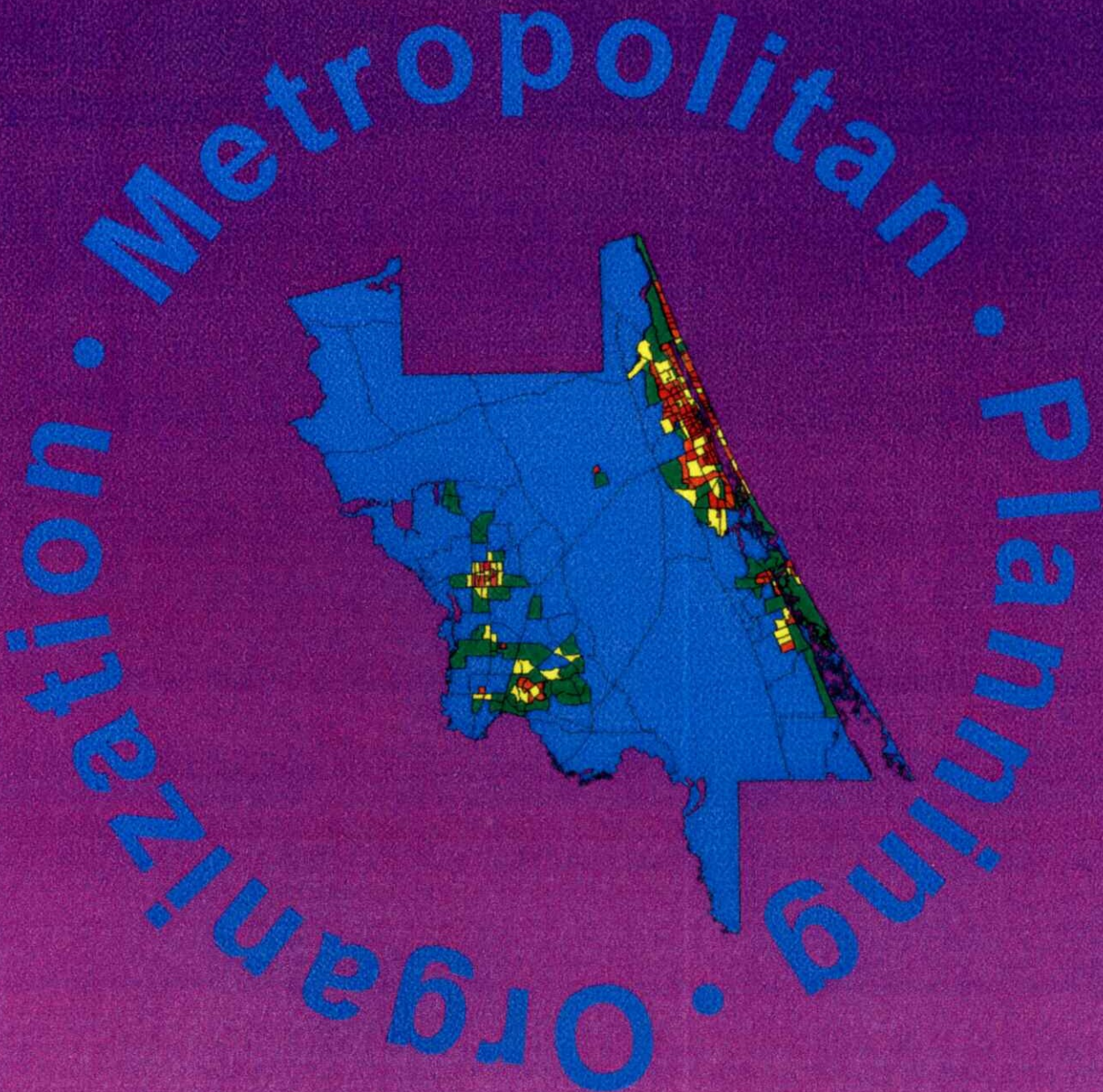


2020 Transportation Plan Update

Volusia County, Florida



CUTR

for Urban Transportation Research

TINDALE
OLIVER and Associates, Inc.



Leftwich Consulting Engineers

TINDALE

OLIVER and Associates, Inc.

May 20, 1996

Mr. James Vandergriff, Chairman
Volusia County Metropolitan Planning Organization
1190 Pelican Bay Dr.
Daytona Beach, FL 32119

Re: 2020 Transportation Plan – Final Report

Dear Mr. Vandergriff:

Transmitted herewith is the final report documenting the Volusia County MPO's 2020 Transportation Plan. The report documents the analyses, findings, and recommendations relating to development of the 2020 Transportation Plan for Volusia County. This submittal was prepared in accordance with our contract dated September 12, 1994.

The Transportation Plan was adopted by the Metropolitan Planning Organization at their meeting on December 12, 1995. Review comments received from citizens, transportation providers, governmental officials, and MPO committee members and staff have been incorporated into this final plan document.

We appreciate the excellent support of your staff during the plan preparation process, and that of the Technical and Citizens Committees. We trust that the Transportation Plan will serve as an effective tool for guiding continuing planning and implementation of the recommended transportation improvements for Volusia County.

Very truly yours,

Tindale-Oliver and Associates, Inc.



William E. Oliver, P.E.
Vice President

WEO:hmt
Enclosure

**VOLUSIA COUNTY
METROPOLITAN PLANNING ORGANIZATION**

RESOLUTION 95-26

**RESOLUTION OF THE VOLUSIA COUNTY METROPOLITAN PLANNING
ORGANIZATION (MPO) ADOPTING THE VOLUSIA COUNTY MPO
YEAR 2020 LONG-RANGE PLAN UPDATE**

WHEREAS, the Volusia County Metropolitan Planning Organization (MPO) is the duly designated and constituted body responsible for carrying out the urban transportation planning and programming process for Volusia County and;

WHEREAS, Florida Statutes 339.175; 23 U.S.C. 135; and 40 U.S.C. 1602(a)(2), 1603(a); and 1604(g)1 and (1) require that the urbanized area, as a condition to the receipt of federal capital or operating assistance, have a continuing, cooperative, and comprehensive transportation planning process that results in plans and programs consistent with the comprehensively planned development of the urbanized area; and

WHEREAS, the Volusia County MPO has developed a Year 2020 Long-Range Plan Update that is consistent with the guidelines mandated in the Intermodal Surface Transportation Efficiency Act (ISTEA) and the local governments' comprehensive plans; and

WHEREAS, the Volusia County MPO's Technical Coordinating Committee (TCC) and Citizens Advisory Committee (CAC) have been participating in the development of the Volusia County MPO Year 2020 Long-Range Plan Update; and

WHEREAS, the TCC and the CAC have reviewed the Volusia County MPO Year 2020 Long-Range Plan Update and have recommended its endorsement to the MPO; and

WHEREAS, the Volusia County MPO Year 2020 Long-Range Plan Update has been available for public review and comment for thirty (30) days and, in addition, four formal opportunities for public comment have been legally advertised; and

WHEREAS, all public comments received regarding the Volusia County MPO Year 2020 Long-Range Plan Update have been considered and responded to.

NOW, THEREFORE, BE IT RESOLVED by the Volusia County MPO:

- A. that the Volusia County MPO Year 2020 Long-Range Plan Update does reflect the growth patterns in Volusia County; and
- B. that the Volusia County MPO Year 2020 Long-Range Plan Update is both multimodal and financially feasible;
- C. that the Volusia County MPO Year 2020 Long-Range Plan Update is endorsed and adopted; and
- D. that the Chairman of the MPO is hereby authorized and directed to submit the Volusia County MPO Year 2020 Long-Range Plan Update, to:
 - 1. the Governor of Florida;
 - 2. the Federal Transit Administration (FTA);
 - 3. the State, Regional, and Area-wide Intergovernmental Coordination Review Clearinghouses;
 - 4. the Federal Highway Administration (FHWA) through the Florida Department of Transportation (FDOT);
 - 5. the Federal Aviation Administration (FAA);
 - 6. the Environmental Protection Agency (EPA);
 - 7. the Department of Environmental Regulation (DER);
 - 8. the Department of Community Affairs (DCA); and
 - 9. the Florida Transportation Commission (FTC).

DONE AND RESOLVED at the special meeting of the Volusia County MPO on the 12th day of December, 1995.

**VOLUSIA COUNTY
METROPOLITAN PLANNING ORGANIZATION**


Chairman / Vice Chairman

CERTIFICATE

The undersigned duly qualified and acting Recording Secretary of the Volusia County MPO, certified that the foregoing is a true and correct copy of a resolution, adopted at a legally convened meeting of the MPO held on December 12, 1995.

ATTEST:


Recording Secretary

VOLUSIA COUNTY METROPOLITAN PLANNING ORGANIZATION
2020 TRANSPORTATION PLAN UPDATE
EXECUTIVE SUMMARY

To guide the expenditure of transportation funds, the United States Department of Transportation (USDOT), the Florida Department of Transportation (FDOT), and local governments in Volusia County participate in a continuing and coordinated transportation planning process. Periodically, the Transportation Plan for the community is updated to reflect updated growth projections, revenue projections, technological advances, and political issues. This report documents an update to the Transportation Plan undertaken in 1995 for a horizon year of 2020.

Passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 required a greater emphasis on alternative modes of transportation to the private automobile. Thus, this transportation plan focuses on rail systems, public transportation, bicycle facilities, and sidewalk facilities for pedestrians in addition to the traditionally studied automobile travel. The role of transportation demand management strategies, performance of truck route systems, roadways designated as important to economic development, and access to significant intermodal facilities has also been considered.

The study process involved defining goals and objectives, and measures to determine how effectively the goals and objectives are being met. Transportation planning tools, demographic and growth projections, and revenue projections were updated. Plans were developed which address rail, highways, public transportation, bicycles, and pedestrians. In addition, a proposed procedure for annually monitoring deficiencies in the transportation system and identifying appropriate solutions to those deficiencies, known as a Congestion Management System, is also presented.

Features of the staged Transportation Plan include improvements to Interstate 95 and Interstate 4, 164 miles of State roads, and 94 miles of County roads. Transit route system expansion and a higher frequency of bus service is also planned. A system of bicycle and sidewalk facilities has also been identified in this transportation plan. Increased transit service and improved bicycle and pedestrian features will dramatically enhance the quality of service provided for these modes. However, in spite of the scheduled road improvements, the rate of growth estimated for the County will exceed the rate at which road systems are being expanded. Thus, overall roadway congestion levels are expected to be greater in 2020 than in 1993. Not all roads will be improved to meet currently adopted performance standards due to cost or physical constraints.

The Transportation Plan is affordable, with estimated improvements costing 2% over estimated revenues through 2010, and improvements costing 19% over estimated revenues by 2020. In the 2011 through 2020 time frame, the majority of the cost exceedance is related to the widening of Interstate 4 from the Seminole County line to Interstate 95. Funding for improvements to the Interstate system is allocated on a national basis and it is anticipated that additional Interstate funding will become available in the 2011 through 2020 time frame to accomplish these improvements. Increases in local property tax rates to fund the expansion of the transit system are anticipated. At the present time, roadway operating conditions are viewed as generally good. Although increased funding for transportation system improvements are available to the local governments, immediate implementation of these revenue sources is not deemed necessary.

**VOLUSIA COUNTY MPO
2020 TRANSPORTATION PLAN**

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VOLUSIA COUNTY MPO 2020 TRANSPORTATION PLAN

CHAPTER ONE

INTRODUCTION

In order to guide the expenditure of transportation funds, the United States Department of Transportation (USDOT), the Florida Department of Transportation (FDOT), and the local governments in Volusia County participate in a continuous, cooperative, and comprehensive transportation planning process. Periodically, the Transportation Plan for the community is revised to reflect updated growth projections, revenue projections, technological advances, and political issues. Once the updated Plan is adopted by the local metropolitan planning organization (MPO), it becomes the urbanized area's official guide for the expenditure of federal transportation system funds. If a transportation project is not a part of the long range transportation plan adopted by the local MPO, then the project is not eligible for federal funding.

The MPO is composed of elected officials from Volusia County and its municipalities. Its 25 members, 19 of which are voting members, meet on a monthly basis to review and direct the development of Volusia County's transportation system. The MPO's staff is a full-time, professional staff consisting of seven people. The MPO is advised by the Technical Coordinating Committee, Citizens Advisory Committee, Bicycle/Pedestrian Advisory Committee, and the Transportation Disadvantaged Coordinating Board. These committees are composed of technical staff of local government organizations, citizens' representatives appointed by elected officials, and others interested in the development of bicycle and pedestrian circulation systems. The technical staff represented include all agencies responsible for providing transportation facilities within the County, including the Florida Department of Transportation (FDOT), Volusia County, municipalities within Volusia County, and VOTRAN, the county's public transportation authority. These organizations meet on a regularly scheduled, monthly basis and all meetings are open to the public.

In 1991, the Federal Government passed the Intermodal Surface Transportation Efficiency Act (ISTEA), an act which updated rulemaking for the preparation of transportation plans for urban areas. These new rules mandate that the MPO update its Long Range Transportation Plan to provide a comprehensive statement of transportation needs and policy. In addition to the traditional focus of these plans on travel by automobile, the updated plans contain a strong emphasis on the movement of persons and goods by modes other than the automobile. The new rules also require that public input be aggressively pursued through formally defined public involvement procedures. The Transportation Plan presented herein was prepared in response to these new rules.

The Plan must consider locally funded transportation improvements so that the transportation system is balanced among modes, and so that coordination among agencies can be achieved. This will help obtain the maximum benefit from the expenditure of all public transportation funds. In addition, the Transportation Plan aims to address the staging of the Plan between now and the Plan horizon year of 2020. The Transportation Plan must be “cost feasible”, i.e., the Plan is required to be funded within existing revenue sources or revenue sources which can, with reasonable certainty, be relied upon to provide and implement the transportation improvements and programs recommended in the Plan.

Since October, 1994, the Volusia County MPO has been developing its Recommended 2020 Transportation Plan. The study process has involved the following major steps:

- Data collection
- Development of growth projections
- Development of transportation planning tools
- Transportation system alternative testing
- Development of a recommended Transportation Plan
- Staging of the Transportation Plan

In accordance with the public involvement procedures adopted by the Volusia County MPO, public input has been solicited throughout the Plan development process. The input has been solicited through public workshops and the involvement of the standing committees in public meetings. Public meetings were held during November, 1995 to present the recommended plan, and public input was considered by the MPO during the Plan adoption public hearing in December, 1995. In the future, further amendments and refinements are likely as a result of further, more specific

planning studies and policy decisions.

The contents of this report are divided into twelve chapters, as listed below:

- Chapter 1, Introduction, provides an overview of the transportation planning process, the context under which the 2020 Transportation Plan for the Volusia County MPO was developed, and an overview of the contents of this document.
- Chapter 2, Compliance with ISTEA Regulations, summarizes the fifteen factors for consideration identified in the Metropolitan Transportation Planning Rules of the Federal Highway Administration and how they were addressed as this plan was developed.
- Chapter 3, Glossary of Terms, contains explanations and definitions of terms and acronyms used throughout this report.
- Chapter 4, Public Participation, summarizes the procedures followed, and key comments that were made during the public participation activities undertaken in support of the Transportation Plan.
- Chapter 5, Goals, Objectives, and Measures of Effectiveness, lists the goals and objectives of the Transportation Plan, and the measures used to determine the extent to which the Transportation Plan accomplishes the goals and objectives.
- Chapter 6, Development of Planning Tools, provides an overview of the transportation planning tools developed and applied during the Transportation Plan study. A companion report, entitled “Model Validation Report and Procedural Guide” dated April, 1996, documents the validation of the transportation system’s planning model. A description of the inventory of data compiled during this study is also included.
- Chapter 7, Land Use Data, documents development of the future year socio-economic (or land use) data projections which was used as the input to development of the Transportation Plan.

