CITY OF PALM BEACH GARDENS
COMPREHENSIVE PLAN

TRANSPORTATION ELEMENT

SUPPORT DOCUMENT

The City of Palm Beach Gardens

With assistance from

McMahon and Associates, Inc.

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I. INTRODUCTION

This document has been prepared in accordance with Section 9J-5 of the Florida Administrative Code (FAC), to comply with the requirements for the Transportation Element Support Document. This support document described existing traffic facilities and operations, future conditions and needs. The proposed transportation element's intent is to plan for a multi-modal transportation system that places emphasis on public transportation systems. The proposed EAR-based amendments are based on sustainable principles including

- Reduced CO2 emissions
- Supporting multi-modal transportation systems, including public transportation
- Promoting Transit Oriented Development

This support document consists of four sections following the introduction. The first session is a definition of terms, abbreviations and acronyms used in the document. The second section is a series of maps containing the required data on the existing transportation system. The third section consists of a series of tables and maps annotated to explain the methodologies used. These maps and tables present the required roadway levels of service analysis, including existing, future projections, and the effect of projects planned by the FDOT, County and MPO. The fourth section consists of a written analysis of: (1) existing characteristics of major residential developments and destinations in the City, (2) growth trends and travel patterns, (3) existing and projected inter-modal deficiencies and needs, (4) coordination and consistency between this element and the future land use element and (5) the City's plan for meeting its needs and advancing the purpose of planning for a multi-modal transportation system that places emphasis on public transportation.

Definitions

The following abbreviations and acronyms are used throughout this Transportation Element Support Document:

AADT	Average Annual Daily Traffic
County	Palm Beach County
FDOT	Florida Department of Transportation
FIHS	Florida Intrastate Highway System as defined in s. 338.001 F.S.
MPO	Metropolitan Planning Organization
TPSO	Palm Beach County Transportation Performance Standards Ordinance, August 1995

The following terms are applied to streets and highways:

Limited Access Facility: a roadway especially designed for long distance travel, with access points limited to specific locations. Owners or occupants of abutting land or other persons have no greater than a limited right or easement of access.

Major or Principal Arterials: a roadway designed to carry relatively high traffic volumes, for long distances at high operating speeds. Every federal-numbered highway is an arterial road. I-95, Beeline Highway and the Florida Turnpike are principal arterials that are part of the FIHS. One of the State objectives is for every local government to plan an adequate local traffic circulation system so that the inter-regional and inter-state functions of these roads are not compromised.

Minor Arterials: emphasizes through traffic movement similar to a major arterial but provides a greater number of access points.

Collectors: carries moderate traffic volume, over moderate distances at moderate speeds. City collectors collect and distribute traffic between major and minor arterials. Neighborhood collectors collect and distribute traffic between local roads and city collectors and minor arterials.

Local Street: carries relatively low traffic volume, for short trips at lower operating speeds, and has many access points for abutting property.

Parkways: is a road classification based more on design than function. A parkway is a Major Arterial which includes 300-400 feet of right-of-way to allow for sidewalks, bike paths, special landscaping requirements, and/or corridor buffers.

"Level of Service" is a representation of the traffic congestion on a roadway. The city sets the level of service standard for City roads. Palm Beach County has a TPSO that applies countywide to County thoroughfares and State roads that are not part of the FIHS. The State sets the standards for FIHS roads. The City may set levels of service higher than the County or State for County and State roads, but it may not adopt a lower standard without State and/or County agreement.

"Maintaining concurrency" is a term used to describe the situation where there is always enough room on the road (capacity) to accommodate traffic without reducing the level of service below the adopted standard. This requires predicting how proposed development will affect traffic congestion. Studies have been conducted to develop formulas for predicting the number of trips various land uses will generate. Computer models have been created to try and predict how many vehicles will use which roadways to get between various land uses. Short term predictions can be fairly accurate, but long term predictions often are not. By convention, level of service is written as "LOS" when accompanying a letter standard.

LOS "A": Highest LOS which describes primarily free-flow traffic operations at average travel speeds. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Stopped delay at intersections in minimal.

LOS "B": Represents reasonably unimpeded traffic flow operations at average travel speeds. The ability to maneuver within the traffic stream is only slightly restricted.

LOS "C": Represents stable traffic flow operations. However, ability to maneuver and change lanes may be more restricted than in LOS B, and longer queues and/or adverse signal coordination may contribute to lower average speeds.

LOS "D": Borders on a range in which small increases in traffic flow may cause substantial increase in approach delay and hence decrease in speed. This may be due to adverse signal progression, inappropriate signal timing, high volumes, or some combination of these.

LOS "E": Represents traffic flow characterized by significant delays and lower operating speeds. Such operations are caused by some combination of adverse progression, high signal density, extensive queuing at critical intersections, and inappropriate signal timing.

LOS "F": Represents traffic flow characterized by extremely low speeds. Intersection congestion is likely at critical signalized intersections, resulting in high approach delays. Adverse signal progression is frequently a contributor to this condition.

II. EXISTING CONDITIONS

Map Descriptions

The following maps were prepared as part of the data and analysis of the transportation element:

Map A.14. Existing Level of Service
The map shows number of lanes and corresponding level of service for all roadways except those considered local or private roads. Corresponding levels of service are according to FDOT 2007 Highway Capacity Manual.

Map A.15. Existing Traffic Circulation
The map shows number of lanes and existing traffic counts (2007 AADT) for all roadways except those considered local or private. The City is responsible for maintenance of City roads. The County is responsible for maintenance of County Minor Arterials, the County and State share responsibility for maintenance of minor State arterials, and the State has primary maintenance responsibility for principal arterial roads and all responsibility for FIHS roads. The source of the counts is Palm Beach County.

Map A.16. Existing Traffic Circulation Classification
The map shows both Federal functional and access classification of all roads in the City, except those considered local or private roads.

Map A.17. Existing Traffic Circulation AM Peak-Hour
Map A.18. Existing Traffic Circulation PM Peak Hour
Both maps show number of lanes and existing traffic counts (2007 PM and AM Peak hour counts) for all roads except those considered local or private roads.

Map A.19. Conceptual Thoroughfare Plan
This map shows future city collector roads combines roads needed to serve future development and roads needed to relieve traffic congestion in already developed areas. It will serve as a backup to the County Thoroughfare Plan and help protect the inter-regional function of FIHS roads.

MAP A.20. Mass Transit Routes
The map shows the railroads that traverse the City, the mass transit routes, major sources of potential transit riders and major destination points for transit riders based on land use. Also noted are the location of the North Palm Beach County General Aviation Airport and significant bicycle and pedestrian ways.

