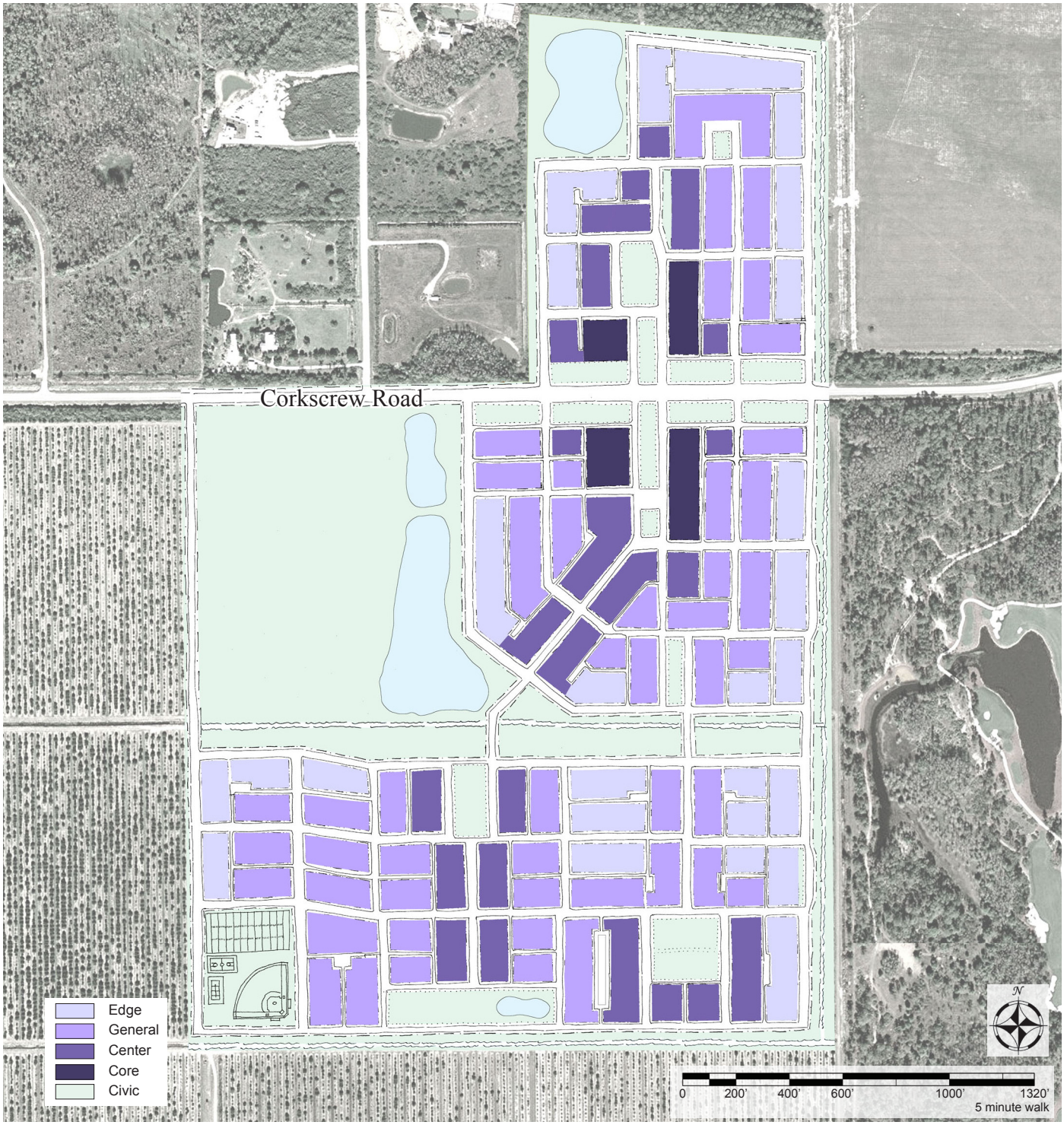
(A) Large community-owned farms are an amenity that preserves the area's identity.

(B) A system of greens span Corkscrew Road and create a landmark center for the DR/GR.

(C) A greenbelt differentiates the communities and provides opportunities to reshape ditches into creeks or flowways.

(D) A site is reserved for a civic building such as a small church, school, or community center.

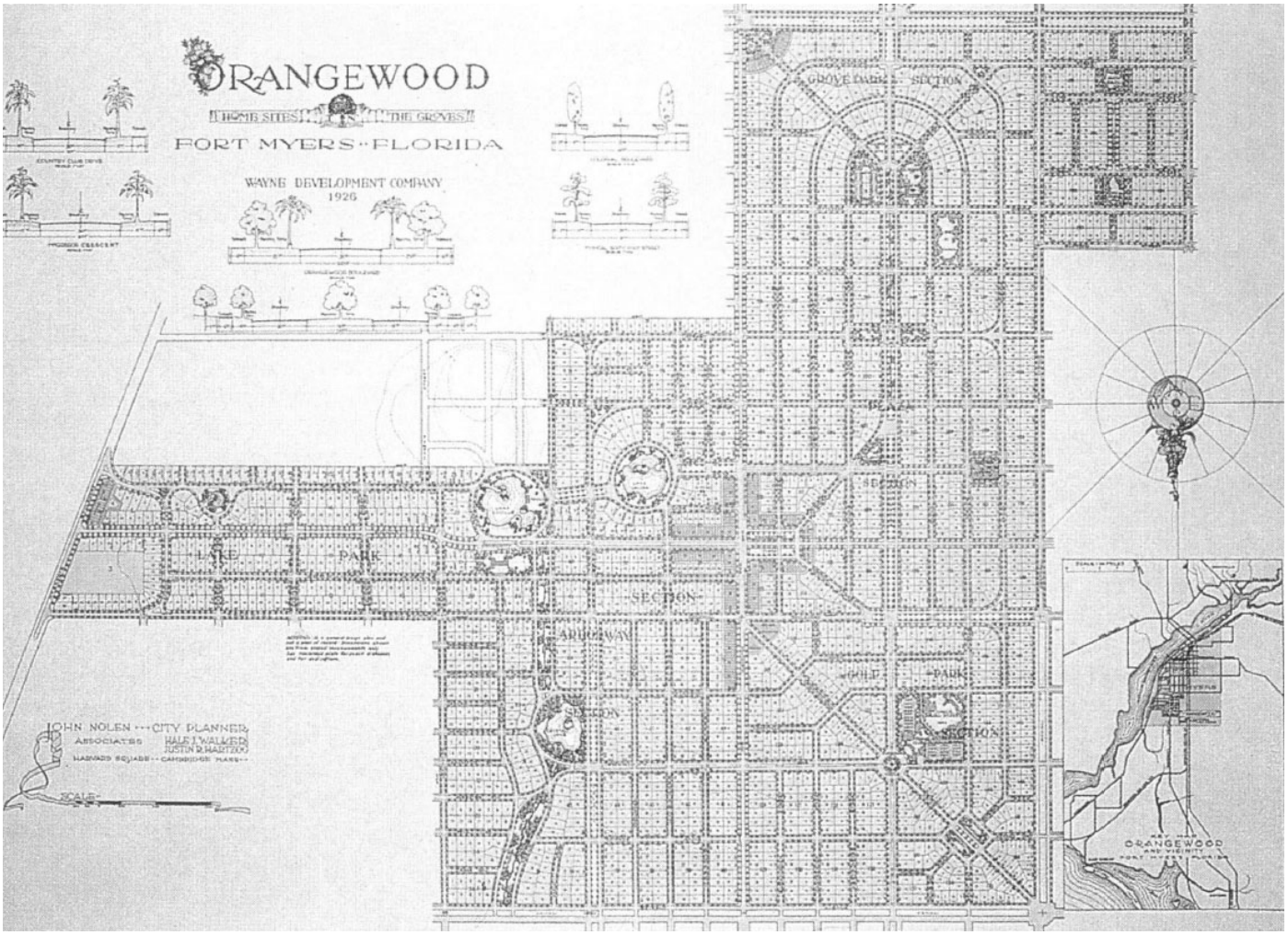
Transect Plan



Plan Essentials: Regional Tradition

The plan for Six L's farms is displayed at the same scale as the plan for the Orangewood community, a development proposed in 1926 for land that is now centered near the intersection of US 41 and Colonial Boulevard. The plan for Orangewood was created by town planner John Nolen. Nolen designed the plan for Venice, Florida in the same year and is considered one of the most influential town planners in American history.