- Chapter 8, Existing Conditions, documents the conditions existing in Volusia County in 1993 using the measures of effectiveness identified in Chapter 5. In addition, related planning studies in progress at the time this Plan was being developed and adopted are reviewed and their influence on the Plan is discussed.
- Chapter 9, Revenue Projections, provides estimates of revenues that will be available over the study period from existing sources and the amount of revenues that may be available from other sources which could be utilized for providing transportation services and facilities.
- Chapter 10, The Transportation Plan, presents the Transportation Plan as adopted by the Metropolitan Planning Organization on December 12, 1995.
- Chapter 11, Financial Plan, outlines the allocation of financial resources to accomplish this Plan, and
- Chapter 12, Congestion Management Plan, presents a preliminary congestion management system in response to ISTEA requirements to monitor the performance of the transportation system and to identify and treat locations where unacceptable levels of congestion and poor mobility exist.

The inclusion of a program or project in the Plan is only the first step in its implementation. Prior to implementation, other studies must be undertaken which focus on the individual improvements or programs and evaluate their benefits and impacts upon the community and environment. For example, for roadway improvement projects, studies which evaluate the specific alignment of roads must also be undertaken. Additional public meetings must be held in order to show precise details of each project. The MPO staff can assist the public in staying up to date on the progress of individual projects through their routine publications.

The Transportation Plan is, at best, a momentary vision of the future. Continual change will occur to influence this Plan. The metropolitan transportation planning rules require that the Plan be updated, at a minimum, every five years. In the interim period, amendments will be necessary to reflect changing community priorities, findings of individual transportation mode studies and subarea studies, and to maintain consistency with the local comprehensive plans and Florida

Transportation Plan updates. To accommodate these changes, the Plan is more a process than it is a product. If the process succeeds in incorporating diverse community needs and aspirations, the resulting transportation system will enrich the entire community.

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CHAPTER TWO

COMPLIANCE WITH ISTEА REGULATIONS

2.0 Introduction

Subpart C -- Metropolitan Transportation Planning and Programming of Section 450.316-Metropolitan Transportation Planning Process: Elements, identifies 15 factors that are to be considered, analyzed as appropriate, and reflected in the planning process products. These factors were considered during the development of Volusia County's 2020 Transportation Plan. This chapter lists the 15 factors and summarizes how they were considered in the development of the Transportation Plan.

2.1 Preservation of existing transportation facilities, and where practical, ways to meet transportation needs by using existing facilities more efficiently.

Funds for the maintenance and operations of public transportation facilities have been budgeted by FDOT and Volusia County before consideration of capital needs. Provision of facilities for alternative modes of transportation on existing roads also promotes the more efficient use of the roadway corridor. The MPO has endorsed the provision of transit service, bicycle facilities and sidewalks, and implementation of ride-sharing programs in congested corridors. These actions support the efficiency of the transportation system. In addition, the efficiency of the road system is monitored through the annual preparation of a report monitoring the level of service on roads. Through the annual level of service reporting process, locations of roadway congestion are identified and, if appropriate, TSM type solutions are identified to resolve congestion.

2.2 Consistency of transportation planning with applicable federal, state, and local energy conservation programs, goals, and objectives.

Fuel consumption was one of the measures of effectiveness used in the evaluation of alternative transportation systems.

2.3 The need to relieve congestion and prevent congestion from occurring where it does not yet occur.

Relief and prevention of congestion will be achieved through the continued implementation of the State of Florida's growth management regulations, specifically, concurrency policies. These policies require the adopted performance standard to be maintained, and ensures that adequate roadway capacity will be provided, before development is permitted. In addition, the systematic identification of congested locations through the annual level of service monitoring process will

allow locations approaching below standard levels of service to be identified and improvements programmed as necessary to resolve these locations. In corridors where roads have reached their maximum allowable lane configuration, alternative mode and demand management strategies will be appropriate.

2.4 The likely effect of transportation policy decisions on land use and development and the consistency of transportation plans and programs with the provisions of all applicable short-term and long-term land use and development plans.

Land use projections that form the basis of the 2020 Transportation Plan are based on an inventory of the land use plans of local governments in Volusia County. The Transportation Plan has identified locations where congestion is expected which must be considered by local governments in their upcoming local government comprehensive plan update process. By requiring the MPO's transportation plan and local government comprehensive plans to be updated on a regular basis, Florida legislation requires the appropriate synergy between land use planning and transportation planning. While the MPO staff provides the Countywide transportation systems planning model and the transportation planning process, local government agencies are empowered with decisions regarding land use and land use plans.

2.5 Programming of expenditures on transportation enhancement activities as required by Federal law.

Programming and expenditure of transportation enhancement activities is primarily carried out through the adoption and implementation of the Transportation Improvement Program which includes enhancement projects. The MPO has adopted a prioritized list of enhancement projects to guide expenditure of enhancement funds, enclosed herein as Appendix 2-A.

2.6 The effects of all transportation projects to be undertaken within the metropolitan area, without regard to how such projects are funded.

The Transportation Plan considered all modes of transportation independent of revenue sources, including roadway improvements funded by local and county governments and private developers, public transportation, bicycle transportation and pedestrian transportation.

2.7 Accessibility to ports, airports, intermodal transportation facilities, and the identification of major freight distribution routes.

Access to intermodal facilities and freight distribution routes have been identified in this Transportation Plan, and specific measures of effectiveness related to these issues have been

defined. No significant shipping ports exist in Volusia County. Section 10.7 discusses goods movement within Volusia County.

2.8 The connectivity of roads within the metropolitan area to roads outside the metropolitan area or to adjacent to metropolitan areas.

Table 2-1 identifies the configuration of major roads at the perimeter of Volusia County and the lane configuration adopted by the adjacent community in their long range transportation plan. Four discontinuities exist. The first discontinuity exists at SR 415 entering Seminole County in the southwestern part of Volusia County. The discrepancy is the result of a difference in the external station traffic volume estimates used by the Orlando Urban Area Transportation Study (OUATS) (14,400 vpd \pm) and those used in this study (30,200 \pm). The volumes used in this study were based on historical trends, the Interstate 4 Multi-Modal Master Plan, and other planning studies. Substantial growth is expected in Southwest Volusia County, which may not be fully anticipated in the OUATS plan study, and continued growth is expected on this road until I-4 is improved. The Florida DOT and Volusia County's Technical Committee has reviewed and concurred with the projections used. Future applications of the Interstate 4 Multi-Modal Master Plan model using Volusia County's current socio-economic data and highway network plan will assist in resolving this discrepancy.

Table 2-1 Major Road Configuration			
Adjacent County	Street Name	Volusia County 2020 Road Type	Adjacent County 2020 Road Type
Seminole	SR15/US 17	4D	2U
	SR 400/I-4	8F	8F
	SR 415/CR 415	4D	2U
	SR 46	2U	2U
Lake	SR44	2U	2U
	SR40	4D	2U ⁽¹⁾
	Lake George Drive	2U	2U
Flagler	Bunnell Rd/CR 305	2U	2U
	SR 11	2U	2U
	SR 5/US 1	4D	4D
	I-95	6F	4F

Table 2-1 Major Road Configuration			
Adjacent County	Street Name	Volusia County 2020 Road Type	Adjacent County 2020 Road Type
	Old Dixie Highway	2U	2U
	Old Kings Rd/CR 2001	2U	2U
	John Anderson Highway	2U	2U
	SR A1A - Ocean Shore Boulevard	2U	2U
Brevard	SR 46	2U	2U
	I-95	4F	4F
	SR5/US 1	4D	4D
	Kennedy Parkway	2U	2U

Three additional discrepancies exist where there is no disagreement on traffic volumes. All three are State roads, and are the likely results of out-of-date transportation plans or cost feasibility constraints.

2.9 Consideration and use of available management systems in the development of transportation needs

The Transportation Plan will utilize, in the future, the management systems prescribed in the urban transportation planning rules as they are implemented. This will primarily be a part of the UPWP and TIP processes. As a part of developing this Transportation Plan, a roadway inventory database and analytical processes were developed and they will become the nucleus of the congestion management system and data analysis methodology to be used by the MPO in the future (see Chapter Six). The management systems will be fully integrated into the metropolitan planning process during the next two to three years.

2.10 The preservation of right-of-way for construction of future transportation projects and transportation corridors.

Preservation of right-of-way is addressed through the County's land development codes. This Transportation Plan identifies future right-of-way needs and, through Florida's land development review process, appropriate corridors can be preserved through new developments and setbacks of structures along existing roadways can be accomplished.

2.11 Consideration of enhancement to the efficient movement of freight.

The primary mode of freight movement within the County is via truck. No major shipping ports or handling of freight between modes occurs within the County. Thus, the emphasis of goods movement within the County is associated with trucking and the designated truck route system. The designated truck route system in the County indicates deterioration of service quality will occur through 2020, emphasizing the need to develop County arterials parallel to State roads to alleviate congestion.

2.12 The use of life-cycle costs in the design and engineering of bridges, tunnels, or pavement (operating and maintenance costs must be considered in analyzing transportation alternatives).

Consideration of life-cycle cost in the design of bridges and pavements is an on-going process for both the FDOT and Volusia County engineering staff. This will continue into the future. As the transportation plan was developed prior to allocating funds for capital improvements and funding of transportation programs, funding for maintenance and operating costs were allocated. Thus, these funds have been reserved to maintain and operate the transportation system.

2.13 The overall socio-economic, energy, and environmental effects of transportation decisions.

Socio-economic and environmental impacts of the Transportation Plan were considered. Specific goals and objectives relating to fuel consumption, emissions, and implementation of road improvements in environmentally sensitive areas, were identified within the Plan. These objectives were measured in the plan development process. In addition, local government agencies, who have the primary authority on land use decisions, are required to review their plans on a regularly scheduled basis. Thus, the relationship between road improvements and land use decisions is an issue regularly reviewed in Volusia County.

2.14 Expansion, enhancement, and increased use of transit services.

Volusia County is committed to expanding transit services to provide mobility to those who are without other modes of transportation and providing transit as an alternative transportation mode in congested corridors. Measures of effectiveness were defined for these issues and were evaluated during testing of different transportation network alternatives.

2.15 Capital Investments that would result in increased security on transit systems.

Security has not been an issue on transit systems within Volusia County. VOTRAN, the County's public transportation authority, routinely monitors complaints regarding the quality of service provided and is sensitive to the need to provide a safe, pleasant environment.

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CHAPTER THREE

GLOSSARY OF TERMS

Throughout this report, various acronyms and terms of the transportation profession are used. This Chapter provides a listing of these terms and their definitions for the reader's reference. The terms are listed in alphabetical order.

Americans with Disabilities Act (ADA) -- A 1990 federal law designed to bring disabled Americans into the economic mainstream by providing them equal access to job, transportation, public facilities, and services.

Analysis Section -- A sequence of consecutive arterial segments considered together in the evaluation of an arterial's level of service.

Arterial -- A roadway that primarily serves through traffic at relatively high speeds and secondarily serves abutting properties.

ART-PLAN -- A Lotus 123 spreadsheet developed by FDOT to estimate roadway performance (i.e., level of service).

Atlas GIS -- A micro-computer Geographic Information Systems software used for mapping purposes.

Average Annual Daily Traffic (AADT) -- The volume passing a point or segment of a highway in both directions for one year divided by the number of days in a year.

Backlogged Roadway -- An unconstrained road on the State Highway System operating at a level of service below the minimum acceptable standard for such a road and not programmed for construction in the first three years of the FDOT's adopted work program or in the five-year schedule of improvements of the capital improvements element of a local government's comprehensive plan.

Bicycle/Pedestrian Advisory Committee (BPAC) -- A committee of citizens and government agency technical personnel generally responsible for making recommendations to the MPO about all matters concerning non-motorized transportation for the County. This includes making recommendations to the MPO concerning planning, implementation, and maintenance of bicycle/pedestrian programs, policies, and facilities for the safe and efficient integration of the bicycle into the transportation system. Additionally, this committee is responsible for developing comprehensive plans for both bicycle and pedestrian planning in the County.

Capacity -- The maximum rate of flow at which vehicles reasonably can be expected to traverse a point on a lane or road during a specified period of time under prevailing traffic, roadway, and signalization conditions; usually expressed in units of vehicles per hour.

Capacity Analysis -- The study of a highway's ability to carry traffic, i.e., of its operational characteristics under a given demand volume.

Capital Improvement Program (CIP) -- The capital projects and programs funded by a local government agency for implementation over the next five years.

Census Transportation Planning Package (CTPP) -- A package of census data related to transportation issues reported at the traffic analysis zone level.

Citizens' Advisory Committee (CAC) -- The CAC is composed of interested community members. This committee has a special advisory role to the MPO because it provides a necessary communication link between the MPO and the community it is serving. Thus, the input provided by the CAC insures that the MPO planning process is actually meeting the needs of its citizens. The CAC members are appointed by each MPO member and are responsible for assisting the MPO in formulating goals and objectives for shaping the urban environment with respect to transportation needs.

Class (Roadway or Arterial) -- Categories of arterials and freeways appearing in Florida's generalized level of service volume tables; arterials are primarily grouped by their signal density; freeways in urbanized areas are primarily grouped by their orientation to a central business district.

Clean Air Act Amendment (CAAA) -- This act requires states to integrate their air quality and transportation planning processes by establishing better coordination between state transportation and air quality planning and setting a firm schedule for states to attain air quality standards.

Collector -- A street providing land access and traffic circulation service to a residential, commercial, or industrial area.

Community -- Outside of an urban or urbanized area, an incorporated place or a developed but unincorporated area with a population of 500 or more identified in the appropriate local government's comprehensive plan.

Community Transportation Coordinator (CTC) -- The designated agency responsible for providing transportation services to the Transportation Disadvantaged.

Congestion Management System (CMS) -- A CMS is a systematic process that provides information on transportation system performance and alternative strategies to alleviate congestion and enhance the mobility of persons and goods. Florida's CMS is known as the Mobility Management Plan (MMP).

Constrained Roadway -- A road that cannot be widened by two or more through lanes because of physical, environmental, or policy restrictions. Physical constraints include prohibitively expensive land immediately adjacent to a state highway. Environmental and policy constraints include ecological, historical, archaeological, aesthetic or social impacts that prevent the highway's expansion.

Controlled Access Highway -- A non-limited-access highway whose access connections, median openings, and traffic signals are highly regulated.

Development of Regional Impact (DRI) -- A development which, because of its character, magnitude, or location, would substantially affect the health, safety or welfare of citizens of more than one county in Florida.

Emissions -- Harmful pollutants (i.e., carbon monoxide, nitrogen oxide, hydrocarbons) that are released from motor vehicles. These pollutants are major contributors to ground level ozone, smog, global warming and related health problems.

Executive Committee -- This committee consists of the MPO Chairman, Vice-Chairman, and five MPO members. The Executive Committee is responsible for setting the agenda for the regular MPO meetings. They also determine the need for special meetings.

Federal Aid Highway System (FAHS) -- Roads to which improvements are eligible for federal funding. This network of roads are those functionally classified as freeways, urban and rural principal and minor arterials, urban collectors and rural major collectors.

Federal Highway Administration (FHWA) -- The federal agency in charge of managing the Federal Highway System and the Federal Plan.

Florida Intrastate Highway System (FIHS) -- A statewide network of limited access and controlled access highways designed with general-use and exclusive-use lanes to accommodate Florida's high speed and high volume highway traffic.

Florida Transportation Plan (FTP) -- The Department of Transportation's component of the State Comprehensive Plan. It includes DOT's goals, objectives, and policies for developing Florida's Transportation System.

Federal Transit Administration (FTA) -- A federal agency that administers federal transit planning and implementation funds.

Freeway -- A multilane, divided highway with at least two lanes for exclusive use of traffic in each direction and full control of ingress and egress.

FSUTMS -- The Florida Standard Urban Transportation Model Structure (FSUTMS) is used in urban transportation planning studies in Florida. The micro-FSUTMS model was developed by the Florida DOT for statewide application. It includes files which describe land use, highway and transit networks to estimate future year travel demands.

Functional Classification -- The assignment of roads into systems according to the character of service they provide in relation to the total road network.

Goals, Objectives and Measures of Effectiveness (MOE) -- Goals are generalized statements that articulate a communities' needs which can be addressed through the allocation of resources;

Objectives are specific actions developed in order to obtain the stated goals; and MOEs are tools by which the extent to which the objectives have been accomplished can be measured.

