

# MANATEE COUNTY CONNECTIVITY STUDY WHITE PAPER

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**MANATEE COUNTY**

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*August 2006*



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## TASK 1: REVIEW EXISTING REGULATIONS AND RESEARCH BEST PRACTICES

### INTRODUCTION

Increasing concerns about traffic congestion and the costs of expanding Manatee County's Thoroughfare Plan network to accommodate existing travel demands as well as future growth have fueled heightened interest among the Manatee County Board of County Commissioners to review the county's street connectivity requirements. While Manatee County has an adopted Thoroughfare Plan roadway network that establishes right-of-way needs and identifies travel lanes needed to accommodate future growth to meet adopted level of service standards, paying for improvements in the network presents a steep financial hurdle for taxpayers and individual developments. One of the main challenges facing the County is that the areas with the most growth and potential for future growth lack a suitable transportation network with proper spacing and connectivity of arterial, collector and local roads to disperse traffic. With physical barriers like the Manatee and Braden Rivers, Interstate 75 and existing subdivisions, most traffic either directly connects or is funneled toward a limited number of state highways, such as US 301, US 41, SR 70, University Parkway or SR 64. The result is predictable; increasing congestion- and incident-related delays that threaten the County's economic vitality and quality of life for those stuck in traffic.

Strengthening the County's street connectivity requirements can play an important, and cost-effective, role in finding a workable solution. Ultimately, it will not be financially, physically or socially possible to widen all the roads that may need additional capacity to meet future demand. Connectivity requirements implemented through the land development code put the onus on private developers to set aside right-of-way easements for future roads or configure their development to accommodate inter-parcel connections, thus substantially reducing costs of needed facilities. Strategic capacity improvements, when coupled with stronger connectivity requirements, can help improve both traffic circulation and the form of the built environment to provide more sustainable development patterns.

The premise is that improved street connectivity – the number of connecting streets in a given area – helps reduce the volume of traffic on the thoroughfare network (arterials and major collectors), by dispersion of traffic and encouraging non-motorized travel. Litman (2005) in his article "*Roadway Connectivity - Creating More Connected Roadway and Pathway Networks*" cites two research efforts, SMARTRAQ Project in Atlanta, Georgia, and LUTAQH, sponsored by the Puget Sound Regional Council, that show a decrease in vehicle miles traveled (VMT) with increased street connectivity. The SMARTRAQ Project analysis in Atlanta found that *doubling the current regional average intersection density, from 8.3 to 16.6 intersections per square kilometer reduces average vehicle mileage by about 1.6 percent, causing a reduction from about 32.6 to about 32.1 average weekday per capita (16+ years old) vehicle miles in the region, all else held constant.* The LUTAQH (Land Use, Transportation, Air Quality and Health) research project sponsored by the Puget Sound Regional



Council also found that *per household VMT declines with increased street connectivity, all else held constant. That study indicates that a 10 percent increase in intersections per square mile reduces VMT by about 0.5 percent.* The decrease in vehicle-miles of travel is attributed to increased mobility. Lower mobility could be an indication of congestion, and increase in accessibility is usually attributed with reduction of congestion. Similarly, a modeling exercise by Alba and Beimborn (2005) of Tallahassee, Florida, showed that *increased neighborhood street connectivity increased the capacity of the entire network.* This modeling exercise also found that the reduction in vehicle-miles of travel is higher when the difference in speeds between the arterial and local roads is smaller.

Even though there are benefits to increased street connectivity, care must be taken to ensure that the local street connectivity requirements do not result in unreasonable impacts to residential areas through excessive traffic volumes and/or speed. Keeping this in mind, the Manatee County Connectivity Study began with the review of Manatee County's existing regulations regarding street connectivity. This white paper presents **Connectivity Issues in Manatee County** and summarizes the national research, literature review, and best practices around the country that would improve street connectivity. Manatee County's Comprehensive Plan was also reviewed to ascertain the goals, objectives, and policies in relation to street connectivity.

The Manatee County Comprehensive Plan sets the direction for transportation needs and future land use by providing long range policy guidance. The Plan currently has goals, objectives, and policies, which address street connectivity as part of the Transportation Element. The Comprehensive Plan requires the County to maintain a traffic circulation map series that would help ascertain adequate interconnected major roadway systems. The Comprehensive Plan policies establish the necessity to develop access criteria, future right-of-way needs maps, and a review process for development in order *to guarantee that transportation facilities are available concurrent with the impacts of development and in a manner consistent with adopted level of service standards.* These goals, objectives and policies have not made their way into the Manatee County's Land Development Code (LDC). The goals of the Comprehensive Plan would be better realized by expanding the tools to ensure street connectivity in the LDC.