Both plans use a grid of blocks which range in scale but are typically 250' x 400'. The grid maneuvers to integrate greens, ponds, walking trails and parks. Avenues cut across the grid to connect community centers or focal points. Civic buildings and public spaces are prominently sited at the end of streets, providing a closed view, or terminated vista. Greens are within comfortable walking distance to all of the homes.



Rural Community West of Corkscrew Airstrip

As Corkscrew Road travels east away from the coast and toward the farm towns of Florida's interior, the plan envisions a community farmstand which will stand as if a gateway to the farming communities beyond.

The entrance road of the community proposed just west of the Carter family airstrip would lead to a formal green flanked by rows of trees and bookended by two civic buildings. Within sight of the green would be the windows of two-story rowhouses and the shopfront of a cornerstore.

Farther from the central green, front stoops at the front doors of homes would transition to front porches. The porches would inevitably grow larger as the increased width of lots away from the center grow more generous. The expectation is that the entire architectural composition of homes would shift from "in-town" formalism to "edge-of-town" rustic.

The shape of neighborhood blocks and greens are designed to transition from the rectilinear to the softer curvilinear, from pure geometries to organic ones.

> *"The street is a room of agreement. The street is dedicated by each home owner of the city."*
>
> *-Louis Kahn, Architect*

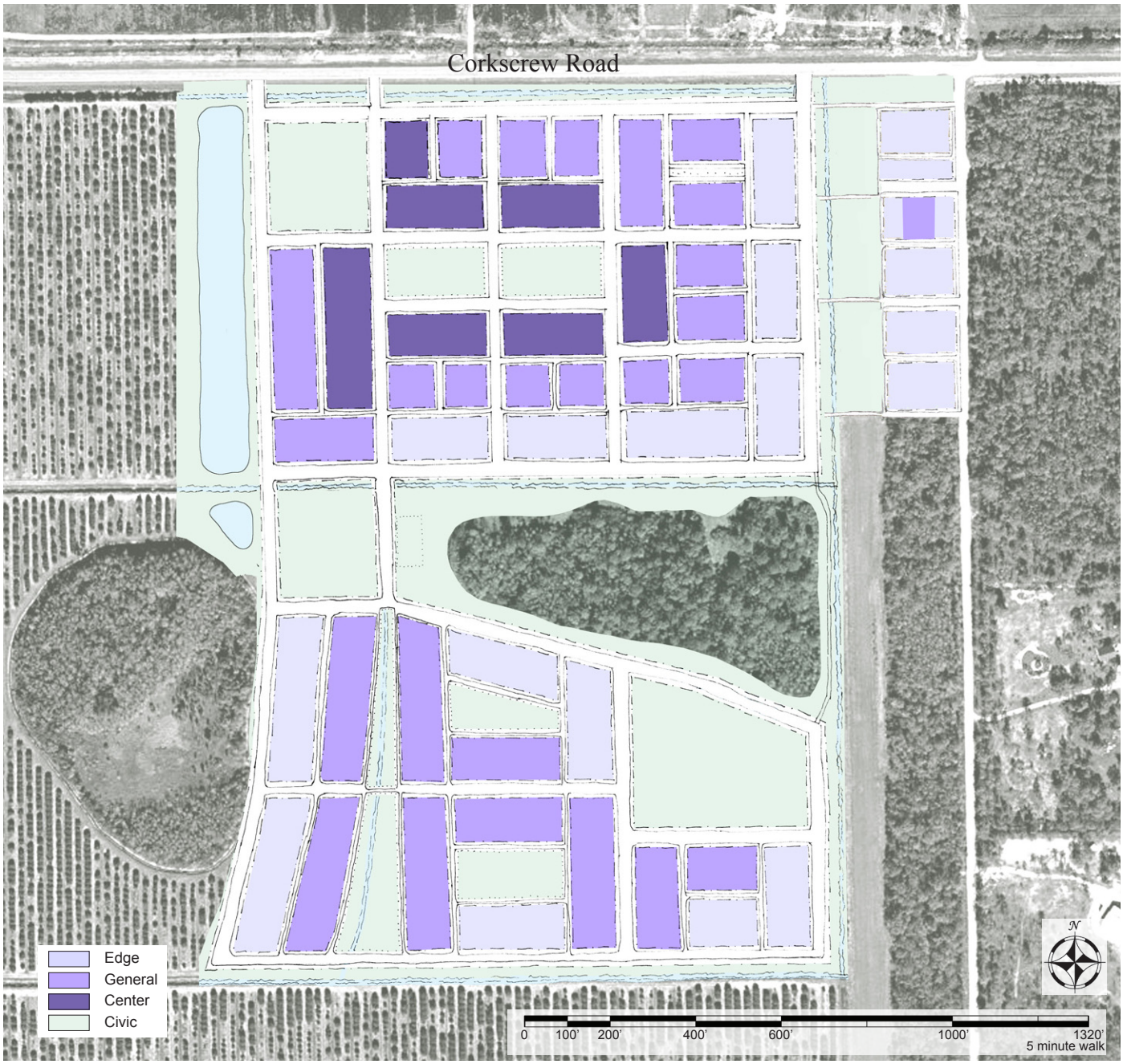
Community spaces would shift from squares spatially defined by building frontages to public gardens located behind people's homes. This all would occur in the span of two neighborhoods, in a ten-minute walk, to provide the kind of pedestrian-scale diversity and subtle stimulation that encourages people to leave their homes and take a walk through their community.

Illustrative Plan

Design Features

- (A) A farmstand on Corkscrew Road.
- (B) Community gardens are located at the center of the blocks.
- (C) A site is reserved for a civic building such as a small church, school, community center, or recreational fields.
- (D) Water flow through the settlement will be facilitated by created streams, wetland flowways and restored existing forested wetlands as discussed on page 3.32.
- (E) Low bridges are recommended to allow the conveyance of water across the site.
- (F) Every street contains planting strips, sidewalks, street tree, and drive lanes which vary in size based on the function and character of the road.
- (G) A walking path connects the eastern edges of the north and south neighborhoods.
- (H) Alleys allow garages to be located at the rear of the lots so that the front facades of homes face one another across the street..
- (I) The Corkscrew Country Store is at the center of a block across the Carter airstrip.

Transect Plan



Plan Essentials: Hydrology

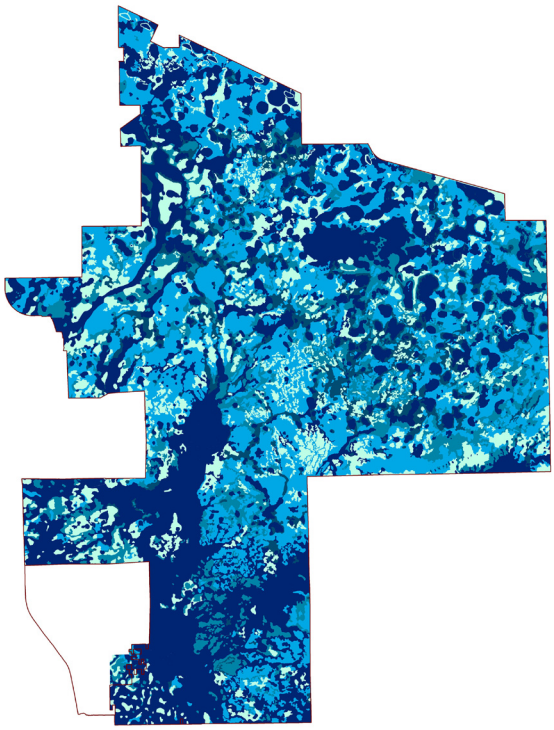
Kevin L. Erwin Consulting Ecologist, Inc. (KLECE) ecologists mapped the historic hydropatterns across the DR/GR using 1953 aerial photographs from the Natural Resources Conservation Service. The pre-development make-up of the DR/GR was very different than it is today as shown in the graphic on the right. Approximately 71,000 acres or 86% of the study area consisted of wetlands. The deeper ponds, cypress forests, and deep marsh areas were assigned dark blue in the mapping. Wetlands with shorter hydroperiods and shallower seasonal high water levels were assigned lighter shades of blue.

The historic hydropattern mapping is one tool to use when designing communities within the DR/GR. The graphic on the lower portion of the page shows the historic hydropattern within the area of the example rural community. The purple dotted line shows the historic movement of water through the deeper slough area conveying water from the northeast to the southwest. The community plan was designed to incorporate the existing forested wetlands as part of a created flowway system based upon the current adjacent land uses with the objective of restoring as much of the historic hydropattern as possible.