Growth Management Concepts -- The ideas necessary for use in careful planning for urban growth so as to responsibly balance the growth of the infrastructure required to support a community's residential and commercial growth with the protection of its natural systems (land, air, water).

HEVAL -- Highway Evaluation Module of micro-FSUTMS model. Provides estimates of emissions, accidents, injury data, and fuel consumption, for a transportation system alternative.

High-occupancy vehicle (HOV) lane -- A freeway lane reserved for the use of vehicles with a preset minimum number of occupants; such vehicles often include buses, taxis, and carpools.

Ideal Conditions -- The conditions assumed to determine a highway's greatest possible capacity, i.e., those which if further improved would not increase capacity; this term typically applies to roads having default values (e.g., 12-foot lane widths), which are not necessarily ideal.

Intermodal Surface Transportation Efficiency Act (ISTEA) -- Federal transportation legislation passed in 1991 that regulates the requirements of metropolitan transportation planning. This legislation emphasizes the need to balance demands between alternative modes to improve linkages between modes.

Interrupted Flow-- A category of traffic flow that occurs on highways having traffic signals, STOP or YIELD signs, or other fixed causes of periodic delay or interruption to the traffic stream.

Interstate Highway System -- A countrywide, federally supported network of controlled and limited access highways.

Intrastate Highways -- Highways on the Florida Intrastate Highway System (FIHS).

Level of Service (LOS) -- A qualitative assessment of a road's operating conditions; an average driver's perception of the quality of traffic flow he or she is in. An LOS is represented by one of the letters A through F, A for the freest flow and F for the least free flow.

Local Government Comprehensive Plan (LGCP) -- Any county or municipal plan that meets the requirements of subsections 163.3177 and 163.3178 of the Florida Statutes.

Long-Range Transportation Plan -- The Long Range Transportation Plan is a plan with a minimum of a 20 year horizon which forecasts future transportation needs and estimates potential transportation revenues. It is developed as a broad guideline for local transportation decision making. This planning tool considers local, state, and federal policies in light of a changing macro- and micro-economic environment. The plan is developed using a combination of complex statistical analysis and sound judgment. It is updated periodically (approximately every three to five years) to reflect urban growth and development, and to ensure proper representation of community transportation needs. Input from local government staffs and citizens is critical in the development of this plan.

Maximum Through Lanes Standards -- The number of through lanes to which FDOT limits facilities under its jurisdiction, with a few exceptions.

Measures of Effectiveness -- Parameters describing the quality of a highway's service to drivers (or passengers), including average travel speed, density, delay, and others.

Metropolitan Planning Organization (MPO) -- A federally mandated decision-making body for an urbanized area over 50,000 in population, to serve as the transportation planning agency for the area.

Metropolitan Planning Organization Advisory Council (MPOAC) -- A council composed of representatives from the twenty-four (24) MPO's in the State. This council makes recommendations to the Florida Transportation Plan.

Multi-lane Highway -- A highway with at least two lanes for traffic in each direction, with no or partial control of access, and that may have occasional interruptions to flow at signalized intersections.

National Highway System (NHS) -- ISTEA legislation has authorized federal-aid programs for highways and transit for a period of six years at a total funding level of \$151 billion. The NHS is one of the programs consisting of a system of roads which includes the Interstate System and other major highways. Under this funding category, Florida will receive a portion of \$21 billion designated as federal aid for roads designated by the State in conjunction with US DOT as being on the NHS.

Non-State Roadway -- A roadway not on the State Highway System.

Other Signalized Roadway -- A signalized road not on the State Highway System and also considered by the local government of jurisdiction not to be a major city/county road.

Other State Roads -- Roads on the State Highway System which are not part of the Florida Intrastate Highway System.

Performance Standard -- The level of service adopted as the poorest level of service acceptable for the 100th highest hour of traffic during the year. The 100th highest hour traffic volumes are estimated by multiplying the AADT times a factor called "K100". The K100 factor is developed by reviewing one full year of daily counts and determining the relationship of the 100th highest daily count for the year to the average for the year. All of the analyses undertaken for this Plan are tied to the 100th highest hour operating conditions as estimated by the AADT times K100.

Physical Capacity -- The physical capacity of the roadway is the maximum number of vehicles that can be accommodated on a roadway before over-saturation occurs. The level of service that would occur at this saturation level frequently, but not always, exceeds the adopted performance standard. If the physical capacity is exceeded, then serious traffic back-ups will occur because the vehicles cannot physically be moved on the roadway.

Posted Speed Limit -- The maximum speed at which vehicles are legally allowed to travel over a roadway segment.

Public Involvement Process (PIP) -- PIP describes the procedures and processes used to actively solicit public comments and concerns during transportation plan development.

Roadway Characteristics-- Parameters describing the geometric conditions of a roadway. These include a road's number of lanes, arterial classification, free flow speed, level terrain, percent of no passing zones, and whether or not it has medians, left turn bays/lanes, or exclusive passing lanes.

Saturation Level -- Saturation level is the percentage of roadway capacity (either service or physical) that is consumed by traffic. When using the term "saturation level", it is appropriate to clarify whether the saturation level refers to the percentage of physical capacity that is consumed, or the percentage of service capacity that is consumed. If not otherwise specified in this document the degree of saturation refers to the degree of service capacity that is consumed.

Segment -- A length of roadway being evaluated, usually the distance from one signalized intersection to the next on an arterial; a series of arterial segments make up an analysis section.

Service Capacity -- Service capacity is the volume of traffic that can be accommodated on a roadway before the adopted performance standard is exceeded. For most roads, service capacity is lower than the physical capacity. Adoption of a level of service standard below the physical capacity provides for a buffer of capacity before physical capacity is reached and serious traffic congestion occurs.

Signalized Intersections Per Mile -- The per-mile number of fixed interruptions (usually signalized intersections) that cause periods of delay or interruption to a traffic stream during the peak hour. These include flashing red signals and stop or yield signed intersections but not flashing yellow signals, draw bridges, or railroad crossings.

State Highway System (SHS) -- All roads and highways that the Florida Department of Transportation operates and maintains. The SHS comprises the Florida Intrastate Highway

System, which includes the Interstate highways within Florida, and all other state-maintained roads.

Surface Transportation Program (STP) -- is a new block grant program that may be used by the States and local governments for any roads (including NHS) that are not functionally classified as local or rural minor collectors.

Technical Coordinating Committee (TCC) -- This committee is composed of planners and engineers from the various local governments that participate in the MPO process. Therefore, the input provided by the TCC is of a very technical nature. This may include making technical design recommendations and verifying that all documents conform to the appropriate standards and are consistent. The TCC members are appointed by the MPO Board.

Traffic Analysis Zone (TAZ) -- TAZ's are established to report pertinent information regarding socio-economic data for an area; i.e., land use, which will affect the travel demand by that particular area. For this transportation planning study, Volusia County was divided into 760 TAZ's ranging from 7 acres to 48,716 acres.

Traffic Characteristics -- Parameters describing the distribution of vehicles in a traffic stream.

Transit Development Plan (TDP) -- An intermediate range transit plan (usually five years) that examines service, markets, and funding to make specific recommendations for transit improvements.

Transitioning Urbanized Area -- An area expected to be included in an adjacent urbanized area within 20 years because of its population's growth to the U.S. Bureau of Census's criterion for urbanization (at least 1,000 people per square mile).

Transportation Concurrency Management Area (TCMA) -- A geographically compact area designated in a local government comprehensive plan where intensive development exists or is planned so as to ensure adequate mobility and further the achievement of identified important state planning goals and policies, including discouraging the proliferation of urban sprawl, encouraging the revitalization of an existing downtown and any designated redevelopment area, protecting natural resources, protecting historic resources, maximizing the efficient use of existing public facilities, and promoting public transit, bicycling, walking, and other alternatives to the single-occupant automobile. A transportation concurrency management area may be established in a comprehensive plan in accordance with Rule 9J-5.0057, Florida Administrative Code.

Transportation Demand Management (TDM / TSM) -- A transportation planning process that is aimed at relieving congestion on highways by the following types of actions: (1) actions that promote alternatives to automobile use; (2) actions that encourage more efficient use of alternative transport systems, and (3) actions that discourage automobile use.

Transportation Disadvantaged Coordinating Board (TDCB) -- This committee is responsible for defining transportation disadvantaged-related goals and objectives, preparing a service plan, and ensuring that the needs of the transportation disadvantaged citizens are being met.

Transportation Improvement Program (TIP) -- The Transportation Improvement Program (TIP) implements projects from the Long Range Plan in three to five years. This intermediate-term planning tool is required to contain all federally funded projects within the urbanized area. In addition, for informational purposes, the TIP traditionally includes local projects and projects that are considered to be regionally significant.

Transportation Planning System Models -- Computerized models of trip distribution and assignment in urban and urbanized areas used for urban transportation system planning.

Unified Planning Work Program (UPWP) -- This is a short-term planning tool that is used to define specific annual goals and projects of the MPO planning staff. Most of the planning activities in the UPWP are required by federal and state laws in order to support the metropolitan transportation planning process. The UPWP provides an annual budget for the planning activities contained in it.

The MPO staff's annual planning activities are funded with Federal Highway Administration (FHWA) Section 112 planning funds (PL), Federal Transit Administration (FTA) Section 8 transit planning funds, and State of Florida Commission for the Transportation Disadvantaged (CTD) transportation disadvantaged planning funds. In addition, local in-kind matching and state "soft-match" funds are included in the UPWP.

Uninterrupted Flow -- The category of traffic flow that occurs on highways having no fixed cause of delay; examples of such highways include freeways and unsignalized sections of rural highways.

Urban area -- A place with a population of between 5,000 and 50,000 and not in an urbanized area. The applicable boundary includes the 1990 Census's urban area and the surrounding geographical area agreed upon by the FDOT, the local government, and the Federal Highway Administration (FHWA). The boundaries are commonly called FHWA Urban Area Boundaries and include those areas expected to develop medium density before the next decennial census.

Urbanized Area -- Based on the 1990 census, any area the U.S. Bureau of Census designates as urbanized, together with any surrounding geographical area agreed upon by the FDOT, the relevant Metropolitan Planning Organization (MPO), and the Federal Highway Administration (FHWA), commonly called the FHWA Urbanized Area Boundary. The minimum population for an urbanized area is 50,000.

VCUATS -- Volusia County Urban Area Transportation Study

Vehicle Miles of Travel (VMT) -- The measurement of the total number of miles traveled on a road for a given time frame.

Volume -- The number of vehicles passing a point on a road during a specific period, often one hour, expressed in vehicles; a volume may be measured or estimated, either of which could be a constrained value, or a hypothetical demand value.

VOTRAN -- The provider of public transit in Volusia County.

Weighted Average Volume to Capacity (V:C) Ratio -- The weighted average volume to capacity ratio indicates the level of congestion of vehicle travel throughout the County. This measure is more indicative of vehicular travel congestion than roadway network congestion levels. By weighting volumes on individual links, the measured congestion level more accurately reflects the overall congestion that individuals traveling throughout the network are experiencing.

The computation of the measure is as follows: the volume to capacity (V/C) ratio on each roadway segment is multiplied by the vehicle miles of travel (vmt) on that segment. These products are then summed for all roadways within the County, and divided by the total countywide VMT.

ZDATA -- Socio-economic and land use data files provided for each traffic analysis zone.

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CHAPTER FOUR

PUBLIC PARTICIPATION

4.0 Introduction

The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) mandates that public input to the development of the 2020 Transportation Plan be aggressively solicited. Prior to developing the transportation plan, a formal Public Involvement Plan was developed which identified milestones in the transportation plan development process and strategies by which the input of the public would be pursued.

The Volusia County MPO has solicited public input in accordance with its Public Involvement Plan, holding workshop sessions, publicizing the plan, holding monthly meetings with its Citizens Advisory Committee, establishing a Long Range Plan Subcommittee, and conducting advertised public hearings in both the Eastern and Western regions of Volusia County. This chapter presents the procedures followed for the inclusion of the concerns of the citizens of Volusia County, the important issues raised during the public participation process, and the impacts of the public involvement on the Transportation Plan.

4.1 Public Involvement Plan

In addition to the regularly scheduled meetings of the Citizens and Technical Advisory Committees, the Public Involvement Plan identified a schedule of public involvement opportunities and meetings held at key milestones while the transportation plan was being prepared. The Public Involvement Plan was prepared in accordance with the MPO's adopted policies regarding public involvement, which are provided in Appendix 4A. Table 4-1 summarizes the schedule for special public involvement opportunities in the Transportation Plan development process.

TABLE 4-1 SUMMARY OF PUBLIC INVOLVEMENT OPPORTUNITIES ⁽¹⁾	
EVENT	DATE
2020 Transportation Vision Workshop	June 17, 1994
Goals, Objectives and Measures of Effectiveness	January 24, 1995
Transportation Model Validation	September 26, 1995
Future Year Growth Projections	October 3, 1995
Recommended Plan Public Meetings	November 15 and 16, 1995
Plan Adoption	December 12, 1995

Note 1. In addition to the above special events, regular meetings of the MPO, TCC, CAC and Long Range Plan Subcommittee were held throughout the duration of the study. These meetings were all open to the public.

2020 Transportation Vision Workshop (June 1994)

The vision workshop was designed to receive local public input on the direction for transportation planning through the year 2020. Emphasis was placed on developing strategies to involve population groups that are often left out of the planning process, but are affected by its results. Participants from various regions of the county represented many different interests and backgrounds. Elected officials, private citizens, engineers, planners, local businessmen, and high school students were in attendance and actively participating. The workshop was divided into the following three breakout sessions: 1) Highways and Aviation; 2) Bicycle and Pedestrian; and 3) Public Transportation and Transportation Disadvantaged. The proceedings of this workshop are documented in a “stand-alone” document entitled “Year 2020 Transportation Vision Workshop -- Updated to Include Results from MPO Transportation Planning Retreat”, dated August 1994 available from the MPO.

For each of the previous sessions, speakers in each group presented existing and possible scenarios for transportation planning within various modes of transportation. At the conclusion of this workshop, several goals to be achieved through transportation planning were outlined. They are as follows:

- Develop a process for including the community in development of the transportation vision (Citizen Participation Process)

- Develop a county-wide integrated network of multi-modal facilities and incentives for utility and recreational purposes
- Return to user-friendly urbanized plan area where services can be met with walkable, bikable trips
- Increase transit use and improve access
- Increase awareness of, and provide incentives for, alternative modes of transportation and efficient land use
- Provide more funds from Federal, State and local agencies
- Create flexible standards to address community diversity and cohesiveness (depending on the scenario)
- Increase use of transportation planning tools or methods that consider long-term economic viability

Goals, Objectives, and Measures of Effectiveness (GOMOE's) (January 1995)

The GOMOE's were developed to guide the development and evaluation of strategies and systems to deliver transportation services to Volusia County. These GOMOE's were presented to the Citizens' Advisory Committee (CAC) and the Technical Coordinating Committee (TCC) in October and November 1994. Members of other agencies, such as the Bicycle/Pedestrian Advisory Committee (BPAC) or the Transportation Disadvantaged Local Coordinating Board (LCB), were invited to attend the public presentation at the CAC meeting. The GOMOE's were then presented to, and were reviewed by the Volusia County MPO Board in January 1995. The adopted goals, objectives, and measures of effectiveness are documented in Chapter Five of this report.

Transportation Model Validation (August - September 1995)

A micro-FSUTMS transportation system planning model was developed and validated for Volusia County. Previously, the MPO had developed separate models for the western and eastern coastal areas. The model used for this study combined the two models, added fixed-route transit, and incorporated the FHWA-sponsored Transit Demand Management (TDM) model. The validation of this model was presented to the TCC and CAC, who endorsed the validation to the MPO Board. The MPO Board endorsed the validated model in September 1995. Documentation of the model validation is provided in a "stand-alone" technical memorandum available from the MPO.