The review of existing Manatee County's land development regulations and the research of best practices, the following key issues were identified. These key issues provide the basis for potential revisions to the County's land development code:

1. External Street Connections
2. Internal Street Connections
  - A. Cul-de-sac Lengths
  - B. Blocks

C. Private Streets

3. Stub-Outs
4. Gated Streets
5. Access Management
6. Turn-Lane Requirements
7. Hierarchy of Streets
8. Transportation Concurrency

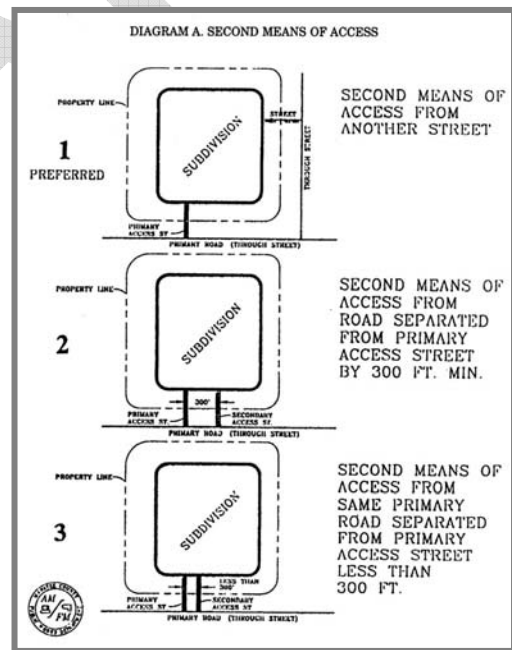
The above key issues are arranged as follows in this white paper. The Code (Manatee County Land Development Code) that guides the above key issues is formatted in *italics*, followed by the commentary of the Code, and practices adopted by other local jurisdiction to influence street connectivity.

**1. EXTERNAL STREET CONNECTIONS**

**MANATEE COUNTY CODE**

*711.4.3. Maximum Number of Driveways. Except for agricultural-zoned property, and lots in excess of five (5) acres, there shall be no more than two (2) driveways from any project, fronting on a single street. In the case of a corner lot fronting on two (2) streets, no more than a maximum of three (3) driveways shall be allowed for the project. In the case of a project abutting three (3) roadways, a maximum of four (4) driveways shall be permitted for the project. Each project shall have a separate access to a street...*

*712.2.8. Second Means of Access. All residential developments or parts of phases thereof, containing more than one hundred (100) residential dwelling units; and all professional, commercial, and manufacturing development, or parts of phases thereof, containing more than fifty (50) lots, shall have a second separate means of access (street), which shall afford an alternate means of safe entry to and egress from the development (see second means of access, Diagram A). The second means of access (street) shall have the access to a through street...*





**COMMENTARY**

The above code sections establish the criteria for a second access requirement. The code does not take into consideration the traffic volumes on local or collector roads in calculating the number of external connections. The methodology to calculate the number of external connections must be sensitive to the community’s perception of heavy traffic, and the differential trip generation/attraction potential of various compatible land uses.

**BEST PRACTICES**

**FUNCTION/FLOW INDEX (FFI)**

The FFI is used to determine the number of external connections that would be required by a development to disperse traffic based on the desired traffic volumes on local and collector roads. The FFI is determined by distributing (routing) the trips generated from each block to the nearest arterial outside the neighborhood. The resulting trips on each street are divided by the maximum desirable annual average daily traffic (AADT) for that segment. If the ratio exceeds 1.0 an additional connection is required to better disperse traffic. *Table 1* shows the desirable traffic flow on road segments by functional class provided by the author (Kenneth Spitz, AICP) based on survey of residents on how satisfied they are with the amount of traffic on their streets and then measuring the actual traffic volumes.

**Table 1 – Desirable Traffic Flow by Functional Class**

RESIDENTIAL USE							
STREET CHARACTER		DESIRED VEHICLE FLOW			MAXIMUM VEHICLE FLOW		
Function	Lanes	Minute	Hour	Day	Minute	Hour	Day
Local	2	1.0	60	600	1.5	90	900
Collector	2-3	2.0	12	1,200	3.0	180	1,800

NON-RESIDENTIAL USE							
STREET CHARACTER		DESIRED VEHICLE FLOW			MAXIMUM VEHICLE FLOW		
Function	Lanes	Minute	Hour	Day	Minute	Hour	Day
Local	2	2.0	120	1,200	3.0	180	1,800
Collector	3	4.0	240	2,400	5.0	300	3,000

## **TRADITIONAL NEIGHBORHOOD DEVELOPMENT (TND) DESIGN RATING STANDARDS FOR EXTERNAL CONNECTIVITY**

This standard proposed by Laurence Aurbach in the *Town Paper* measures external connectivity based on *how well a neighborhood is connected to its surroundings*. It measures the average distance between entrance/exit points along the perimeter of a neighborhood by counting all the entry/exit points from a neighborhood that intersect a thoroughfare, including potential future connections, and divides this count by the neighborhood perimeter. The neighborhood perimeter excludes all portions of the perimeter that are adjacent to undevelopable land. Per this standard, 250 feet to 350 feet is an acceptable measure of average distance between entrance/exit points and any measure above 1500 feet or below 250 feet is considered unacceptable. This is an important consideration because excessive connectivity could erode livability in any neighborhood and traffic functionality in terms of mobility and level of service.