Map A.21. Projected 2030 Traffic & Laneage - Projected Peak Hour
Map A.22. Projected 2030 Traffic & Laneage - Daily Volume
Both maps show number of lanes and existing traffic counts (2030 PM and AM Peak hour and daily counts) for all roads except those considered local or private roads. The 2030 daily and peak hour volumes were extracted from the Palm Beach County Transportation Model.

Map B.1. City Center Linkages – Vehicular Traffic Connection Classifications
Map B.2. City Center Linkages – Existing and planned Vehicular Traffic Connections
Map B.3. City Center Linkages – Pedestrian/Bicycle Connections
These maps show the City Center vehicular and pedestrian/bicycle linkages as proposed by the Regional Center DRI.

Existing and Projected Levels of Service

Tables 2-1 through 2-3: Existing Conditions – show the most current 2007 traffic counts available for roadway segments within the City, the corresponding level of service, existing number of lanes and the capacity of the road as it existed in 2007. Eight roadway segments exceed LOS “D”. None of these roadways are included within the City or Palm Beach County Five Year Work Program, adopted November 20, 2007. The traffic counts were provided by Palm Beach County.

Table 2-4 shows the daily, AM peak hour and PM peak hour traffic projections for 2030 based on Palm Beach County data. The 2030 daily volumes were extracted from the Palm Beach County Transportation Model. The Palm Beach County Transportation

model uses census based socio-economic data and future land use designation densities and land uses to generate 2030 daily traffic volumes. Vacant parcels are assumed to be built by 2030 and their traffic impacts are estimated based on their future land use designation. Appropriate adjustment factors were used to develop projections for 2030 AADT and peak hour volumes. The number of lanes shown for each roadway segment listed is the number of lanes included on the 2030 Palm Beach County Long Range Cost Feasible Plan. This table also provides LOS values for each roadway listed. Nineteen roadways are projected to exceed their adopted LOS by 2030

Transportation System

The region's growth and development patterns have created demands for highways that have exceeded government's ability to meet expanded capacity requirements (FDOT, 1995 – Treasure Coast Regional Planning Council [TCRPC] Strategic Policy Plan [SRPP]). Existing low density, scattered development patterns in the Region aggravate this problem by increasing auto-dependency, vehicle trips, trip lengths, vehicle miles traveled, and ultimately, the demand for more and larger highways (TCRPC-SRPP, 1995). To reverse these trends, TCRPC recommends encouraging development and redevelopment which have community-oriented patterns characterized by having a network of streets, configured in a grid pattern, with multiple routes for intra-community trips and alternate routes for external travel. The State's transportation planning requirements places an emphasis on public transportation systems.

The Treasure Coast's low densities, however, do not lend themselves to cost efficient transportation or mass transit. This is a regional characteristic, not just a city or county trend. This situation is particularly noticeable in Palm Beach Gardens, nearly all of which has developed since the 1950's, and which contains no traditional downtown area. Recent development in the City has occurred at less than approved densities, and this trend toward low density communities is expected to continue, due to the popularity of golf course oriented and private, gated communities. However, the City should anticipate that areas around transit could redevelop at the maximum density, or request greater densities. Furthermore, as the city builds out, there will be no new vacant land to build at lower densities. Redevelopment will be the only way to build newer products and this type of development is typically more intense than the existing development. Both of these trends indicate that the eastern section of the City has a potential to develop a traditional downtown able to support cost efficient public transportation.

Map A.9. depicts transportation facilities critical for evacuation of coastal areas. These are components of the regional roadway network identified in the Strategic Regional Policy Plan by the Treasure Coast Regional Planning Council. The City will implement the following initiatives toward reducing congestion on Florida Strategic Intermodal System, County and City roads, support regional public transportation investments by creating a transit ready community, and improve multi-modal transportation, including bicycle, pedestrian and public transportation.

The PGA Boulevard segments that are currently exceeding their adopted LOS are expected to be relieved by the construction of the Kyoto Gardens Drive roadway extension between North Military Trail and Alternate A1A. The segment of Northlake Boulevard that is currently exceeding its adopted LOS has been permitted to use a LOS consistent with uninterrupted roadway facilities because there are a limited number of traffic signals on Northlake Boulevard west of the Beeline Highway. A corridor Masterplan is planned for Donald Ross Road and land use and transportation mitigation strategies are expected to be implemented that will address its LOS. Other City roadways that are exceeding their corresponding LOS will be monitored and any land development projects that significantly impact them will be required to construct roadway and/or intersection capacity improvements.

PGA Boulevard and Northlake Boulevard are constrained facilities which are already built to their ultimate cross-section. Model runs show that two additional lanes are needed on both of these arterials in order for them to operate at an acceptable level of service; however, no additional right-of-way is available for expansion. Other traffic constraints occur at the at-grade FEC railroad crossings. These crossings, which are protected by traffic signals, gates and flashing lights, hold traffic several times a day. Congestion is compounded by the proximity of the railroad to Alternate A1A. To alleviate congestion, an overpass was constructed at the intersection of PGA Boulevard and A1A to allow traffic to flow regardless of the railroad and traffic signals.

Two roadways are currently proposed for Constrained Roadway at Lower Level of Service (CRALLS) designations: Military Trail between Northlake Boulevard and Interstate I-95 for LOS F for a period of 3 years, and Northlake Boulevard between Military Trail and U.S. Highway 1 for permanent LOS F. Palm Beach County adopted the CRALLS on Northlake Boulevard with Riviera Beach and Lake Park agreeing to the designation via interlocal agreement. (Palm Beach Gardens did not enter into the interlocal agreement). The CRALLS allows a higher volume of traffic to occur on the roadway. New development can occur as long as it does not have an impact of more than 3 percent of the LOS E capacity.

Burns Road expansion cannot be undertaken by the City until enough revenue is generated from developments which are required to contribute monies for its expansion. The expansion of Interstate I-95, which passes over Burns Road, is another constraint to the improvement timing. Until Interstate I-95 is widened, and the overpass modified, Burns Road is a constrained facility. The eight-laning of Interstate I-95 is shown in the 2015 FDOT plan; however, improvements are being conducted northward from the southern section of the County. This segment of the Interstate is not targeted for improvement until 2011-2015.

Thoroughfare Plan

The City has taken important strides toward addressing the State and Regional goals. One is the establishment of a Conceptual Thoroughfare Plan for the City along with a hierarchy of City streets.

The Conceptual Thoroughfare Plan is shown on Map A.19 and Table 2-5. This plan for future city collector roads combines roads needed to serve future development and roads needed to relieve traffic congestion in already developed areas. It will serve as a backup to the County Thoroughfare Plan and help protect the inter-regional function of FIHS roads. By establishing enough of a network of city collector roads, the City hopes to be able to permanently maintain all of its city collectors at no more than four lanes. The right-of-way requirement allows for creating attractive roadways.