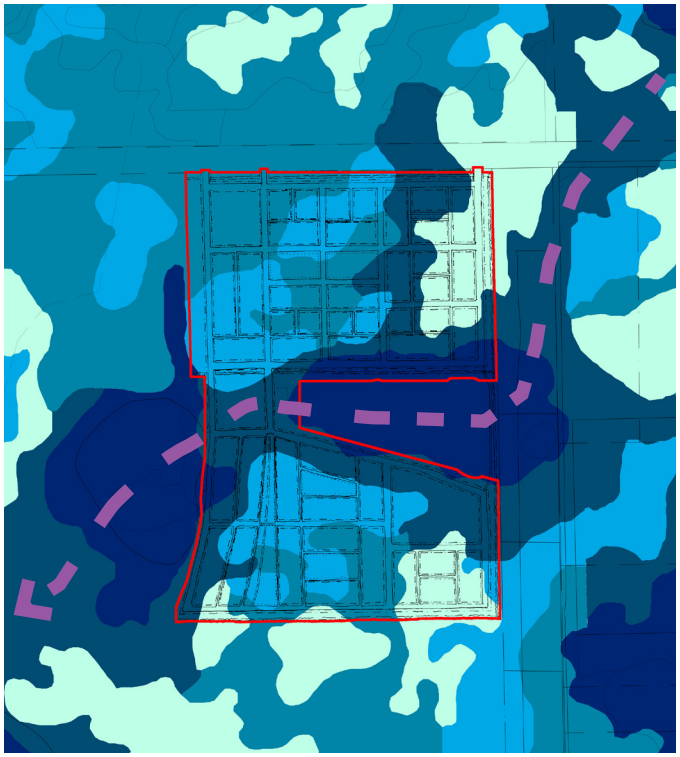
In this community design, the created flowway would receive water from the Corkscrew Regional Mitigation Bank and other public conservation lands to the north. A created stream and wetland system would convey the water south to southwest through the existing forested wetlands and created or restored native ecosystems to the existing agricultural ditches. This plan is schematic to demonstrate a potential flowway design.

Combining the existing wetlands with created streams or restored wetlands forming a flowway that is crossed by a vehicle and pedestrian bridge, provides a green space center to the community. This preserve area offers passive recreation opportunities and reinforces the rural nature of the area.

The TDR program is designed to offer the opportunity to reallocate development rights throughout the DR/GR to open up opportunities for wetland and flowway restoration and continued farming. Opportunities also exist within designing the rural communities to incorporate flowways and native ecosystems. Over time, this will lead to enhanced water resources through improved water storage and appropriate water conveyance to a more natural hydropattern benefitting the DR/GR and all of Lee County.



Historic hydrology within the DR/GR shown in shades of blue.



The historic hydropattern is to be reconnected across the proposed community based upon current adjacent land uses.

Rural Community East of Carter Road

Community, agriculture, and the natural landscape have a unique opportunity to intertwine in the proposed communities of southeast Lee County.

The community east of Carter Road is located on a site currently operated as a farm, growing food that could be sold and consumed locally. Productive farmland in Florida is an asset and arguably as precious a resource as the wetlands and cypress swamps. The DR/GR has the ability to produce the food we eat, clean our water and provide homes in functional and picturesque communities. If this site was converted to 10- to 20- acre home sites these assets could be lost.

An alternative to large-lot home sites on this property is to condense the residential development rights along Corkscrew Road and retain the majority of the property as the working farm that operates there today.

The community east of Carter Road has an opportunity to become a working community by providing a mix of lot and home sizes that would allow rural employees to live in the community where they work. The social aspect of living and working in one's community is an invaluable one that may gain in importance as fuel prices continue to rise.

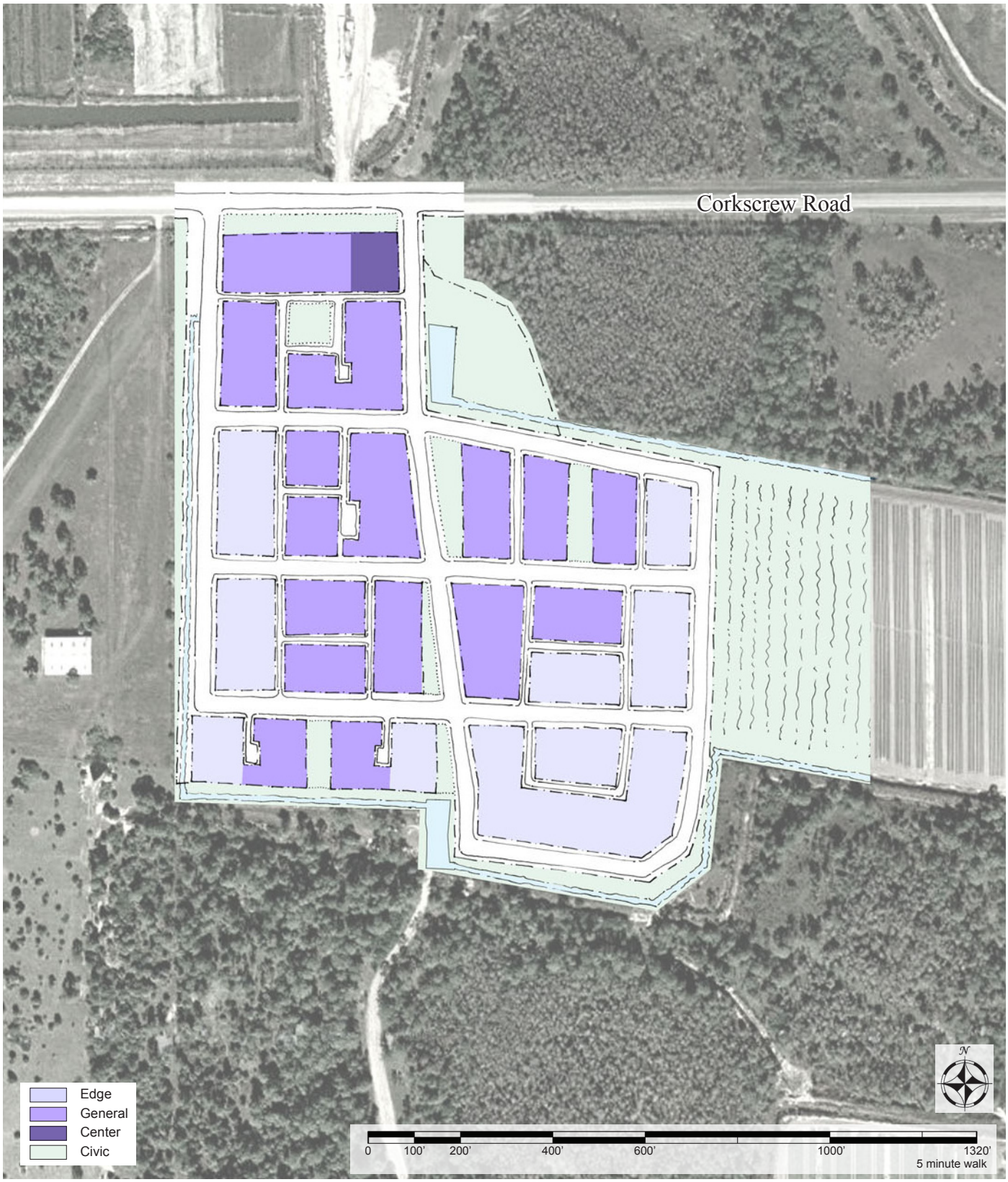
With working farms remaining in place, a farmer's market could sell fresh vegetables and fruits directly to the community and to passers-by on Corkscrew Road. Portions of the natural landscape could also be restored, reconnecting wetlands systems that surround the community.

"We complain that the streets of the urban peripheries are boring, that they do not offer the same opportunities for encounter, exchange, curiosity, attention, offered by the streets of the historic centers. It is not surprising, as the streets of the historic centers were made for the motion of human beings whereas the streets of the periphery have been made for the motion of automobiles."

-Giancarlo De Carlo, *The Contemporary Town*

Illustrative Plan

Transect Plan



Plan Essentials: Elements of the Plan

The rural community hosts 100 units on 35 acres with a density of three units per acre. 350 acres would be necessary to host the same number of units under the existing regulations.

Even on a small site a hierarchy of interconnected streets is used to provide multiple routes for vehicular traffic and a variety of paths for the pedestrian.

Existing farm buildings and the drainage canals which service the surrounding farming opperations are retained.