## **2. INTERNAL STREET CONNECTIVITY**

### **A. CUL-DE-SAC LENGTHS**

#### **MANATEE COUNTY CODE**

907.9.4.2. *Where a road is not intended to extend beyond the limits of a subdivision in accordance with this Section, a cul-de-sac or turn-around shall be constructed. For greater convenience to traffic, and more efficient police and fire protection, a cul-de-sac or turn-around street shall not exceed eight hundred (800) feet in length. Cul-de-sacs and turn-arounds shall be constructed to the Manatee County Public Works Standards and paved with a minimum unobstructed, diameter of ninety (90) feet, unless specifically approved by the Fire District.*

#### **COMMENTARY**

The above code can potentially allow 35 single-family lots that would have only one road access. This kind of development can cause accessibility issues during emergencies. As seen in **Figure 1**, this development has only one external access and several internal cul-de-sac residential streets. The cul-de-sac streets also have a perception of safety, which could have a possible adverse impact. According to research conducted by William Lucy, a professor of environmental studies at the University of Virginia, *cul-de-sac communities turn out to have some of the highest rates of traffic accidents involving young children.*



**Figure 1 – Residential Development**

**BEST PRACTICES**

**HUNTERSVILLE, NORTH CAROLINA - SUBDIVISION ORDINANCE 7.1**

Cul-de-sacs (streets designed to be permanently closed at one end), may not be longer than 350 feet and must be terminated by a vehicular turnaround design as accepted by the County Engineering Department; provided, however, that this requirement may be waived where topographical or other unusual conditions exist.

**FT. COLLINS, COLORADO - LAND USE CODE, SECTION 3.6.3B**

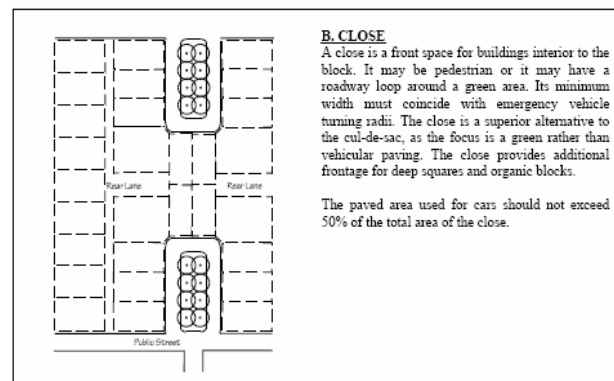
Cul-de-sacs shall be permitted only if they are not more than 660 feet in length and have a turnaround at the end with a diameter of at least 100 feet. Surface drainage on a cul-de-sac shall be toward the intersecting street, if possible, and if not possible a drainage easement shall be provided from the cul-de-sac. If fire sprinkler systems or other fire prevention devices are to be installed within a residential subdivision, these requirements may be modified by the City Engineer according to established administrative guidelines and upon the recommendation of the Poudre Fire Authority.

**TOWN OF CARY, NORTH CAROLINA - LAND DEVELOPMENT ORDINANCE, SECTION 7.10.3 (B) (4)**

In general, permanent cul-de-sacs and dead-end streets are discouraged in the design of street systems, and should only be used when topography, the presence of natural features, and/or vehicular safety factors make a vehicular connection impractical. Where cul-de-sacs or dead-end streets are unavoidable, site and/or subdivision plans shall incorporate provisions for future vehicular connections to adjacent, undeveloped properties, and to existing adjacent development where existing connections are poor.

**CITY OF MCKINNEY, TEXAS – CODE OF ORDINANCE, SECTION 11-47 (16)**

All structures and subdivisions shall provide two points of access. The two points of access shall be a minimum of 140 feet apart. The maximum cul-de-sac length shall not exceed 600' in length as measured from the centerline of the intersection, street to the center point of the radius.



**Figure 2 - Alternative to Cul-de-sac**



**TOWN OF CORNELIUS, NORTH CAROLINA, LAND DEVELOPMENT CODE, SECTION 7.1**

Where practical, a *close* should be used in place of a cul-de-sac. Cul-de-sacs, if permitted, shall not exceed 250 feet in length from the nearest intersection with a street providing through access (not a cul-de-sac). Cul-de-sacs shall be offset from the street centerline and shall form a square. (See Figure 2)

**CITY OF ORLANDO, FLORIDA – LAND DEVELOPMENT CODE, SECTION 68.404****Connectivity Index**

In accordance with GMP Future Land Use Policy 4.2.5, and consistent with the GMP Transportation Element, the City shall combine the mobility of the traditional interconnected street pattern with the safety, security, and topographic sensitivity of the conventional or contemporary network. Such a hybrid network features short, curved stretches that follow the lay of the land or contribute to good urban design, as well as short loops and cul-de-sacs, so long as the higher-order street network is left intact.

"Higher-order" means arterials, collectors, and sub-collectors that carry through traffic. An acceptable individual project master plan may feature interrupted grids of short streets ending at T or Y intersections, traffic circles or squares/parks. By design, local streets may carry some through traffic, but the truncated nature of local streets means that traffic moves more slowly and the heaviest volumes are diverted to higher-order streets.

A simple measure of connectivity is the number of street links divided by the number of nodes or link ends (including cul-de-sac heads). The more links relative to nodes, the more connectivity. A connectivity index of 1.4 to 1.8 represents an acceptable street network in the Southeast Plan area. The optimal connectivity index for a perfect grid network is 2.5.

