

Mobility Manual

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INTRODUCTION

In less than ten years, the population of Collier County has increased by fifty percent. This growth has occurred in a spread-out development pattern that requires an automobile for most daily trips. These factors, combined with a sparse network of major roads, have given Collier County residents a taste of big-city traffic congestion.

Collier County's response to this congestion will shape its future. This plan proposes mobility strategies that will begin to improve the sparse road network while enhancing community character.

The county's transportation strategy has been to create a system of wide arterial roads to serve a sprawling development pattern in the absence of a secondary road network. Unfortunately, wide roads are very difficult to make into positive features for our communities, and the sparse network requires motorists to travel greater distances to reach everyday destinations, thus worsening traffic congestion. This plan recommends the simultaneous creation of a network of secondary roads and proposes designs for these roads that would make them welcome near and through residential neighborhoods.

The benefits of better networks accrue at smaller levels as well. New neighborhoods should emulate the best older neighborhoods by having multiple street connections, rather than a single entrance that is inconvenient to the residents and tends to overload the arterial network.

The pattern of connections between individual parcels and neighborhoods to the major road network is very long lasting. Once lots are subdivided to create neighborhoods, the street pattern is very difficult to change. Individual buildings can be replaced through time, and

land uses can evolve to meet changing needs, but these future actions will be constrained by the initial street pattern. Where this opportunity hasn't already been foreclosed, Collier County should insist that the original street pattern in new neighborhoods be designed to allow healthy changes during future generations.

This chapter provides an overview of Collier County's framework for making transportation decisions in the recent past and at present and then describes five specific mobility strategies to further improve this framework. All five strategies are designed to forge a strong link between transportation and land-use planning.

TRANSPORTATION PLANNING IN COLLIER COUNTY

Collier County residents are very troubled by increasing congestion on their roads. During the past five years, many roadway projects were planned and designed, but some had fallen severely behind schedule.

Last winter, rush-hour delays at major intersections were declared unacceptable and a "roadway emergency" was declared. Local officials reevaluated the previous system for improving county roads and established a new Transportation Services Division which immediately set into motion an aggressive construction program to widen and extend many roads far sooner than previously planned.

Traffic congestion is caused by a growing population forced to use inadequate roads and is aggravated by development patterns that require local residents to get in a car and drive long distances to meet

everyday needs. Collier County's response to congestion should address all of these causes. If not, an aggressive roadbuilding program may still not provide the level of mobility that Collier County residents have come to expect.

STANDARD METHODS FOR PREDICTING THE NEED FOR FUTURE ROADS

For long-range road planning, Collier County has followed the standard process used by Metropolitan Planning Organizations (MPOs) across the state. Like other MPOs, the Naples (Collier County) MPO is a multi-jurisdictional entity involving the cities, Collier County, and the Florida Department of Transportation.

MPO planners use a computer model that assesses future road needs by projecting 20-25 years into the future the development patterns and driving habits of the recent past. The model assumes the indefinite continuation of these practices (for example, Collier's pattern of segregating land uses into large gated communities, isolated office complexes, and strip shopping centers at major intersections, and the absence of a collector road system). The computer model then simulates the travel behavior of the expected future population on the arterial road network, helping decide which roads will need to be widened or extended.

If the cost of these new roads exceeds road-building revenues during the same period, two different road networks are created. One is called a "needs plan," a road network that might be built if unlimited funds were available. The other is a "financially feasible plan" that is

limited to roads that can be paid for by transportation revenues to be generated during the same period. This fiscal limitation means that the result in twenty years may be similar or worse delays than are currently being experienced.

Financially feasible plans created by MPOs are then adopted into county and city growth management plans, and the road improvements shown on them are designed and built individually, mainly by county and state agencies.

MPO computer models give little consideration to non-auto travel modes, and are only rarely used to test the effectiveness of growth patterns other than the low-density disconnected form that has been popular across Florida in the past fifteen years. Yet Collier County's pattern of new neighborhoods being connected to major roads at only a single point may well change in the future; a primary hypothesis of the Focus planning process and this Community Character Plan is that this disconnected pattern is overdue for reexamination. The next section describes these and other factors about Collier County's framework for making transportation improvements.

SOME REASONS WHY GROWTH MANAGEMENT HASN'T STOPPED CONGESTION

The "concurrency" growth management technique that was pioneered by the state of Florida in the 1980s promised to avoid road congestion by forcing a building permit moratorium along a road that has reached its capacity. The unexpected result of this system has been to make infill development more difficult by increasing uncertainty on the part of developers, while spurring development in outlying areas.

Concurrency is narrowly focused on the short-term capacity of adjoining roads, rather than community character or the long-term functioning of the entire road network. This planning approach, combined with the recent popularity of low-density golf course subdivisions, precludes the creation of a normal road network. The result has been today's situation in Collier County where roads are passing the formal concurrency test but the physical form of much new development will have serious long-term consequences for mobility. Collier County is now beginning to pay the price of the resulting discontinuities in its road network that will ultimately limit residents' ability to drive on uncongested roads.

During this same period, Collier County has experienced record growth. The total volume of traffic might be expected to increase proportionately with this rate of growth. However, traffic has actually grown at a significantly faster rate than population when measured in "vehicle-miles traveled," a measure of both the number and length of trips made. This relative increase is also occurring nationwide due to increasing prosperity and the number and length of individual trips as jobs, housing, and services grow further apart.

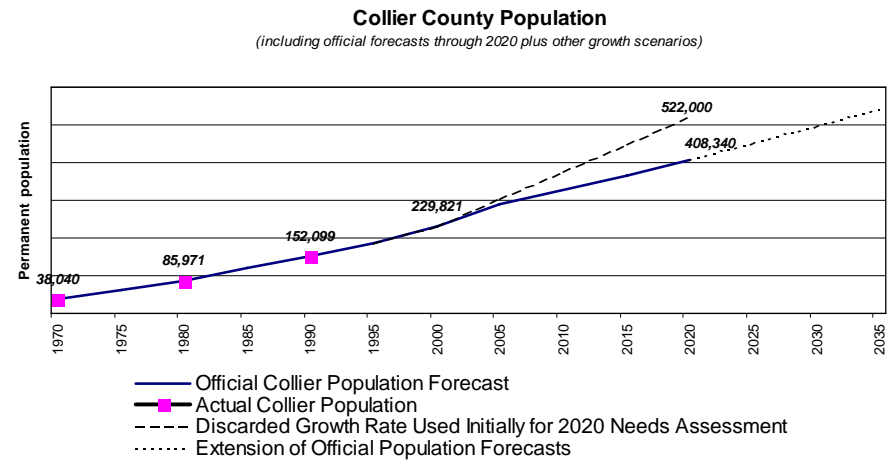


Figure (1) Collier County Population

Sources: U.S. Census; Collier Co. Planning Dept.; Naples (Collier Co.) MPO; Ord.. 00-31

The future rate of growth in population and jobs is of course difficult to determine. In 1995, Collier County began its last major MPO plan update with an extremely high population forecast for the year 2020 (522,000 permanent residents, as shown in **Figure 1**). A "needs plan" was created to provide roads for this population, but its cost was \$1.23 billion, more than double the available transportation revenue by the year 2020. This unrealistically high population forecast was quickly abandoned in favor of the current 2020 forecast of 408,340 people.

When the financially feasible plan was tested using the lower population, it functioned so well even with existing revenues, that there was no longer any reason to have a separate needs plan. In fact, several unnecessary road widenings were then deleted and the financially feasible road network still functioned well, even through the year 2024. However, the original needs plan for a population of 522,000 was never formally repealed, and that needs plan is sometimes mistaken for a prediction of travel demand for the year 2020.

Until a recent policy shift, Collier County had chosen through its growth management plan to wait to widen roads until they reached full capacity, putting the county in a reaction-to-crisis mode which was not able to fulfill community demands for free mobility during recent

winter seasons. This reaction mode made it difficult to balance community character with desired mobility levels, because once traffic conditions have deteriorated to such an extent, there is overwhelming citizen pressure for immediate action. With this pressure, there was little time to consider roadway or land-use alternatives that might respond to additional traffic more effectively than simply widening the existing road.

FUTURE ROAD EXPANSIONS & COMMUNITY CHARACTER

The breakdown of the previous road planning system has caused a major swing of the pendulum, with the previous approach of not widening roads until they reach capacity recently replaced with a highly accelerated road expansion program. The new approach is focused on widening the network of principal arterial roads as quickly as possible, which will require funds far beyond those available from the previous "pay as you go" approach. The county has begun engineering design on fifteen separate road improvements and is considering many more. The county has budgeted \$83 million for road construction in the current fiscal year, including a proposed \$58 million bond issue to be repaid from as-yet unidentified sources.

The new approach may also make it difficult to include citizen-driven corridor management plans to evaluate alternatives before final roadway design is undertaken. Acceleration of the most important projects is appropriate; however, if some roads were widened beyond the number of lanes shown on the adopted "financially feasible" road plan, it would require changes to the county's self-imposed prohibition against borrowing to build excess road capacity.¹ While that change is being

made, time will be available to conduct corridor management plans as suggested later in this chapter.

Roads greatly affect community character. Many roads in Collier County have already been expanded in response to actual and anticipated growth. Because many county roads serve only high speed traffic and lack street trees, sidewalks, and other features that make streets inviting places to be, both developers and taxpayers often install expensive berms and landscape buffers to protect themselves from those roads. Without a closer link between mobility and land use, increases in roadway capacity may lead mainly to continued development that consumes the roadway capacity without contributing in return the creation of road frontages that will be beautiful and positive community attributes. Also, building more lanes than are needed will encourage development in the furthest reaches of the county, supporting further urban sprawl, because excess road capacity in remote areas spurs land speculation, which leads to development proposals that often are later approved.

Development in isolated pods often maximizes its private realm but contributes little to the public realm. Collier County contains some of the state's highest quality residential and commercial development, but, with several notable exceptions, its major roads are taking on a generic look and feel rather than enhancing local character. This trend should be reversed, so that the public realm improves as the community grows.

¹ Capital Improvements Policy 1.2.4 in the Growth Management Plan



Figure (2) Colonial Blvd. at US 41, Lee County
Grade separations destroy intersections and retail while creating purely automobile oriented environments

GRADE SEPARATED INTERCHANGES FOR COLLIER

Grade separated interchanges have been mentioned frequently as a possible solution to Collier's congestion. There are several negative impacts caused by grade separation that should be considered carefully before such a solution is pursued. These are:

1. *Poor Cost Effectiveness* - Even a budget grade separation is likely to yield only a marginal cost / benefit ratio (1.0-1.5). A long list of other transportation investments (new collector streets, valuable address streets, etc.) yield more on initial investment.
2. *Loss of Street Frontage* - Grade separations pre-empt all of the fronting uses along the arterial street for about one-quarter mile in both directions, on both sides of the street. Impact on commercial property value, tax base, residential property value and tourism are likely to be immense and negative.
3. *Appearance* - Aesthetics are a primary concern with grade separations. These are frequently detailed in a similar manner to highway overpasses. This type of street detail is not conducive to great streets that support thriving retail, mixed-use, and pedestrian environments.

The fundamental, overarching objection to grade separations is that they are a step backward, introducing freeways back into the city. The grade separation is the most often cited cause of disruption to neighborhood fabric in existing cities. Freeways in cities, and therefore

grade separated interchanges, fail because of:

1. *Loss of control over land use* - Urban form is no longer set by local preference and vision, but by the realities of intersection placement. Growth and re-distribution follows major roads, not community plans.
2. *Increase in traffic congestion* - A supporting network is non-existent or lagging in Collier County; therefore, existing arterials will have to support a huge increase in travel on grade separated routes, and will likely fail in this role.
3. *Deformed retail environment* - Deprived of attractive arterial frontage and promised high speed, cross county traffic, retailers will have little choice but to create character destroying big box structures clustered around cross streets at the grade separated interchanges.
4. *Delay in doing the right thing* - When Collier County begins placemaking according to the principles of character and design found in this document, a grade separation program could retard, by a generation, the resolve to deal with root issues (community) rather than fix symptoms (traffic congestion).

Collier County is continually improving its system of selecting and building better roads. This mobility manual offers a variety of suggestions to continue this evolution and to respond to the citizen-developed visions of community character that are expressed in this plan. These suggestions are grouped into five major mobility strategies

MOBILITY STRATEGIES FOR MAXIMUM COMMUNITY CHARACTER

This section suggests mobility strategies that Collier County can undertake to enhance its current framework for making transportation decisions. By adding these strategies to its current approach, Collier County will begin making lasting progress toward resolving its current transportation problems.