Design Features

- (A) Existing farm buildings are preserved.
- (B) A structure on a large corner lot is designed to have wrap-around porches so that each side of the street is addressed with some form of frontage.
- (C) Outbuildings offer additional living space and storage.
- (D) Small cottage lots are designed specifically for this location. The purpose is to create a condition where the building placement is properly aligned to terminate the incoming street.
- (E) Front porches give a sense of safety to the street and help foster community.
- (F) Houses front a well-proportioned green to form a community outdoor room. These units are accessed by the rear alley only with no street between them and the green.
- (G) A variety of lot sizes and price points allows for a diverse community.
- (H) Street design features include a linear central street which shifts at intersections, requiring cars to slow down.
- (I) Street trees and properly sized sidewalks along existing and new streetscapes create desirable addresses and enhance the pedestrian environment.

Rural Community South of Wildcat Farms

Rural communities can be designed to maintain their bucolic character while also featuring the basic features that make for a complete and sustainable neighborhood. The proposal for the rural community south of Wildcat Farms is for a small neighborhood of 85 units with street networks and blocks arranged in such a way as to take maximum advantage of the area's idyllic setting.

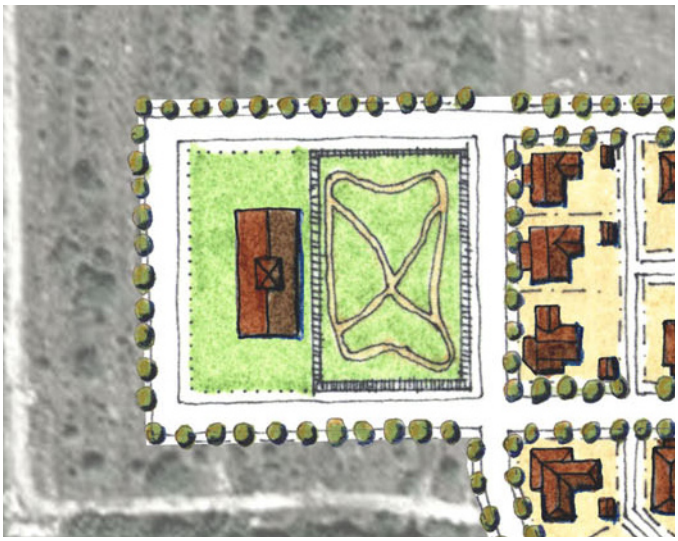
Access to the neighborhood is via two main connections, rather than the one-way-in/one-way out proposals of the conventional suburb. Linear blocks are kept relatively small. This condition creates a web of connected streets that make travel through the neighborhood easy for pedestrians, cyclists, and automobiles alike.

A mix of housing types is also included, ranging from affordable townhouses to large estate lots. Front porches are a prominent architectural feature throughout the neighborhood. These outdoor rooms not only take advantage of breezes but also foster a sense of community and security along the street. Continuous sidewalks lined with street trees also encourage pedestrian activity. A corner store provides the daily needs for the community and passers-by.

> *"The country town is one of the great American institutions; perhaps the greatest, in the sense that it has had a greater part than any other in shaping public sentiment and giving character to American culture."*
>
> *-Thorstein Veblin, 1922*

The heart of the neighborhood is defined by the community gardens. As fuel costs rise food-producing and self-sustaining communities are likely to become increasingly vital. The gardens are overlooked on three sides by neighborhood housing. The anchor of the community, the gardens and surrounding green add a source of civic pride, provide educational opportunities for children, and serve as the central outdoor gathering place for family and community events.

A special recreational component is also included, which relates to and reinforces the rural quality and character of the neighborhood. The red barn and equestrian center, found in the northwestern part of the community,



Community equestrian center

Community gardens and tennis court

reinforces the importance and notion of play within the community. It also offers educational opportunities as well as stable space for area horse owners. The equestrian center can also serve the community's farming population, providing a location within the neighborhood to care and look after working horses and pets.

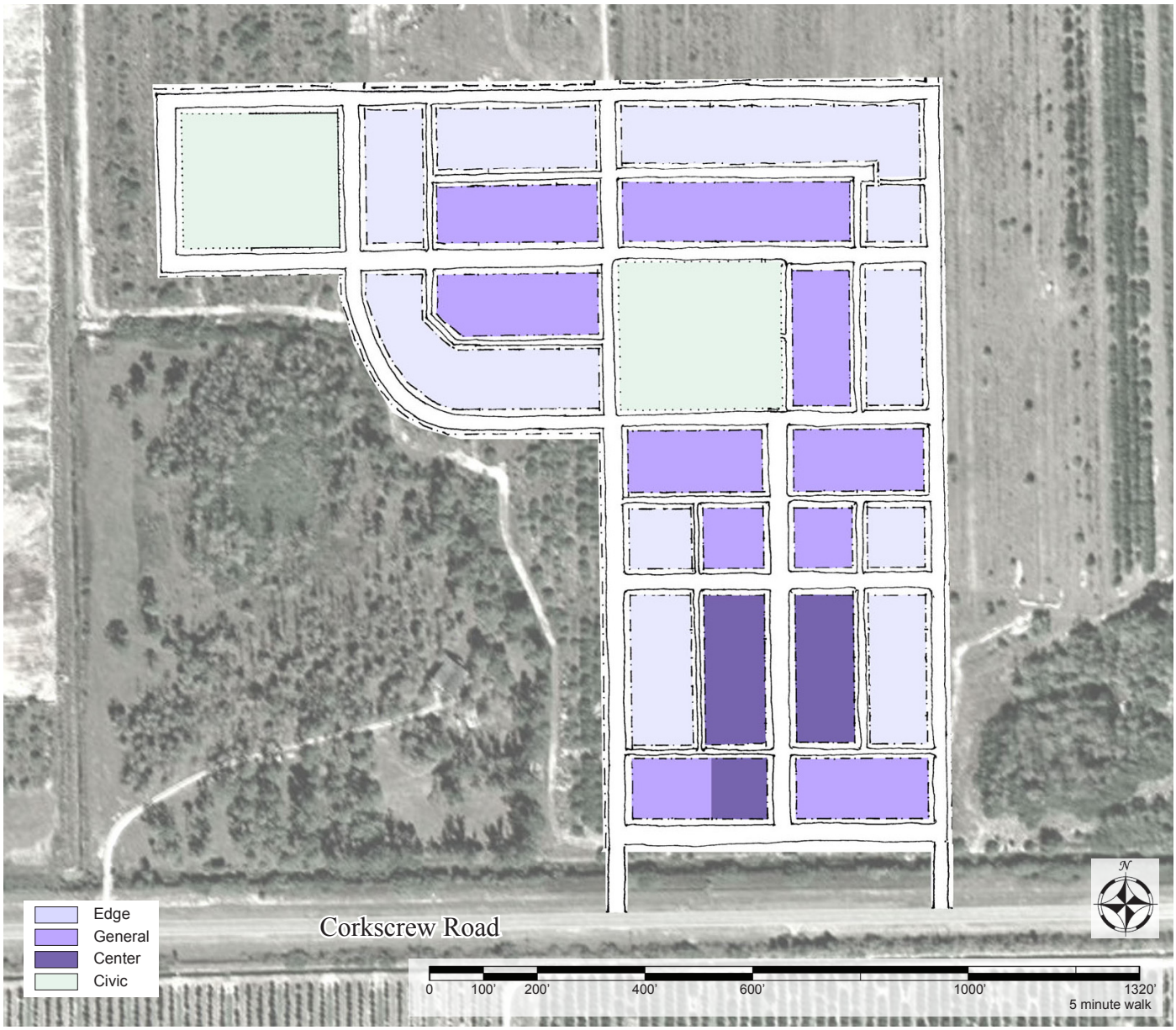
Where possible in all of the DR/GR communities, but especially along Corkscrew Road, the use of on-site renewable energy technologies should be encouraged.

Illustrative Plan

Design Features

- (A) Multiple entrances into the community prevent the bottlenecking and disconnectedness of one-way-in/one-way-out communities.
- (B) A corner store, located parallel to Corkscrew Road, provides daily needs to the community and passers-by.
- (C) Parking is located mid-block with garages placed on alleys.
- (D) Townhouses lining the first block of the Main Street provide affordable housing to the community.
- (E) A north-south street is terminated by a small civic and gardening building.
- (F) Wetlands are preserved while flowways are maintained to connect larger systems.
- (G) Civic buildings terminate vistas or front greens. In smaller developments, civic buildings may include community centers or club houses.
- (H) An equestrian center serves as a civic building.
- (I) Squares and greens are spatially defined by building frontages.
- (J) Street trees and properly sized sidewalks along streetscapes create desirable addresses and enhance the pedestrian environment.
- (K) Lots are oriented to take advantage of the natural views.