Future Year Growth Projections (July - October 1995)

The 2020 growth projections were developed in a series of technical workshop sessions in July and August 1995, in which planners from local government agencies reviewed and adjusted projections

of population, housing, and employment. Upon completion of the workshop sessions, the projections were presented to the CAC and TCC. A public workshop session was held in September 1995 to allow public review and comment on the projections. The MPO Board adopted the projections, which are documented in Chapter Seven, in October 1995.

Long-Range Alternatives Development and Evaluation (September- December 1995)

The series of tasks in this category involved the development, testing, and evaluation of the 2020 and intermediate-year transportation systems. Through the establishment and periodic meetings of the Long Range Plan Subcommittee, the CAC, and the TCC, many comments of citizens and public agencies were obtained regarding the strategies to accommodate the projected travel demands. At the end of this process, these committees endorsed one plan alternative for presentation to the public and adoption by the MPO Board.

Plan Adoption Process (November - December, 1995)

A 30-day public review period, which included public meetings at two locations in Volusia County in November 1995, was officially advertised to present and inform the public about the recommended Plan. The public review period and public meetings were advertised in the local newspapers and via radio announcements. A copy of the press release used for this purpose is provided in Appendix 4B. Comments received from these meetings were incorporated, where appropriate, into the final Plan. The final proposed Plan was then presented to the Volusia County MPO Board for adoption at a specially called meeting held on December 12, 1995. During this meeting, comments from the public were also received.

4.2 Comments

A record of public workshops and meetings is provided in Appendix 4C. Some of the key issues that were raised in the public meetings over the course of the plan update study are summarized below:

- **Growth Projections.** The allocation of expected growth throughout the County generated substantial comment throughout the study process. Initial growth allocations were reviewed not only by local government planners, but by developers and citizens who were interested in ensuring that their interests were adequately represented. These comments resulted in adjustments to socio-economic data in specified TAZ's, while the countywide development totals were maintained.

- **Bicycle Facility Linkage Among Communities Within the County.** Development and promotion of bicycle and pedestrian facilities' projects are addressed in Goal 1.2.0 in the Plan document: "The Plan will consider effective alternative modes of transportation to the automobile." These issues are further addressed in a much more specific manner in several of the objectives under Goal 1.2.0 of the 2020 Long Range Plan. Funding for implementation and linkage of bicycle and pedestrian facilities into a continuous network is included in the transportation budget.
- **Consideration of Other Plans.** The 2020 Long-Range Plan Update should include recommendations from the other major regional studies currently underway. Specifically, the Plan should consider the I-4 Multi-Modal Master Plan Study, the Central Florida Regional Transportation System Plan, and the High Speed Rail Study. The Volusia County Metropolitan Planning Organization 2020 Long-Range Plan Update has been developed in full consideration of the major regional studies identified above. Furthermore, the Plan is required to be coordinated with all local comprehensive plans and other adopted plans in the study area. The local government comprehensive plans will be updated in 1996. Thus, this Plan is a predecessor to the local government Plans. Because the Plan is required to be completely financially feasible, the only recommendations from other studies that can be included in the Plan are those that can be funded or for which it can be demonstrated that funds are available to complete the projects.
- **Inclusion of Port, Airport, and Rail Projects.** The ISTEA requirements guiding the development of the MPO's Plan mandate that this Plan consider alternative modes of transportation. The Plan supports consideration of future rail projects as funding and population densities begin to avail themselves to those types of projects. Furthermore, the highway network has been developed with consideration given to improving both access to and connections between other modes of transportation to arrive at a Cost Feasible Plan. As the plan was developed, the MPO specifically reiterated its commitments to public transit systems, statewide high-speed rail, and regional commuter , and light rail systems.

4.3 Conclusion

In summary, Volusia County's 2020 Transportation Plan was developed with full consideration given to the public's opinions and ideas. Public participation was achieved through standing committees such as the CAC and TCC. The CAC consists of concerned citizens who connect the

MPO with the community they serve and the TCC consists of planners and engineers from local government agencies. The TCC provides technical assistance to the MPO on appropriate guidelines and standards which apply to the Plan development process. The public meetings and workshop sessions identified issues, concerns, and priorities which may not otherwise have been incorporated into the Plan.

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CHAPTER FIVE

GOALS, OBJECTIVES AND MEASURES OF EFFECTIVENESS

5.0 Introduction

The Transportation Plan (the Plan) development process is guided by a series of goals and objectives that articulate the needs of the community in developing a multimodal transportation system. The principle purpose of these goals and objectives is the translation of the community values into quantifiable measures to which the transportation facilities and services can respond. To allow effective system evaluation of transportation proposals, goals should be clearly defined and placed in an organizational sequence that is logical to the general public.

Goals are generalized statements that articulate community needs that can be addressed through the allocation of resources. They broadly relate to the social, physical and environmental needs of the community. These goals are a reflection of the community's interest and should give direction and focus to the development and allocation of resources during the decision making processes.

Objectives should be very specific and developed from the general goals. They should give agencies and individuals the ability to perceive how the general goals can be accomplished through specific actions that will affect particular interest groups within the community. The ability to obtain objectives should be represented through measures of effectiveness that can be accomplished. The objectives should be stated in a manner that makes it possible to measure the extent to which the objective has been accomplished. Even with unlimited resources, transportation services and facilities can often generate conflict and controversy because their social and economic impact can be seen by various groups and individuals as conflicting. However, this conflict and the measurement of the value of these conflicts should help to clarify the priority placed on proposed goals and objectives before substantial resources are committed to the objectives.

To be effective, the goals, objectives, and measures of effectiveness must serve the public in a process to reconcile or balance diverse interests and gain acceptance of decisions which may require compromise from each of the individual interest groups.

The goals, objectives and measures of effectiveness presented in this chapter have been developed based upon a review of the ISTEA requirements contained in the Metropolitan Planning Rule Sections 450.316 (ISTEA Factors), and Section 450.322 (Transportation Plan) and Rule 9J-5 of the

Florida Administrative Code, which governs the preparation of local government comprehensive plans. The Goals, Objectives and Measures of Effectiveness were distributed to the Technical Coordinating Committee (TCC) and Citizens Advisory Committee (CAC) for review and discussion during October and November, 1994. In January, 1995, these committees endorsed them to the Metropolitan Planning Organization Board (MPO Board) for the purpose of guiding the preparation and evaluation of transportation system alternative plans. During the plan development and adoption process, adjustments to the Goals, Objectives and Measures of Effectiveness are possible.

The goals and objectives have been structured to follow the general areas indicated below, which are consistent with the organization of goals and objectives of the Florida Transportation Plan (FTP). Coordination between the FTP and local government comprehensive plans is required by Rule 9J-5.

- 1.0.0 - Infrastructure Facilities
 - 1.1.0 Intermodal Facilities (Port, Airport, and Rail)
 - 1.2.0 Public and Alternative Forms of Transportation
 - 1.3.0 Highway
- 2.0.0 - Economic Development and Financing Options
- 3.0.0 - Land Use and Growth Management
- 4.0.0 - Environment, Social and Community Impacts
- 5.0.0 - Public Involvement
- 6.0.0 - Transportation Planning Process Activities
- 7.0.0 - Management System Process and Development

Section 1.0.0 entitled "Infrastructure Facilities" addresses the issue of availability and utilization of infrastructure in three areas: (1) Ports, Airports and Rail, (2) Bicycles, Pedestrians and Public Transportation including Transportation Disadvantaged), and finally (3) Highways. Section 2.0.0 addresses the issue of economic development and financing options for the community in question. Section 3.0.0 deals with Land Use and Growth Management in Volusia County by proposing goals, objectives and measures of effectiveness. Section 4.0.0 contains goals, objectives and measures of effectiveness for environmental concerns and social impacts. Section 5.0.0, Public Involvement is an important aspect of the community's decision-making process and is highly emphasized by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. Sections 5.0.0, 6.0.0, and 7.0.0

address general and specific requirements for the Public Involvement Planning Process and the development of the ISTEA Management Systems.

5.1 Designated Activity Centers and Intermodal Facilities

In the goals and objectives, references are made to “Designated Activity Centers”. These Centers have been identified because they are important to the economic welfare of the County, as outlined in the “Overall Economic Development Plan, Volusia County, Florida”, prepared by the Volusia County Overall Economic Plan Committee in May, 1994. This document has identified 42 locations in the County where economic development is particularly desired, and through the provision of effective transportation service, should be encouraged. In addition to the sites identified in the “Overall Economic Development Plan”, the MPO identified the DeLeon Springs State Park and the Blue Springs State Park as significant sites to which good access should also be considered. These locations are listed below, and selected transportation facilities providing access to these centers have been identified for special consideration and prioritization so that these centers will be served efficiently and effectively. The following areas have been designated:

1. The Daytona Beach International Airport
2. The LPGA/CTLIC Development of Regional Impact (DRI)
3. Daytona Beach Business Park
4. Daytona Beach Downtown Enterprise Zone
5. Daytona Beach Coastal Tourist Core
6. Volusia Mall
7. Interstate Business Park (Port Orange Business Park)
8. Eastport Center
9. Ridgewood Development Corridor
10. Ormond Beach Municipal Airport and Airport Business Park
11. Downtown Ormond Beach
12. East Granada Boulevard Corridor/Casements Area
13. Granada Boulevard/SR 40/Williamson Boulevard Commercial Node
14. North US 1 Corridor
15. New Smyrna Beach Downtown
16. Southeast Activity Center (I-95/SR 44)
17. New Smyrna Beach Airport and Airport Industrial Park
18. Northwest Commercial and Industrial Region
19. Ridgewood/US 1 Commercial Corridor
20. Indian River Boulevard/SR 442 Industrial Area

21. Daytona Beach Outlet Mall and Big Tree Plaza
22. South Daytona Business Park
23. South Daytona's Ridgewood/US 1 Commercial Corridor
24. Beville Road/SR 400 Commercial Corridor
25. North Ridgewood Avenue/ US Commercial Corridor
26. Nova Road/SR 5 Mixed Heavy Commercial/Industrial Corridor
27. Atlantic Avenue/SR AIA Corridor
28. Halifax Activity Center
29. DeLand Municipal Airport and Industrial Park
30. Buckminster Fuller Research and Development Park
31. Downtown DeLand
32. I-4/SR 44 Activity Center
33. US 17-92 Commercial Corridor
34. Orange City Industrial Center/Shadick Drive
35. Four Townes Commercial Corridor
36. Southwest Activity Center (I-4/SR 472)
37. Saxon Boulevard Corridor/I-4 Interchange
38. South Volusia Heavy Industrial Park
39. Power Plant Facilities
40. Gemini Springs Resource-Based District Park
41. Lake Helen Industrial Park
42. Volusia County Beaches:County-Wide
43. DeLeon Springs State Park
44. Blue Springs State Park

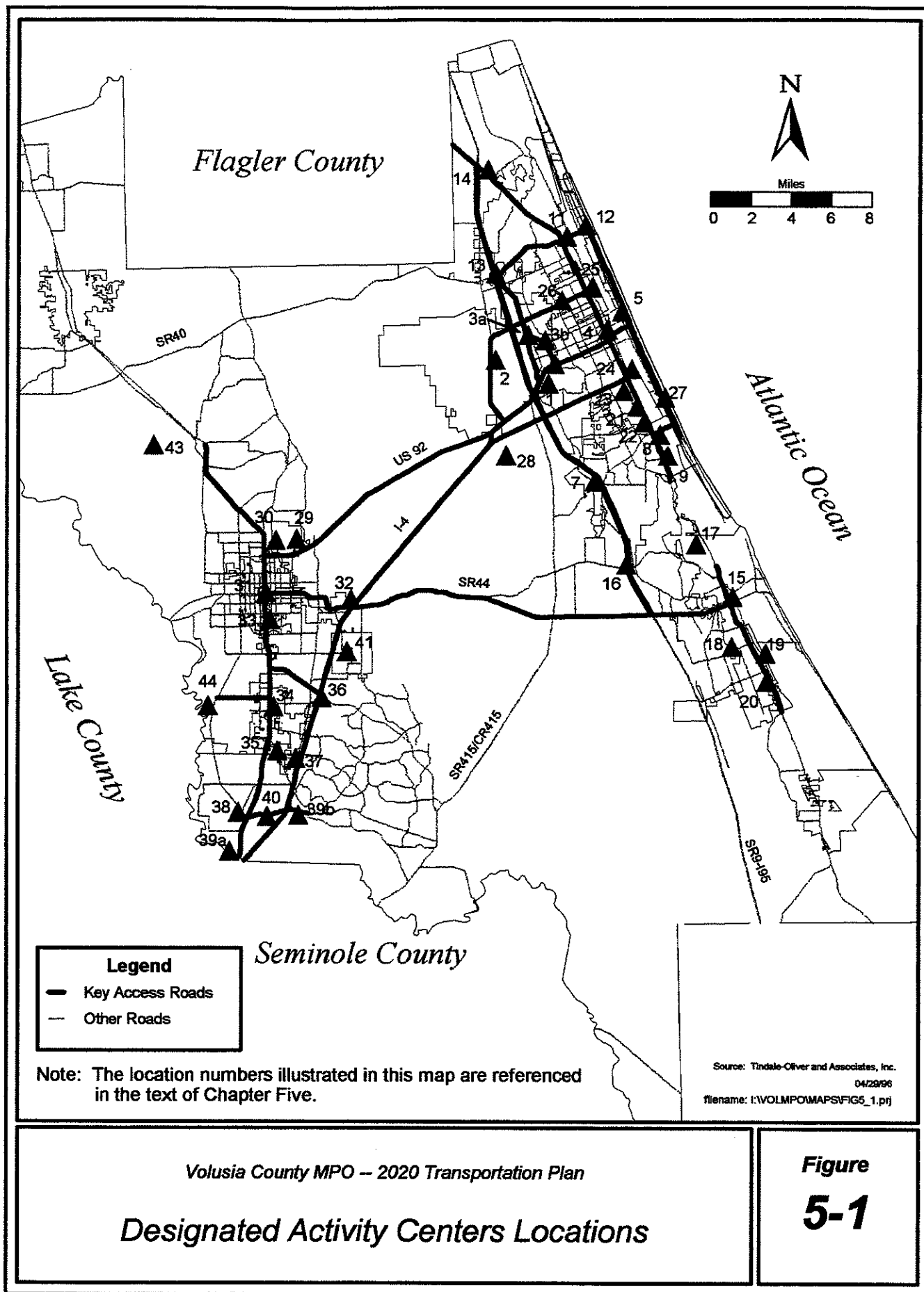
Figure 5-1 illustrates the locations of these centers, identified by number, and also the facilities which have been designated as key access facilities to serve these sites. In the alternative transportation system evaluation process and in the process of prioritizing candidate improvements for funding and implementation, facilities and programs serving these centers will be identified for special consideration.