The mobility strategies are organized into five groups:

Connecting neighborhoods

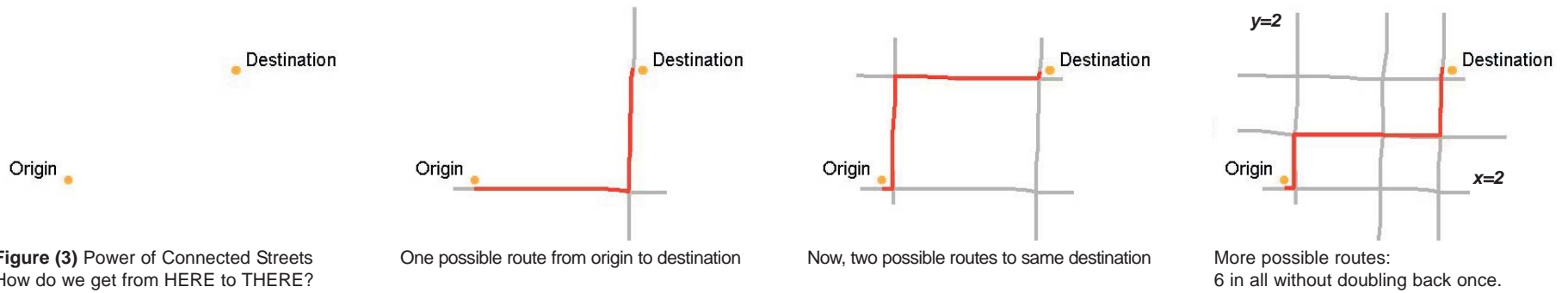
Enhancing Collier's road network

Designing great streets

Balancing character with congestion

Planning road corridors

Each strategy section is followed by specific recommendations. *Setting the Course* provides a broad summary of the strategy's goals. *Getting There*, provides the step by step modifications that are suggested changes to specific countywide regulations and policies.



MOBILITY STRATEGY #1:
Connecting Neighborhoods

This mobility strategy addresses the streets that form and connect individual neighborhoods, known as local and minor collector streets. The layout of major collector streets and other larger roads are addressed in the second mobility strategy; and the third strategy illustrates a palette of street types of all sizes.

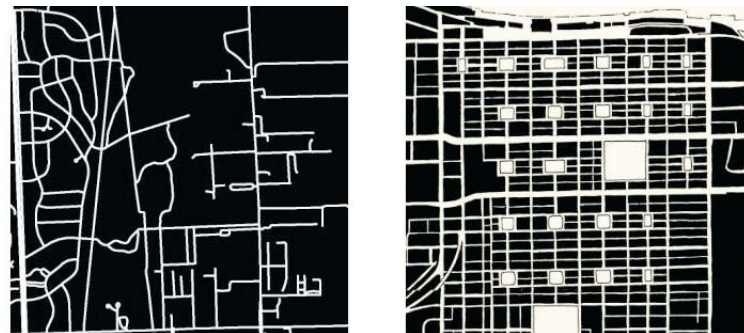
TRADITIONAL STREET NETWORKS

While preceding the automobile by centuries, the traditional way of laying out streets is proving to be an excellent model for accommodating automobile traffic. A dense network of well-connected streets at the neighborhood level provides a large number of possible routes for neighborhood traffic, thereby dispersing the traffic to a number of routes rather than concentrating it on a single route. Further, the dense and well-connected neighborhood street system affords a myriad of opportunities to "keep local traffic local," so that travel to many destinations comprising the most local of community needs (daily shopping, day care, etc.) can be accomplished on local streets, eliminating unnecessary use of chronically overcrowded arterial roads. As traditional towns grew into cities, their street networks continued

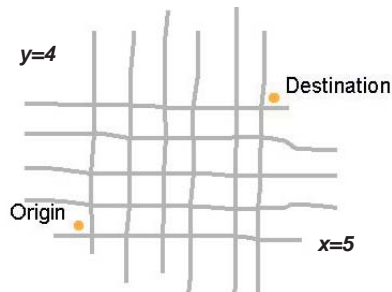
to grow in their pattern of dense and well-connected links. Some of the links then evolved into collector streets and arterial streets, taking on the role more of mobility (far and fast) as opposed to access to immediately adjacent properties. The hierarchy of "arterial," "collector," and "local" streets, still the basis of the street classification system, is patterned directly after the functional use of streets as they evolved historically.

Examples of towns and cities built on the principle of a dense and well-connected network of streets are abundant here in Florida. Naples offers a fine example of a town street network that grew over time, with the accretion of numerous pieces of street fabric as subdivisions were built. The pattern of providing a dense and well-connected network of streets continued even with the first era of large subdivision building. The mid-century layouts of Marco Island, Golden Gate, and Naples Park, while not grown "organically" in a piece-by-piece manner, still exhibit the street connectivity of the traditional town.

Figure (4) Street Network Comparison
1 sq. mile in Collier County (left) and 1 sq. mile in Savannah (right).



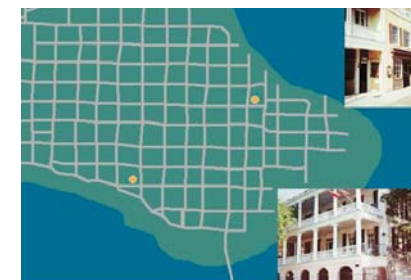
$$\frac{(x+y)!}{(x!)(y!)} = \text{\# of possible routes}$$



As you continue enhancing and expanding the network: 5 x 4 grid yields 126 routes using the traffic route equation



Make a town NOT "pods" 8 x 8 grid yields 12,870 routes...



...as can be seen in the actual plan of Beaufort, SC.

The Casey Hawthorne Traffic Routes Equation (only accounts for one direction)

THE RETURN OF WELL-CONNECTED LOCAL STREET NETWORK

The traffic advantages of a dense and well-connected street network are becoming more appreciated as it becomes apparent that such networks outperform the modern unconnected layout that is sometimes assumed to be superior or inevitable. Several high-tech developments (most notable cellular telephone systems and the internet) exploit the advantages of dense networks of low-capacity links, illustrating how the same principles can apply to street networks.

Perhaps the most compelling argument for a dense connected network is dispersal - its ability to spread traffic over an immense mileage of streets- rather than focus it all onto small "bottleneck" links or single subdivision entrances.

The ability of a network to disperse traffic is apparent from simple arithmetic. Residential development (regardless of whether in a traditional town or new suburb) requires around 25 miles of local street to service each square mile of new development, simply to provide access to residential lots. In a fully connected street system, all 25 miles are usable for travel from residential origins to daily destinations (daily shopping, school, day care, access to the arterial system, and so forth). If, on the other hand, the streets are laid out in an unconnected manner so that only a few of them are usable, then all of the travel becomes focused on those few streets that are connected. As the size of the unconnected areas begins to approach a square mile (as in Collier County), the disadvantages of the unconnected system quickly

become apparent. Instead of the local traffic demand being diffused over 25 miles of street (a fully-connected network), the same volume of travel demand is concentrated onto just one or two miles.

Another advantage of the highly connected street system is its ability to provide a "driving neighborhood." With the connected street system, motorists are able to travel to their daily destinations (which comprise almost two-thirds of all travel) on local streets. Drivers need not contend with multi-lane arterial highways for their daily travel needs, an increasingly important advantage for older drivers, inexperienced drivers, and visitors. The large volume of short trips and associated turning movements on arterial streets, arising from travel that must now use the arterials, can be greatly reduced, freeing the arterial streets for their intended purpose of longer-distance mobility. Further, providing access to daily travel destinations from streets other than the major arterials is a powerful factor in the ability to have such destinations in patterns such as neighborhood commercial and village centers, rather than arrayed in a linear fashion (strip development) along the major multi-lane arterials.

A well-connected network of local streets is one of the most effective measures that can be taken to accommodate travel by walking, bicycling, and transit. The enormous number of possible routes through a well-connected street system assures that attractive walking and bicycling routes can always be found (**Figure 3**). These streets are almost always two lanes and have low traffic volumes due to dispersal of traffic. The multitude of available routes between any given origin and

Figure (5)
Bicycle / pedestrian access forbidden. No more physical barriers precluding access to adjacent land uses



Figure (6)
Bicycle / pedestrian access welcomed. Connections between land uses accommodating non-auto modes

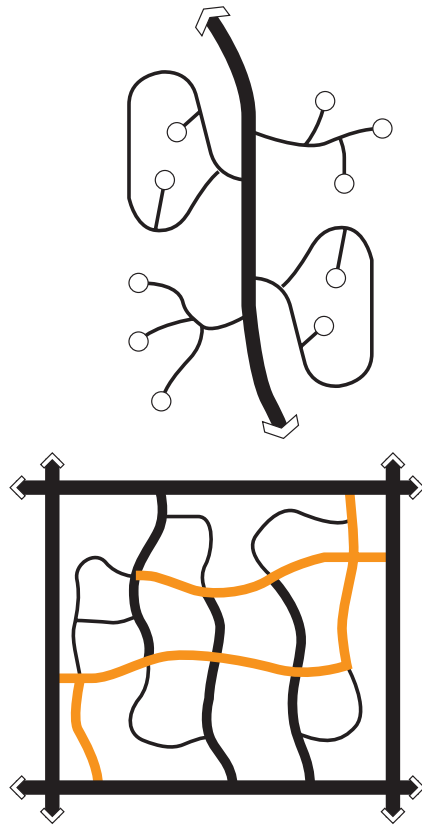


Figure (7) A "New" Pattern
(top): Discontinuous and impermeable
(bottom): Discontinuous, but Permeable
(same lane miles.)

destination provide an almost endless variety of paths that can be taken by walkers and bicyclists. This last feature is being appropriated by the latest generation of shopping malls, which are now creating "blocks" and multiple levels so that pedestrians need not ever retrace their steps.

The low volumes of vehicular traffic on local streets, resulting from the dispersal of traffic to a large network of streets, renders almost the entire local street system suitable for in-street bicycle use, typically as bicycle routes (i.e., bicycles simply sharing the street space with motor vehicles). A further option for the accommodation of bicycle travel on local streets is to designate the on-street bicycle lane along parts of the preferred route. The well-connected network of local streets puts a large number of "purposeful" trip designations (i.e., other than recreation) within bicycling range, using local streets only.

Sometimes shopping facilities are close to neighborhoods but fail to provide even minimal connections for pedestrians and bicyclists. Sidewalks and bicycle lanes not only provide better access but can also improve the physical character of the road, thus favoring pedestrians and bicyclists - and motorists - at the same time. **Figures 5 and 6** show wrong and right ways to connect adjoining land uses.

A well-connected network of local streets is also highly supportive of transit by providing good routes for transit and a high degree of connection for pedestrians between their origins/destinations and the transit stops. The connected street system permits transit routes to penetrate and connect the centers of residential concentrations and business, rather than having to either circuitously enter and exist indi-

Figures (8 & 9)
Central Avenue (right) and Crayton Road (far right) are excellent examples of efficient, multimodal, two lane collectors.



vidual subdivisions, or serve only the arterial streets fronting subdivisions. The highly connected network of local streets maximizes the number of households within walking distance of any given transit stop and provides a superior walking environment between homes and transit stops.

When neighborhoods are functionally and physically separated from each, travel between them is forced onto Collier County's sparse arterial network, as illustrated in the upper portion of **Figure 7**. By getting away from the recent pattern of single entrances to neighborhoods, multiple local streets can provide greater mobility to residents, as in the lower portion of **Figure 7**, while relieving congestion on the major arterials. Single connecting streets would not be left with unreasonable burdens.

Even gated communities with private roads can provide far better street connectivity than they do today. Instead of one gate blocking a single entrance, the main entrance would be a collector road open to the public, with gated enclaves permitted off the collector road where they don't block access to surrounding neighborhoods.

There are four major principles for connecting neighborhoods:

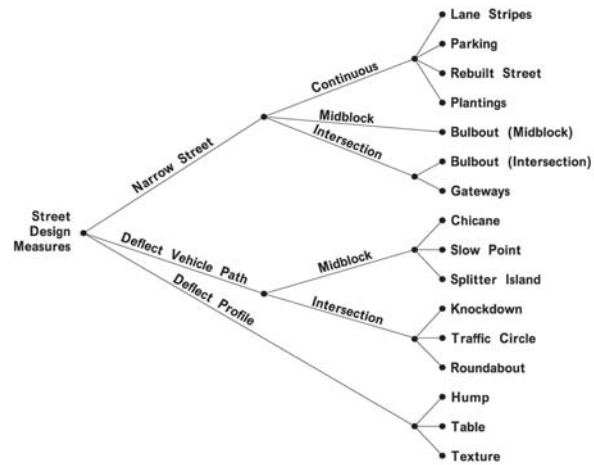
- Maintain existing connecting streets;
- Provide multiple entrances into and out of large residential developments;
- Create additional connections with new minor roadways (when opportunities are available); and
- Manage traffic and high vehicular speed through neighborhood traffic calming programs.

Collier County already has regulations and policies favoring interconnections between neighborhoods, although many have been weakened in recent years. Currently on the books is the following language:

§3.2.8.4.16, Streets: ... *Adjacent properties shall be provided with local street interconnections unless topography, other natural features or other ordinances/regulations do not allow or require said connections.... The arrangement of streets in subdivisions or developments may be required to make provision for the continuation of existing or proposed collector or arterial streets to and from adjoining properties, whether developed or undeveloped, and for their proper projection to ensure a coordinated and integrated street system per requirements of the growth management plan, this code or other ordinances and regulations.... Use of local streets by cut through traffic shall be discouraged, using methods (like traffic calming) that do not compromise connectivity or reduce the number of access points to the subdivision.* (from the Land Development Code)

Policy 9.3: *The County shall encourage the interconnection of local streets between developments to facilitate the convenient movement throughout the local road network unless such action will promote through traffic.* (from the Growth Management's Plan Transportation Element)

However, these provisions are somewhat ambiguous, with one reading of Policy 9.3 being that if any new through traffic might flow through the local road network, then the interconnection is suspect, regardless of how much other traffic might be removed from the network by the interconnection. Policy 9.3 needs to be modified to clearly state the



great potential of connected networks in reducing traffic congestion, and also to ensure that excessive or speeding through traffic will be limited by the layout and design of the connecting roads themselves. Many disconnected developments are already permitted and under construction. To move in the direction of better-connected neighborhoods, Collier County could use an objective tool to evaluate the street systems in applications for new development as to their level of connectivity. A tool of this type would take the form of a scorecard that developers and county staff can use to measure the following factors:

1. Internal street connectivity (more is better)
2. Connections to adjoining neighborhoods (more are better)
3. Percentage of acreage behind gates (less is better)
4. Percentage of street mileage ending in cul-de-sacs (less is better)
5. Blockage of the future street network (any is unacceptable)

This tool could also measure other factors that the county decides are appropriate in evaluating the overall merits of development proposals, such as:

6. Street widths (narrow streets work best in neighborhoods, while wide streets encourage speeding)
7. Proximity (or inclusion) of commercial uses (more is better)
8. Increase variety of housing types (more housing types, such as adding accessory apartments and live-work units, is better)
9. Percentage of wetlands saved or restored; integration of appropriate greenspaces; amount of shared parking; etc.