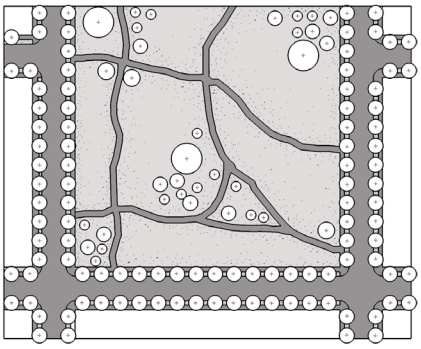
Transect Plan



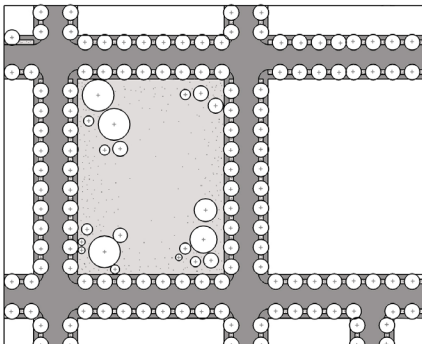
Plan Essentials: Public Open Space

The size and shape of open space varies based on its position in the transect and the intended function of that space. Four main categories are described below. Plazas and squares are the most urban types of space, they are bounded spaces enclosed by surrounding buildings and forming an outdoor room. Parks and greens are more open, bounded on at least one side by buildings with outdoor rooms framed by plantings. Community fields, gardens and multi-use play fields are the most open and unshaped types of public space.

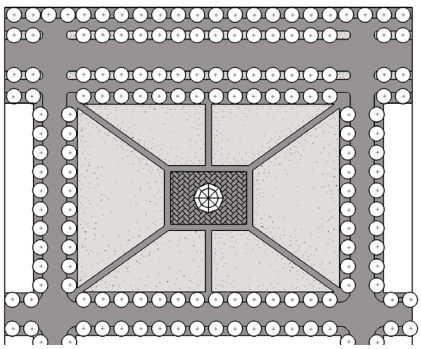
A **park** is a natural preserve that serves environmental goals such as the preservation of habitat or filtration of water. It may also be available for unstructured recreation. The shape of the park is independent from surrounding building frontages and tends to follow the boundaries of natural features. Parks contain trails, waterbodies, woodlands and meadows.

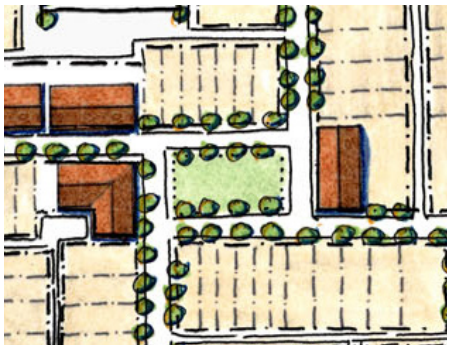


A **green** is available for structured or unstructured recreation. A green may be spatially defined by landscaping rather than by buildings. Trees can be formally or naturalistically planted. A green contains lawns, trees, pavilions, memorials, benches and playground equipment.

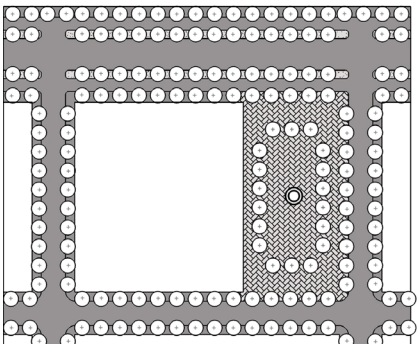


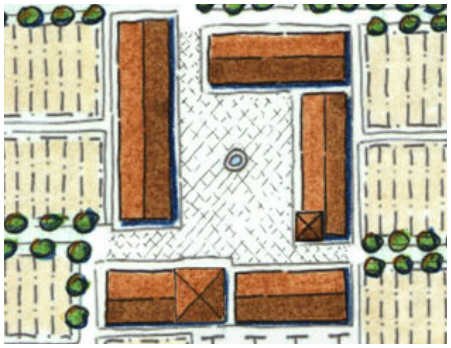
A **square** is available for structured or unstructured recreation and civic purposes. A square is clearly defined by building frontages. A square can provide a public open space that provides a setting for civic buildings. Squares are located at the intersection of important thoroughfares. Squares contain lawns, trees and pavilions that are formally disposed.





A **plaza** is designed for civic and commercial activities. A plaza is clearly defined by building frontages. Its surface is typically covered with pavers or compact earth. Trees are optional and plazas are located at the most central intersections.





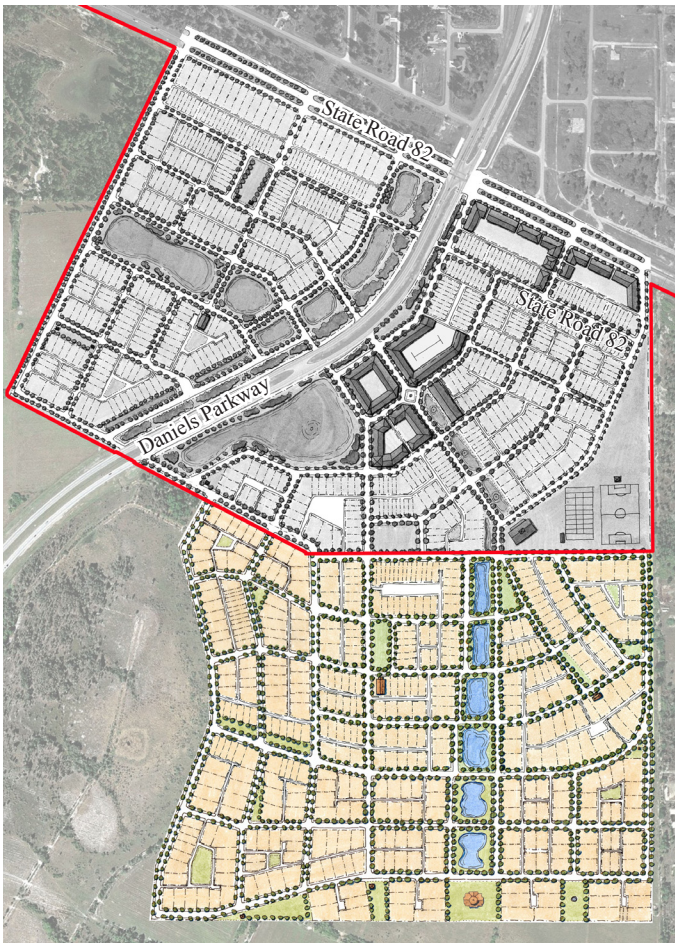
Mixed-Use Community at Daniels Parkway

The community is located at the intersection of Daniels Parkway and State Road 82. Only a portion of the site is located in the DR/GR, but an intergrated plan has been created for the entire site.

The settlement is made-up of five neighborhoods ranging from 40 to 80 acres clustered around a main street shopping area. The neighborhoods utilize a general-purpose block network which can support a diversity of uses and housing types. The residential densities in each neighborhood would average four to eight units per acre with multifamily homes and townhouses at the center and larger lots at the neighborhood edge.

The core of the community would contain multistory, mixed-use buildings with commercial, office and residential uses. The commercial and office uses would help offset the shortage of commercial land in Lehigh Acres. The plan arranges these uses around water fountains and linear pools. The center of each neighborhood would contain an important civic building such as a town hall, library or church situated on a public green.