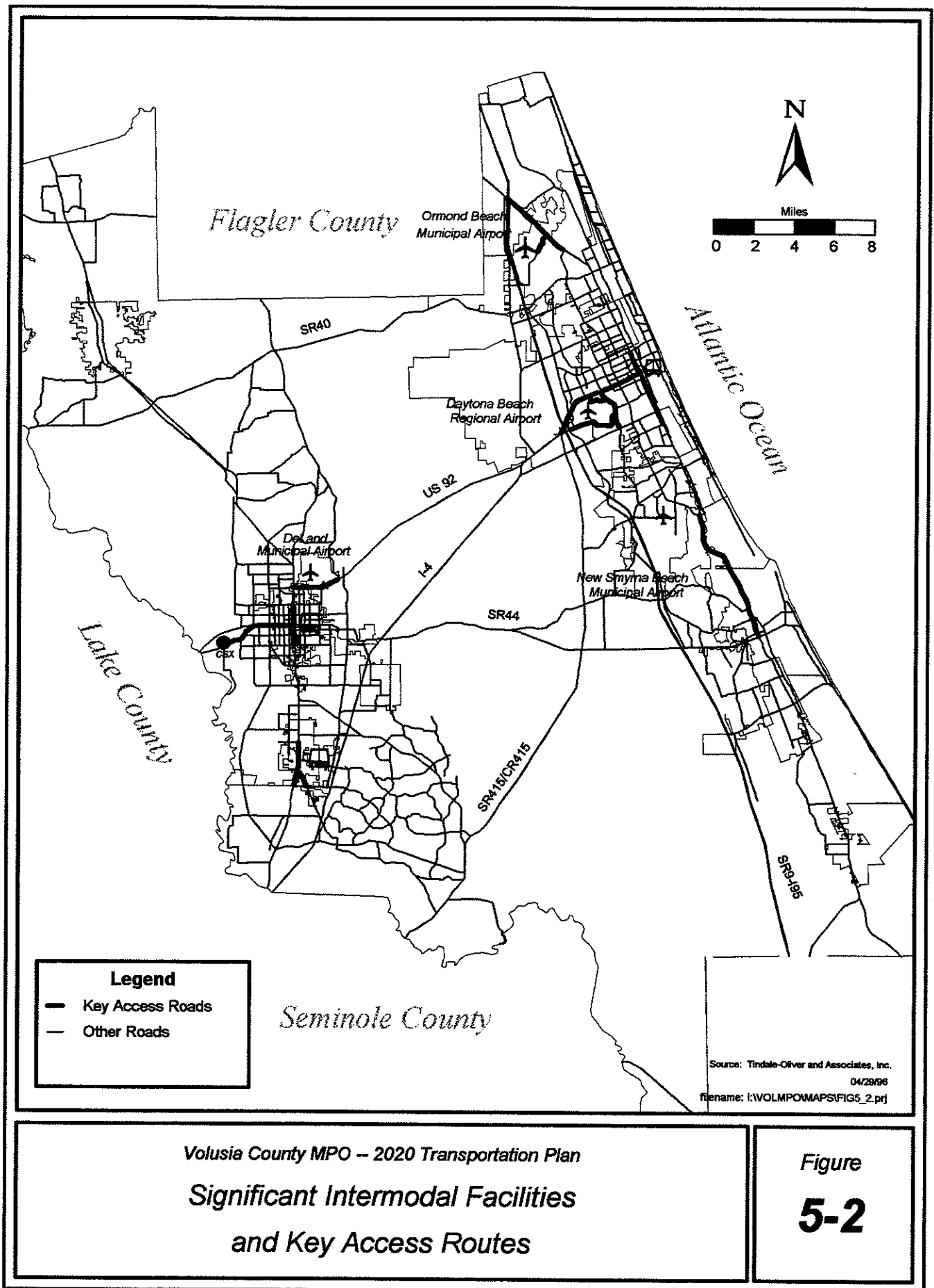
The ISTEA regulations encourage efficiency of access to intermodal facilities, and that access to airports and ports be considered. In Figure 5-2, the locations of the five airports in Volusia County are illustrated, along with key roads that provide access to these terminals. No commercial ports

exist in the County. As can be done for facilities providing access to the Key Strategic Locations, a priority can be attached to these facilities providing access to the airport terminals.

5.2 Goals, Objectives and Measures of Effectiveness

The goals, objectives and measures of effectiveness in Table 5-1 have been defined to guide the Plan development process. The definitions of acronyms used in the goals, objectives and measures of effectiveness are also provided in Table 5-1.





The objectives proposed herein fall into three categories (Type 1, Type 2, and Type 3). The first category, Type 1, addresses the preparation of the plan document and/or the planning process. Many of the measures of effectiveness for this type of objective are simple "Yes/No" measures indicating that the Plan document, the transportation system, or the implementing agency's response to the required process.

The second category, Type 2, of objectives relate to the transportation system. They can be measured at the present time, and should be monitored in the future. This future monitoring will measure progress made towards the objective. However, available transportation planning tools and models can provide no forecasts of measures as transportation system alternatives are being tested.

The third category are the measures of effectiveness that will be used in the evaluation of future year alternative system plans and short range strategies. The third category has been subdivided into Types 3 and 3P. Type 3 are those which relate to the transportation system and for which current conditions can be measured and future conditions can be estimated. Type 3P indicates a primary objective to be used in the evaluation and comparison of alternatives.

The following goals, objectives, and measures of effectiveness have been defined to guide the Plan development process. The first heading lists one of seven general areas discussed in the introduction. Under each general heading a goal statement is listed. Under each goal statement, a list of objectives are provided. These objectives indicate how the goal can be achieved. For each objective, a measure of effectiveness (M.O.E.) is identified. Finally, the methodology by which the M.O.E. is to be analyzed and reported is described.

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**TABLE 5-1
VOLUSIA COUNTY METROPOLITAN PLANNING ORGANIZATION
TRANSPORTATION PLAN
GOALS, OBJECTIVES, AND MEASURES OF EFFECTIVENESS**

1. Infrastructure Facilities (Intermodal)

GOAL 1.1.0: The plan will effectively address the integration of port, airport, and rail modes of transportation, and associated intermodal facilities into a cohesive intermodal system.

OBJECTIVE	MEASURE OF EFFECTIVENESS	TYPE	COMPUTATIONAL METHODOLOGY
Objective 1.1.1: The transportation system will provide for safe and efficient movement of freight via the highway, airport, and rail systems.	M.O.E. 1.1.1.1 Truck VMT by level of service (or for designated truck routes)	3P	Select Truck-Taxi purpose in model, track trips and load to road database
	M.O.E. 1.1.1.3 Level of service on designated access roads serving air and rail terminals.	3P	Use road database for selected roads

**TABLE 5-1
VOLUSIA COUNTY METROPOLITAN PLANNING ORGANIZATION
TRANSPORTATION PLAN
GOALS, OBJECTIVES, AND MEASURES OF EFFECTIVENESS**

1. Infrastructure Facilities (Alternative Modes)

GOAL 1.2.0: The Plan will consider effective alternative modes of transportation to the automobile.

OBJECTIVE	MEASURE OF EFFECTIVENESS	TYPE	COMPUTATIONAL METHODOLOGY
Objective 1.2.1: The needs of that portion of the population considered low income and traditionally underserved will be considered.	M.O.E. 1.2.1.1 Percent of County land area served by transit with 1 hour peak hour headways.	3P	Measurable by Atlas Geographic Information System (AGIS), using 1/4 mile buffer zone about selected transit lines. (If data is available, consider population)
Objective 1.2.2: Alternative forms of transportation will be considered as part of the systematic approach to congestion management.	M.O.E. 1.2.2.1 Percent of congested road corridors with sidewalks	3P	Measurable by road inventory database.
	M.O.E. 1.2.2.2. Percent of congested road corridors with bicycle facilities (i.e., lanes, paths, paved shoulders)	3P	Measurable by road inventory database.
	M.O.E. 1.2.2.3. Percent of congested road corridors with transit routes	3P	Measurable by road inventory database.
Objective 1.2.5: Operational and management strategies to increase vehicle occupancy rates will be considered within the plan.	M.O.E. 1.2.5.1 Proportion of person-trips made by non-auto modes or car-pool.	3P	Observe average vehicle occupancy at selected locations.
Objective 1.2.10: The Plan will consider, promote, improve, and increase, as appropriate, the use of	M.O.E. 1.2.10.1 Percent of person-trips by transit	3P	Daily transit system ridership

**TABLE 5-1
VOLUSIA COUNTY METROPOLITAN PLANNING ORGANIZATION
TRANSPORTATION PLAN
GOALS, OBJECTIVES, AND MEASURES OF EFFECTIVENESS**

1. Infrastructure Facilities (Alternative Modes)

GOAL 1.2.0: The Plan will consider effective alternative modes of transportation to the automobile.

mass transit as a viable alternative form of transportation.			
	M.O.E. 1.2.10.4 Percent of transit route-miles with sidewalks	3P	Compute from road inventory database
Objective 1.2.11: The Plan will consider the enhancement and protection of the existing bicycle, pedestrian, and transit systems.	M.O.E. 1.2.11.1 Percent of major road network with bicycle facilities	3P	Compute from road inventory database
	M.O.E. 1.2.11.4 Percent of major road network with sidewalks	3P	Compute from road inventory database
	M.O.E. 1.2.11.7 Percent of County area served by transit	3P	Compute from database and AGIS (if data is available, consider population).

**TABLE 5-1
VOLUSIA COUNTY METROPOLITAN PLANNING ORGANIZATION
TRANSPORTATION PLAN
GOALS, OBJECTIVES, AND MEASURES OF EFFECTIVENESS**

1. Infrastructure Facilities (Highways)

GOAL 1.3.0: The Plan will provide highway corridor capacity for the safe, effective, and efficient movement of people and goods.

OBJECTIVE	MEASURE OF EFFECTIVENESS	TYPE	COMPUTATIONAL METHODOLOGY
Objective 1.3.4: The Plan will consider the connectivity of roads with other adjacent urbanized areas.	M.O.E. 1.3.4.1 Percent of roads crossing County Line with same number of lanes and same functional classification in adjacent County.	3P	Compare plan with plans of adjacent jurisdictions, measure in percent-- e.g. "9 out of 10 = 90%"
Objective 1.3.6: The Plan will consider the use of existing transportation corridors prior to building new ones.	M.O.E. 1.3.6.1 Miles of new corridors designated	3P	Use database, to identify total miles where existing Road Type (RT) =0 and Future Road Type (RT) >0
Objective 1.3.8: The project prioritization methodology and process will address the effect of improvements to highway facilities on all modes of travel.	M.O.E. 1.3.8.1 Effect on transit service route coverage	3P	Percent of County population served by transit
	M.O.E. 1.3.8.2 Miles of bicycle facilities continuity provided	3P	Percent of major road network with bicycle facilities
	M.O.E. 1.3.8.3 Effect on transit route congestion levels	3P	VMT by V:C on transit routes
	M.O.E. 1.3.8.4 Miles of sidewalk system continuity	3P	Percent of major road network

TABLE 5-1 VOLUSIA COUNTY METROPOLITAN PLANNING ORGANIZATION TRANSPORTATION PLAN GOALS, OBJECTIVES, AND MEASURES OF EFFECTIVENESS			
1. Infrastructure Facilities (Highways)			
GOAL 1.3.0: The Plan will provide highway corridor capacity for the safe, effective, and efficient movement of people and goods.			
	provided		with sidewalks

**TABLE 5-1
VOLUSIA COUNTY METROPOLITAN PLANNING ORGANIZATION
TRANSPORTATION PLAN
GOALS, OBJECTIVES, AND MEASURES OF EFFECTIVENESS**

2.0 Economic Development and Financing Options

GOAL 2.0.0: The Plan will be financially feasible and develop multimodal facilities and services that support economic development.

OBJECTIVE	MEASURE OF EFFECTIVENESS	TYPE	COMPUTATIONAL METHODOLOGY
Objective 2.0.1: The Plan will support economic development through consideration of improved access and connections to port, rail, and airport facilities.	M.O.E. 2.0.1.1 Level of service on corridor designated as access to these facilities	3P	Compute from road inventory database
Objective 2.0.2: The Plan will support economic development in specific geographic areas by providing access to urban redevelopment and urban infill areas, central business districts and designated activity centers.	M.O.E. 2.0.2.1 Level of service on roads designated as access to these designated areas	3P	Compute from road inventory database
Objective 2.0.3: The Plan will support economic development by ensuring that transportation systems are in place that promote and enhance the efficient and safe movement of freight and services.	M.O.E. 2.0.3.1 Percent of truck VMT below adopted standard	3P	Compute from road inventory database

**TABLE 5-1
VOLUSIA COUNTY METROPOLITAN PLANNING ORGANIZATION
TRANSPORTATION PLAN
GOALS, OBJECTIVES, AND MEASURES OF EFFECTIVENESS**

4. Environment, Social, and Community Impacts

GOAL 4.0.0 - The Plan will preserve, and, wherever possible enhance the community social and environmental values.

OBJECTIVE	MEASURE OF EFFECTIVENESS	TYPE	COMPUTATIONAL METHODOLOGY
Objective 4.0.1: The Plan will be sensitive to preserving the quality of the environment, and in responding to air quality and energy conservation.	M.O.E. 4.0.1.1 Total Vehicle Miles of Travel (VMT)	3P	Compute from road inventory database
	M.O.E. 4.0.1.2 Percent Vehicle Miles of Travel (VMT) at Volume to Capacity (V:C) ratio over 1.2	3P	Compute from road inventory database
	M.O.E. 4.0.1.3 Weighted Volume to Capacity (V:C) ratio	3P	Compute from road inventory database
	M.O.E. 4.0.1.4 Total Carbon Monoxide (CO), Hydrocarbons (HC), and Nitrogen Oxide (NO) emissions	3P	Computed by FSUTMS HEVAL (Computer Program)
	M.O.E. 4.0.1.5 Total fuel use (gallons)	3P	Computed by FSUTMS HEVAL (Computer Program)
	M.O.E. 4.0.1.6 EMIS/air quality modelling output reports	3P	Computed by FSUTMS/EMIS (Computer Program)
	M.O.E. 4.0.2.2 Percent	3P	FSUTMS (Computer Program)

**TABLE 5-1
VOLUSIA COUNTY METROPOLITAN PLANNING ORGANIZATION
TRANSPORTATION PLAN
GOALS, OBJECTIVES, AND MEASURES OF EFFECTIVENESS**

4. Environment, Social, and Community Impacts

GOAL 4.0.0 - The Plan will preserve, and, wherever possible enhance the community social and environmental values.

	person-trips by non-auto modes		
	M.O.E. 4.0.2.3 Percent of major road system with bicycle facilities	3P	Compute from road inventory database
	M.O.E. 4.0.2.4 Percent of major road system with sidewalks	3P	Compute from road inventory database
Objective 4.0.3: The Plan will consider the designation of scenic corridors and parkways that enhance the overall social and aesthetic values of the community.	M.O.E. 4.0.3.1 Percent of major road network designated as scenic corridor	3P	Compute from road inventory database
Objective 4.0.4: Disruption to established communities, activity centers, redevelopment areas, and infill areas will be minimized.	M.O.E. 4.0.4.1 Miles of lane addition or new roads within designated areas	3P	Compute from road inventory database
	M.O.E. 4.0.4.2 Acres of right-of-way needed in designated areas	3P	Compute from road inventory database
	M.O.E. 4.0.4.3 Miles of residential collectors with Average Annual Daily Traffic (AADT) over 8,000 vpd	3P	Compute from road inventory database
	M.O.E. 4.0.4.4 Miles of urban	2P	Compute from road inventory

**TABLE 5-1
VOLUSIA COUNTY METROPOLITAN PLANNING ORGANIZATION
TRANSPORTATION PLAN
GOALS, OBJECTIVES, AND MEASURES OF EFFECTIVENESS**

4. Environment, Social, and Community Impacts

GOAL 4.0.0 - The Plan will preserve, and, wherever possible enhance the community social and environmental values.

	collectors with speed > 35 mph		database
	M.O.E. 4.0.4.5 Miles of collectors with lanes > 4	3P	Compute from road inventory database
Objective 4.0.5: The requirements of Environmental Protection Agency (EPA) conformity regulations will be addressed.	M.O.E. 4.0.5.1 Does Plan meet EPA standards? (Yes/No)	3P	Monitor ambient air quality. Volusia County is <u>not</u> a non-attainment area.