Simple changes in design, such as removing cul-de-sacs and connecting the street-ends to other streets, can bring about significant changes in connectivity index scoring. The City shall utilize the connectivity index mechanism, in addition to other qualitative measures, to determine whether transportation impact fees can be reduced within the Southeast Orlando Sector Plan area.

**B. BLOCKS****MANATEE COUNTY CODE**

**907.8.3. Length.** *Block lengths in residential areas shall not exceed two thousand (2,000) feet, or be less than four hundred (400) feet in length, except where necessary to intersect with an existing street. Wherever practicable, blocks along thoroughfares and arterials, shall not be less than eight hundred (800) feet in length.*



## COMMENTARY

The code that guides the block lengths (above) generally promotes a suburban, automobile-oriented development pattern, and does not distinguish between a compact, mixed use setting and a residential development. The above block length might be suitable for downtown development, but is overly general and provides little guidance for different land use contexts. This could potentially cause accessibility and mobility issues in a residential development. Also, block proportion (length to width ratio) would be a consideration, if mobility of traffic in a particular direction is critical. For example, the block length along Manatee Avenue could be greater than the block length along an intersecting street.

## BEST PRACTICE

### **HILLSBOROUGH COUNTY, FLORIDA - LAND DEVELOPMENT CODE 5.08.07(B)**

1. The average length of all block faces in the development shall not exceed 400 feet; and,
2. No individual block face shall exceed 1,000 feet in length.

### **MCCALL, IDAHO - ZONING AND SUBDIVISION CODE 9.3.02**

Block lengths shall be between three 300 feet and 750 feet, with a recommended distance of 500 feet, provided block lengths may be a greater, or lesser, length upon showing of cause or to conform to major existing terrain features. The block lengths are controlled to provide for adequate connectivity, convenient pedestrian circulation, access, and to control traffic rates. Alternatively, traffic calming measures of an approved type may be a part of street design. Generally, smaller block lengths should be used in more pedestrian-oriented and/or mixed use settings and projects.

## **TND DESIGN RATING STANDARDS FOR INTERNAL CONNECTIVITY**

This standard proposed by Laurence Aurbach in the *Town Paper* measures internal connectivity based on *the density of intersections*. Unlike the connectivity index used in the City of Orlando LDC, this standard references development area or size. Intersection density is calculated by counting the number of intersections in a given area, excluding dead-ends but including stub-outs, and dividing it by the developed area. A measure of 250 to 290 intersections per square mile is considered acceptable, while less than 80 intersections per square mile is considered unacceptable. It is important to note that this standard must be supported by appropriate design guidelines in order to ensure appropriate interpretation into physical layout.



## C. PRIVATE STREETS

### MANATEE COUNTY CODE

740.2.1. Private streets are allowed in any planned development zoning district if approved as part of the planned development approval process. Private streets are allowed in any other zoning district upon approval by the Planning Director.

### COMMENTARY

Even though the private street reduces the maintenance responsibility of the County, it is another code that could reduce connectivity of streets. Additional language in the LDC under private streets should be drafted so that the private streets meet minimum connectivity requirements.

### BEST PRACTICE

#### MCALL, IDAHO - ZONING AND SUBDIVISION CODE 9.6.05 (A)

Private Streets are discouraged, and cause must be shown for their approval. The Commission and Council will decide in every case which streets, if any, are to be private. Normally, these will only be emergency access streets, cul-de-sac streets and streets to serve a maximum of ten (10) residential dwelling units, in which case the street is essentially an extended two-way driveway.

## 3. STUB-OUT REQUIREMENTS

### MANATEE COUNTY CODE

907.9.1.3. Local streets shall be extended to the property limits of the subdivision to allow for the logical future extension of the streets into adjacent undeveloped land and to new and existing adjacent developments to complete the inter-neighborhood road system ties. Non-egress easements prohibiting access to streets or adjoining property shall not be permitted unless the easement is designated in accordance with the Manatee County Public Works Standards and is dedicated to Manatee County.

### COMMENTARY

The above code will prevent dead end streets, while allowing potential connection capability for future developments. To enable potential home buyers to be aware of the potential extension, code language could be drafted into the LDC that requires developers to install signs of street extensions on such streets.



## **BEST PRACTICE**

### **FORT COLLINS, COLORADO - LAND USE CODE 3.6**

All development plans shall incorporate and continue all sub-arterial streets stubbed to the boundary of the development plan by previously approved development plans or existing development. All development plans shall provide for future public street connections to adjacent developable parcels by providing a local street connection spaced at intervals not to exceed 660 feet along each development plan boundary that abuts potentially developable or redevelopable land.

### **CITY OF MIRAMAR, FLORIDA – LAND DEVELOPMENT CODE 714.6 (E) (2)**

Streets shall, wherever practicable, terminate at other streets within the TND and connect to existing and projected streets outside the TND. Street stubs shall be provided within the development adjacent to open land to provide for future connections. Cul-de-sac and other dead-end streets are discouraged. In the event a cul-de-sac must be used, it shall not exceed 250 feet in length, must be accessed from a street providing internal or external connectivity, and shall be permanently terminated by a vehicular turnaround. In most instances, a close or eyebrow is preferred to a cul-de-sac. Vehicular turnarounds of various configurations are acceptable so long as emergency access is adequately provided, as determined by the city's fire department.