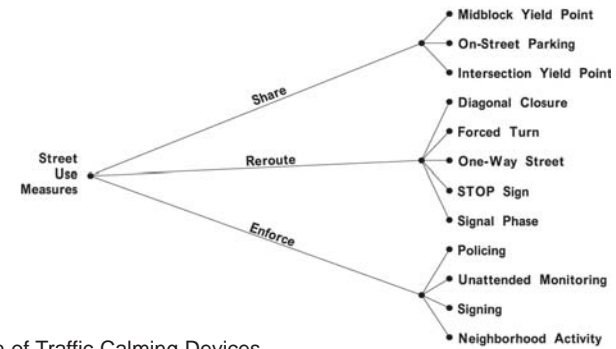


Figure (10)
Classification of Traffic Calming Devices

Each development proposal would be scored by county staff, but the tool would be able in advance for developers to analyze and improve their proposals prior to submission. A fixed score for approval probably would not be appropriate because the connectivity of some sites will be severely constrained by wetlands or adjoining gated communities, but this tool would provide an objective way to compare various neighborhood designs and to show how changes to proposals would improve them.

NEIGHBORHOOD TRAFFIC CALMING

When traffic moves at unsafe speeds through neighborhoods, traffic calming techniques can be introduced. The purpose of traffic calming is to retrofit existing streets by controlling the speed of traffic while not restricting mobility by closing streets. Traffic calming techniques generally fall into three categories: narrowing the street; deflecting the vehicle path horizontally; and deflecting the vehicle path vertically. When new residential through streets are built, they can be planned for slow speeds at the outset, whereas traffic calming is often used as a retrofit technique.

Collier County's Neighborhood Traffic Management Program (NTMP) provides a good menu of traffic calming strategies, using the following principles:

1. **Narrowing the street** reduces the speed that most drivers find reasonable and comfortable (the design speed). Actual narrowing is done by reducing the pavement width, adding parking to the street,

or adding a median. The effect of narrowing can be accomplished with street trees along the curb, a tree canopy in the median, and buildings placed closer to the street.

2. **Deflecting the vehicle path** causes drivers to slow and devote more attention to the task of driving. Deflection is done through changing the automobile's route slightly. Some measures apply at mid-block locations, while others are appropriate for intersections.
3. **Changing the pavement surface** demands attention from drivers and reduces speed. Speed humps, speed tables, and special pavement materials are common methods for changing the pavement surface.
4. **Sharing the pavement** with other vehicles slows vehicles and raises the attention level of drivers. Long a feature of traditional local streets, shared-use can be reintroduced into other streets by selective short sections of narrow pavement, either at mid-block locations or near intersections.
5. **Diverting the driver's route** makes vehicular access more difficult, and encourages the driver to use another route. Diagonal street closures, one-way streets, median closings, and turning movement restrictions are primary examples of diversion.
6. **Traffic control devices** slow traffic through regulation. STOP signs, four-way STOP signs, traffic signals, and posted speed limits are devices frequently used to calm traffic. Intensified enforcement of traffic regulations can calm traffic, generally by reminding drivers of posted speed limits and by enforcing STOP sign observance. Police officers are the best source of intensified enforcement, but neighborhood volunteers can also be effective without the high cost of continued law enforcement personnel.

This plan recommends doubling the NTMP budget in order to develop appropriate measures to enhance sub-arterial connecting streets and prevent speeding, to make the program more comprehensive in scope (rather than looking at a single street in isolation), and to use the NTMP process to prioritize future improvements on streets within and between neighborhoods. **Figures 10 and 11** illustrate a method of classifying traffic calming devices and a range of actual traffic calming techniques.

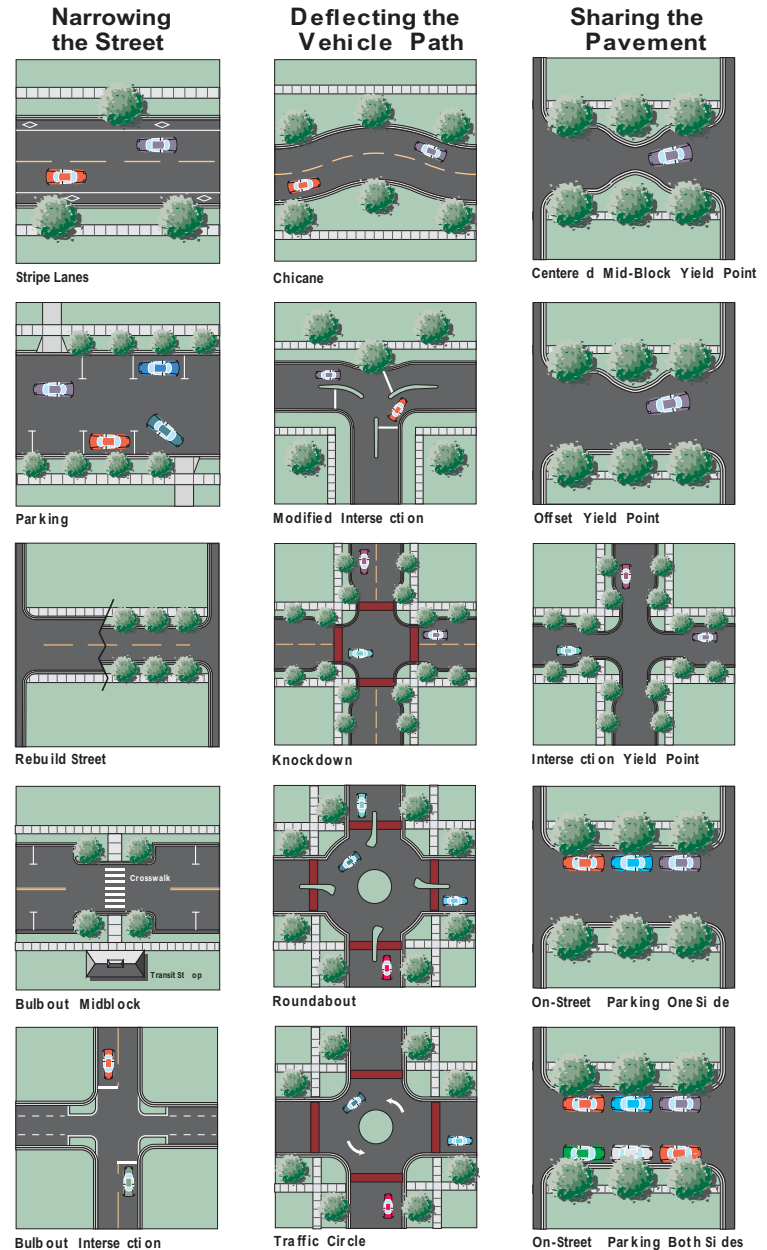
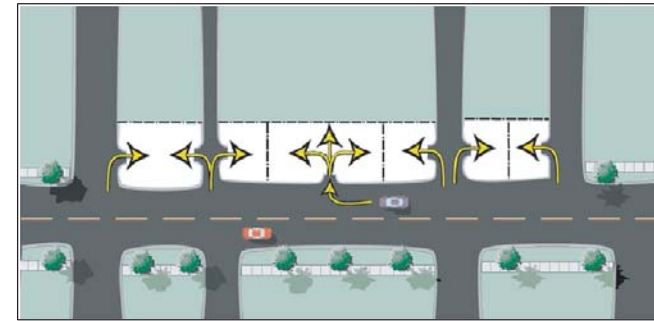


Figure (11) Typical Menu of Traffic Calming Devices

Figure (12)
Connections at the Parcel Level
showing shared driveway, cross access
and reverse frontage conditions.

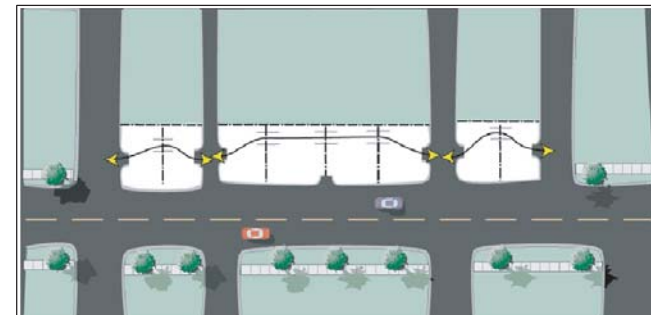
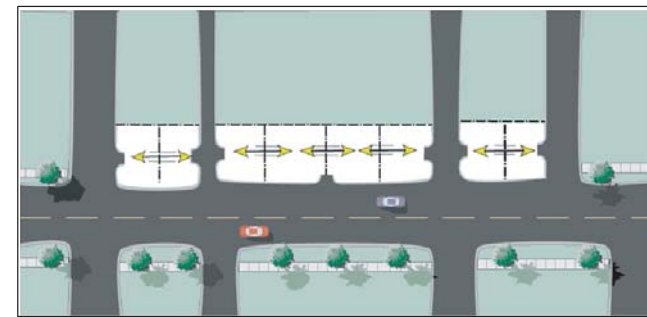


PARCEL-LEVEL CONNECTIONS

As additional land is developed and commercial driveways are created, congestion intensifies to yet another level. Vehicles on already densely packed roads experience additional delay from interruptions to the traffic stream when vehicles use the driveways. These delays lead to longer commute times and additional complaints from residents. This report emphasizes connectivity at several scales, from pedestrian connections to shopping centers all the way to the county-wide grid of arterial roads. At the smallest scale, individual parcels in shallow strips can be better connected with shared driveways, cross access easements, and reverse frontage roads, as illustrated in **Figure 12**. These techniques reduce conflicts with the main flow of traffic by accessing commercial land from minor streets. Many commercial uses benefit from such collocation, and reverse frontage roads, when extended, form a parallel roadway.

Parcel-level connections can be taken another step when parking lots are shared by adjoining land uses. When land uses are separated physically and functionally, each use requires a full supply of dedicated parking spaces, and walking between the isolated uses is unappealing. When different land uses are closer to one another, walking is convenient, and the total number of parking spaces can be reduced when the busiest hours for each land use are somewhat different.

On a larger scale, clusters of commercial parcels should be integrated in a logical and functional pattern prior to building on individual parcels. Collier County's current system for approving new commercial development is not accomplishing this goal. Commercial PUDs are being approved with insufficient detail to show interconnections among nearby parcels; and the Land Development Code does not



clearly require new commercial activities on land zoned C-3 to C-5 to anticipate connections to adjoining parcels. This lack of foresight will cause some of Collier County's major commercial concentrations to function poorly and will forever add unnecessary trips onto major roads simply to allow movement between adjoining parcels.

CONNECTING NEIGHBORHOODS

SETTING THE COURSE

New neighborhoods should be connected to their surroundings rather than being isolated. Where possible, existing neighborhoods can also be connected, using traffic-calming techniques to prevent excessive or speeding traffic. Adjoining commercial parcels should have an integrated system of connections before new buildings are constructed.

GETTING THERE

1. Growth Management Plan:

- a. Clarify and strengthen the county's policy on interconnections between neighborhood by amending Transportation Element Policy 9.3 to recognize the great potential of connected networks to reduce traffic congestion and also to ensure that *excessive* or *speeding* through traffic will be limited by the layout and design of the connecting roads themselves.
- b. Add a policy that requires a technical evaluation of proposed residential PUDs and other larger rezonings as to the spacing and connectivity of local streets, percentage of land behind gates, and interconnections with adjoining neighborhoods.
- c. Add a policy that requires commercial PUD rezonings, plats, and site development plans to demonstrate reasonable integration and interconnection with adjoining developed or undeveloped land
- d. Add a policy supporting improved parcel-level connections through future changes to the land development code.
- e. Add a policy that new residential developments provide either a connection or the opportunity for a connection to support a collector road network at about one quarter mile intervals.

2. Land Development Code:

- a. Provide the detailed criteria for evaluating the connectivity and spacing of local streets in proposed developments.
- b. Amend §3.2.8.4.16 of the code to delete the ambiguity as to when street interconnections will be not be required.

c. Require newly subdivided neighborhoods to:

- (1) Establish a connected street pattern with only a minimum of cul-de-sacs; and
- (2) Limit gates and other access restrictions to portions of neighborhoods so that even communities with gates can have street interconnections with adjoining neighborhoods and can be connected to collector roads at about one-quarter mile intervals.

d. Amend current code provisions that unnecessarily restrict shared parking lots or provide insufficient criteria for shared driveways and cross access easements.

e. Amend the code as needed to require commercial PUD rezonings, plats, and site development plans to demonstrate reasonable integration and interconnection with adjoining developed or undeveloped land

3. Neighborhood Traffic Management Plan (NTMP):

a. Double the annual funding for the NTMP in order to:

- (1) Expand the program to develop measures that would enhance sub-arterial connecting streets and prevent speeding; and
- (2) Make the NTMP more comprehensive in scope, to examine neighborhood traffic patterns rather than individual streets in isolation; and
- (3) Prioritize future improvements on streets within and between neighborhoods.