The EAR-based amendment proposes to provide disincentives for removing links off of the Thoroughfare Plan through the following policy:

> ***Policy 2.2.1.3.:*** *The City shall evaluate and encourage improvements to the Conceptual Thoroughfare Plan (Map A.19.) to ensure that there is an adequate network of public streets (City Collectors, Neighborhood Collectors and Local Roads) to efficiently move traffic within the City and serve as a backup system to the County thoroughfare roads. Actual alignments for these public roadways will be established as part of the development review process. By 2010, the City shall adopt Land Development Regulations discouraging the removal of the links identified on the Conceptual Thoroughfare Plan through disincentives in the development or redevelopment process.*

High Traffic Accident Locations

In August 2005, SAFETEA-LU was signed into law by the President, which authorizes federal surface transportation programs for highways, highway safety and transit for the five-year period, 2005-2009. The Safe Accountable, Flexible, and Efficient Transportation Act: A Legacy for Users (SAFETEA-LU) requires state and local departments of transportation and metropolitan planning organizations (MPOs) to consider safety as one of eight (8) planning factors. According to the U.S. Department of Transportation, intersection crashes account for more than 45 percent of all reported crashes, and 21 percent of fatalities. In 2003, 9,213 Americans lost their lives as a result of intersection-related crashes, a rate of more than one every hour.

Source: *US Department of Transportation, Federal Highway Administration*
http://safety.fhwa.dot.gov/intersections/index.htm

Traffic engineers and traffic police generally know of the tendency for road accidents to cluster together at certain locations, commonly termed 'accident blackspots'. The straightforward process of plotting accidents on maps reveals this and this method remains an important means of identifying accident blackspots

Since road intersections are often accident blackspots, it is important to distinguish between accidents occurring at intersections or on the sections of road between intersections as the factors contributing to the accidents and possible treatments are

generally very different for each. While in many cases the location will be clear, there will be accidents near to intersections that might fall into either category. In such cases, depending upon the quality and extent of data, it is desirable to examine the factors contributing to the accident in order to establish whether the features of tile intersection where important, and if so to classify the accident accordingly as an intersection accident. Generally, accidents that occur within 60 feet of an intersection can be regarded as 'intersection' accidents.

Because the number of accidents may vary considerably from year to year at any given location, a single year's data will be subject to considerable statistical variation. Three to five years is generally regarded as a practicable minimum period for which a reasonably reliable annual average rate can be calculated.

The severity of accidents should also be taken into account and each intersection can be given a weighted count, relative to their cost in human life or property value.

The goal of collecting accident data is to aide in the development of accident countermeasures. Examples of countermeasures include adopting Intelligent Transportation Systems strategies, improve the ability to enforce traffic violations at high-crash intersections, and develop and implement intersection improvement projects and traffic calming techniques. Ancillary goals include increased multi-modal Levels of Service (MMLOS) and safer conditions for pedestrians and bicyclists.

The following policy supports the City efforts in this matter:

Policy 2.1.1.9.: *The City shall conduct a review of high traffic accident locations to identify those occurrences on City maintained roadways. The City shall investigate the causes to provide corrective measures to mitigate future accidents.*

III. TRENDS AND CHALLENGES

The State of Florida is preparing a comprehensive Florida Energy and Climate Action Plan to achieve or surpass the statewide targets for greenhouse gas (GHG) reduction. As part of this State Comprehensive Action Plan, the following key challenges are considered:

- The transportation sector accounts for 46 percent of the carbon dioxide greenhouse gas emissions in Florida and that between 2006 and 2050 the daily vehicle miles traveled is forecast to increase by 240 percent based on current trends

- Strategies for relieving congestion, providing travel alternatives to automobiles, and integrating transportation and land use planning to produce compact and transit-oriented development can reduce the growth rate of vehicle miles traveled

- Reducing the greenhouse gases associated with vehicle miles traveled and congestion includes key strategies such as transportation demand management, providing modal options, pricing strategies, and freight-specific strategies

- Greenhouse gas emission reduction strategies be incorporated into state, regional, and local growth management and transportation planning processes

- Promote energy efficient mass and rail transit wherever feasible as well as strategies to ease the movement of freight in more GHG-efficient methods.

The proposed EAR-based amendments are based on sustainable principles, including reducing CO2 emissions, promoting transit oriented development, supporting multimodal transportation opportunities and reducing congestion through transportation demand management strategies.

Traffic Calming Techniques and Cross Connections

Traffic conditions on residential streets can greatly affect neighborhood livability. When our streets are safe and pleasant, the quality of life is enhanced. When traffic problems become a daily occurrence, our sense of community and personal well-being are threatened.

Traffic calming techniques may be designed to be sensitive to emergency vehicle access and maintain cross-connectivity. Traffic calming techniques are aimed toward reducing vehicular speeds, promoting a safe and pleasant condition for motorists, bicyclists, pedestrians and residents, improving the livability and multi-modality of the street, improving real and perceived safety for non-motorized users, and discouraging the use of residential streets by cut-through vehicular traffic.

The following techniques are the common examples of traffic calming:

- Bike Lanes. A portion of the roadway is designated for the preferential or exclusive use of bicyclists
- Bulb outs/neck downs/chokers. Curb extensions at intersections reduce curb-to-curb roadway travel lane widths so that pedestrians have fewer lanes to cross traffic.
- Center islands. Raised islands located along the centerline of a roadway that allow pedestrians a chance to cross a single direction of traffic and stop safely in the center and observe the opposite direction before completely crossing.
- Chicanes/lateral shifts. Curb extensions that alternate from one side of the roadway to the other, forming S-shaped curves that are affective at slowing down traffic.
- Diverters and forced turn lanes. Raised islands located on approaches to an intersection that block certain movements.

- Median barriers. Raised islands located along the centerline of a roadway and continuing through an intersection to block cross traffic.
- Police Enforcement. Employing law enforcement techniques, such as posted speeds and traffic signal/signs.

- Realigned intersections. Changes in alignment that convert T-intersection with straight approaches into curving roadways meeting at right angles.
- Roundabouts and traffic circles. Barriers placed in the middle of an intersection directing all traffic in the same direction.

- Speed humps. Rounded raised pavement devices placed across roadways to slow vehicle speeds or discourage cut-through traffic
- Speed tables/textured pavement/raised crossings. Flat topped speed humps often constructed with a brick or other textured material to slow traffic in areas that pedestrians typically cross the street.

Roundabouts and Traffic Circles

Several features of roundabouts and traffic circles promote safety. At traditional intersections with stop signs or traffic signals, some of the most common types of crashes are right-angle, left-turn, and head-on collisions. These types of collisions can be severe because vehicles may be traveling through the intersection at high speeds. With roundabouts and traffic circles, these types of potentially serious crashes essentially are eliminated because vehicles travel in the same direction. Installing roundabouts and traffic circles in place of traffic signals can also reduce the likelihood of rear-end crashes and their severity by removing the incentive for drivers to speed up as they approach green lights and by reducing abrupt stops at red lights. The vehicle-to-vehicle conflicts that occur at roundabouts and traffic circles generally involve a vehicle merging into the circular roadway, with both vehicles traveling at low speeds — generally less than 20 mph in urban areas and less than 30-35 mph in rural areas.