### **ALACHUA COUNTY, FLORIDA – UNIFIED LAND DEVELOPMENT CODE, SECTION 404.70 (A) (1)**

Street stubs shall be provided to adjacent open land to provide for future connections. Signs shall be posted, at the expense of the developer, advising residents of the intent and purpose of the stubbed street. Cul-de-sacs shall be permitted only where environmental concerns or existing development makes a street connection impracticable. Cul-de-sacs shall not exceed 250 feet in length and shall be accessed from a street providing internal or external connectivity.

## **4. GATED STREETS**

### **MANATEE COUNTY CODE**

There is no mention of gated streets in the Manatee County Code. Possibly, this street type is considered a variation of the private street category.



**COMMENTARY**

Gated communities could potentially decrease street connectivity. There could be flexibility in the code for gated streets as long as the overall development meets minimum connectivity standards and maintains required access for transit and/or emergency vehicles.

**BEST PRACTICE**

**FORT COLLINS, COLORADO - LAND USE CODE, SECTION 3.6**

Gated street entryways into residential developments shall be prohibited.

**TOWN OF CORNELIUS, NORTH CAROLINA, LAND DEVELOPMENT CODE, SECTION 7.1**

Closed or gated streets are strictly prohibited.

**5. ACCESS MANAGEMENT**

**MANATEE COUNTY CODE**

*741.3.2. Provisions: Median Opening Intersection: Median Opening Intersections shall be allowed only at the following University Parkway intersections: Kentucky/28th Street Court East, Shade Avenue, Tuttle Avenue, Lockwood Ridge Road Conservatory, Drive Whitfield Avenue, DeSoto Road/Park Boulevard (extension through Longwood Run Development, former McIntosh Road), Saunders Road (extension), Honore Avenue, Cooper Creek Road/Brown Road or as otherwise approved by the Board. Median Opening Intersections, are limited to a minimum average of one-half (1/2) mile spacing.*

*Cross Access Easement: When vehicular traffic is projected to exceed 75 vehicle trips per day on the subject property, a 30 foot wide vehicular cross access easement(s) to adjacent parcels shall be granted to adjoining property owners and the public in a location acceptable to the Manatee County Planning Department.*

**COMMENTARY**

Manatee County’s access management code, which is applied to specific intersections along University Parkway, could be expanded to the entire County. Generalized access management standards could help future connected street networks in undeveloped areas of Manatee County per the County’s Traffic Circulation Maps. Given below is an excerpt from the Collier County’s access management regulation.



**BEST PRACTICE**

**COLLIER COUNTY, FLORIDA - RESOLUTION No.01-247**

**Purpose:** This Policy replaces that established Resolution No. 92-442 for the classification system and standards to implement regulation and control of vehicular ingress to, and egress from, arterial and collector roadways. The implementation of the classification system and standards is intended to protect public safety and general welfare, provide for mobility of people and goods, and preserve the functional integrity and capacity of arterial and collector roadways. To the extent that Collier County has jurisdiction to do so, all limited-access, arterial and collector roadway facilities shall be assigned as access classification and access standards. These standards shall be the basis for developing access management plans for county roadway improvements and modifications, and for roadway or driveway connection permitting.

**Table 2 - Access Classification Standards**

ACCESS CLASS	FACILITY FEATURES (MEDIAN TREATMENT AND ACCESS ROADS)	MINIMUM CONNECTION SPACING (FEET) (2) (3)	MINIMUM MEDIAN OPENING		MINIMUM SIGNAL SPACING (MILE) (2)
			DIRECTIONAL (FEET) (2)	FULL (MILE OR FEET) (2)	
1	Limited Access	N/A	N/A	N/A	1
2	Controlled Access	1320/600	1320	2640	0.5
3	With Median Restrictions	660/330	660	1320	0.5
4	Without Median Restrictions	660/330	N/A	N/A	0.5
5	With Median Restrictions	330/220	440	1320/660	0.5/.25
6	Without Median Restrictions	330/220	N/A	N/A	0.25
7	With and Without Median Restrictions	125	330	440	0.25

(Greater than or equal to 45 mph/less than 45 mph)

Notes:

- (1) Section Four of this Policy contains supplementary and more detailed instructions for use of these standards.
- (2) These minimum spacing standards may not be adequate in auxiliary lane and storage are required.
- (3) Single property's with frontages exceeding the minimum spacing criteria may not necessarily receive permits for the maximum number of possible connections.

**6. TURN LANE REQUIREMENTS**

**MANATEE COUNTY CODE**

*722.1.3.4. Circulation and Traffic Control. To facilitate on and off-site traffic circulation, a developer shall construct or install street signs at each intersection of the development, any traffic controlling techniques (signalization, turn lanes, service roads, deceleration lanes, etc.) and provide for adequate horizontal and vertical sight distances, as provided in the Manatee County Public Works Standards or deemed necessary by the County Engineer in accordance with professional engineering and roadway standards, when the need for improvements directly attributable to the development.*



**COMMENTARY**

Establishment of development standard requirements for turn lanes at median openings and at entrance/egress would ensure maximum uninhibited traffic movements. This promotes mobility but the added cost of implementing these standards could discourage connectivity. The issue here is to balance these stringent requirements with exceptions and deviations which would promote connectivity.