MOBILITY STRATEGY #2:

Enhancing Collier's Major Road Network

As a result of Collier County's coarse spacing of arterial roads, neighborhoods that contain a connecting street sometimes experience a high level of cut-through traffic that travels too fast for neighborhood safety. Important connecting streets such as Kings Way have been closed recently, diverting more traffic to the congested arterial network. Eliminating such a street solves one site specific problem but unfortunately increases congestion on the arterial network.

Without a network of collector streets and interconnected neighborhoods, drivers are forced to over-use Collier County's network of major arterial roads. As growth continues, the only apparent method to relieve traffic congestion is to widen those arterial roads up to the practical cap of six lanes. Although past development patterns have made many of these six-lane widenings inevitable, there are still many opportunities to:

- Ensure that newly developing areas are provided with a proper collector network;
- Preserve existing collector roads, using traffic calming techniques where necessary to protect neighborhoods from high speed cut-through traffic; and
- Retrofit at least a minimal collector network where opportunities still exist.

LAND DEVELOPMENTS THAT BLOCK THE FLOW OF TRAFFIC

The predominate development pattern in Collier County in the past fifteen years has been inward-facing communities with high amenity levels but very limited connections to surrounding land uses. This disconnected and impermeable pattern forces more cars onto the already sparse arterial network while precluding the creation of public connector roads and neighborhood interconnections.

Despite a policy to the contrary in Collier County's growth management plan, new Planned Unit Developments (PUDs) have often been approved with only a single connection in and out. This impermeable development pattern has many sections of land completely unable to serve local and regional travel demands. **Figure 13** indicates the amount of land in Collier County where the street network is inhibited such that short local trips are forced to mix with longer regional trips on the same roadways. This mixing creates a great deal of "friction" to the flow of traffic and is very inefficient in terms of circulation.

A low-density sprawling development pattern has become the norm. In place of the earlier moderate-density pattern typical of Naples, Golden Gate City, and Naples Park, new homes are going up at much lower densities in Golden Gate Estates and in golf-course communities. Very high land costs have pushed moderate-cost housing further from jobs and shopping opportunities, even into central Lee County. Travel to and from this housing adds further pressure on the sparse road network, including the difficult-to-expand roads through existing neighborhoods and wetlands just north of the county line.

In addition, there has been a strong trend toward large stores and large schools, all surrounded by parking lots. These destination have

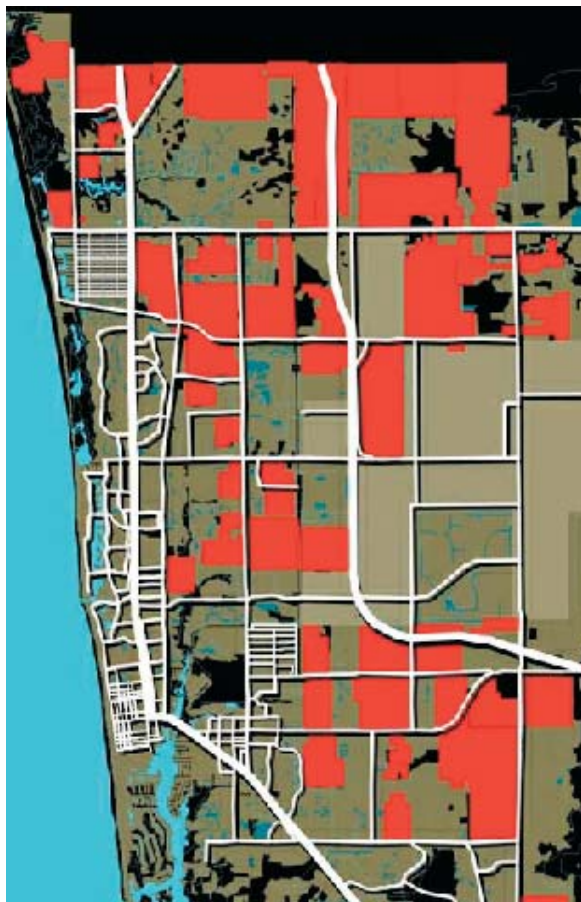


Figure (13)
Existing planned unit development where no thoroughfares exist.



Figure (14)
Collier has plenty of roads...



Figure (15)
...unfortunately too few lead to another public thoroughfare.

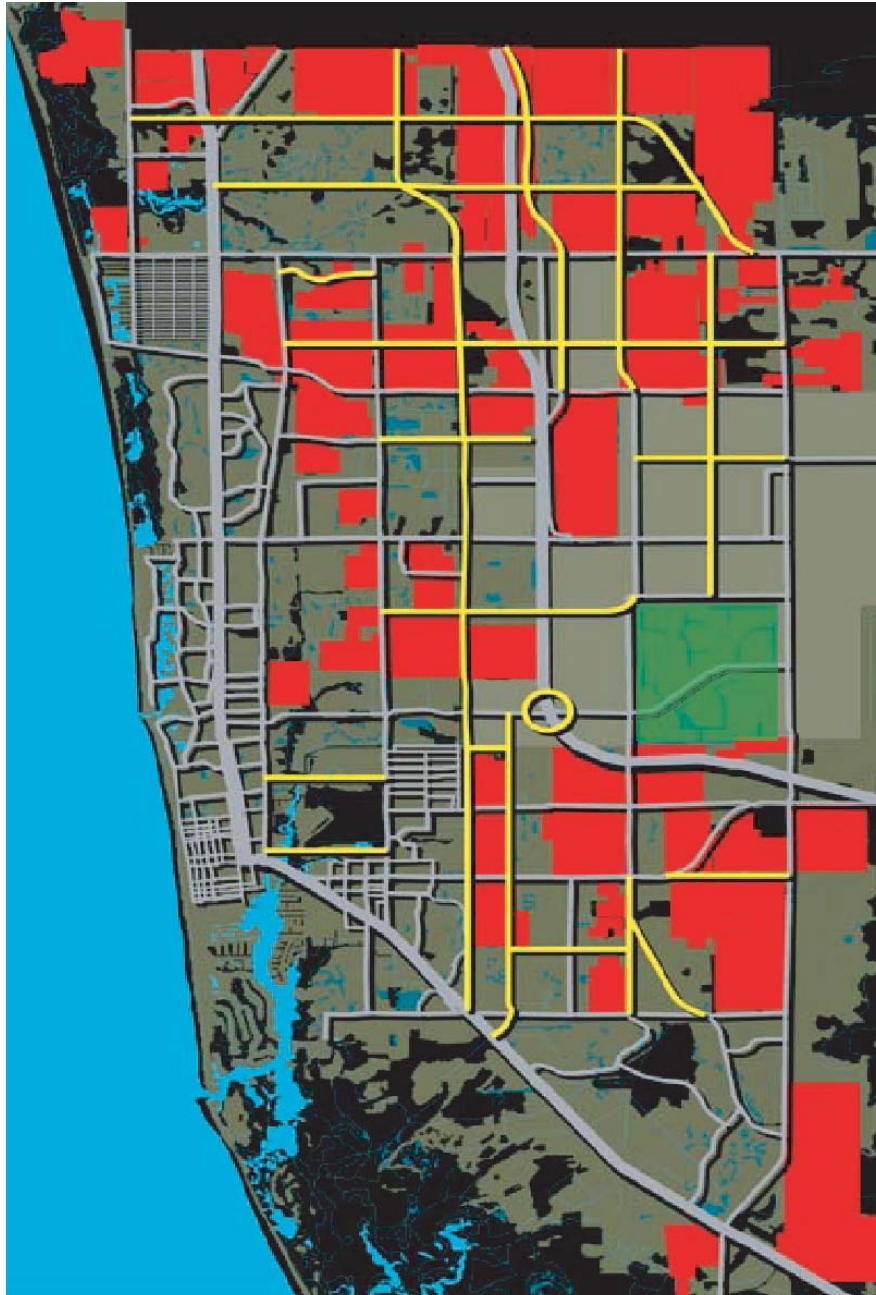


Figure (16)

Managing mobility through increased choices: Conceptual Thoroughfare Plan for western Collier County

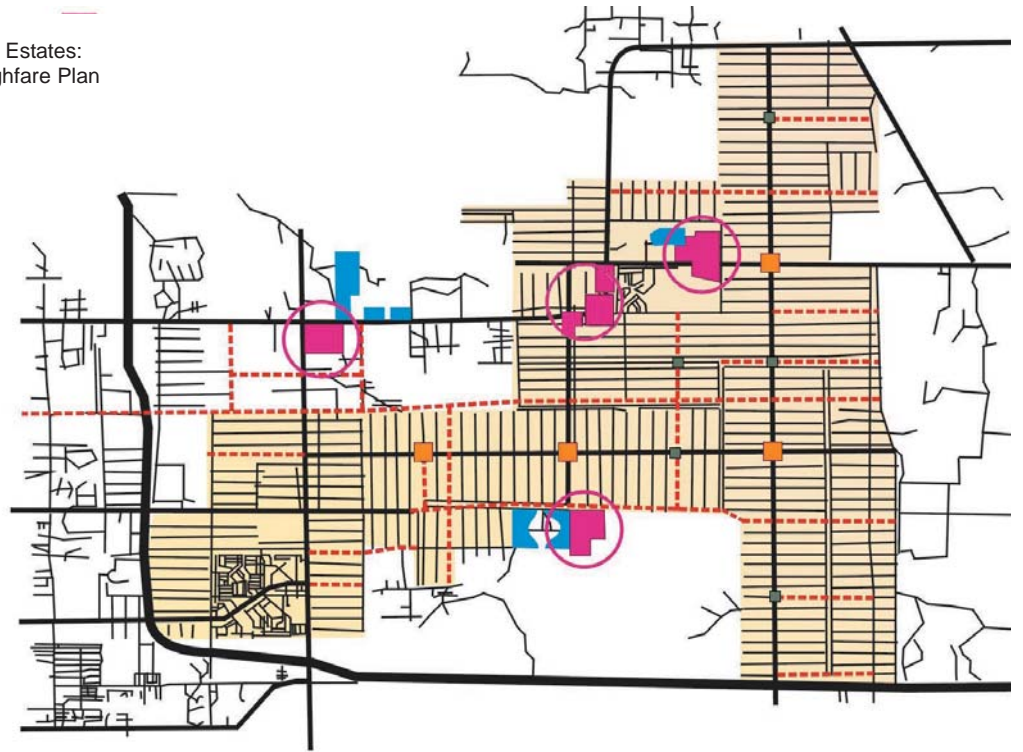
become difficult to reach except by car, forcing people to drive almost everywhere, often at increasing distances. This sprawling settlement pattern requires more roads, yet there are serious discontinuities in (and often the virtual absence of) the collector and minor arterial roads that Collier County needs.

CREATING A MORE BALANCED ROAD NETWORK

A well-connected road network has less traffic friction and lower levels of unnecessary induced traffic caused by the need to go "out the main entrance and around" for most trips. For these reasons, a connected network of two and four-lane roadways spaced every mile or less apart can carry traffic considerably more efficiently than a system of four or six-lane arterials spaced several miles apart. The widest and highest-speed roads are the most difficult to design as comfortable places for pedestrians and bicyclists, further encouraging people to use their cars even for short trips. Therefore, while preparing for continued strong growth in Collier County, county officials should seek a more balanced road network and consider character-maximizing practices for new and widened roads, both of which will help establish more desirable patterns of growth.

The creation of a more balanced road network should begin immediately. There are major difficulties involved in retrofitting missing collector roads, and those difficulties will increase as privacy-seeking families build homes near potential alignments, unaware of the need for a new roads. Also, land developers will plan infill developments on vacant parcels that could take advantage of a first-class connector road if they knew it was in the planning stages. The current demand

Figure (17)
 North Golden Glade Estates:
 Conceptual Thoroughfare Plan



for reducing congestion in Collier County makes this the ideal time to identify where connector roads could be retrofitted into the road network and to begin building them with the same urgency given to widening major arterial roads. Road network planning of this kind has been upheld by the Florida Supreme Court as a valuable long-range planning tool provided it is an integral part of an adopted growth management plan.²

Collier County's growth management plan now includes three maps that show future roads, all derived from the MPO's long-range transportation plan. One is the same map as the MPO's most recent financially feasible plan, which indicates the desired road network for the year 2020. The second map shows a similar but less-developed network indicating the progress toward that network anticipated for the

year 2010. The third map shows the roads to be built or widened in the next five years.

Collier County does not currently have a thoroughfare plan that includes roads that are smaller than those contained on these three maps. A thoroughfare plan would include a map that shows all roads on these maps but would also include existing and potential collector roads and prime opportunities for interconnections between existing neighborhoods and future development. **Figures 16 & 17** show a conceptual thoroughfare plan that overlays potential connector and minor arterial roads onto the planned grid of major arterials and freeways. (The "divided connector street" described in the next section of this report would be the most appropriate type of street for the yellow "missing links" depicted on this conceptual plan.)

The adoption of a thoroughfare plan for Collier County would be a

² Palm Beach County vs. Wright (Florida, Supreme Court, 1994)

vital part of a formal policy establishing a collector road system and beginning to plan for neighborhood interconnections. The preparation of a thoroughfare plan would require the careful study of the feasibility of each potential connector road (and additional minor arterials) plus evaluating the street pattern in existing neighborhoods that adjoin undeveloped land.