TABLE 5-1 ACRONYMS

Acronym	Unabbreviated Term	Acronym	Unabbreviated Term
ADA	Americans with Disabilities Act	HEVAL	Highway Evaluation Module of FSUTMS
Atlas GIS	A micro-computer Geographic Information System	ISTEA	Intermodal Surface Transportation Efficiency Act
BACS	Bay Area Commuter Service	of	1991
CAA	Clean Air Act	Mobile 5a	An Air Quality Modelling Program
CAC	Citizens Advisory Committee	MOE	Measure of Effectiveness
CIP	Capital Improvement Program	MPO	Metropolitan Planning Organization
CMS	Congestion Management System	P 'n R	Park and Ride
CO	Traffic Signal Cycle Length	SOV	Single Occupancy Vehicle
FDOT	Florida Department of Transportation	TD	Transportation Disadvantaged
FHWA	Federal Highway Administration	TDM	Transportation Demand Management
FIHS	Florida Intrastate Highway System	TIP	Transportation Improvement Program
FSUTMS	Florida Standard Urban Transportation Model Structure	TMO	Transportation Management Organization
FTA	Federal Transit Administration	TSM	Transportation Systems Management
FTP	Florida Transportation Plan	UGM	Urban Goods Movement
G:C ratio	Green time to Cycle Length Ratio at a Traffic Signal	UTCS	Urban Traffic Control System
GIS	Geographic Information System	V:C ratio	Volume to Capacity Ratio
		VMT	Vehicle Miles of Travel

CHAPTER SIX

DEVELOPMENT OF PLANNING TOOLS

6.0 Introduction

Developing a transportation system plan requires a broad range of information and the development of planning tools specialized to conditions in Volusia County. These tools make use of state-of-the-art techniques and procedures. The primary analysis tools developed in support of this plan are:

- the micro-FSUTMS transportation system planning model;
- the FHWA-sponsored Transportation Demand Management (TDM) model, (which is integrated into the micro-FSUTMS modelling process);
- geographic information system mapping, compiled in Atlas*GIS; and
- a facility inventory database and analysis system for evaluating operating conditions and improvement costs which links to the GIS mapping system.

This chapter documents the development of these planning tools, including a summary of the validity of the transportation model and documentation of the cost data on which improvement costs were based.

6.1 Transportation System Planning Model

A transportation system planning model is a series of computer programs used to estimate the demand for transportation services. These models have been in widespread use for planning studies of this type since the early 1960's. They use land use data (e.g. housing, population, employment, school enrollment), data describing the transportation facilities and services available (e.g. roads, transit routes, etc.), and data describing the preferences of the public to estimate how many trips are generated, to where they will go, and by what mode of travel and what route they will use.

The Florida DOT has developed a standardized transportation system planning model to be used in Florida, called the Florida Standard Urban Transportation Model Structure (FSUTMS). FSUTMS models have been developed in the past for, and used in, Volusia County. The FSUTMS model prepared for this study represents an advancement of previous models in that it combines the two previous models for the eastern coastal areas and western county and adds a model to simulate transit services into one single model.

This model was reviewed and validated for conditions existing in Volusia County. This was done by assembling input data for 1990, along with traffic volume count data for 1990. The model was applied, and appropriate input factors were adjusted until the model replicated the 1990 traffic volumes to an acceptable level of accuracy. Once the model can replicate existing conditions to an acceptable level of accuracy, then it is judged appropriate to forecast future year conditions when projections of future housing population, employment, etc. are entered to it. The paragraphs below describe the process of preparing this model for use in Volusia County, a process called “validation. The validation process, including a model user guide, has been fully documented in a “stand-alone” report available from the MPO entitled “Model Validation Report and Procedural Guide”, dated April, 1996.

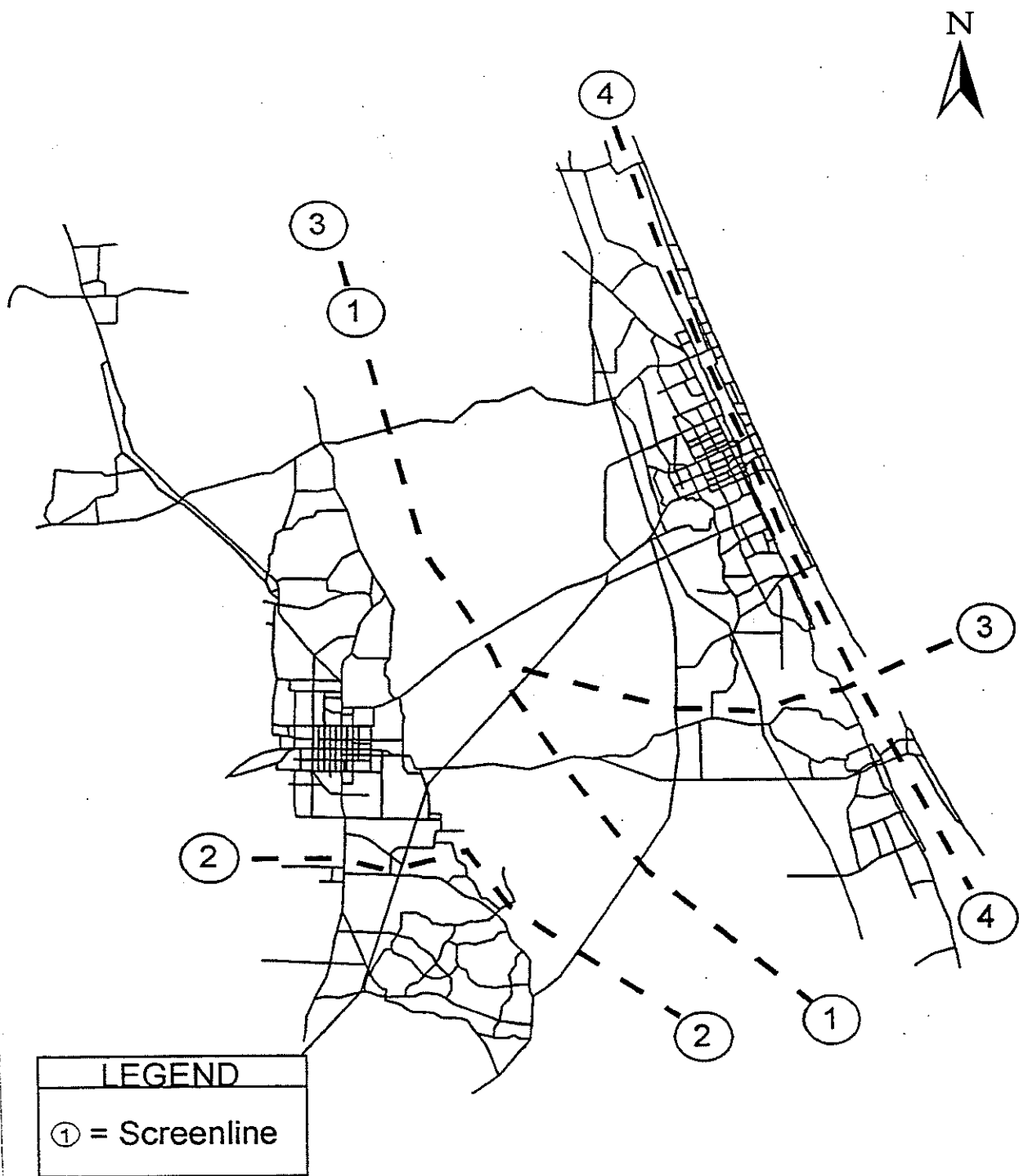
The model validation process includes checking the performance of the model at the critical steps of trip generation, trip distribution, and traffic assignment. Florida’s FSUTMS model set contains a program designed specifically for assisting the user in evaluating the results of model applications. The model is known as HEVAL. HEVAL provides a variety of reports to compare and summarize output data. The overall VCUATS’ HEVAL.OUT statistics are shown in Table 6-1 for the final 1990 VCUATS assignment. The key evaluation statistics in Table 6-1 are the VMT V/C and VHT V/C ratios, both statistics should be $\pm 5\%$ of 1.00. Both ratios are acceptable for the model performance.

Table 6-1 Year 1990 HEVAL.OUT FILE STATISTICS*	
Total Number of Links	1,944.00
Total System Miles	825.72
Total Lane Miles	2,043.46
Total Directional Miles	1,651.44
Total VMT Using Volumes	3,531,468.25
Total VMT Using Counts	3,562,021.25
Total VMT V/C	.99
Total VHT Using Volumes	105,801.62
Total VHT Using Counts	107,920.74
Total VHT V/C	.98
Total Volumes All Links	20,080,374.00
Average Total Volume	10,329.41
Total VMT All Links	8,813,114.00
Total VHT All Links	272,028.41
Total Original Speed (Mph)	35.53
Total Congested Speed (Mph)	32.43

* Results may differ slightly depending on HEVAL.EXE version.

The accuracy of trip distribution across a study area can be determined through analysis of volume-to-count summaries along screenlines (Figure 6-1). Screenline summaries are crucial to an assessment of the traffic assignment, and Table 6-2 shows that the intercounty movements are accurately represented.

The most crucial model validation comparisons for VCUATS will be based on traffic assignment volumes. These comparisons include the following:



Volusia County MPO -- 2020 Transportation Plan

1990 Validation Screenline Locations

Figure

6-1

Table 6-2 Year 1990 Screenline Summaries			
Screenline Number	Total Volume	Total Count	Volume Over Count Ratio
1	72,552	67,292	1.08
2	117,546	105,024	1.12
3	125,665	107,234	1.17
4	200,520	203,948	0.98
99	6,150,136	6,545,264	0.94

- Ratio of volume over count VMT
- Ratio of volume over count VHT
- Ratio of volume over count volume
- Volume-to-count ratios along screenlines
- % Root Mean Square Error (RMSE) for link groups and urban areas

Ratios of volumes over count VMT and volume over count VHT are given in Table 6-1. Volume to count ratios along screenlines are presented in Table 6-2, above and Table 6-3(a), below, gives countywide %RMSE for link groups.

Table 6-3(a) Year 1990 Percent Root Mean Square Error - Countywide		
Count Range	First Run	Last Run
0-5,000	89.055	47.586
5,000-10,000	46.889	37.354
10,000-20,000	43.582	24.058
20,000-30,000	43.552	14.393
30,000-40,000	67.715	--
0-40,000	63.637	33.288

Table 6-3(b) Year 1990 Percent Root Mean Square Error - Subareas				
Count Range	East Beach	East Non-Beach	West All	Total
0-5,000	50.903	55.226	38.557	47.586
5,000-10,000	28.766	38.573	39.659	37.354
10,000-20,000	25.037	24.121	23.101	24.058
20,000-30,000	8.960	17.252	10.856	14.393
0-30,000	28.980	32.642	35.199	33.288

Table 6-3(b) compares the % RMSE of the first run of the VCUATS model with the last calibrated version for East Volusia County (Beachside), East Volusia County (Non-Beachside), and West Volusia County. Since the FDOT standard is 35-50% RMSE, for the urban area, it can be concluded that the VCUATS validation exceeds the required standards.

As with the traffic assignment performance, there are a number of transit assignment performance standards. Basically, the overall daily transit trips need to be within plus or minus three (3) percent error. For the individual lines, various standards exist depending on the number of daily riders per each route. The standard VCUATS was less than 150% on transit lines.

Table 6-4 summarizes the transit ridership projections by each of the transit lines. As shown, the overall daily transit trips are within the accepted error range and all but one route meet the minimum per line standards.

Detailed review of model results indicates an excellent validation to base year conditions. Trip generation and trip distribution summary statistics are all within acceptable ranges. Assignment volumes summed along critical screenlines closely replicate ground counts. Good model validation statistics will allow for adequate simulation using future year data for the VCUATS area.

Table 6-4 Year 1990 Transit Validation						
VOTRAN Route		Model Line #	Observed Trips	Estimated Model Trips	% Error*	Accept
1	1A	13, 14				
	1B	15, 16	339	463	36.6%	YES
1C		17, 18	208	99	-52.4%	YES
3		3, 4	326	343	5.2%	YES
4		5, 6	313	348	11.2%	YES
5		11, 12	232	194	-16.4%	YES
6		19, 20	179	413	130.7%	YES
7		1, 2	218	341	56.4%	YES
8		9, 10	186	177	-4.8%	YES
9		23, 24	368	311	-15.5%	YES
10		21, 22	340	293	-13.8%	YES
11		7, 8	443	250	-43.6%	YES
12		26, 27	279	211	-24.4%	YES
15		25	565	63	-88.8%	YES
17	17A	28, 29				
	17B	30, 31	227	678	198.7%	NO
		TOTAL**	4223	4184	-0.9%	YES

Note: *Acceptable range = 150%

**Acceptable range = \pm 3%

In conclusion, it can be stated that the VCUATS travel models are in proper order for preparing and testing future year assignments to alternative networks. The model's performance exceeds that found in previous study updates and will provide the MPO and FDOT with reliable forecasts of travel patterns. For additional information, refer to the "Base Year 1990 Model Validation" report.

6.2 Road Inventory Database

Two types of road inventory data were assembled to develop a database of conditions for the Volusia County MPO 2020 Transportation Plan. The first type of data is standards and constant factors applicable to groups of facilities, and the second type is an inventory of existing facilities. The data compiled for these databases are discussed below. The standards and unit costs presented in this document will serve as a basis for estimating the costs of and evaluating the performance of alternative transportation system plans.

6.2.1 Standards and Constant Factors

The transportation analysis makes use of a series of tables containing planning policies, standards, and other information applicable to groups of roads. For long-range planning purposes, average or "typical" values applicable to groups of roads are acceptable, rather than roadway link-specific information which is costly to determine. The following information has been assembled by the Florida DOT, MPO, local agencies, or the Consultant, as discussed below:

- service volumes
- construction costs
- right-of-way widths
- cost per square foot estimates for right-of-way acquisition
- traffic volume seasonal adjustment factors
- historical and future growth rates

6.2.1.1 Roadway Service Volumes

The Florida DOT has developed procedures for estimating roadway peak-hour and daily service volumes for long-range transportation planning services (ART-PLAN and other level of service analysis software). These procedures and the generalized input parameters upon which they have been developed, were used for long-range planning purposes. A set of these generalized planning capacity tables, documenting the input assumptions, is provided in Appendix 6-A.

6.2.1.2 Construction and Annual Maintenance Costs

Tables 6-5 and 6-7 provide a summary of average costs per mile to improve State urban and rural roads from the existing lane type to a future lane type (e.g., a two-lane undivided section to a four-lane divided, urban section). These unit costs have been developed for a variety of road improvement types which will be encountered in Volusia County between the “existing” condition and the future year road network. These unit costs are based on the Florida DOT’s 1993 Transportation Costs publication. Worksheets documenting the development of unit costs not provided in this source are provided in Appendix 6-B.

Tables 6-6 and 6-8 provide a summary of average costs per mile to improve non-state urban and rural roads. For non-State facilities, unit costs for construction that are 90 percent of the state costs were used. This ratio was used because local agencies are not always faced with the same administrative procedures or design standards that the State is, and road improvement costs are typically lower. This percentage was based on generalized road improvement unit costs prepared by the Volusia County Engineering Department and improvement costs reported by other Florida counties. The improvement cost per mile for both State and non-State facilities include the provision of bicycle facilities and, in urban areas, sidewalks.

The annual maintenance costs for state-urban and state-rural facilities (also provided in Tables 6-5 and 6-7) are also based on the Florida DOT’s 1993 Transportation Costs publication. For non-Interstate roads, the unit maintenance costs in the tables are 20 percent higher than the “low value” provided in Transportation Costs for the respective class of road. For Interstate highways, values 10 percent lower than the “high value” for the appropriate facility were applied. This approach was used because, based on discussions with the Florida DOT staff, the high and low cost estimates provided represent the highest and lowest values of a variety of conditions tested.

The construction and maintenance costs per mile for major non-state, urban and rural facilities were not available; however, the current expenditures of Volusia County for roadway maintenance and operation were available and are discussed in Chapter Nine, Revenue Projections. The majority of revenues allocated by local agencies to maintenance are typically expended on non-functionally classified roads, and therefore the current and future inventories of major roads will not serve as an effective method of forecasting maintenance funding needs for local government agencies. Thus, no maintenance cost per mile information has been developed for non-State facilities. The approach to allocating non-State funds to maintenance activities is discussed in Chapter Nine, Revenue Projections.

In addition, costs for bicycle and pedestrian facilities are provided in Tables 6-9 and 6-10. These costs were used to estimate the costs of adding these facilities to roads not being otherwise improved. These unit costs were also obtained from the Florida DOT's 1993 Transportation Costs publication.

6.2.1.3 Right-of-Way Widths

For each roadway type available to the database, three types of right-of-way widths are required. They are as follows:

- a "Minimum" right-of-way width for use in urban core areas or other areas where right-of-way costs are extremely high,
- a "Standard" right-of-way width for general use, and
- an "Enhanced" right-of-way width for scenic corridors or other special purposes.