Several studies have concluded that roundabouts and traffic circles have several benefits:

- Reduce incident of all crashes, and at an even greater rate crashes that cause injury. (Reduction of approximately 80% of injurious accidents)
- Significant traffic flow improvement. Reduction of vehicle delays (reduced by 30-90% reduction of average vehicle delay depending on design type, volume and speeds)
- Increased safety for non-motorized users, due to effects related to proper traffic calming design and decreased number of potential accident conflict points.

- Because of improved efficiency of traffic flow, they also reduce vehicle emissions and fuel consumption by 30-40% and therefore reduce carbon dioxide emissions.
- They can enhance aesthetics by providing landscaping and art in public places opportunities

The EAR-based amendments propose the following policies to support connectivity and relieve congestion:

Policy 2.2.1.5.: *By December 31, 2010, the City shall establish regulations to control vehicular access onto arterials and collectors in order to reduce existing or potential congestion problems. Whenever possible, the City shall encourage minimizing access points by requiring shared access with adjacent development.*

Policy 2.2.1.6.: *Encourage connectivity of roadways and cross connection of property with similar or compatible land uses in the City to reduce congestion on arterial and collector roads, including bicycle and pedestrian connections, and utilize traffic calming techniques to minimize the traffic impacts on residential neighborhoods.*

Policy 2.2.1.7.: *By December 31, 2010, the City shall create opportunities to relieve congestion on FIHS roads by encouraging parallel roadways, transit routes or other local traffic initiatives facilitating local traffic flow.*

Policy 2.2.3.6.: *The City shall encourage the use of roundabouts at suitable locations, in order to provide efficient flow of traffic.*

Bicycle, Pedestrian Network and Parking

The Conservation and Future Land Use Elements of this Comprehensive Plan also include discussions of a Parkway System concept which the City will require for all development in the newly annexed areas. These parkways, the precise locations of which will be partially determined based upon existing natural features, will be incorporated into all developments which are proposed for the newly annexed areas. The parkways will serve a conservation function and a land use function, but they also will provide non-motorized transportation opportunities surrounding and connecting residential developments with neighborhood commercial centers and with other parts of the pedestrian/bicycle system in the City. The Future Land Use Element describes the trail ways and their relationship to the parkways and future development in more detail. Map 1-7 in the Future Land Use Element illustrates this conceptual linkage plan.

As bikeways, pathways and sidewalk plans are implemented, they will include signing and marking to delineate the limits of these facilities particularly where interaction between various modes of transportation occur. Signing and marking shall be in conformance with the Manual on Uniform Traffic Control Devices as amended.

The City desired to maintain its recreation orientation while providing an alternative non-motorized means of transportation. Pedestrian ways in Palm Beach Gardens are plentiful but are not continuous. The designated parkways will provide an opportunity to introduce new pedestrian-ways and bike paths. Future development will include pathways to link residents with neighborhood commercial and recreational facilities. In addition, bicycle access to existing and future parks and recreation areas, to Palm Beach Community College, the municipal complex, and to the Regional Center will be evaluated in conjunction with the Comprehensive Bicycle Plan being developed by Palm Beach County.

There are no public parking facilities in the City. All development projects and uses provide on-site parking for the patrons/residents. Since major transit facilities are planned to locate in the City, public parking facilities will be needed. Furthermore, in order to facilitate redevelopment and infill impacts, the City will need to consider the need for the provision of public parking facilities.

The EAR-based amendments propose the following policies to support bicycle and pedestrian connectivity:

Policy 2.2.1.4.: *By December 31, 2010, the City shall adopt a City-wide Bicycle and Pedestrian network plan, which shall include an inventory and evaluation of the existing network. At minimum, the network plan shall propose strategies to provide safe bicycle and pedestrian routes to public schools. The City shall utilize the Bicycle and Pedestrian network plan in its review of all proposed development for its accommodation of bicycle and pedestrian traffic needs.*

Policy 2.2.5.2.: *By December 31, 2010, the City shall adopt a City-wide Streetscape and Landscaping Plan providing design guidelines that address pedestrian and bicycle use, urban aesthetics, and accepted traffic calming techniques specific to each classification of roadways. The Plan shall encourage street trees for green linkages outside of the parkway system, in order to connect with the parkway system.*

Policy 2.2.6.5: *Facilities which accommodate the needs of the handicapped, pedestrians and bicyclists shall be assessed and required during the development review process.*

Transportation Demand Management (TDM) Strategies

Chapter 399.177 Florida Statutes requires a traffic congestion management process. Florida adopted the Florida Mobility Management Process (MMP) to better reflect the intent of ISTEA and to emphasize the positive aspects of providing transportation mobility. According to the Federal Register (December 19, 1996), an effective congestion management system is "a systematic process for managing congestion that provides information on transportation system performance and on alternative strategies for alleviating congestion and enhancing the mobility of persons and goods..."

All of Florida's twenty-five Metropolitan Planning Organizations (MPOs) currently operate MMPs. Typically a Florida MPO's MMP:

1. Identifies the location of congestion by measuring the system's performance
2. Identifies the causes of congestion
3. Reflects the collaboration a multi-disciplinary local steering committee with FDOT representation
4. Recommends strategies to alleviate congestion which can be implemented quickly, inexpensively and can avoid the addition of general purpose lanes of roadway
5. Is corridor-based
6. Provides a link between the short-range transportation improvement program (TIP) and the long-range planning process (LRTP)

Transportation Demand Management (TDM) describes the use of one or more strategies designed to encourage more efficient use of transportation systems, most notably to reduce the use of private vehicles, especially at peak periods. TDMs are numerous and address everything from transportation modes to the time at which trips take place. However, the most influential strategies involve adjusting the cost and/or supply of specific transportation-related factors. For example, a combined approach of reimbursing the cost of transit and reducing free off-street parking may result in more people switching from private vehicle trips to transit or other non-motorized mode trips.

While no single TDM strategy significantly impacts the proportion of walking, bicycling, or transit trips, an integrated suite of strategies can produce worthy results. As such, many MPOs and local governments have adopted TDM policies for large employers, including themselves, in an effort to meet government environmental standards (i.e., Clean Air Act air quality standards for ozone and fine particulate matter), congestion objectives, and other transportation-related goals. TDMs are likely to play a major role in influencing travel patterns as transportation's role in contributing to global warming becomes quantified and increasingly visible.