> *"Perhaps the worst sin of zoning is that it violates an essential social characteristic of neighborhood planning, namely, that each unit must be balanced- it is the city writ small. Each unit, accordingly, must have a place for the industrial, political, educational, and domestic facilities which pertain to its special purposes."*
>
> *-Lewis Mumford, The Lewis Mumford Reader*



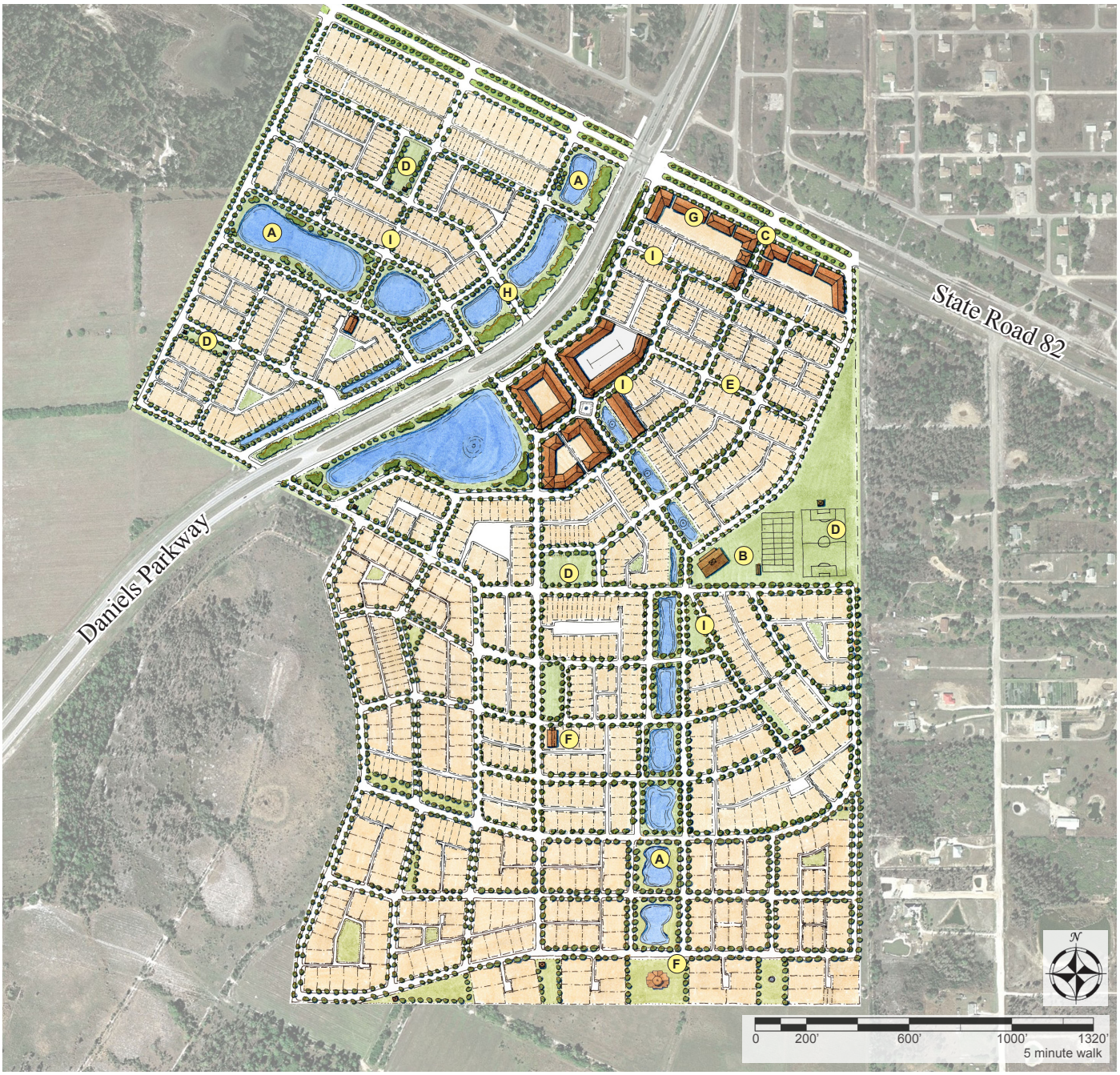
The DR/GR includes the portion of the plan and aerial shown in color.

The typical block is 250 feet by 400 feet. 250 feet is deep enough to be double-loaded with 110-foot lots connected by rear alleys. 110 feet produces lots deep enough for private garages without producing excessively deep lots and wasted space. 400 feet is long enough to include a long row of homes without creating a block perimeter so large that it discourages walking by adding to pedestrian travel times across the grid.

All streets would be designed for both cars and the pedestrian and street types in the community would vary based on the different purposes the streets are to serve - transportation follows land use. A multi-way boulevard access lane contains on-street parking that would serve businesses on State Road 82. Commercial streets provide wide sidewalks and narrow lanes to slow traffic and provide ample space for pedestrians. Alleys allow for parking areas and garages to be in the rear of lots with garage doors facing the alley instead of the street. Parkways with wider travel lanes, sidewalks on one side and drainage swales on the other follow the periphery of the neighborhoods.

A wide variety of parks and open spaces are provided to address a variety of needs including small tot lots for children close to homes, centrally located greens for unstructured recreation and public gatherings, and expansive recreational fields for soccer and football at the edge of the development. The multi-use playfields are incorporated into land dedicated to a proposed school site.

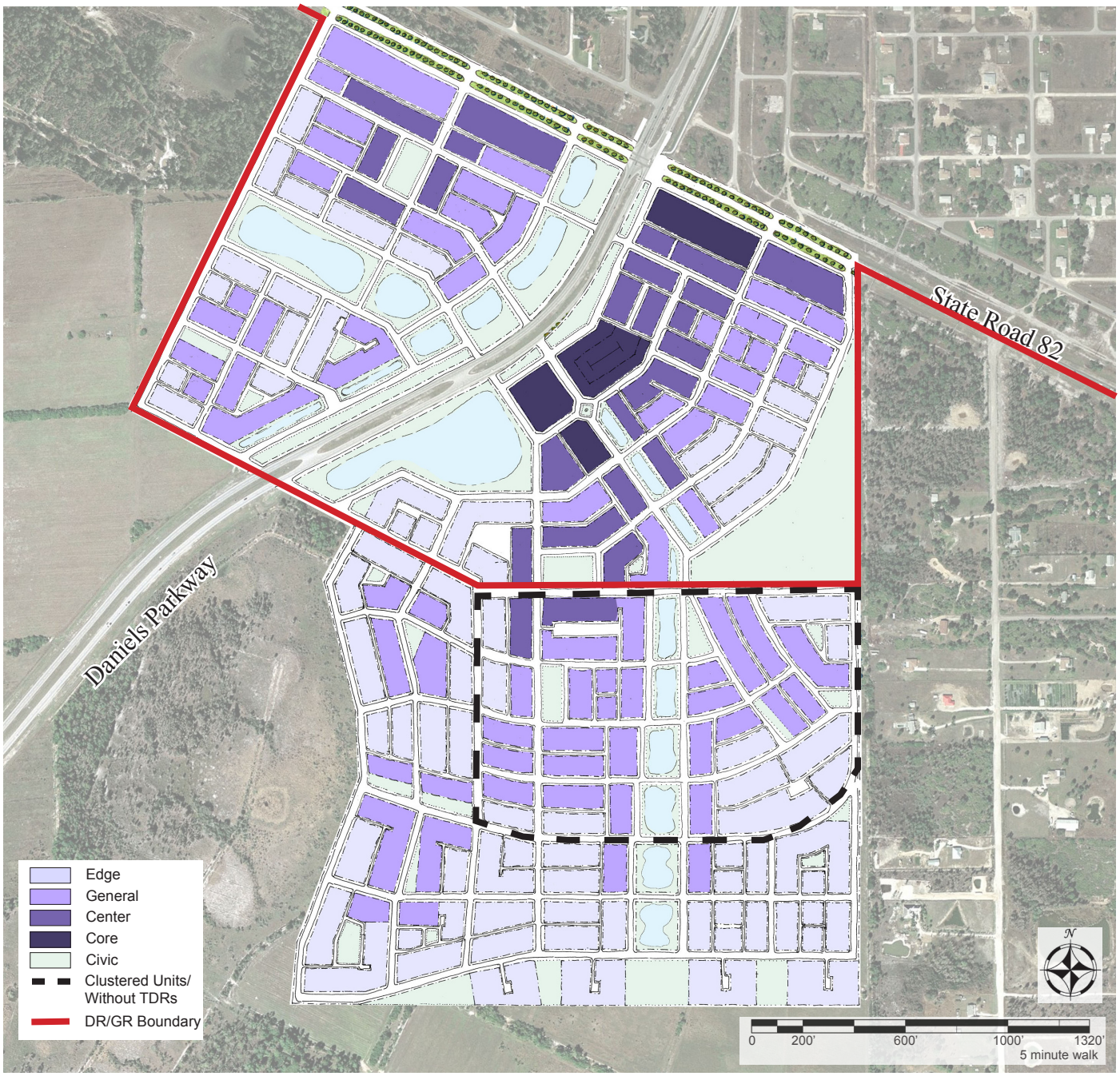
Illustrative Plan



Design Features

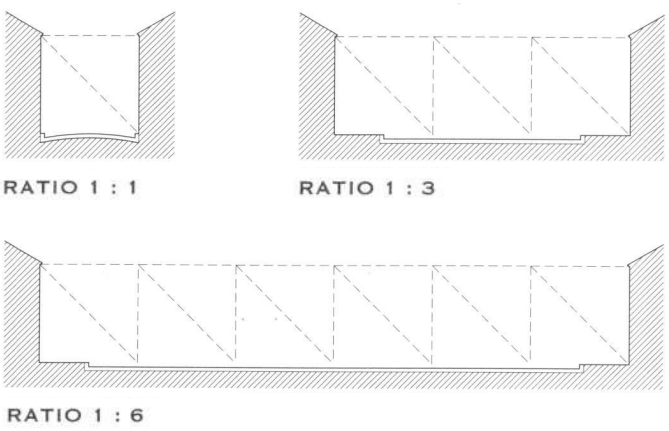
- (A) Retention ponds and water features channel water through the entire site.
- (B) A potential school campus is positioned at the terminus of a line of fountains leading from the center of the community.
- (C) A main street on State Road 82 leads into the community.
- (D) Playgrounds, squares and greens are located at the center and edge of neighborhoods.
- (E) A grid of streets connects the entire settlement.
- (F) Civic sites are reserved in prominent locations.
- (G) An employment center for the region is integrated into the settlement but retains easy access onto Daniels Parkway.
- (H) Connections across Daniels Parkway link both sides of the settlement.
- (I) Street trees and properly sized sidewalks along existing and new streetscapes create desirable addresses and enhance the pedestrian environment.