To create a balanced and expanded road network, Collier County should take the following actions (each is described more fully below):

- *Prepare a county-wide thoroughfare plan and adopt its map into the land development code*
- *Encourage the use of development agreements to allocate costs of transportation improvements that are required because of new development.*
- *Amend the road impact fee ordinance to help pay for the new collector road system.*
- *Extend the county's 5-cent gas tax when it expires at the end of 2003 (this tax brings in over \$4 million each year).*
- *Direct the MPO to conduct technical evaluations of these new road proposals.*

ENHANCING COLLIER'S MAJOR ROAD NETWORK

SETTING THE COURSE

Collier County should create a balanced road network by improving its network of principal arterial roads while simultaneously creating a secondary network of smaller roads that link neighborhoods. The potential for this secondary network should be illustrated on a new thoroughfare plan map. Road impact fees should be increased to pay for this secondary road network.

GETTING THERE

1. Thoroughfare Plan:

- a. Prepare a thoroughfare plan identifying a secondary road network including potential collector and minor arterial roads, plus opportunities for interconnections between existing neighborhoods and future development.

2. Growth Management Plan:

- a. Add policies to the GMP to describe the purpose of the thoroughfare map, direct its creation, and outline how it will be implemented, including:
 - (1) Not issuing any development approvals that would block future roads;
 - (2) Requiring unbuilt PUDs to modify their site plans upon expiration of their rezoning approval to provide future roads on the thoroughfare map and to improve internal connectivity; and
 - (3) Requiring developers to build links on the thoroughfare plan that run through their properties at the time of development.
- b. Modify GMP financing policies as follows:
 - (1) Establish an appropriate priority for public construction of links on the thoroughfare plan, by amending Policies 1.1.2.D and 1.1.4 of the Capital Improvements Element (CIE) and Policies 1.1 and 1.2 of the Transportation Element; and
 - (2) Delete the prohibition on borrowing funds to build any connector roads that might be deemed as providing "avoidable excess capaci-

ty," by amending CIE Policy 1.2.4; and

- (3) Adopt a policy encouraging the use of development agreements (as authorized by F.S. 163.3220) to allocate costs of transportation improvements resulting from new development to the benefitting parties."

3. Land Development Plan:

- a. Adopt the thoroughfare plan's map into the land development code.
- b. Amend the land development code to require newly approved developments to:
 - (1) Include collector roads that are open to the public and not blocked by gates;
 - (2) Incorporate any road links shown on the thoroughfare map; and
 - (3) Prior to renewal of rezoning approval for unbuilt PUDs, require the modification of their site plans to provide collector roads that are open to the public.

4. Road Impact Fee Ordinance:

- a. Conduct a new impact fee rate study that includes an evaluation of the use of road impact fees to pay for the expanded road network shown on the thoroughfare map.
- b. Amend the road impact fee ordinance to:
 - (1) Increase impact fees to pay for these roads and for sidewalks and bike paths;
 - (2) Offer impact fee credits to developers who build these roads through their property;
 - (3) Regularly update the impact fee rates to match increases in construction costs; and
 - (4) Ensure that impact fee credits are not granted for road improvements that benefit only private parties.

5. Financing Issues:

- a. Extend Collier County's 5-cent gas tax beyond its current expiration at the end of 2003 and pledge its proceeds to borrow funds, part of which can be used to immediately begin building links shown on the thoroughfare

plan map.

- b. During each annual budget cycle, review a schedule of proposed capital improvements to roads for the next five years:
 - (1) This schedule should include road improvements needed to avoid a concurrency moratorium and other priorities in the growth management plan, plus acquiring land and building those links shown on the thoroughfare plan that are not likely to be built by private developers;
 - (2) The full five-year schedule should be published in Collier County's annual budget book and incorporated into the growth management plan immediately after budget adoption. This schedule should include a map plus details for each road project such as:
 - (a) the starting and ending points for the project;
 - (b) the number of existing and proposed lanes;
 - (c) the general character of the project; and
 - (d) whether the project includes design, right-of-way acquisition, construction, or all three steps.

6. Long Range Transportation Plan:

- a. Direct the Naples (Collier County) Metropolitan Planning Organization to expand its computer modeling during the next update of its long-range transportation plan in order to:
 - (1) evaluate the expanded collector road network and better-connected neighborhoods, as proposed in this plan; and
 - (2) test alternate land-use scenarios such as a trend toward more compact mixed-use neighborhoods.
- b. The MPO should continue its traditional role of integrating a wide range of land-use and environmental goals into transportation planning, and its staff director should report directly to the elected officials who comprise the MPO's governing board.



MOBILITY STRATEGY #3: ***Designing Great Streets***

A community's streets represent a large portion of its public land. First and foremost, streets provide mobility, but they also are critical public spaces that help form a community's image, for itself and its visitors. Negative images result from overcrowding, plainness, ugliness, and lack of public amenities. This is widely understood in Collier County, as evidenced by the broad consensus to make the new intersection of Interstate 75 and Golden Gate Parkway into a beautiful gateway to Naples, rather than a typical commercial interchange.

Most great streets result from great design, although an occasional street may be good or even great because of happenstance, such as natural vegetation or attractive development along the street. The design of great streets combines vehicular movement with other roles that the street will play in forming the town. To expedite the road design process, Collier County has adopted a standard cross-section for a six-lane arterial road. This single design should be replaced with a palette that includes parkways and minor arterial roads as well as connector and local streets.

A PALETTE OF "GREAT STREETS"

A palette of "Great Streets" for Collier County should include the following range of street types. Each type is described and illustrated by one or two examples.



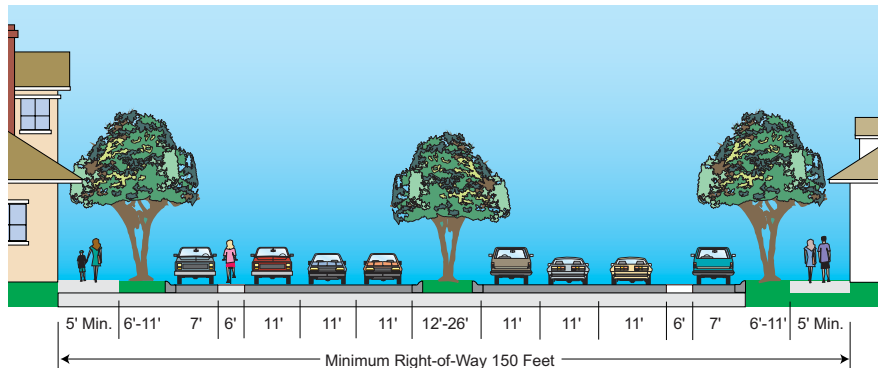


Figure (18)
6 Lane Major Arterial

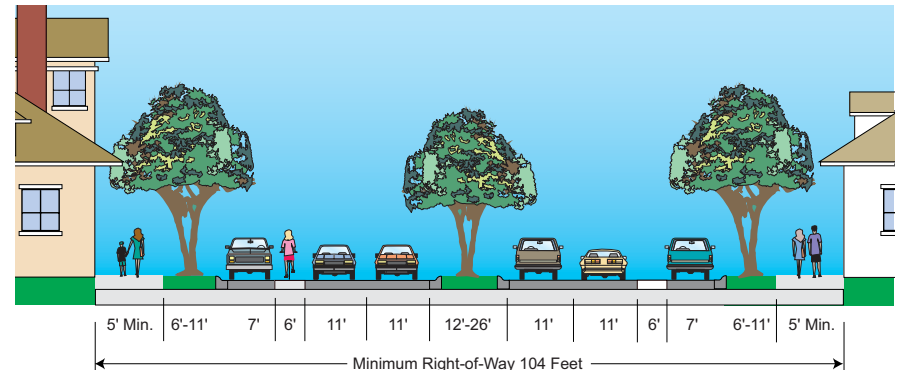


Figure (19)
4 Lane Major Arterial

MAJOR ARTERIAL

The primary function of the major arterial street is through movement; that is, moving the maximum number of vehicles at the highest reasonable speed. Access to adjacent properties is not a major function of arterials. Rather, most access is intended to be provided by the network of intersecting streets (connectors) and the even-more intricate network of local streets of various types.

The divided four-lane or six-lane cross-section of the major arterial emphasizes its function as a provider of mobility rather than access. The median limits the amount of conflict with intersecting traffic and channels this conflict into intersections where it can be best managed by signals and other traffic control devices. In addition to being a traffic control measure, the median provides the important benefits of narrowing the apparent width of the road (an aesthetic value) and in providing a refuge for pedestrian crossings (a safety advantage).

Variations of the major arterial reflect the nature of the adjoining lane uses. Depending on the adjacent lane uses, the drainage can either be accommodated with an enclosed (i.e., curb and gutter) system or with open swales. Bicycles are accommodated in an off-street side path, or in a off-street combination bicycle/pedestrian side path. While street trees are included in the county's current cross-section, these cross-sections move them to the traditional location, the planting strip between

the sidewalk and the road.

It is entirely reasonable that, at selected locations, the major arterial also serves as a "Main Street" for a business or institutional district. Florida abounds with good examples of four-lane and six-lane arterial streets that are valuable addresses for occasional concentrations of businesses while remaining attractive and valued public spaces. When serving as a commercial street, the major arterial cross-section has curb and gutter edges, with generous (12-15 feet) sidewalks extending to the curb. On-street parking is permitted and even encouraged through the major business district. The on-street parking lane can be shielded by "bulbouts" at intersections and at mid-block locations, thereby lending a sense of security for users of the parking lane, as well as narrowing the apparent width of the street for all users (a traffic calming and pedestrian crossing advantage). Bicycles are accommodated in either a pair of bicycle lanes between the parking lane and the outer driving lane, or, alternatively, in a combination bicycle / pedestrian side path on one side of the street.

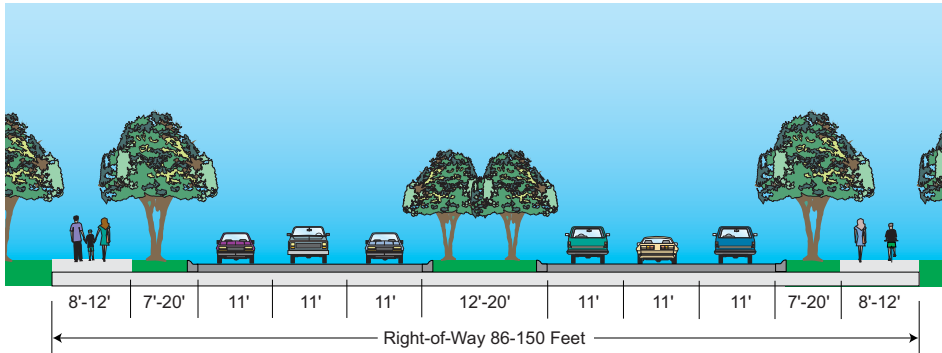


Figure (20)
6 Lane Parkway

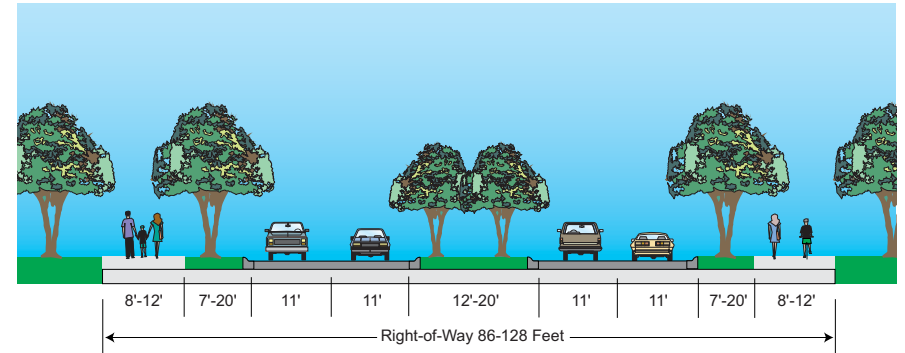


Figure (21)
4 Lane Parkway

PARKWAY

In addition to the cross-sections described above, the major arterial can also take the form of the parkway, a divided highway bordered by rural, forested, park-like, or other natural environment. As is the case with all arterial streets, the primary function of the parkway is through movement, that is, moving large volumes of traffic at the highest reasonable speed. The absence of fronting activity along the parkway further reinforces its function as a conduit for through traffic.

Parkways, once a standard component in urban and suburban street systems, have become a rarity. This scarcity, however, is not justified. Parkways could be used for substantial portions of Collier County's major arterials given the wide rights-of-way being acquired, the abundant rural and natural features, and the desire by many private developers to "hide" from the road rather than face it. Parkways are a powerful and memorable signature of an area.

Parkways can contain a median of varying width, to accommodate natural features (for example, patches of wetlands) or to accommodate new vegetation intended to promote the "park-like" environment. Almost always, the drainage is accommodated with open swales, and curbs are not used. Exceptions can be made for segments in which a smaller clear zone (i.e., distant between pavement edge and trees) is desired. Bicyclists are accommodated on a bike path, which can take advantage of natural features to meander within the right-of-way. Combination bicycle/pedestrian side paths are also appropriate.



The scenic George Washington Parkway leading into Washington DC.