All of the above right-of-way widths include the right-of-way required for sidewalks, bicycle facilities, or transit amenities. The right-of-way needed for these facilities when added to roads not otherwise being improved are identified in their respective cost tables (Tables 6-9 and 6-10).

This information serves as a basis for the planning estimate of right-of-way costs, and is based on local subdivision ordinances or standards, adopted standard roadway cross-sections from a long-range highway plan, or Florida DOT design standards.

The Minimum Right of Way and Enhanced Right of Way widths used for non-state urban and non-state rural facilities in Tables 6-6 and 6-8 are the same as those used for state, urban and rural facilities.

Table 6-5
State Urban Road Improvement Costs and Right-of-Way Standards
(\$1,000,000's)

Future Road Type																					
	0	2U	2D	2O	3O	4U	4D	4O	4G	4F	6D	6G	6F	8D	8G	8F	10F	MROW	SROW	EROW	Mtce
0	\$0.000	\$0.732	\$1.250	\$0.732	\$0.993	\$1.253	\$1.511	\$1.253	\$1.511	\$2.898	\$2.159	\$2.159	\$4.271	\$2.807	\$2.807	\$5.186	\$7.169		0		0
2U	NA	\$0.000	\$0.716	\$0.316	\$0.716	\$1.197	\$1.767	NA	\$1.767	NA	\$2.457	\$2.457	NA	\$3.063	\$3.063	NA	NA	54	56	100	\$0.013
2O	NA	NA	NA	\$0.000	\$1.250	NA	NA	\$1.616	NA	NA	NA	NA	NA	NA	NA	NA	NA	65	80	126	\$0.013
3O	NA	NA	NA	NA	\$0.000	NA	NA	\$1.250	NA	NA	NA	NA	NA	NA	NA	NA	NA	65	80	126	\$0.016
4D	NA	NA	NA	NA	NA	NA	\$0.000	NA	\$0.000	NA	\$1.197	\$1.197	NA	\$1.845	\$1.845	NA	NA	96	102	126	\$0.023
4O	NA	NA	NA	NA	NA	NA	NA	\$0.000	NA	NA	NA	NA	NA	NA	NA	NA	NA	65	80	126	\$0.020
4G	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	NA	NA	\$1.197	NA	NA	NA	NA	NA	96	102	126	\$0.023
4F	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	NA	NA	\$2.792	NA	NA	\$4.165	\$5.538	170	212	292	\$0.032
6D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	\$0.000	NA	\$1.197	\$1.197	NA	NA	118	124	150	\$0.028
6G	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	NA	NA	\$1.197	NA	NA	118	118	150	\$0.028
6F	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	NA	NA	\$2.792	\$4.165	170	224	292	\$0.063
8D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	\$0.000	NA	NA	139.5	150	160	\$0.040
8G	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	NA	NA	140	142	160	\$0.040
8F	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	\$2.792	194	250	340	\$0.068
10F	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	218	275	364	\$0.073

Source: Tindale-Oliver and Associates, Inc.
Filename: I:\volmpol94a\SUCOSTS.WK3
Date: 12/18/95

Notes:

0	No Road	4O	Four-lane one-way	6F	Six-lane freeway	MROW	Minimum ROW width allowable
2D	Two-lane urban divided	4G	Four-lane grade separated	8F	Eight-lane freeway	SROW	Standard ROW width
2O	Two-lane one-way	4F	Four-lane freeway	10F	Ten-lane freeway	EROW	"Enhanced" ROW width
3O	Three lane one-way	6D	Six-lane divided			MTCE	Maintenance Cost per mile
4D	Four-lane urban divided	6G	Six-lane grade-separated				

The above values are cost per mile estimates for long-range planning purposes. For grade-separated facilities, or major bridge structures, manual costs for Interchanges or bridges must be added.

Table 6-6
Non-State Urban Road Improvement Costs and Right-of-Way Standards
(\$1,000,000's)

	0	2U	2D	2O	3O	4U	4D	4O	4G	4F	6D	6G	6F	8D	8G	8F	10F	MROW	SROW	EROW	Mile
0	\$0.000	\$0.659	\$1.125	\$0.659	\$0.893	\$1.128	\$1.360	\$1.128	\$1.360	\$2.608	\$1.943	\$1.943	\$3.844	\$2.526	\$2.526	\$4.667	NA		0		0
2U	NA	\$0.000	\$0.644	\$0.284	\$0.644	\$1.077	\$1.590	NA	\$1.590	NA	\$2.211	\$2.211	NA	\$2.757	\$2.757	NA	NA	54	56	100	\$0.010
2O	NA	NA	NA	\$0.000	\$1.125	NA	NA	\$1.454	NA	NA	NA	NA	NA	NA	NA	NA	NA	68	80	96	\$0.010
3O	NA	NA	NA	NA	\$0.000	NA	NA	\$1.125	NA	NA	NA	NA	NA	NA	NA	NA	NA	68	80	96	\$0.013
4D	NA	NA	NA	NA	NA	NA	\$0.000	NA	\$0.000	NA	\$1.077	\$1.077	NA	\$1.476	\$1.661	NA	NA	96	100	126	\$0.018
4O	NA	NA	NA	NA	NA	NA	NA	\$0.000	NA	NA	NA	NA	NA	NA	NA	NA	NA	68	80	96	\$0.016
4G	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	NA	NA	\$1.077	NA	NA	NA	NA	NA	96	100	126	\$0.018
4F	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	NA	NA	\$2.513	NA	NA	\$3.749	\$4.984	170	212	292	\$0.026
6D	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	NA	\$0.000	\$0.000	NA	\$0.958	\$1.077	NA	NA	118	124	150	\$0.022
6G	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	NA	NA	\$1.078	NA	NA	118	124	150	\$0.022
6F	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	NA	NA	\$2.513	\$3.749	170	224	292	\$0.050
8D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	\$0.000	NA	NA	139.5	150	160	\$0.032
8G	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	NA	NA	140	150	160	\$0.032
8F	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	\$2.513	194	250	340	\$0.054
10F	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	\$0.000	218	275	364	\$0.056

Source: Tindale-Oliver and Associates, Inc.
Filename: I:\Volmpo194a\NUCOSTS.WK3
Date: 12/18/95

Notes:							
0	No Road	4U	Four-lane urban undivided	6D	Six-lane divided	MROW	Minimum ROW allowable
2U	Two-lane urban undivided	4D	Four-lane urban divided	6G	Six-lane grade-separated	SROW	Standard ROW width
2D	Two-lane urban divided	4O	Four-lane one-way	6F	Six-lane freeway	EROW	"Enhanced" ROW width
2O	Two-lane one-way	4G	Four-lane grade separated	8F	Eight-lane freeway		
3O	Three lane one-way	4F	Four-lane freeway	10F	Ten-lane freeway		

The above values are cost per mile estimates for long-range planning purposes. For grade-separated facilities, or major bridge structures, manual costs for interchanges or bridges must be added.

Table 6-7
State Rural Road Improvement Costs
and Right-of-Way Standards
 (\$1,000,000's)

0	2U	4D	4F	6D	6F	8F	10F	MROW	SROW	EROW	Mtce
\$0.000	\$0.810	\$1.462	\$2.564	\$2.089	\$3.778	\$4.588	NA	0	0	0	0
NA	\$0.000	\$1.126	NA	\$2.322	NA	NA	NA	96	100	160	\$0.011
NA	NA	\$0.000	\$3.076	\$1.126	NA	NA	NA	160	200	220	\$0.013
NA	NA	NA	\$0.000	NA	\$1.623	\$2.854	\$4.071	270	300	330	\$0.021
NA	NA	NA	NA	\$0.000	NA	NA	NA	166	220	230	\$0.021
NA	NA	NA	NA	NA	\$0.000	\$1.643	\$2.854	278	320	340	\$0.034
NA	NA	NA	NA	NA	NA	\$0.000	\$1.643	302	340	360	\$0.047
NA	NA	NA	NA	NA	NA	NA	\$0.000	326	360	380	\$0.060

Source: Tindale-Oliver and Associates, Inc.

Filename: I:\Volmpo\94\RCOSTS.WK3

Notes:

0	No Road	6D	Six-lane divided	MROW	Minimum ROW width allowed
2U	Two-lane undivided	6F	Six-lane freeway	SROW	Standard ROW width
4D	Four-lane divided	8F	Eight-lane freeway	EROW	"Enhanced" ROW width
4F	Four-lane freeway	10F	Ten-lane freeway		

The above values are cost per mile estimates for long-range planning purposes.

For grade-separated facilities, or major bridge structures, manual costs for interchanges or bridges must be added.

Table 6-8
Non-State Rural Road Improvement Costs
and Right-of-Way Standards
 (\$1,000,000's)

0	2U	4D	4F	6D	6F	8F	10F	MROW	SROW	EROW	Mtce
\$0.000	\$0.729	\$1.316	\$2.308	\$1.880	\$3.400	\$4.129	NA	0	0	0	0
NA	\$0.000	\$1.013	NA	\$2.090	NA	NA	NA	64	80	98	\$0.009
NA	NA	\$0.000	\$2.768	\$1.013	NA	NA	NA	130	140	220	\$0.010
NA	NA	NA	\$0.000	NA	\$1.461	\$2.569	\$3.664	270	300	320	\$0.017
NA	NA	NA	NA	\$0.000	NA	NA	NA	166	212	220	\$0.022
NA	NA	NA	NA	NA	\$0.000	\$1.479	\$2.569	278	320	340	\$0.027
NA	NA	NA	NA	NA	NA	\$0.000	\$1.479	302	340	360	\$0.033
NA	NA	NA	NA	NA	NA	NA	\$0.000	326	360	380	\$0.038

Source: Tindale-Oliver and Associates, Inc.

Filename: I:\Volmpo\94a\RCOSTS.WK3

Date: 12/18/95

Notes:

0	No Road	6D	Six-lane divided	MROW	Minimum ROW width allowed
2U	Two-lane undivided	6F	Six-lane freeway	SROW	Standard ROW width
4D	Four-lane divided	8F	Eight-lane freeway	EROW	"Enhanced" ROW width
4F	Four-lane freeway	10F	Ten-lane freeway		

The above values are cost per mile estimates for long-range planning purposes.

For grade-separated facilities, or major bridge structures, manual costs for interchanges or bridges must be added.

Table 6-9 Bicycle Facilities Costs			
Treatment	Code	Added Cost/Mile	Added Right-of-Way
None	0	\$ 0	0 ft.
Paved Shoulders	1	\$100,000	0 ft.
Wide Curb Lane	2	\$100,000	4 ft.
Bicycle Lanes	3	\$185,000	8 ft.
Bike Path	4	\$125,000	10 ft.
TABLE 6-10 Pedestrian Facilities Costs			
Treatment	Code	Added Cost/Mile	Added Right-of-Way (1)
No Sidewalks	0	\$ 0	0 Ft.
Sidewalk one-side	1	\$22,500	0 Ft.
Sidewalk two-sides	2	\$45,000	0 Ft.

Note: Sidewalks are usually built within standard rights-of-way and no additional right-of-way is usually needed.

6.2.1.4 Right-of-Way Cost Per Square Foot

To estimate right-of-way costs, a code indicating an average right-of-way cost per square foot was assigned to each roadway link. This code was assigned to each roadway segment in the database based on a review of the adopted future land use plans of the County or municipalities. In some cases, the future land use plan maps were unavailable, so input from MPO and other local government agency staff was solicited. The code allows a dollar value per square foot to be applied to the area of right-of-way to be acquired. The unit costs provided in Table 6-11 were based on discussions with the Volusia County Right-of-Way Department, who relied upon their judgement. They are intended to include costs of condemnation, and an average estimate of damages, but these costs are very difficult to estimate with significant accuracy. Research into historical records may provide useful information for these estimates, but the judgement of experienced County staff members is probably equally valid for long range planning purposes.

Table 6-11 Typical Right-of-Way Costs per Square Foot		
Land Use Type	Code	Cost Per Square Foot
Agricultural	A	\$0.34
Commercial	C	\$8.50
Mixed Use	MU	\$4.00
Industrial	I	\$1.50
Residential - Low	RL	\$0.50
Residential - Medium	RM	\$0.75
Residential - High	RH	\$1.00
Public, Semi-Public	PSP	\$0.34
Environmentally Sensitive	E	\$0.03

6.2.1.5 Growth Rates

Historical growth rates and growth rates anticipated in the future can be used to adjust traffic volume data collected in the past to current and/or future estimates. Table 6-12 provides for these growth rates to be applied by roadway functional classification. These growth rates are provided as a general reference only. For this plan, traffic growth projections were based on the micro-FSUTMS transportation system planning model.

Table 6-12 Growth Rates		
Functional Class	Historical Rate	Future Rate
Principal Arterial	3.0	2.5
Minor Arterial	3.0	2.5
Collector	2.0	1.5
Rural Major Collector	2.5	2.0
Rural Minor Collector	2.0	1.5

6.2.2 Link Data Requirements

A link-by-link inventory of the existing road network was also compiled in the database, which is maintained in dBase (*.DBF) file format. Tindale-Oliver and Associates assembled data for all state and major non-state roadway facilities in Volusia County. Data for forty variables were compiled for each road link. The current database contains all roadway links included in the micro-FSUTMS model network, as well as many functionally classified roads not in the FSUTMS model. The sections below describe the data variables assembled for the database, and the data compiled is reported in three separate appendices. These appendices are:

- Appendix 6-C: Administrative Data Inventory
 - Appendix 6-D: 1993 Level of Service Data Inventory
 - Appendix 6-E: Cost Data Inventory
1. **Road Link Identification (ID, ON, FROM, TO):** Unique record ID, name of street, and termini (From/To).
 2. **Florida Intrastate Highway System (FIHS):** A "Yes/No" flag to identify if the road link is a part of the FIHS. This information was entered using maps of the FIHS provided by the Florida DOT.
 3. **National Highway System (NHS):** A "Yes/No" flag to identify if the link is a part of the NHS. This information was entered using maps of the NHS provided by the Florida DOT.
 4. **Federal Aid Highway System (FAHS):** A "Yes/No" flag to identify if the link is a part of the FAHS. This field was completed using the Federal Functional Classification information provided by the Florida DOT. All roads classified as Freeway, Urban and Rural Principal and Minor Arterials, Urban Collectors and Rural Major Collectors were identified as being on the FAHS.
 5. **Impact Fee District (DIST):** This field indicates the impact fee district in which the road is located. This information was entered based on a map indicating impact fee district boundaries provided by Volusia County.

6. **Length (LENGTH):** reports the length, in miles, of each road segment between the termini described above. This information was entered into the database from the Atlas GIS map of Volusia County.
7. **Right-Of-Way Type (LROWTYP, RROWTYP):** describes the general value classification of land adjacent to the road link. Values entered match those for which codes are defined in Table 1. This information was assigned by Tindale-Oliver and Associates, Inc. in consultation with the adopted future land use plan maps of Volusia County and staff of local agencies.
8. **Historical Growth Rate (HGR):** provides for a unique historic annual traffic growth rate for each roadway link. A “default” value of 99.99 has been entered, indicating this field will not be used.
9. **Future Growth Rate (FGR):** provides for a unique future annual traffic growth rate for each roadway link. A “default” value of 99.99 has been entered, indicating this field will not be used.
10. **Count Station 1 and Count Station 2 (CS1 and CS2):** an indication of the Florida DOT, County, or municipal count station from which the traffic count for the link was obtained.
11. **Scheduled Improvement Year (SIY):** Not used. Can be filled with the year of construction of road improvements scheduled in the current Transportation Improvement Program (TIP).
12. **Manual Costs for Road Improvement (MCRT, MDC, MROW, MCC, and MUC):** These variables represent information from the TIP. The first variable (MCRT) establishes the type of road for which the manually estimated costs have been established, and the remaining variables are the design costs, the right-of-way costs, the construction costs, and any unique costs such as bridge construction or overpass construction. If cost estimates for other improvements have been prepared that provide greater accuracy than the "standard tables" approach, this information can be entered here also.
13. **Validation Year Count Volume (VYCV):** This volume is the 1990 Average Annual Daily Traffic (AADT), which was used in projecting future year traffic volumes. This

data was compiled from Florida DOT and County data sources by the MPO staff, and has been entered into the database.