Transect Plan



Plan Essentials: Proportions of Building Height to Public Space

A primary task of all architecture and landscape design is the physical definition of public spaces as places of shared use. The height-to-width ratio of building heights to the width of space between the buildings is critical to creating a sense of spatial enclosure outdoors.

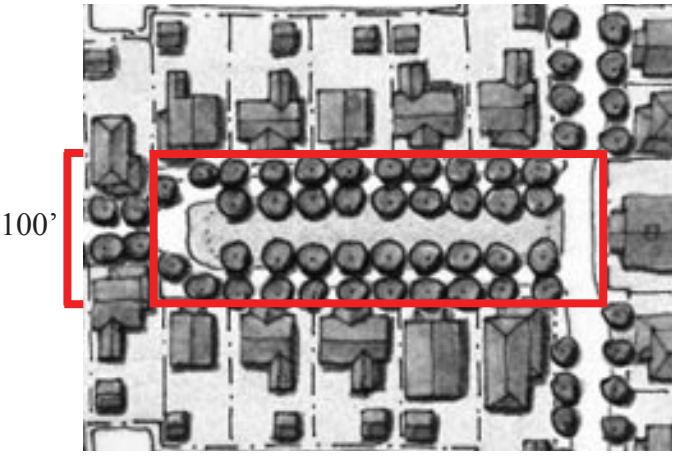


The eye must perceive more street wall than open sky to sense an outdoor room. The ration of 1 increment of height to 6 of width (1:6) is the absolute minimum. The ratio of 1:3 is ideal. The tighter the ratio, the stronger the sense of place and the higher the real estate value along shopping streets in particular. In the absence of spatial definition from a street wall, street tree plantings can have a similar effect.

"Beauty has twice the effect when experienced outdoors."

-Bertrand Russell, Philosopher

In the example shown on the right a ratio of 1:4 is created across the 100 foot width of streets and green. This requires homes of a standard two stories or 25 feet from base to eave and shallow front setbacks. The view from the sidewalk across the green in the plan would be comparable to the one shown in the lower left picture below.



Ratio 1:4

Baldwin Park in Orlando, FL features several small, well-defined, greens which are framed by homes.

The Redlands farming district southwest of Miami has a large-lot zoning requirement similar to that of the DR/GR. Public space is obviously not shaped by large-lot zoning.

Mixed-Use Community at Sunshine Boulevard

While every town, neighborhood and street is a unique place the principles of good urban design can be applied practically anywhere. The Mixed-Use community at Sunshine Boulevard provides housing, workplaces, a small shopping district and ample greenspaces which exemplify fundamental urban principles.

A neighborhood green at the center of the Sunshine Boulevard Mixed-Use Community could provide a destination and gathering place within a five-minute walk from homes and businesses. The green could be fronted by a civic building to the northwest. A row of two-story townhouses or live-work units would front the south side of the green to create a transition from the center of the community to the larger, single-family residences.

The streets and squares of the community should be planned to be safe, comfortable and interesting to the pedestrian with wide sidewalks, street trees and a selection of pathways. Because there are no cul-de-sacs or dead-ends a variety of walks or jogs are possible through the neighborhoods.

> *"The thought must arise even in circles untouched by Art, that without . . . largeness of conception and breadth of vision . . . and without the constant hand and touch of Art upon every detail, a beautiful [town] can never be built."*
>
> *-Otto Wagner, Architect*

A main street leads from State Road 82 to the main green. An essential distinction of vibrant, pedestrian-oriented main street districts is that the whole public space which businesses front is designed as an ensemble, including auto elements (such as travel lanes, parking and curbs), public components (such as trees, sidewalks and lighting) and private elements (shopfronts and buildings). These elements should be coordinated to create a unified outdoor space, just as rooms are designed to achieve a unified, comfortable space. A proper urban landscape is safe, comfortable and interesting to pedestrians. Many of the activities of daily living can occur within walking distance to the surrounding residences, allowing independence those who do not drive, especially the elderly and young.

A linear green fronts State Road 82. A central green is planned at the center of the Mixed-Use Community.

The commercial areas along State Road 82 require multi-story buildings. Successful streets depend on the sense of spatial enclosure that is created when certain proportional relationships are achieved between the width of the street space and the height of the buildings on either side.

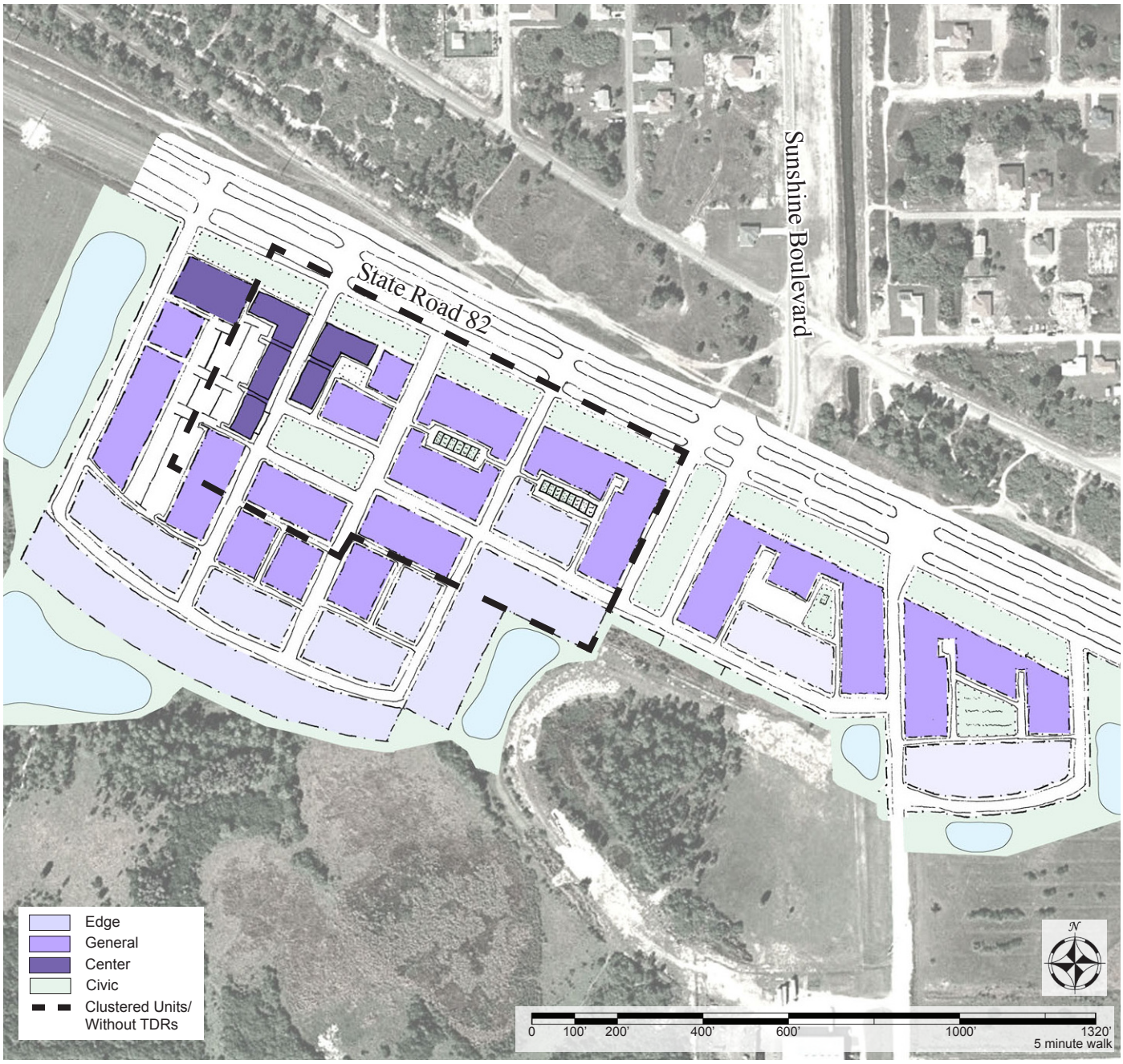
Multi-story buildings can also adapt better to a changing markets than large, single-story, single-use buildings because of the wider range of potential tenants and the ability to include multiple tenants who provide a mix of goods and services.