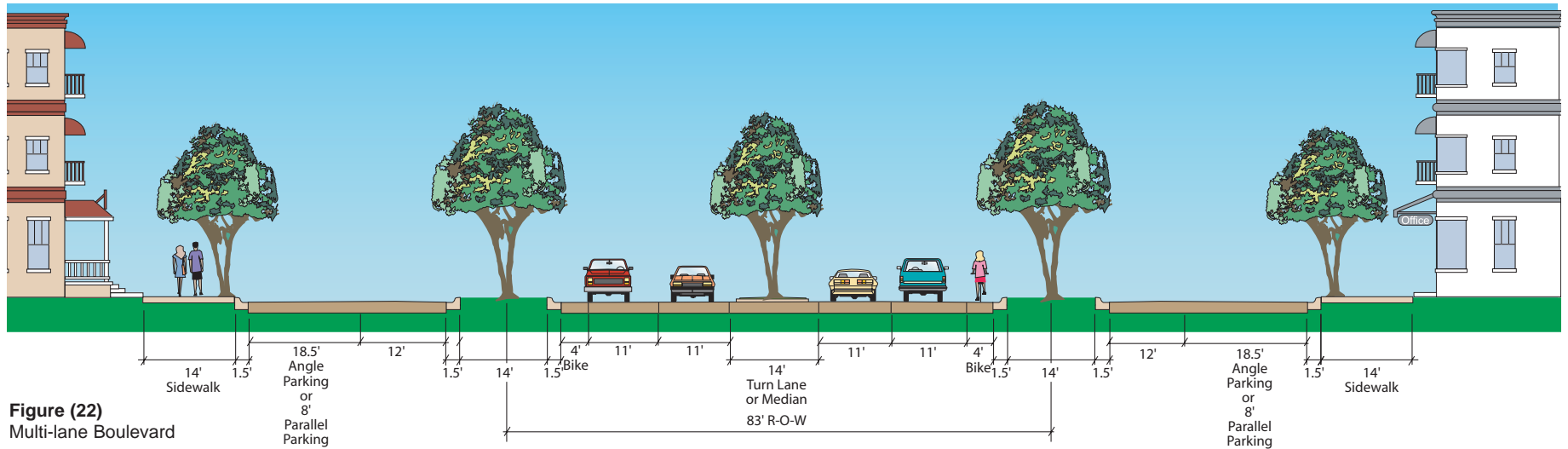
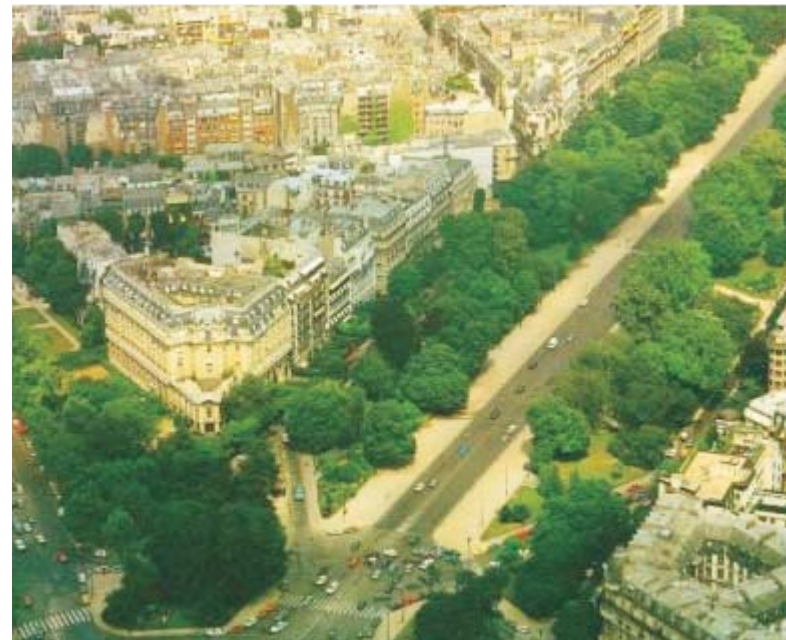


Figure (22)
Multi-lane Boulevard

MULTI-LANE BOULEVARD

The multi-lane boulevard serves the high traffic demands commonly found in areas with big box retail and a lack of dense street network. In areas that are growing quickly in the conventional strip development, nonresidential multi-lane boulevards are the preferred option for retrofitting the road and spurring redevelopment. Found in cultural capitals of the world, as well as in significant corridors in small American cities, multi-lane boulevards provide for mobility along with the dramatic landscaping and pedestrian-serving opportunities.

The provision for on-street parking depends on traffic volume and the nature of traffic using the roadway. For roadways operating at or above an acceptable level of service with a high percentage of local internal trips, on-street parking is recommended. On-street parking is less appropriate for roadways with a large number of through traffic and turning movements.



Aerial picture of a grand boulevard, the Champs Élysées in Paris.

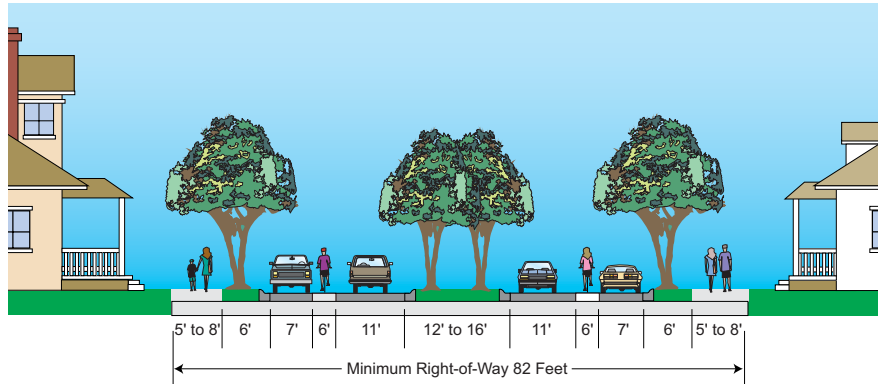


Figure (23)
Divided connector street

DIVIDED CONNECTOR STREET

This street type provides a prominent address for residential development while also connecting neighborhoods with each other and to travel destinations such as shopping areas and arterial streets.

These two functions are accommodated by a street design that provides for a free flow of traffic, but reduces the impact of the traffic by dividing the street with a median, thereby minimizing the apparent size of the street and its impact on adjacent properties. On the divided connector street, each direction of traffic has its own lane, and traffic flow is therefore never impeded by parked vehicles, even when parking is present. This contrasts with the street (to be described shortly), where, by design, the presence of a parked vehicle slows traffic flow.

The median in the divided connector street improves traffic flow by organizing the points of access to the street. The median also controls vehicular speeds by reducing the apparent width of the street, by providing space for an additional row of street trees, and by facilitating the crossing of the street by pedestrians. These design features make the divided connector street an appealing residential address.

Traffic flows freely at 25-30 miles per hour on the divided connector street. Bicycling is accommodated either through a 6-foot on-street bicycle lane (adjacent to the parking lane or adjacent to the pavement



Figures (24 & 25) Examples of divided connector streets in Collier County. Central Blvd (above) and Park Shore Drive (below)



edge if there is no parking) or through an off-street bicycle/pedestrian side path on one side of the street. The divided connector street accommodates pedestrians with sidewalks on both sides of the street or with a combination of sidewalk on one side and bicycle/pedestrian side path on the other.

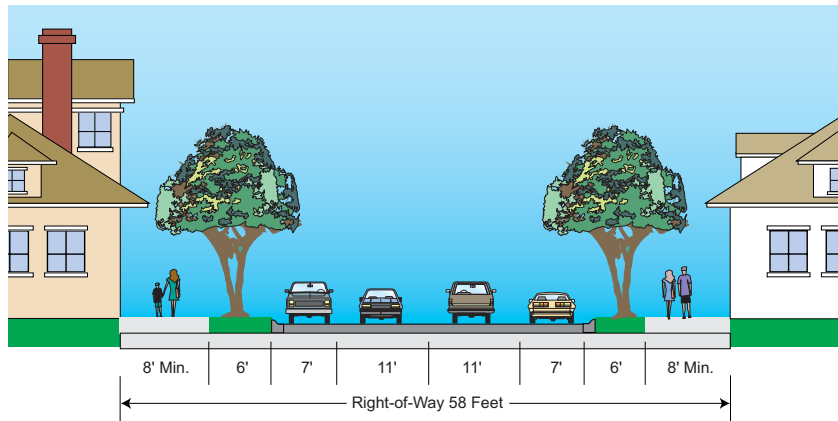


Figure (26)
Connector street without median

CONNECTOR STREET WITHOUT MEDIAN

The connector street without median, a two-lane free flowing street, is similar to the connector street with median (on the previous page) in its role of connecting neighborhoods to other neighborhoods and to arterial roads. In addition to these functions (i.e., connecting streets and neighborhoods), the connector street without median is highly appropriate for neighborhood and small community commercial areas. The connector street without median provides for one lane of traffic in each direction and separate marked parking lanes on both sides of the street.

Bicycles can be accommodated in the traffic lane, or, on important bike routes or where traffic volumes are high, in a separate lane located between the parking lane and the traffic lane. Sidewalks are provided on both sides of the street. In residential areas, a 6-8 foot planting strip, intended for street trees, separates the sidewalk from the street. In business districts, an appropriate sidewalk design would be a 12-15 foot sidewalk extending all the way to the curb, with street trees and other street furniture inserted into the sidewalk intermittently.

The connector street without median is readily recognizable as the neighborhood and small-town "Main Street." This street figures prominently in imagery such as tourism materials that intend to convey the home-town atmosphere of a place.



Figures (27 & 28)
Examples of connector streets without medians in Collier County



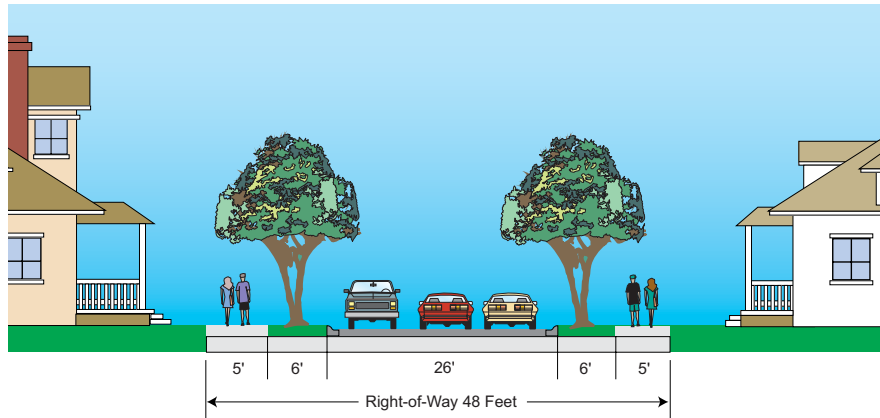


Figure (29)
Street

STREET

The street is by far the most important building block for building neighborhoods, and therefore in building towns and cities. The 24-26 foot street, with well proportioned (6 foot) planting strip and sidewalks on both sides is an American classic found throughout the country, with a long history of acceptance and celebration in art, photography, motion pictures, and imagery of all sorts.

The street is the basic armature on which most of a town's residential development should be arranged. The compact size of the street, the availability of on-street parking, and the provision for well-formed street trees and sidewalks on both sides are all elements that support homes fronting on the street.

Where parking is not present, the street permits unhindered traffic operations in both directions. When parking is present on one side of the street, traffic operations are typically slowed, as drivers in opposing directions maneuver around the parked vehicles. When vehicles are parked on both sides of the street, opposing traffic goes into a "yield" operation, with one or the other drivers needing to stop and yield to allow the passage of the opposing driver. Rather than being seen as a detriment to traffic flow, this "yield" operation on local streets is a decided advantage in controlling vehicle speeds and making the street more inviting for all other users.



Figures (30 & 31) Two types of neighborhood streets. A local street (above) and 7th Avenue North (below)



The street invites bicycle travel mixed with vehicular travel, due to the compact size and low vehicular speeds. Sidewalks on both sides accommodate pedestrians, although pedestrians frequently choose to walk in the pavement on lower volume streets.

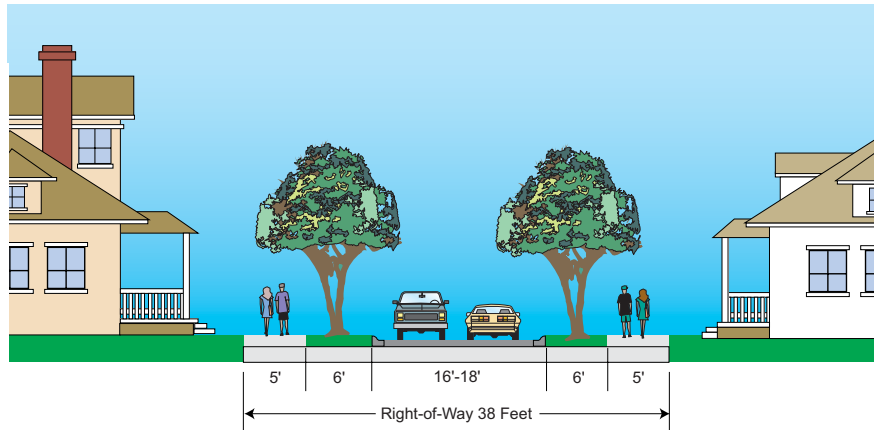


Figure (32)
Lane

LANE

The smallest of streets, the lane is suited to rural villages and hamlets, to town and city streets that are only one or two blocks long, and in areas of particular environmental concern. The lane is most appropriately bordered by low-density residential development. As densities rise, the lane becomes inappropriate due to the demand for on-street parking which begins to interfere with traffic flow.