**BEST PRACTICE**

**LEE COUNTY, FLORIDA – ADMINISTRATIVE CODE 11-4**

Deceleration, left and right turn lanes shall be provided at all intersections and/or access points on county maintained and privately-maintained facilities as required by this policy. Deceleration, left and right turn lane requirements shall not apply to a single family residence, a duplex residence, or two (2) family residence. When an existing development increases trip generation by expanding facilities or by change in use, a one-time deviation may be granted whereby only the increased trip generation is considered in determining if the warrants for requiring deceleration, left and right turn lanes are satisfied providing such deviation does not create a new or increased existing hazard which is detrimental to the health, safety and welfare of the traveling public.

**7. HIERARCHY OF STREETS**

**MANATEE COUNTY CODE**

907.9.1. *Arrangement.*

907.9.1.1. *All streets shall be properly integrated and aligned with the existing and proposed system of thoroughfares and local streets.*

907.9.1.2. *Local streets shall be arranged in a manner that discourages their use by through traffic as major thoroughfares.*

**COMMENTARY**

One of the major concerns with street connectivity is the diversion of non-local traffic into residential neighborhoods and diminished capacity on major streets due to new intersections. One of the ways to mitigate these impacts is classifying streets to the sub-collector and residential street level based on levels on mobility. These standards provide clear guidelines for residential neighborhood developments and roadway network.



**BEST PRACTICE**

**CITY OF SAN ANTONIO, TEXAS – UNIFIED DEVELOPMENT CODE 35-506 (C)**

**(1) Conventional Classification System.**

Classification of an existing or proposed street not already identified on the Major Thoroughfare Plan, for the purpose of determining the appropriate design of a roadway or development, or for the purpose of determining the appropriateness of a location for a proposed use, shall be done by the director of development services in consultation with the director of public works. Pursuant to the Major Thoroughfare Plan, the following classification system is hereby adopted:

**Table 3 – Functional Classification System Description**

Functional Class	Level of Mobility	System Access	Level of Accessibility
Freeway	Connects all urban sub regions together, connects urban and rural service areas with metro major activity centers; connection to outside cities.	to other freeways, principal arterial, and selected arterial; no direct land access.	Long trips at high speed within and through the metro area; express transit trips.
Primary Arterial	Connects two or more sub regions; provides secondary connections outside cities; complements freeway in high volume corridors.	to freeways, other principal arterial, and high volume collectors; no direct land access except major traffic generators.	Medium distance to long trips at high to moderate speeds within the urban area; express transit trips.
Secondary Arterial	Connects adjacent sub regions and activity centers within sub regions.	to freeways, principal arterial, other arterial, and collectors; restricted direct land access.	Medium to short trips at moderate to low speeds; Local transit trips.
Collector	Connects neighborhoods within and between sub regions.	to arterial, other collectors, and Local streets; direct land access.	Primarily serves collection and distribution function for the arterial system at low speeds; Local transit trips.
Local (includes Conservation Access, Local Type A, Local Type B.)	Connects blocks within neighborhoods and specific activities within homogeneous land use areas.	to collectors and other Local streets; direct land access.	Almost exclusively collection and distribution; short trips at low speeds.

**(2) Traditional Design Classification.**

The following classification system shall be used for designing a traditional neighborhood development (TND) pursuant to § 35-207 of this chapter:





**Table 4 – Functional Classification System Description**

Functional Class	Level of Mobility	System Access	Level of Accessibility
Parkways	Parkways bring people into a neighborhood, or pass traffic through natural areas. Parkway are not designed for development. When the parkway enters the new neighborhood, it becomes a boulevard.	to parkways, boulevards, and to freeways, principal arterial, and selected arterial; no direct land access.	Long trips at moderately high speeds within and through the metro area; express transit trips.
Boulevard	Provides multi-lane access to commercial and mixed-use buildings, and carries regional traffic.	to freeways, other principal arterial, and high volume collectors; no direct land access except major traffic generators.	Medium distance to long trips at high to moderate speeds within the urban area; express transit trips.
Main street	Provides access to, and a space for, neighborhood commercial and mixed-use buildings.	to Local streets, lanes, and other avenues or main streets.	Medium to short trips at moderate to low speeds; Local transit trips.
Avenue	Connects centers and neighborhoods. Avenues go from neighborhoods to centers, and are not long (no more than one mile). Avenues may circulate around a square or neighborhood park.	to Local streets, lanes, and other avenues or main streets.	Primarily serves collection and distribution function for the transportation system at low speeds; Local transit trips.
Local	Provides access to housing	to Local streets, alleys, and avenues or main streets	Almost exclusively collection and distribution; short trips at low speeds.
Lanes	Provides access to single-family homes.	to Local streets, alleys, and avenues or main streets	Almost exclusively collection and distribution; short trips at low speeds.
Alleys	Provides access to rear of property.	to Local lanes and Local streets	No direct frontage. Access is from the rear of lots.
Trails	Provides non-motorized access throughout a neighborhood.	Connects homes, parks and schools, and shopping districts	No vehicular access.