The following TDM strategies are just a few that may influence the proportion of walking trips:

- Transit Oriented Development
- Access management (provide incentives to employers)
- Provide on-site amenities such as lockers, showers, bicycle racks, and preferential carpool parking
- Parking policies that increase the cost of parking or reduce the supply of off-street parking encourage patrons to consider using modes other than private vehicles.
- Provide grid system, street connectivity, and mixed land use

- Connections and coordination with Advanced Traveler Information Systems and State Highway HOV lanes.
- Trip reduction ordinances
- Incentives toward providing on-site facilities, such as cafeterias, fitness centers, financial institutions, and day care
- Commuter assistance programs and incentives for employers that utilize compressed work week, staggered work hours, telecommuting, and flex hours.
- Financial incentives to use modes other than the private vehicle encourage their use. Incentives may be formed as parking cash-out programs, off-street parking fees, pre-tax transit reimbursements, subsidized transit, or some combination.
- Unbundling parking spaces in new residential developments gives buyers and renters the opportunity to purchase only the amount of parking they need, which may lead to fewer overall parking spaces and the associated vehicles. Studies show that fewer vehicles per household reduces vehicle miles traveled and increases the use of modes other than the private vehicle.

Source: http://www.walkinginfo.org/develop/policies-transportation.cfm

TDM encourages better management of existing transportation infrastructure, services and resources. Examples of TDM tactics include public transit services, ridesharing, compressed work week, telecommuting, limiting parking, and provision of bike and locker facilities by employers.

Transportation Demand Management or TDM refers to various strategies that change travel behavior in order to increase transport system efficiency and achieve specific objectives, such as reduced traffic congestion, road and parking cost savings, increased safety, improved mobility for non-drivers, energy conservation and pollution emission reductions.

The EAR-based amendments propose the following objective and corresponding policy in support of utilizing TDM strategies to relieve congestion:

Objective 2.2.1.: To encourage strategies which reduce demand on the City's traffic circulation system and alleviate street traffic congestion.

Policy 2.2.1.1.: *The City shall encourage the utilization of Transportation Demand Management (TDM) strategies to increase the efficiency of the transportation system and influence the amount and demand for transportation. These strategies may include ridesharing programs, flexible work hours, telecommuting, shuttle services, and parking management. By December 31, 2009, the City shall adopt and implement TDM strategies through the following programs:*

- *Coordination with the Metropolitan Planning Organization*
- *Traffic Calming*
- *Intersection improvements*
- *Coordination with Palm Tran routes*
- *Transit Oriented Development/ Tri Rail*

The City will be investigating transportation demand and transportation system management strategies to try and determine if level of service can be improved on any of these roads without widening them.

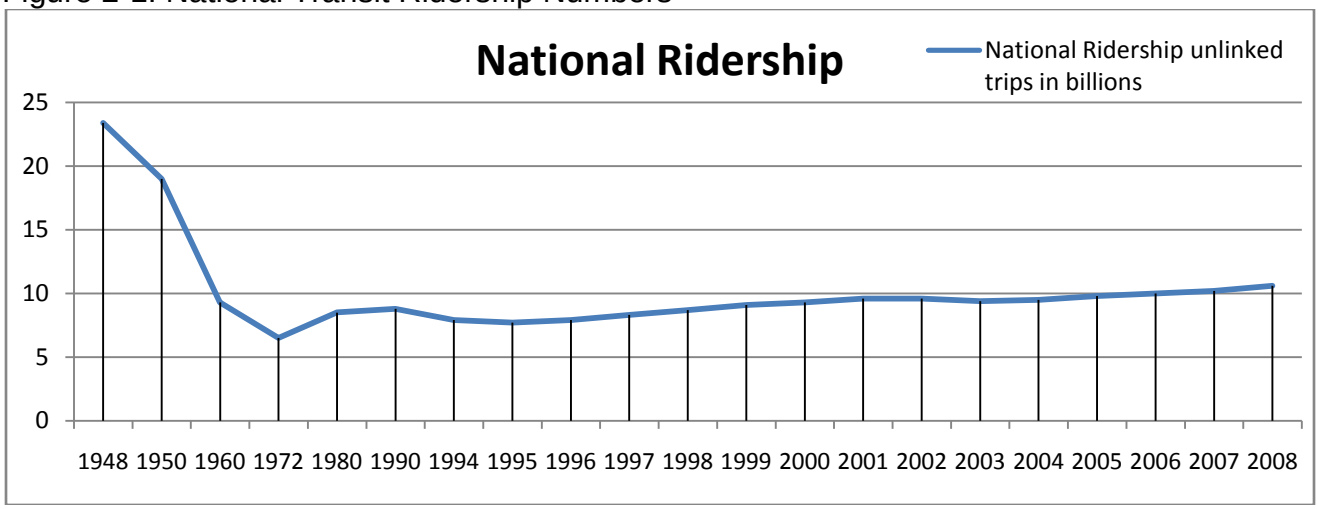
Public Mass Transportation, Air and Freight

The increase in ridership for public mass transportation is the largest in over 50 years, according to ridership tallies from the American Public Transportation Association (APTA). For the first time in nearly half a century, more new trips are due to public transit than new automobiles on the road.

According to the APTA, transit ridership is in a period of steady increase since 1995. Public mass transit ridership in America hit an all-time high in 1946, in a year when nearly 23.5 billion unlinked passenger trips were taken by bus, rail and other modes. As shown in Figure 2-1, reliance on public mass transit steadily decreased since 1946, falling as low as 6.5 billion in 1972. Although public transit did not suffer a net loss in actual ridership through the 80s and into the early 90s, the use of public mass transit was largely stagnant. It was not until the 1999 that the number of transit trips surpassed 9 billion, for the first time since the early 1960s that mass transit efforts seem to make an impact. For the past 8 years, transit ridership in America has grown over 1 billion trips annually, and in the past year, growth in mass transit users outpaced the growth in new automobile users. The tide that was once racing toward automobile independency is moving toward public mass transit accessibility. Although a larger price tag for gasoline per gallon seems to be the driving factor, public investment in better mass transit systems should not be overlooked.

Federal spending heavily investing in mass transit began in 1990. Many states followed suit, using matching federal grants to launch new transit agencies, build tracks, buy trains and busses and also improve on existing transit services. As illustrated in the figure below, mass transit ridership in the country, state and region has historically made great strides before the gas prices first began to soar after 2003. As illustrated by the unprecedented increase in public transit ridership in the first quarter of 2008, the rising gas prices creates a sense of urgency for many families to find mass transit alternatives; however, continued heavy investment in public transportation is the reason why those choosing to use public transit will continue to make the choice.