Illustrative Plan

Design Features

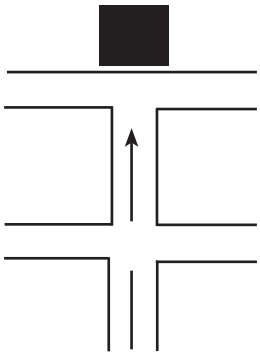
- (A) Civic buildings are positioned in key locations to provide a formal center to the community.
- (B) Squares and greens are spatially defined by building frontages.
- (C) Street trees and properly sized sidewalks are features of every street.
- (D) Retention areas filter runoff from the streets.
- (E) A potential transit stop for future bus routes.
- (F) Large parking areas lined by units create a "park once" environment so that patrons can walk to many destinations rather than having to drive to each.
- (G) A green is a place-holder for a proposed expansion of the Alico Connector Road which would travel from the DR/GR's western boundary to State Road 82. The precise location for this connection is still unclear.

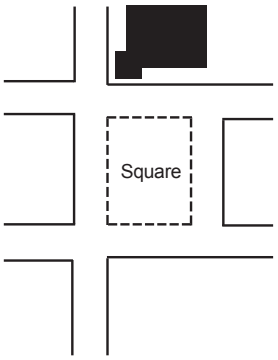
Transect Plan

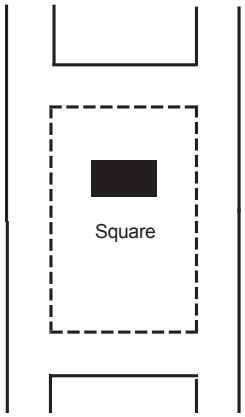


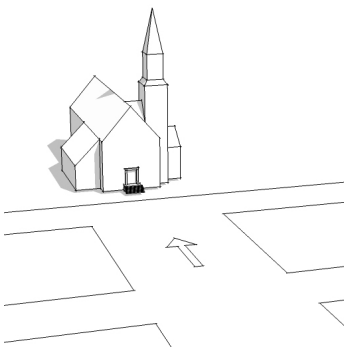
Plan Essentials: Placement of Civic Buildings

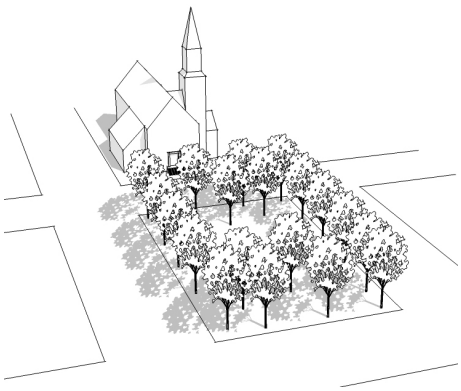
Civic buildings should be placed prominently and the urban fabric should stand back from the building. Approaches include locating public buildings at the ends of streets, across greens, or at the center of greens. Public buildings can be relatively small if placed strategically in the public view. Sites for civic purposes should be reserved even before there is a need for them to be constructed. The uses of these buildings may change over time as the needs of the community evolve.

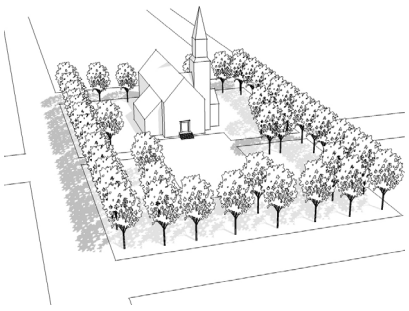












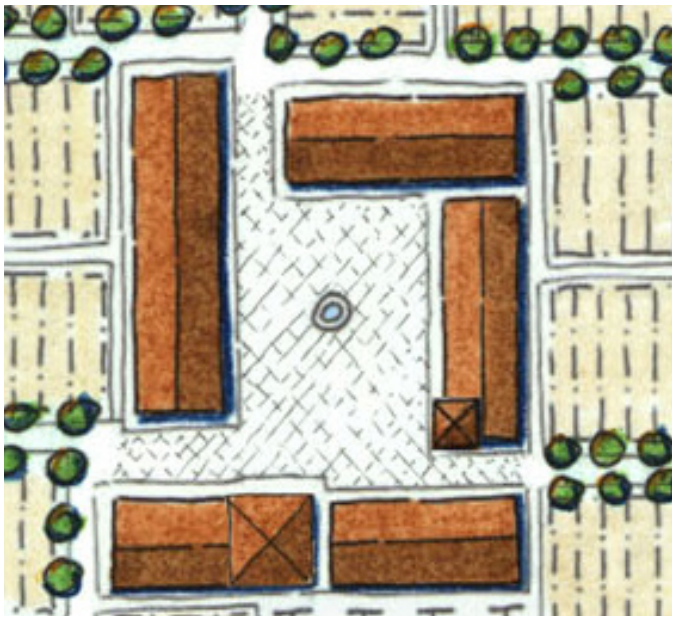
Mixed-Use Community at Homestead Road

The neighborhood is the essential building block of all sustainable places. A single isolated neighborhood on State Road 82, when constructed in accordance with traditional town-building principles, would function as a small village. Multiple small villages create towns. With three complete neighborhoods Homestead Road will have the feeling of a budding town, yet because it participates in the DR/GR system the community's other boundaries would be tightly limited by protected lands.

Civic and commercial buildings are embedded in the neighborhoods instead of isolated in remote single-use complexes. Commercial and office uses would help offset the shortage of commercial land in Lehigh Acres. Residential homes ring the neighborhood centers. At the community's periphery farmfields will allow large-scale farming to continue and potentially encourage community-supported small-scale farming. A market plaza is at the center of the neighborhood, spatially defined by a mix of civic buildings, commercial buildings and rowhouses.

> *"Big cities and countrysides can get along well together. Big cities need real countryside close by. And countryside – from man's point of view – needs big cities, with all their diverse opportunities and productivity, so human beings can be in a position to appreciate the rest of the natural world...."*
>
> *-Jane Jacobs, The Death and Life of American Cities*

Local agriculture can play a key role in improving southeast Lee County's economic, environmental, and nutritional state of affairs. Local agriculture can improve the area economy by keeping food dollars close to home, and improve household economies for residents who choose to keep a garden. It improves the environment by lowering the amount of fossil fuels that must be devoted to processing and shipping fruits and vegetables long distances. Organic, small-scale agriculture, in particular, can improve the environment by protecting watersheds from the chemical run-off that is typical of large-scale, conventional industrial farming. Producing food close to home ensures that the produce will be fresh and retain more of its nutrients, improving the health of the local community.



A market square is the most urban of public spaces. With few or no trees and hardscaping such as cobblestones the square is intended to host continual activity. Shade for pedestrians is provided in galleries or arcades around the edge. A fountain or statue could mark the center.

Local agriculture can be incorporated in southeast Lee County at all scales. New public parks and plazas can host farmer's markets, giving residents access to fresh, local produce. Parks in the proposed communities can be landscaped with low-maintenance edible plants such as fruit trees. Community gardens can be established on semi-public lands such as apartment complex lawns, and residents in townhouses and mixed-use buildings can use window boxes and pots to grow herbs and small vegetables. Residents in single-family homes can have small garden plots in their front or backyards.

Interconnected networks of streets should be designed to encourage walking, reduce the number and length of automobile trips and conserve energy. The network of streets in the initial neighborhood should end in stubs which can be extended outward if new neighborhoods are added. Alleyways would follow the east and west perimeter of the initial development, allowing new development on either side of the initial neighborhoods to complete the block and continue the original pattern. Once enough neighborhoods have been constructed to equal a small town, traffic is able to reach the center from all directions, using many possible routes, preventing congestion.