**CITY OF DENVER, COLORADO – BLUEPRINT DENVER**

In *Blueprint Denver*, the City retains its historical functional classification system (arterials, collectors and local streets) and overlays these classifications with five "street types" based on adjacent land use (residential, main, mixed-use, commercial, and industrial streets). This classification considers the functionality of the roadways and the land uses adjacent to the roadways. For example, a collector is further classified as a residential collector or a commercial collector. This approach to street classification is suited to a multi-modal approach where alternative modes could be planned based on the street typology. As a next step, Denver is developing new design standards and guidelines for each of these street types.

**8. TRANSPORTATION CONCURRENCY**

**THE MANATEE COUNTY COMPREHENSIVE PLAN**

*Objective 5.2.3: Concurrency: To guarantee that transportation facilities are available concurrent with the impacts of development approved by Manatee County and requiring the issuance of a Certificate of Level of Service Compliance, in a manner consistent with adopted level of service standards.*



*Objective 5.1.2: Level of Service Standards: Implement adopted roadway Level of Service (infrastructure) Standards for review of proposed development orders, for use in capital improvements programming, and for quantifying the long-range goals for operation of major roadways.*

*Policy 5.1.2.1: Implement the 2020 level of service (infrastructure) standard for each major roadway based on the projected traffic volumes on the planned road network as identified on the Future Traffic Circulation Maps. These adopted goals shall remain fixed, and will represent a goal toward which annually-revised five-year level of service standards (objectives) will be targeted. These long-range level of service standards are contained in Table 5-1, following Policy 5.1.2.6.*

*Policy 5.1.2.6: Prohibit the adoption of any current year, five-year, or 2020 Level of Service standard on any segment of I-275 and I-75 which is lower than Level of Service "C".*

*Policy 5.1.3.2: Develop an adequate road network of arterials and collectors which are parallel to, or otherwise limit the degree of local travel demand on I-275 and I-75. As used in this policy, an "adequate" parallel road network shall mean a network designed to maintain a peak hour Level of Service on I-275 and I-75 of "C" or better.*

## **COMMENTARY**

Transportation concurrency is a mechanism to ensure that transportation impacts of development will not reduce the adopted level of service standard provided in the Comprehensive Plan. Traditional concurrency measures mobility on arterials and collector roads in terms of roadway level of service. Alternative concurrency may include multimodal transportation districts, long term concurrency management systems or transportation concurrency exception areas, each of which encourages street connectivity as one way of achieving improved mobility.

## **BEST PRACTICES**

### **CITY OF KISSIMMEE CONCURRENCY STRATEGY**

An appropriate strategy (or combination of strategies) is one that will best promote the vision for the City and add flexibility to the concurrency management system while improving multimodal travel options and enhancing the design and character of key areas targeted for redevelopment. That vision is to provide a highly accessible and efficient multimodal transportation system that will contribute to the economic revitalization of the City's downtown and commercial corridors.

A **Transportation Concurrency Exception Area (TCEA)** provides flexibility towards meeting concurrency obligations. The **Multimodal Transportation District (MMTD)** designation is a tool to encourage redevelopment and infill development focused around multimodal infrastructure while providing



flexibility by establishing Level of Service Standards to support connectivity for vehicles, pedestrians, cycles and transit. A **Transportation Concurrency Management Area (TCMA)** is meant to promote redevelopment and infill development within *a compact geographic area with an existing network of roads where multiple, viable alternative travel paths or modes are available for common trips*. This study recommended the implementation of a Multimodal Transportation District for the City of Kissimmee.

#### **CITY OF DESTIN MULTIMODAL TRANSPORTATION DISTRICT LAND DEVELOPMENT CODE**

The City of Destin Multimodal Transportation District is intended to encourage a mix of land uses, support transportation options, and promote pedestrian-oriented site and building design. All developments in the MMTDs (Primary and Secondary) are required to contribute to alternative modes such as bicycles, pedestrians and transit. The Land Development Code establishes specific design guidelines for the pedestrian, vehicular, transit, and cycling networks.

#### **CITY OF GAINESVILLE TRANSPORTATION CONCURRENCY EXCEPTION AREAS**

Gainesville has adopted a Transportation Concurrency Exception Area (TCEA), which divides most of the city into a Zone A and Zone B. Where the concurrency management system promoting adequate facilities and services have tended to favor outlying areas, the TCEA is intended to reduce the adverse impact that transportation concurrency requirements have on urban redevelopment or downtown revitalization by promoting other planning strategies that correspond to the local circumstances of a specific geographic area. Zone A is the Eastside area, which has had little growth for 20 years (economic decline has occurred), and where the city and county are targeting economic development and community redevelopment efforts. With a defined grid street network and minimal congestion, development within Zone A has no concurrency restrictions. In Zone B, the high growth areas west of downtown and University of Florida, the TCEA exempts developments from traditional roadway level of service requirements, but developers must achieve a minimum number of multimodal mitigation measures, including mixed-use provisions, from a menu of options prior to development approval.