Figure 2-1. National Transit Ridership Numbers

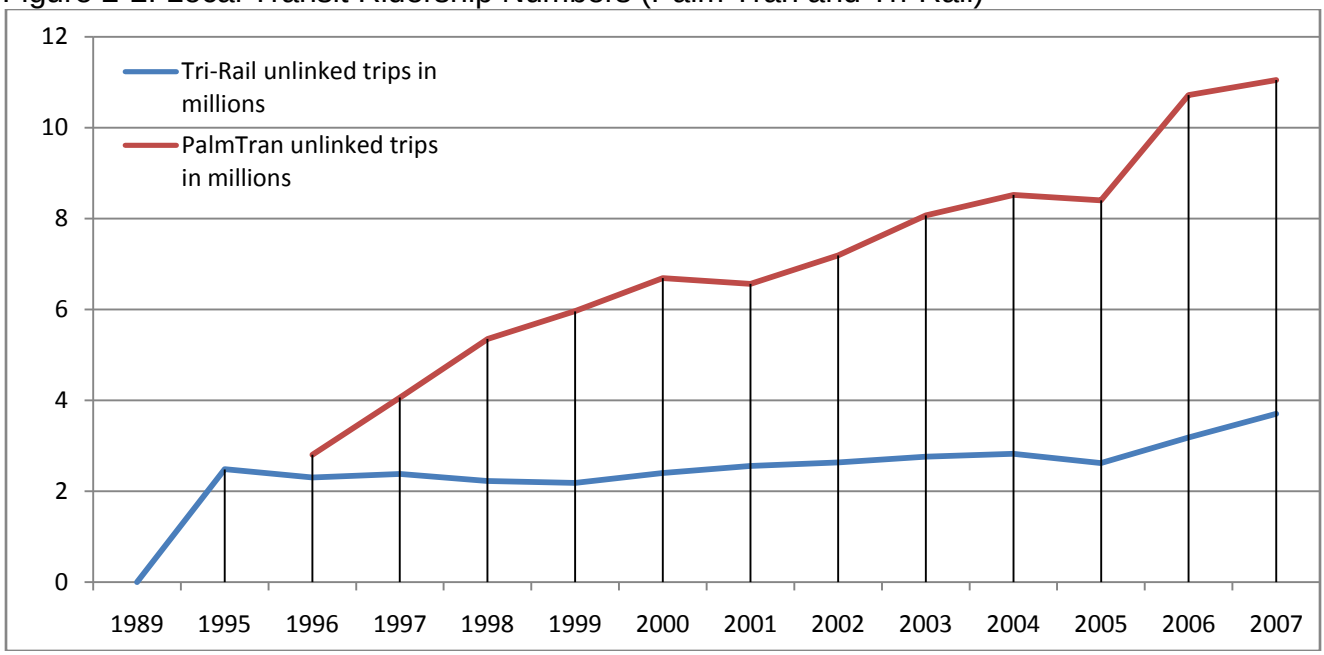


Source: American Public Transportation Association ridership reports

Our regional public transportation service providers have been experiencing similar success. Tri-Rail has been the nation's leader in ridership growth, carrying 15.4% more passengers in the first half of 2007 than in 2006. In all of 2006, Tri-Rail led the nation in ridership growth in the commuter rail sector. Tri-Rail posted a record-setting month for the 19 year old service, when in carried 371,798 passengers in May 2008. The number of passengers carried in May represents a 22.4% increase from May 2007. If the trend continues, Tri-Rail will post double-digit increases in ridership for three straight years and will continue to lead the nation. "The fact that our ridership continue to grow is a testament to the need for public transportation in South Florida", said Joe Guilietti, SFRTA Executive Director. "The increase public transit ridership we are seeing this year clearly shows that people want travel choices,", said APTA President William W Millar, "Additionally, we are releasing a new report that shows that millions of Americans from all walks of life use and depend on public transportation". In fact, based on the trips counted in the first quarter of 2008, an estimated 10.5 billion trips may occur throughout the nation in 2008.

According to APTA transit ridership data, ridership for the State of Florida increased by approximately 2 million trips from 1996 to 2000. Due to expansion of services and demand for transit, trips on Florida transit agencies totaled 252 million trips, which represent a dramatic increase of approximately 98 million trips from 2000 to 2007. It is clear that the funding for transit in the State of Florida is paying dividends in greater ridership numbers.

Figure 2-2: Local Transit Ridership Numbers (Palm Tran and Tri-Rail)



Source: American Public Transportation Association ridership reports

Of the two potential rail transit corridors, the Florida East Coast (FED) railroad which parallels A1A and travels through the traditional downtown of cities to the north and south of Palm Beach Gardens, is the most likely to support transit oriented residential development. Tri-Rail, which provides rail transportation services from West Palm Beach to Miami, is currently studying extending its service to the north Palm Beach County/Palm Beach Gardens area.

In March 1996, the Treasure Coast Regional Planning Council adopted a resolution which encourages the FDOT to purchase the FEC railway. Such a purchase would allow for increased mass transit rail opportunities through the heart of the large majority of coastal communities, including Palm Beach Gardens. Currently, Tri-Rail operates on the Seaboard Railway (CSX), which largely runs immediately west of Interstate I-95 and out of the business districts of most coastal communities.

Commuter rail service to the City is expected to serve the Northern Palm Beach County area, and the City is coordinating with Treasure Coast Regional Planning Council, the South Florida Regional Transit Authority and FDOT in identifying future Tri-Rail station(s) and developing planning strategies to create a transit ready environment for the expanding public transportation service.

The CSX line parallels Beeline Highway and may offer the best opportunity for transit oriented industrial development. There are approximately 300 acres of vacant land along this railroad, much of it separated from the rest of the City by large natural areas. The Port of Palm Beach lies four miles to the southeast of the City along this line. At this time, few industries in Palm Beach Gardens rely on the Port for transportation of goods. Not in the City, but surrounded by it, is the Northern Palm Beach County General Aviation Facility, also along the CSX track. The opportunity presented by connection of airport and port by rail was addressed in the land use element through designation of industrial lands near the airport.

The City, through an economic development task force, can identify businesses which rely on the Port and general aviation facilities so that the City may prepare itself for potential development oriented to the CSX line. For the present and near future, mass transit opportunities have increased with the expansion of Palm Tran, the County transit service. Palm Tran has recently expanded its service from 68 buses serving 18 routes to 143 buses serving 32 routes. Four of those 32 routes will pass through the Gardens Mall as a destination, as well another service and business centers, including the Gardens Hospital, North County Senior Center, North County Courthouse and Palm Beach Community College.

Current ridership is summarized on Table 2-6 (please see the table on the following page). Headways of 30 and 60 minutes are provided, which makes Palm Tran a convenient and easily accessible transportation alternative. The City has adopted policies to increase public awareness of this service and to promote the use of Palm Tran by City residents.