The 16-18 foot width of the lane allows for a single moving traffic lane and space for parked vehicles on one or the other side of the lane. Where parked vehicles are present, traffic in opposing direction slows (or stops) and yields right-of-way. Because of its narrow width and low operating speed (20-25 miles per hour), the lane is an inviting route for bicycle travel. Lanes include a sidewalk or side path on at least one side of the lane.

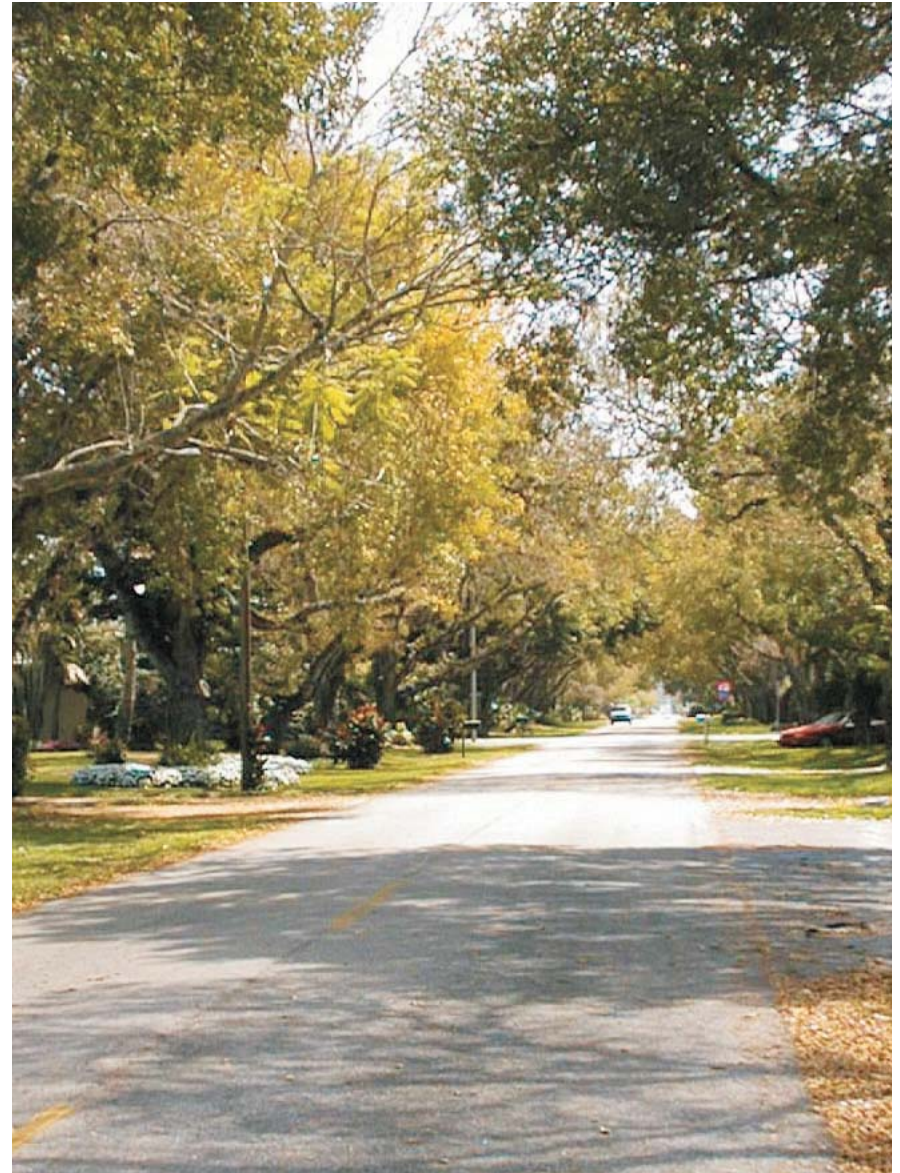


Figure (33) A local example of a lane

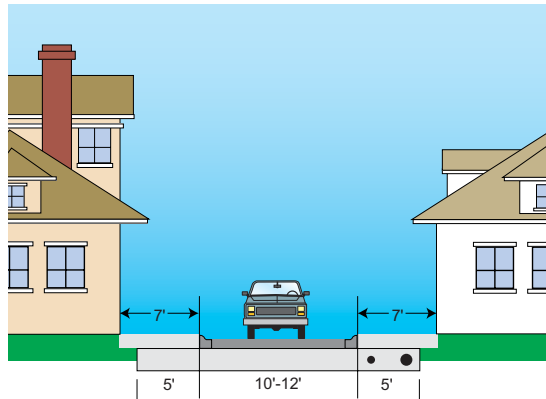


Figure (34)
Alley

ALLEY

Although seldom built in Collier County in recent years, the alley should be a desirable option for private development. By bringing all vehicular access to the rear of properties, the alley permits an unbroken curb face along the front of the blocks. This, in turn, permits a far more gracious street appearance, with unbroken rows of trees, a useful planting strip, and an improved pedestrian environment. While often (and mistakenly) thought of as an appropriate design only for large "estate" homes, the alley is perhaps even more appropriate for modest homes on small lots, where otherwise the intrusion of driveways and garage fronts would seriously degrade the appearance of the community from the street.

The 10-12 foot pavement in the alley allows for a single lane of traffic. Passing is accomplished within the 20-foot width of the alley.



Figures (35 & 36)
2 local examples of alleys





Figure (37) left
Street trees are an important part of Collier's character.

STREET TREES

Quality street trees are a valuable component of each of the Community Character development prototypes produced for the Community Character Plan. Street trees are valuable community assets that contribute significantly to the visual and environmental character of neighborhoods and commercial thoroughfares. Mature street trees help soften the landscape in urban areas and tree lined streets serve to enhance the ambiance of a neighborhood. In addition, studies have shown that trees increase property values for both residential and commercial areas. Other benefits of developing a comprehensive street tree program in Collier County include:

Pedestrian amenity - Street trees should be placed in a linear fashion between the roadway curb and sidewalk. Placement in this position buffers the pedestrian from moving traffic, provides shade protection from the tropical sun, and creates an enclosed environment that fosters pedestrian activity.

Traffic calming - Street trees limit sight distances on roadways and therefore are a valuable tool for slowing traffic to speeds appropriate for different development settings.



Figure (38) above
Recent road building projects in Collier County have not included street trees.

Environmental benefit - Street trees will provide both practical and aesthetic environmental benefits to the county by providing urban wildlife habitat and providing valuable green space that buffers roadways from adjacent development. Since street trees require significantly less irrigation than other forms of roadside landscape, valuable water resources are also conserved.

Street trees are not luxuries, nor are they expensive to maintain. Shrubs and ground cover are expensive to maintain, because of this, they should be limited to applications where funding and maintenance is available (in accordance with the county's streetscape master plan)

A street tree program for Collier must be implemented as part of the roadway design process and must include drought-resistant tree species that have sufficient heights and spreads to eventually frame both auto and pedestrian spaces.

Trees in the city are living building materials used to establish spatial boundaries. They make the walls and the ceilings of outdoor rooms, but with more subtlety than most architectural building materials. They create a spatial rhythms to heighten the experience of moving through outdoor spaces.

-- Henry F. Arnold, in *Trees in Urban Design*



Figure (39) above
Roadway elements are as important as the roadway section in generating character and should be considered carefully



Figure (40) right
Sidewalks, lighting, and signage should be considered carefully in all new road building projects.

ROADWAY DESIGN FEATURES

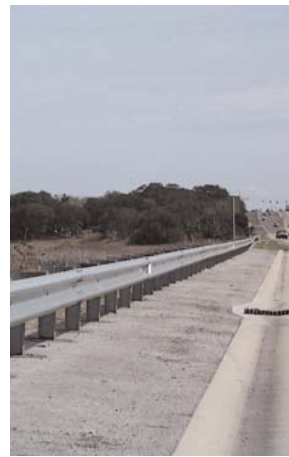
The AASHTO Green Book is the reference that almost all roadway engineers use as a guide for designing streets and highways. However this reference is not an exhaustive source of street design standards. The Green Book is primarily concerned with travel lane widths, median design, and turning radii. There are a number of important elements that all roadway corridors must contain that are not addressed in the Green Book. These elements include:

- *Design within the appropriate context*
- *Street trees*
- *Aesthetic treatments*
- *Landscape development*
- *Determination of functional classification*
- *Selection of light fixtures*
- *Roadside development*
- *Traffic operations, and*
- *Selection of appropriate guardrail/ bridge rail*

The development of character enhancing streets does not adapt well to a "one size fits all" model for design of either the physical roadway or for roadway-related elements located in the right-of-way. Therefore, each new project for either a capacity improvement or new

facility should include a detailed design palette of right-of-way design features that include elements that might be included in the entire right-of-way or corridor design envelope.

In order for Collier County to build more character enhancing streets, the roadway design process should begin during the project development phase of a new project and be expanded to include design features within an entire right-of-way. This expansion of the design envelope should include non-road improvements to bridges, guardrails, sidewalks, lighting and signage. The selection of a palette of desirable right-of-way design features should begin early in the corridor management planning process.



Do... use streetlights as a tool for creating a distinct identity for the roadway corridor. Fixture height and spacing should be scaled to human, not automobile, proportions and should be placed on the street side of the sidewalk.

Do not... treat streetlights like any other utility. High, widely spaced cobra head lights placed on the outside edge of the sidewalk yield no character enhancing return on public investment and frames an uncomfortable pedestrian space.

Do... utilize stylized bridges and guard rails. Where possible, design bridges to be slightly above grade to breakup site distances and calm traffic.

Do not... use standard guardrails as the only vertical element along side a roadway. When they must be used, use landscaped hedges to screen their visual impact.

Do... size directional and traffic control signs to scale appropriate to desired travel speeds. Poles should be fashioned in a manner that helps tie together the overall streetscape.

Do not... use oversized street or directional signs or place on plain metal poles.

Street Design: More than Just Pavement

Character-enhancing streets incorporate many more design elements than just the pavement between curbs. All elements of the Community Character Plan emphasize the street's vital function as public space. In order for Collier's streets to retain this important role, it is necessary to expand the envelope of street design to include not only pavement, but also the design elements that make a street a public amenity. There are two categories of design elements that Collier County should consider when planning for new or expanded streets:

Right-of-way design elements including lighting, bridge design, street trees, physical barriers and sidewalk furniture. Right-of-way design elements should be included either as part an overall capital improvement program or added on through a special assessment or benefit assessment district.

Peripheral elements are specific to a roadway corridor and provided by private property owners. These elements include signage standards and landscape screens to soften the visual impact of parking lots and commercial structures. Private design elements should be specified in the county's land development code and should be specific to the character of the type of roadway being served.

Public Right-of-Way Design Elements

Lighting

Streetlights provide a sense of safety for pedestrians and motorists alike, while providing the opportunity for meaningful streetscape. Lighting fixtures must be appropriately sized and spaced so that they not only increase safety, but also enhance the pedestrian experience and attractiveness of the street.



Do... design transit facilities to attract new customers and provide shelter.

Do not... banish the transit customer to facilities that are undignified or exposed to traffic and inclement weather.

Do... design signs that blend in with the architecture of the buildings.

Do not... utilize signs that stick out from parking lots and were designed just to be seen at 45 miles per hour.

Do... use colonnades, walls, hedges, and street trees to define pedestrian space and increase address value for commerce.

Do not... not treat sidewalks as a mere extension of either parking lots or the automobile's right-of-way.

Bridges and Guardrails

Bridges and guardrails should be viewed as an opportunity to use public investment as a tool for improving the aesthetic quality of the corridor. Whenever possible, roadway designers should view these vertical elements as an opportunity to increase the aesthetic quality of the street. Standard or "off the shelf" designs, while less expensive, represent a missed opportunity for Collier County as it proceeds towards enhancing its community character.

Public Signs

The use of non-standard street signs and poles is a popular and effective tool for establishing a unique identity for a roadway corridor. These elements should not be overlooked and incorporated into the corridor plan for any new or improved roadway.

Transit Stops

Public transit stops should be safe, dry and dignified. High-quality transit stops not only provide positive exposure for the county's new system, but attract new customers as well.

Peripheral Elements

Commercial Signs

Buildings should be the most visual and important part of any commercial corridor. Unfortunately, when each building attempts to make up for its poor relation to the street by erecting large freestanding signs, visual clutter is often the result.

Landscape Screening

Landscape standards should also be addressed during the corridor planning process. Historically, Collier County has used landscape requirements to buffer or hide development from the street. The Community Character Plan suggests that landscape be used to enhance pedestrian mobility, and to create public space that connects buildings to the street.

DESIGNING GREAT STREETS

SETTING THE COURSE

Great streets come in all sizes and types. Even the widest roads—major arterials—can be configured as parkways, or as boulevards, or as conventional highways with occasional urban segments that have on-street parking and buildings close to the road. Collier County should adopt a “palette” of street types that can be used (or improved upon) during the road design process.

GETTING THERE

1. Road Cross Sections:

- a. Replace the six-lane arterial cross-sections adopted by Resolution 2000-77 with the "Great Street" palette suggested in this report for arterials, parkways, and connector streets. These cross-sections would become acceptable road types for public construction projects and for privately built roads; they are not intended to limit road designs, but to illustrate desirable features and right-of-way requirements for each type of roads.

2. Growth Management Plan:

- a. Add one or more policies supporting the frequent use of regularly spaced street trees throughout Collier County and requiring them on public road construction projects.