#### **SUMMARY/CONCLUSIONS**

The preceding section reviewed the existing regulations for Manatee County and researched best practices for the following key issues related to street connectivity: External Street Connections, Internal Street Connections, Stub-Outs, Gated Streets, Access Management, Turn-Lane Requirements, and Hierarchy of Streets. While Manatee County has a number of basic regulations that encourage and guide street connectivity, in general the regulations are vague and overly flexible, thus limiting their applicability to different land use types, street characteristics or other environmental conditions. The development code also does not address providing additional street connectivity as a potential strategy for achieving transportation concurrency. This type of flexibility may be applicable in areas designated for mixed use,



transit-oriented development, in which shorter trip lengths and greater non-auto mode share can be achieved through improved site design. Alternative forms of transportation concurrency, such as establishing a Transportation Concurrency Management Area, Transportation Concurrency Exception Area or a Multimodal Transportation District per state law, encourage street connectivity as a primary consideration of providing mobility and accessibility in specific areas with supportive land use objectives and urban design strategies.

Some key findings based on this analysis are as follows:

- Establish indices/standards for evaluating existing connectivity and performance.
- Discourage cul-de-sacs, private streets, and gated streets.
- Encourage grid networks with stub-outs for future connections.
- Manage block sizes based on type of development, full opening median spacing, and turn lane requirements.
- Modify transportation concurrency requirements to promote street connectivity when roadway widening is not desired or possible.

Based on the analysis and findings, this study suggests that Manatee County approach this street connectivity issue in three phases:

### **Phase 1**

Assess the connectivity of existing street networks using indices/standards similar to the Function/Flow Index or the Internal/External Connectivity Standards (TND Design Rating Standards, version 2.2). It is important to note that these indices/standards could be applied as stand-alone measures for street connectivity but are more informative when evaluated in a context-sensitive framework including measures such as land-use and streetscape standards.

This phase should include mapping the existing street network and planning future connections in the “higher-order” thoroughfares (arterials, collectors, and sub-collectors). This process would help in establishing points of weakness in the existing network and provide direction for future growth in the area. It is important to separate the findings of this assessment as short term and long term objectives for the street network. This work effort is not currently anticipated in the scope of services for this project.



## Phase 2

As addressed in Task 2 of this project's scope of services, revise existing regulations in Manatee County Land Development Code related to internal/external connectivity, cul-de-sacs, blocks, stub-outs, private streets, gated streets, access management, turn lane requirements, and street hierarchy. Some suggested policy recommendations are as follows:

### External Street Connections:

- For larger development parcels (in excess of five acres) require additional driveways and means of access based on the accessible perimeter of the parcel.
- Limit maximum intersection spacing on major through streets including arterial streets to approximately one mile.
- Limit maximum spacing on collector streets to approximately ½ mile.
- Internal Street Connections:
- Limit maximum spacing for local streets within residential developments to approximately ¼ mile.
- Require accessways for bicycles, pedestrians, and emergency vehicles where full street connections are not possible.

### Cul-de-sacs:

- Limit cul-de-sacs to only 20 percent of the development, conditioned upon evaluating alternatives layouts such as closes, common greens, fused grids, etc.
- Limit maximum length of cul-de-sacs to approximately 300 feet.
- Waive vehicular turn-around requirements for cul-de-sacs conditional to provision of easements for emergency access.

### Blocks:

- Limit maximum block size to approximately five acres and require full street connections, preferably public, for development parcels in excess of this area, i.e. larger development parcels (in excess of five acres) must be sub-divided into appropriately sized blocks.



### **Private/Gated Streets:**

- Allow private/gated streets only in larger development parcels (in excess of five acres) conditional to minimum public access provision including accessways for bicycles, pedestrians, transit, and emergency vehicles.

### **Stub-Out Requirements:**

- Provide stub-outs in lieu of cul-de-sacs where full street connections are not possible at this time but planned for future connectivity.

### **Turn Lanes:**

- Provide exceptions for turn lane requirements for residential developments based on trip generation.

### **Hierarchy of Streets:**

- Consider overlaying the existing functional street classification (freeway, arterial, collector, and local) with alternative classification systems based on adjacent land uses (residential, commercial, industrial, etc.) and/or streetscapes (parkway, avenue, boulevard, lane, alley, etc.). Illustrate streetscape standards based on the reclassification of street types.

### **Transportation Concurrency**

- Consider implementing a Multimodal Transportation District in areas where redevelopment or new transit oriented, mixed use development is a priority. This boundary definition must be supplemented by standards for transportation concurrency management, connectivity and urban design guidelines for vehicular, pedestrian, transit and cycling networks.

### **Phase 3**

Monitor street connectivity using indicators such as the City of Orlando Connectivity Index. Supplement this process with design review procedures to qualitatively evaluate proposals for urban infill projects and suburban development.

Implement traffic calming measures on streets, especially in residential communities, where safety is compromised by increased traffic volumes due to increased connectivity. It is possible to include traffic calming measures such as encouraging street parking and reducing street widths in the revised streetscape standards. Numerous local governments have adopted procedures for residential areas to request or apply for traffic calming measures to be evaluated and implemented in their neighborhoods.



## **NEXT STEPS**

Following discussions with Manatee County staff on the findings and conclusions from this white paper, the next task of the project entails drafting recommended land development code modifications for consideration by staff, the Planning & Zoning Commission and Board of County Commissioners. It is anticipated that this task will lead to amendments to the County's regulations to promote improved street connectivity that is properly balanced with preservation and protection of neighborhood character and quality.

## **REFERENCES**

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