Table 2-6. Palm Tran Ridership Counts by route

	Oct-07	Nov-07	Dec-07	Jan-08
Route 1	218,939	200,267	200,244	200,251
Route 2	103,840	95,888	92,395	99,284
Route 3	101,684	94,921	89,090	96,740
Route 10	6,147	6,178	6,266	6,074
Route 20	8,539	7,807	7,688	8,110
Route 21	10,084	8,698	8,140	8,501

Source: Palm Tran, ridership counts on all routes serving Palm Beach Gardens

The North County General Aviation Facility (GAF) is surrounded by western Palm Beach Gardens. The airport's noise plumes extend off the airport property and Residential uses are prohibited within the 65 Ldn noise contour, therefore land uses in these areas must be nonresidential in nature. Also, the flight patterns extend over western portions of the City. The Department of Airports asks that appropriate documentation be contained in future home/property owner's papers to ensure that potential homeowners are aware of the location of the GAF and the ability to see and hear airplanes operating from this facility.

The EAR-based amendments propose the following policies that support alternate modes of transportation (pedestrian and public transportation):

Policy 1.1.1.20.: *By December 31, 2011, the City shall conduct a study that explores the adoption of a new overlay specific toward the goal of creating transit ready development. The study shall identify major corridors which interconnect prominent north-south and east-west traffic patterns within the City, as well as connections with regional corridors from adjacent municipalities and shall identify land development regulations to encourage multi-modal transportation choices.*

Policy 1.3.5.1.: *By December 31, 2010, the City shall conduct a community-based planning process to create land development regulations for a Transit Oriented Development Zoning Overlay, and coordinate these efforts with the Florida East Coast Railroad, Treasure Coast Regional Planning Council and the Palm Beach County Metropolitan Planning organization.*

Policy 2.2.7.5.: *The City shall encourage the development of a people moving system (such as a trolley or any combination of similar systems) to provide connections within the City Center area and connection to the surrounding residential community.*

Policy 2.3.1.7.: *The City shall adopt and maintain an advanced right-of-way acquisition program to provide for the protection and acquisition of existing and future rights-of-way, including public transit right-of-way and exclusive public transit corridors.*

Multimodal Transportation Level of Service

The Florida Department of Transportation has developed a *Multimodal Transportation Districts and Areawide Quality of Service Handbook* (FDOT 2004) to provide guidance on the designation and planning of MMTDs as provided in Florida's growth management legislation. The handbook provides for MMTD designation in a downtown or urban core area, regional activity center, or traditional town or village in accordance with certain criteria. In these areas, planning efforts would focus on enhancing multimodal elements, guiding redevelopment, and encouraging appropriate infill. An MMTD could also be applied to a new or emerging area, where adopted plans and regulations would need to ensure the internal and external connectivity, a mix of uses, densities, and urban design features necessary to support alternative modes of transportation.

The new legislation also allows local governments in Florida to use alternative approaches to concurrency determinations (Chapter 163.3180(15)(d), F.S.). Typically, minimum level of service standards are established in local comprehensive plans based solely on automobile usage. In an MMTD, concurrency determinations may be based on multimodal performance measures that consider all of the available modes of transportation, including walking, biking, and transit.

Source: http://www.dot.state.fl.us/planning/systems/sm/los/pdfs/MMTDregs.pdf
State of Florida Department of Transportation

The EAR-based amendments propose the following policy to support multi-modal transportation efforts:

> ***Policy 2.2.6.6.:*** *By December 31, 2011, the City shall adopt a sustainable Multi-Modal Transportation Plan incorporating the findings of the Transit Needs Assessment and Bicycle and Pedestrian Plan. The Plan shall develop a long term strategy to reduce CO2 emissions, provide the public and business additional transportation alternatives, but will not replace, reduce or weaken road concurrency measurements.*

Transit Oriented Development (TOD)

Transit Oriented Developments (TOD's) are typically mixed use development designed to complement public transportation and provide access to multiple modes of transit including pedestrian corridors, bicycling paths, streetcars, trolleys, and rail and bus transit. TOD's are designed to be pedestrian friendly and concentrates density around a quarter to half mile ring (a 10 to 15 minute walk) around transit nodes, such as a rail station. They are ideal for regional destinations and regional transit corridors. The proximity to employment centers, movie theaters, restaurants, shopping, hotels, libraries, artwork, cultural attractions, pharmacies, parks, sports fields, and a mix of housing types are essential to the success of a TOD. Connections such as bicycle networks, between the different uses are equally essential.

TOD's provide a community with many benefits and the residents can tailor design guidelines to create safety, encourage community character, and quality of life place-making. TOD's can also include luxury shopping and residences that are not typically found in strip mall development. Community involvement is necessary and very important when designing a TOD. Charettes, a design process driven by participating residents, encourage the community to understand the type of project being developed and allows input in a proactive approach. TOD's are a unique mechanism for stimulating an economy because needs and wants are easily accessible by foot, bicycle, or transit.

There are a number of important benefits gained by encouraging TOD's, all of which improve the City residents' overall quality of life.

<u>TOD can provide mobility choices</u>
By creating "activity nodes" linked by transit, TOD's provide mobility options to key destinations, which are very much needed for households of every income level. This offers the young, the elderly, people who prefer not to drive, people who wish to save on gas money, and those who don't own cars, the ability to get around. A successful TOD provides alternative means of transportation for residents and work personnel that commute to Palm Beach Gardens. The impacts of greater mobility are:

- Reduced commute times and traffic congestion
- Reduced dependence on oil
- Increased mobility and accessibility to every citizen
- Support for the City workforce that benefit from or may require public transportation to get to work

TOD can increase public safety

By creating active places that are busy through the day and evening and by providing natural surveillance (eyes on the street), TOD helps increase safety for pedestrians, transit-users, and others. Natural surveillance is a main concept of Crime Prevention Through Environmental Design, and is a concept supported by the City.

TOD can increase transit ridership

By improving the safe and direct connection to a lively mix of destinations and by increasing the density of potential riders living within the PUD, the efficiency and effectiveness of transit service investments is proven to increasing the use of transit by 20 to 40 percent.

TOD can reduce rates of Vehicle Miles Traveled (VMT)

By increasing transit ridership by 20 to 40 percent, the annual household driving rates for those living, working, and/or shopping near transit stations are likewise lowered. This is particularly significant compared to nation-wide trends where vehicle travel has increased faster than population. The impacts of reduced VMT's are reduced roadway congestion and injuries due to decreased number of vehicular car accidents.

TOD can increase disposable household income

By reducing the need for more than one car per household and reducing driving costs, a Palm Beach Gardens household can save an average of $3-4,000 per year. This is significant considering that housing and transportation are the first and second largest household expenses, respectively. The impacts are a healthier local economy, by potentially shifting dollars spent on high gas prices to local commodities.