3. Land Development Code:

- a. Amend §3.2.8.3.2 of the code to allow alleys to provide the principal vehicular access in residential subdivisions.
- b. Amend §3.2.8.4.16.5 of the code to allow and encourage the use of the alley, lane, street, and connector cross-sections from the "Great Street" palette in this report.

MOBILITY STRATEGY #4: Balancing Character With Congestion

DEFINING CONGESTION

Congestion is defined generally as an unacceptable level of delay in travel time between a trip's origin and its destination. Delay is usually measured in terms of a roadway's "level of service" which is measured from "A" (free flow operation) to "F" (less than one-quarter free flow speed).

In accordance with state law, Collier County sets minimum acceptable levels of service in its growth management plan. These are the minimum levels that should not be exceeded during the busiest part of the winter tourist season. Future road networks are designed to achieve these levels of service. If traffic congestion on a road exceeds these levels at any time, the "concurrency" law requires the county to halt building permits along that road for short periods until that road is widened. The plan currently sets the minimum level of service at "D" for most county roads³ and "E" for the most congested portions of Airport-Pulling Road, Golden Gate Parkway, Goodlette-Frank Road,

Pine Ridge Road, and Tamiami Trail⁴. The plan also designates a "traffic congestion boundary," generally west of Airport-Pulling Road, where long-term traffic congestion is expected because the existing development pattern may make it impossible to retrofit a road network that would provide the most desirable levels of service.

CONCURRENCY

Florida's original concurrency law required level-of-service standards to be met on every major road at all times. When congestion already exists, that approach often spurs urban sprawl because there is usually some excess road capacity in outlying areas even when roads closer in are near capacity. When growth is pushed further outward, new residents have to make ever-lengthier car trips to get to work, school, and shopping; thus, a sprawling development pattern usually worsens congestion rather than solving it. At worst, increased interregional traffic brought about by development in more distant locations could ultimately force Collier County to transform some of its arterial roads into urban expressways with numerous grade-separated interchanges, seriously damaging property fronting on those arterials and diminishing overall community character.

³Collier's growth management plan defines level of service "D" as follows:

Approaching unstable flow. Tolerable operating speeds are maintained but subject to considerable and sudden variations. Freedom to maneuver and driving comfort are low because of increased lane density. The probability of accidents has increased and most drivers consider this level of service undesirable.

⁴Level of service "E" is defined as follows:

The upper limit of LOS "E" is the capacity of the facility. Operation at this level of service is unstable, and speeds will fluctuate widely from point to point. There is little independence of speed selection and maneuverability. Driving comfort is low and accident potential is high.

“Acceptable” Travel Time:	7 Minutes
“Unacceptable” Travel Time:	9 Minutes
Difference:	2 Minutes

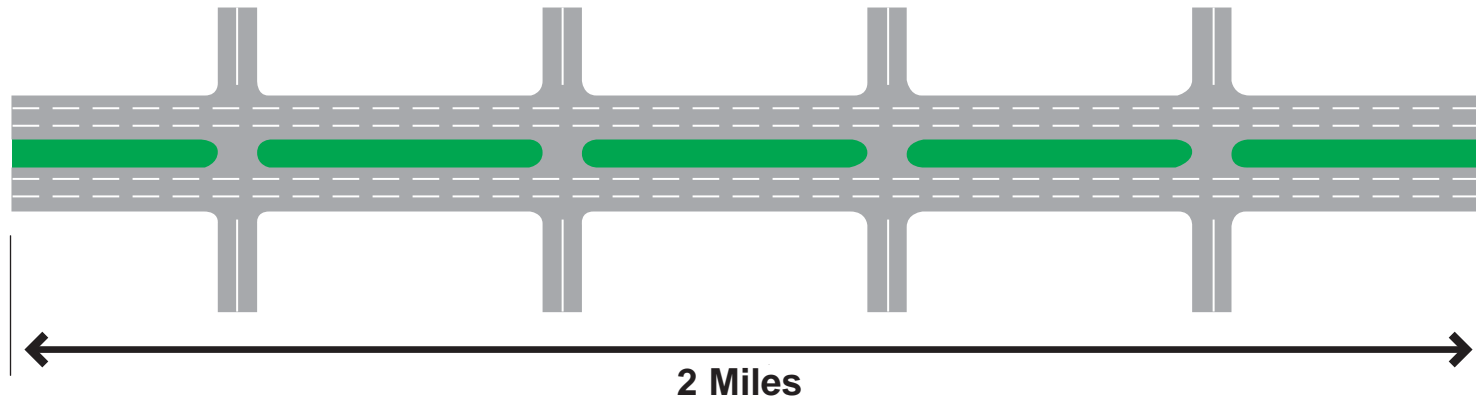


Figure (41)
 Goodlette Frank Road: U.S. 41 to
 Golden Gate Parkway

The original concurrency approach seemed to a fair and objective way to ensure that road capacity keeps up with growth. However, in addition to its sprawl-inducing effects, concurrency has other subtle effects that offset its value. It replaces broader approaches to improving mobility with a narrow focus on the flow of cars. Adding more lanes to a road nearing capacity is sometimes not desirable for a variety reasons including community character, yet a narrow concurrency-driven approach can make widening seem like the only alternative to a legally risky building permit moratorium that severely penalizes abutting property owners. (Those property owners are not the only users of an overcrowded road, yet they would pay the biggest price for its congestion.)

Measuring concurrency separately on each road segment is sometimes known as a "link-level" analysis, which breaks each road into segments between major intersections. For concurrency purposes, each segment's level of service is measured numerically, irrespective of the availability of parallel roads that can serve the same trips. This simplistic analysis then drives the prioritization of capital improvements and forces some results that are incompatible with the ideals of this plan. Link-level analysis sometimes provides only minor improvements in travel time. For instance, the difference between level of service "C" and "D" represents a decrease in average travel speed of approximately five miles per hour (22 to 17 m.p.h.). **Figure 41** shows that this difference on a short road segment can be only a short period of time.

ALTERNATIVE SCALES FOR MEASURING SYSTEM EFFECTIVENESS

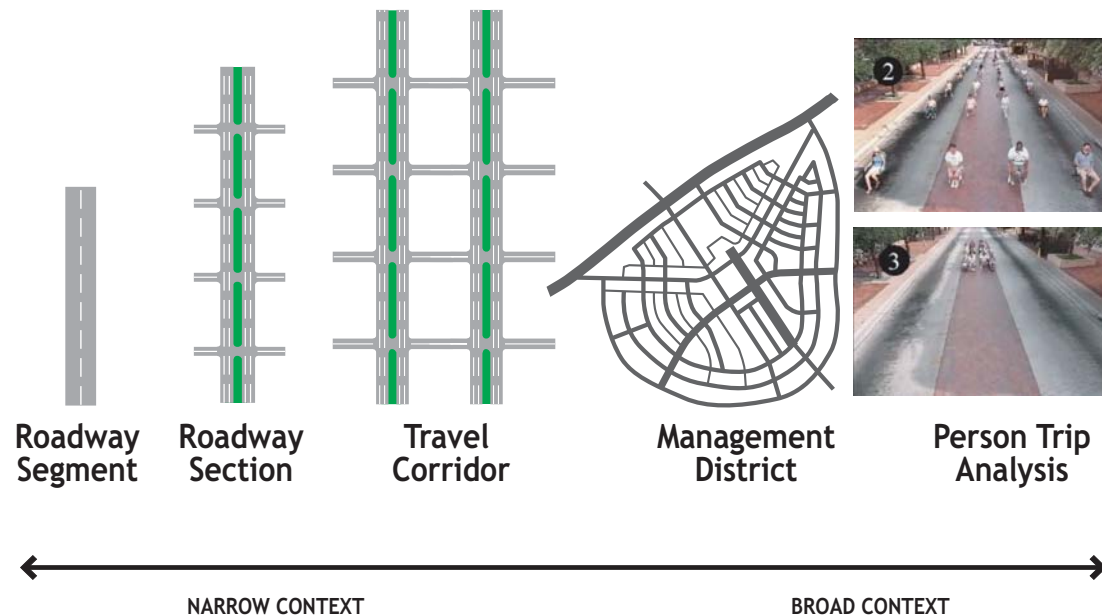


Figure (42)
Alternative scales for measuring system effectiveness.

BROADER APPROACHES TO CONCURRENCY

Recognizing these flaws and the potential for inducing urban sprawl, the state now allows counties a number of alternative means of assuring acceptable road conditions, which have in common an attempt at taking into account a road segment's context (or potential context) in the larger urban setting. These new approaches can be more complicated to set up but they can expand the range of decisions a community has available to it when planning new roads. Several of these approaches use "aggregate" level-of-service measurements that consider the diversity of routes available for any single trip, in effect broadening the definition of a transportation facility beyond each individual road segment. Some examples are shown in **Figure 42**. The practical effect of an aggregate approach is to allow public investments to be focused on road improvements that enhance the county's overall carrying capacity and character rather than simply ensuring incremental availability of roadway capacity to accommodate short-term growth. The most promising concurrency alternative available to Collier

County is a "transportation concurrency management area." Under this approach, the county would designate in its growth management plan one or several areas where it intends to improve mobility, for instance by interconnecting local streets, adding connector roads, or offering public transit. The areas so designated must be compact and must have existing or proposed multiple travel paths. Within such areas, the level-of-service standard for roads can use the aggregate approach.

The benefit to Collier County would be the ability to carry out the mobility alternatives recommended by this plan without fear of causing an arbitrary building moratorium due to link-level concurrency. If there is no threat of a concurrency-based moratorium, this alternative need not be pursued. If such a threat exists, however, this alternative could provide the time to carry it out without penalizing landowners in congested areas. Because this approach to concurrency must be placed into the county's growth management plan before being used, it is a lengthy process and is subject to state approval.

BALANCING CHARACTER WITH CONGESTION

SETTING THE COURSE

Community character should be at the forefront of all planning decisions. For example, concurrency, the system used to determine road capacity, can inadvertently aggravate urban sprawl, or force auto-dominated solutions to broader planning problems. By developing “transportation concurrency management areas,” Collier County can ensure that concurrency contributes to the character-enhancing planning solutions identified by elected officials.

GETTING THERE

1. Modified Concurrency Approach:

- a. If any year's Annual Inventory and Update Report (AUIR) determines that a concurrency-induced building moratorium may occur within the next 2-3 years, Collier County should initiate the studies needed to support the establishment of one or more “transportation concurrency management areas” that would provide mobility alternatives and promote infill development.

2. Growth Management Plan:

- a. If warranted by the outcome of these studies, begin steps to amend the growth management plan to:
 - (1) Formally designate and map the transportation concurrency management areas.
 - (2) Modify Objective 1.5 and Policy 1.5.3 of the capital improvements element to explain the transportation concurrency management areas and authorize modification of the county's Adequate Public Facilities Ordinance to include techniques to implement this new system.

3. Long Range Transportation Plan:

- a. Direct the Naples (Collier County) Metropolitan Planning Organization to expand its computer modeling during the next update of its long-range transportation plan to test the effects of different levels of service on the cost, size, and type of roads needed through the year 2025.

MOBILITY STRATEGY #5: *Planning Entire Road Corridors*

In Collier County, roadway design and land development approvals often are distinct processes, with only concurrency and access management standards formally linking them. The concurrency link tends to be crisis-driven, leaving little time to develop roadway plans that do more than solve an immediate congestion problem. Thus there often is little time to consider anything outside the actual right-of-way.

Uniform design standards for highways are useful for expediting the design process when road widening is overdue. However, in communities of character, no two roads have exactly the same needs or constraints, or serve the exact same land uses. Whenever possible, the design of roads and intersections should be linked to their context and the desired pattern of adjoining land uses.

Collier County has completed corridor management plans for three major roads as an urban design initiative, seeking better ways for commercial and other development to interact with major roads. This kind of plan can be expanded to address the physical design of a new or expanded roadway and the adjoining land uses simultaneously, ensuring that the roads' existing capacity is being used to its fullest and that the improved road will support a pattern and mix of development that maximizes community investment and character. The development of the new road's exact cross-section would be an important step in the corridor planning process, but just as important would be planning for right-of-way enhancements, access and parking management, signage, and more detailed land planning.

Components of a typical corridor management plan would include:

- 1.** A physical master plan, including roadway cross-sections and perspective drawings;
- 2.** An access management plan that will control traffic from adjoining land uses; and
- 3.** An action plan with detailed implementation strategies, including land development code amendments where warranted.

A more detailed description of the components of expanded corridor management plans is found in Appendix C. Corridor management plans containing these elements could be performed either by county staff or outside consultants and should take about six months to complete.

PLANNING ENTIRE ROAD CORRIDORS

SETTING THE COURSE

Road design and land development approvals usually are distinct processes. A closer link between adjoining land uses and the character of the road would benefit both, with the improved road able to support a development pattern that maximizes community investment and character. Collier County should expand its involvement in such “corridor management plans.

GETTING THERE

1. Growth Management Plan:

- a. Amend Policy 4.4 of the future land use element to expand the scope of corridor management plans to include plans conducted concurrently with, or integrated into, the project development process of major roadway improvements. The purpose of these expanded plans is to integrate land-use issues (including access management) with the selection of optimal right-of-way and cross-sections for road improvements.
- b. Unless specifically exempted by the board of county commissioners, the county would prepare a corridor management plan for major roadway improvements, especially for road expansions that are not shown on the 2010 or 2020 road expansion maps as adopted into the growth management plan (Maps TR-6AW and TR-7AW).

2. Land Development Code:

- a. Amend the land development code to implement corridor management plans when so indicated by the results of those plans.