TOD can reduce air pollution and energy consumption rates

By providing safe and easy pedestrian access to transit and greater per rider efficiency through public transportation, TOD's can lower rates of air pollution and energy consumption. Also, TODs can help reduce rates of greenhouse gas emissions by 2.5 to 3.7 tons per year for each household. The environmental impacts increase the City's quality of life:

- Healthier lifestyles which encourage walking, biking, and less stress
- Reduced pollution and environmental destruction
- Improved air quality

TOD can be used as a redevelopment tool

By reviving aging or underutilized downtowns, revitalizing declining urban neighborhoods, and enhancing tax revenues for local jurisdictions, TOD's may encourage sustainable growth. The impacts of redevelopment are:

- Reduced sprawling development
- The City remains competitive in the regional and national market
- Assists in promoting the bioscience cluster
- Expands the demand for Class A office that requires access to large markets
- Focuses growth toward the regional center
- Higher and stable property values than strip mall development
- Revitalization and redevelopment to neighborhoods and corridors adjacent to transit

TOD can help conserve resource lands and open space

Because this type of development consumes less land than low density, auto-oriented growth, it reduces the need to convert farmland and open spaces to development. Improves aesthetics of redevelopment/infill station areas. Impacts are:

- Preservation of open space and environmentally sensitive areas
- TIF funds can be used to buy additional open space, streetscapes, or programs

TOD can promote affordable housing

By utilizing more efficient, lower-cost housing and by reducing household transportation expenditures, TOD's create a better framework for true affordable housing. Housing costs for land and structures can be significantly reduced as the result of more compact growth patterns. Also, low cost access to public transportation further lowers the overall costs of living and increases long term affordability of housing options.

TOD can decrease local infrastructure costs

Through more compact infill development, TODs can help reduce infrastructure costs (such as for water, sewer, and roads) to local governments and property owners by up to 25 percent.

TOD creates new opportunities for residents

People who choose to live in a TOD can take pride and have a stake in living more sustainably. TODs concentrate development and reinvestment in existing built environment and transit served neighborhoods. Inclusive and diverse TOD neighborhoods promote walking, bicycling, and transit use through their design and orientation. TODs encourage the design of usable open spaces and the maintenance of existing ecosystems to provide urban dwellers with respite and a connection to the natural world.

The EAR-based amendments propose the following policies that support Transit Oriented Development:

Policy 1.1.1.20.: *By December 31, 2011, the City shall conduct a study that explores the adoption of a new overlay specific toward the goal of creating transit ready development. The study shall identify major corridors which interconnect prominent north-south and east-west traffic patterns within the City, as well as connections with regional corridors from adjacent municipalities and shall identify land development regulations to encourage multi-modal transportation choices.*

Policy 1.3.5.1.: *By December 31, 2010, the City shall conduct a community-based planning process to create land development regulations for a Transit Oriented Development Zoning Overlay, and coordinate these efforts with the Florida East Coast Railroad, Treasure Coast Regional Planning Council and the Palm Beach County Metropolitan Planning organization.*

V. SUMMARY AND RECOMMENDATIONS

The proposed EAR-based amendments for the transportation element recognize the direct link between land use, economic development and housing policies. The amendments are based on sustainable principles such as reducing CO2 emissions, supporting multi-modal transportation systems, including public transportation and promoting Transit Oriented Development.

The region's growth and development patterns have created demands for highways that have exceeded government's ability to meet expanded capacity requirements. Therefore, the City is proactively planning for the future by proposing several new policies in the EAR-based amendments that do not rely on single-occupancy vehicle transportation. The transportation element contains policies that support public mass transportation and the integrity of the thoroughfare plan, and encourage traffic calming techniques, cross connections, bicycle and pedestrian safety and mobility, transportation demand management strategies, and transit oriented development.

Initiatives and Studies

- Maintain adopted level of service (LOS) standards on the City's traffic circulation system. *(Objective 2.1.1., Page 2-1, Existing)*
- Encourage strategies which reduce demand on the City's traffic circulation system and alleviate street traffic congestion. *(Objective 2.2.1., Page 2-14, Proposed)*
- Maintain a sustainable transportation system through the adoption of a financially feasible Capital Improvement Program. *(Objective 2.2.2., Page 2-16, Proposed)*
- Establish a network of streets that provide multiple routes for intra community trips and alternate routes for external travel. *(Objective 2.2.3., Page 2-16, Existing)*

- Maintain and revise where necessary, the land development regulations for the provision of motorized and non-motorized transportation. *(Objective 2.2.4., Page 2-17, Existing)*
- Maintain land development regulations which set requirements for safety and aesthetics in the transportation system. *(Objective 2.2.5., Page 2-18, Existing)*
- Continue coordinating transportation planning with the future land uses shown on the Future Land Use Map of this plan, the FDOT Five Year Transportation Plan, plans of neighboring jurisdictions, and Palm Beach County transportation and future land use plans. *(Objective 2.2.6., Page 2-18, Existing)*
- Continue to plan for and provide transportation facilities encouraging various modes of transportation, through the Conceptual Thoroughfare Plan map and the City Center Linkages Plan. *(Objective 2.2.7., Page 2-19, Existing)*
- Encourage the use of public transit, bicycle, and pedestrian paths within City boundaries through use of the Parkway System and support the proposed multi-modal overlay. *(Objective 2.2.6., Page 2-20, Existing)*
- Coordinate with the Metropolitan Planning Organization, Palm Beach County, Treasure Coast Regional Planning Council, Palm Tran, other local transit service providers and local municipalities in regard to the City's transit initiatives. *(Objective 2.3.1, Page 2.20, Proposed)*
- Promote sustainable growth, the City recognizes the direct link between public transit, land use, workforce housing, and economic development. *(Objective 2.3.3., Page 2-21, Proposed)*
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The following studies or actions are recommended as part of this EAR-based Comprehensive Plan Amendments:

COMPLETION YEAR	STUDY
2009	Adopt peak-hour, intersection and daily traffic standards for concurrency management in LDRs (policy 2.1.1.2., Page 2-1)
	Transit Demand Management strategies (Policy 2.1.1.1., Page 2-14)
	Transit Needs Assessment Study (Policy 2.3.3.1., Page 2-20)
	Assess LDRs (parking regulations) to accommodate and incentivize compact vehicles (Policy 2.2.4.2., Page 2-17)
2010	Adopt disincentives for removal of links on Thoroughfare Plan in LDRs (Policy 2.2.1.3., Page 2-16)
	City-wide Bike/Pedestrian network plan (Policy 2.2.1.4., Page 16)
	Adopt regulations to control vehicle access and encourage cross-connections in LDRs (Policy 2.2.1.5., Page 2-14)
	Strategies to relieve congestion off FIHS (Policy 2.2.1.7., Page 2-14)
	Streetscape and Landscaping Plan (Policy 2.2.5.2., Page 2-17)
	TOD Overlay Study (Policy 2.3.3.2., Page 2-21)
2011	Multi-Modal Transportation Plan (Policy 2.2.6.6., Page 2-19)