14. **Validation Year Model Volume (VYMV):** These daily traffic volumes are the raw output of the micro-FSUTMS transportation model for Volusia County adjusted to AADT values. This data was used to assist in projecting future year traffic volumes.
15. **Maximum Road Type for Constrained Facility (MAXRT):** This variable establishes the maximum extent to which a road may be improved. The maximum road type is usually set by policy or as a result of physical constraints. For example, urban interstate highways, by policy of the Florida DOT, are limited to a maximum of ten lanes. Urban arterials are limited to six lanes. The local government Traffic Circulation Elements were reviewed to identify constraints that have been established for specific roads.
16. **Reason for Constraint (CON_R):** Not Used.
17. **Planned Bicycle Facility (BIKE_PLN):** the type of bicycle facility that is planned (not existing) for the road segment. Allowable choices correspond to the bicycle facilities listed in Table 6-5, Bicycle Facilities Costs, in this report.
18. **Planned Pedestrian Facility (PED_PLN):** the type of pedestrian facility that is planned (not existing) for the road segment. Allowable choices correspond to the pedestrian facilities listed in Table 6-6, Pedestrian Facilities Costs.
19. **Bridge Length (CC_BL):** the length, in feet, of bridges in the road segment was provided by Florida DOT.
20. **Street Lighting (CC_SL):** a "Yes/No" flag indicating if street lighting is to be included in the costs of road improvement. The database has been set up to indicate street lighting will be provided as a part of improvements to all arterial roads in the urban areas.
21. **1993 Road Type (RT and TYPE):** describes the operational characteristics of the existing (1994) road. This information is coded in two fields, a number representing the number of lanes (2, 4, 6, etc.) is entered into the field "RT", and a character in the field "TYPE" representing the facility type as follows:

U- undivided -	A collector or arterial facility with no median or barrier between opposing traffic.
D- divided -	A collector or arterial facility with a median or barrier or two-way left turn between opposing traffic.
G-grade separated -	An arterial road with overpasses at major intersections
F- freeway -	A limited-access facility (e.g., Interstate)
O- one-way -	A collector or arterial facility that carries a one-directional flow of traffic.

The number of lanes and road type for the existing road system was entered into the template based on the “9193 LOS” database maintained by the Volusia County MPO.

22. **Jurisdiction (JURIS):** e.g., State (SR), County (CR), or name of City with jurisdictional responsibility over the road. In Volusia County, the following standard codes have been established for municipalities:

DB	Daytona Beach	DS	Daytona Beach Shores
DY	DeBary	DL	DeLand
DEL	Deltona	ED	Edgewater
HH	Holly Hill	LH	Lake Helen
NS	New Smyrna Beach	OH	Oak Hill
OC	Orange City	OB	Ormond Beach
PR	Pierson	PI	Ponce Inlet
PO	Port Orange	SD	South Daytona

23. **Functional Classification (FC):** e.g. Rural Minor Collector (MIC), Rural Major Collector (MAC), Collector (C), Minor Arterial (MA), or Principal Arterial (PA). This information was entered into the template based on the current Federal Functional Classification of Roads, provided by the Florida Department of Transportation, District Five, in a listing dated April 15, 1993.
24. **Performance Standard (PERF_STD):** the standard at which the road or system is desired to operate. This information is based on information contained in local governments' Comprehensive Plan Traffic Circulation Element.

25. **Capacity Analysis Facility Type (CAFT):** This variable indicates the type of level of service analysis that will be applied to evaluate the operating condition of the link. The facility types are numbered as follows:

- 1 = Freeway
- 2 = Urban Interrupted Flow Facility
- 3 = Urban Multi-lane Uninterrupted Flow Facility
- 4 = Urban Two-lane Uninterrupted Flow Facility
- 5 = Suburban Collector
- 6 = Urban Interrupted flow arterial with signal spacing > 2 miles.
- 7 = Rural Multi-lane Uninterrupted Flow Facility
- 8 = Rural Two-lane Uninterrupted Flow Facility

The analysis methodology for each road link was extracted from facility type descriptions provided in the 9193 LOS database maintained by Volusia County MPO and was reviewed and adjusted by local government agency staff.

26. **Aggregated Segment Number (AS1):** This number denotes the individual links which are aggregated together to form a continuous analysis segment for level of service and capacity analysis purposes. The aggregation has been established for interrupted flow urban arterials only, as aggregation is meaningless on uninterrupted flow road segments. All links having the same aggregated segment number are grouped together for level of service analysis purposes.
27. **Existing Number of Signals (NO_SIG):** This variable is used to determine arterial group type and to quantify estimated delay in the level of service analysis. Arterial group refers to the roadway group classifications of the Florida DOT's generalized service volume thresholds based on signal spacing. This information is based on information provided by the Volusia County MPO, and from local agencies.
28. **Existing Right-Of-Way Width (ROW):** the width in feet of the existing right-of-way. This data was tabulated for the State road system from right-of-way maps provided by the FDOT. TOA extracted the needed information from these maps for all state roads. Leftwich Consulting Engineers, with assistance from the MPO, inventoried right-of-way widths for non-State roads. In instances where this information was unavailable, or right-of-way was unplatted, the existing right-of-way width was assigned based on

assumptions that right-of-way widths corresponding to the existing road type could be claimed by rights of occupation and maintenance.

29. **Directional Distribution Factor (D_FAC):** describes the percent of traffic flow in the peak direction during the peak hour. This factor was obtained from the generalized capacity tables published by the Florida DOT.
30. **K100 Factor (K100):** describes the design hour factor used to convert AADT volumes to design hour volumes. This factor was obtained from the generalized capacity tables published by the Florida DOT.
31. **Capacity Analysis Variables (VAR1 through VAR11):** A group of additional variables are required for the database to compute roadway capacities and levels of service. The Florida DOT has established standard "default" values for these variables in developing its generalized planning capacity tables. The DOT default values are a function of the capacity analysis facility type (CAFT), the area within which the facility is located, number of lanes, speed limits, and other variables. Default values from the Florida DOT's Level of Service tables were entered into the database. These variables are:
 - Arterial class (VAR1);
 - Saturated flow rate per lane (VAR2);
 - Peak-hour factor (VAR3);
 - Percent turns from auxiliary lanes (VAR4);
 - Area type (VAR5);
 - Speed (speed limit for interrupted flow facilities, design speed for uninterrupted flow facilities) (VAR6);
 - Arrival type at signalized intersection (VAR7);
 - Percent no passing zones for two-lane, rural, uninterrupted flow facilities (VAR8).
 - Controller type at signalized intersections (VAR9)
 - Source of cycle length (VAR10S)
 - Signal cycle length (VAR10)
 - G:C ratio at signalized intersections (VAR11)
 - Source of G:C ratio (VAR11S)

32. **Annual Average Traffic Volume (AADT):** the AADT volume for the segment was provided by the MPO for the year 1993.
33. **Source of Count (SOURCE):** the source of the 1993 AADT as follows:
- | | |
|---------|--------------------|
| FDOT - | Florida DOT |
| VC - | Volusia County |
| MPO - | Volusia County MPO |
| Other - | Other source |
34. **Existing Bicycle Facility (BIKE_FAC):** the percentage of the length of the road segment on which the planned bicycle facility exists. Information combined in this data field was provided by the Volusia MPO.
35. **Existing Pedestrian Facility (PED-R, PED-L):** the percentage of the length of the road segment on which the planned pedestrian facility exists on the "right" and "left" side of the road, respectively. The right and left side corresponds to the right or left side of the road, following a convention of "south-to-north" and "west-to-east". No information was available for entry to this data field.
36. **Transit Route (TRAN_RT):** an indicator of the presence of transit routes on the road. This variable was obtained from bus route maps provided by VOTRAN.
37. **Truck Route Flag (TRUCK_RT):** an indication if the road segment is a part of a designated truck route network.
38. **HEVAC_RT:** Roads designated as hurricane evacuation routes were identified in the "Hurricane Evacuation Report" of the Volusia County Coastal Management Element, dated October, 1988.
39. **GROUP1:** This field contains a "flag" to indicate that the road segment has been designated as a key access facility to support economic development. (See Figure 5-1).
40. **GROUP2:** This field contains a "flag" to indicate that the road segment has been designated as an access facility to significant intermodal facilities (See Figure 5-2).

The inventory data described herein, and the results of the computations which make use of the data, are displayed graphically in various Figures and Tables provided throughout this report.

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CHAPTER SEVEN

LAND USE DATA

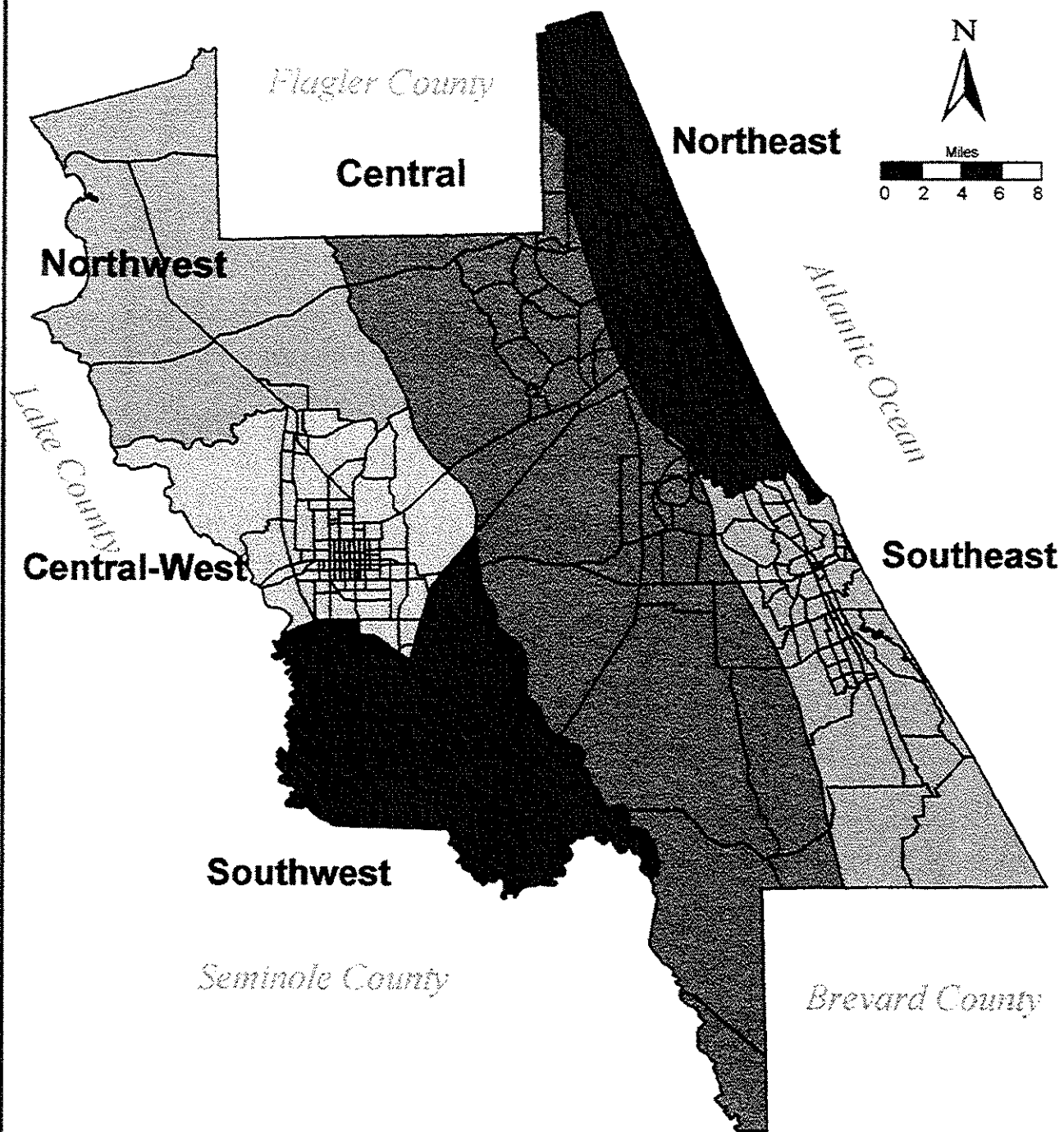
7.0 Introduction

Travel demands in Volusia County result from the types and locations of land uses in and around the County. This transportation planning study required the preparation of a land use inventory for 1990 for transportation model validation purposes, and projections of future land uses in 2000, 2010, and 2020 on which the future travel demand estimates are based. The land use data is prepared on a traffic analysis zone (TAZ) basis. A map illustrating the 564 TAZ boundaries in Volusia County is provided in Figure 7-1. A TAZ map series, indicating individual TAZ numbers is provided in Appendix 7-A.

The land use data is contained in a series of files named "ZDATA1" through "ZDATA4", "ZDATA" being the acronym for zonal data or TAZ data. The data contained in these files is as follows:

ZDATA1: Trip Production Variables

- Single Family Dwelling Units (DUs);
- Percent Single Family DUs vacant or occupied by non-permanent population;
- Percent Single Family DUs vacant;
- Permanent Population housed in Single Family DUs;
- Percent Single Family DUs with no auto;
- Percent Single Family DUs with one auto;
- Percent Single Family DUs with two or more autos;
- Multi-Family DUs;
- Percent Multi-Family DUs vacant or occupied by non-permanent population;
- Percent Multi-Family DUs vacant;
- Permanent Population housed in Multi-Family DUs;
- Percent Multi-Family DUs with no auto;
- Percent Multi-Family DUs with one auto;
- Percent Multi-Family DUs with two or more autos;
- Transient DUs (hotel/motel units);
- Percent transient DUs occupied;
- Population housed in transient DUs



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Volusia County MPO – 2020 Transportation Plan
1995 Traffic Analysis Zones
and Planning Regions

Figure

7-1

ZDATA2: Trip Attraction Variables

- Industrial employment;
- Commercial employment;
- Service employment;
- Total employment; and
- School enrollment.

ZDATA3: Special Generators

- Contains trip generation data for significant trip-generating land uses which are not adequately represented by the ZDATA1 or ZDATA2 file data.

ZDATA4: Internal/External Trips

- Internal/External trips at boundary of study area

These variables are standardized in the Florida Standard Urban Transportation Model Structure (FSUTMS). This chapter documents the development of 1990 socio-economic data for purposes of transportation model validation, and the development of future year projections of the socio-economic data used to develop future year transportation network alternatives.

The Volusia County Growth Management Department has divided the County into six planning “regions” for purposes of developing forecasts and monitoring growth. Summary tables in this chapter provide information at this level of detail, and data for each TAZ is reported in Appendices 7-B, D, E, and F. The boundaries of each of these planning regions is also indicated in Figure 7-1.

The socio-economic data projections contained herein were presented and reviewed by the Technical Coordinating Committee (TCC), the Citizens Advisory Committee (CAC), and the MPO Board during the months of August and October, 1995.

7.1 Development of 1990 Socio-Economic Data

The transportation model validation was based on 1990 conditions. The 1990 socio-economic data was developed from data compiled by the 1990 U.S. Census, information available through the Florida Department of Transportation, from the Florida Department of Labor and Employment Security, employment data tabulated by the U.S. Department of Commerce Bureau of Economic Analysis, and the resources of the staff of the Volusia County MPO, Volusia County School Board, and local agencies. The 1990 ZDATA1 files, which contain information relating to population and housing, was assembled from the 1990 Census Transportation Planning Package (CTPP) which contains the information necessary to complete the ZDATA1 file, with the exception of transient dwelling units. The CTPP provides information at the traffic analysis zone level. Appendix 7-B contains a description of how the 1990 CTPP data files were used to develop the 1990 ZDATA1 file, and a printout of the 1990 ZDATA follows the description.

The 1990 ZDATA2 file contains employment data and school enrollment. Employment by TAZ was developed by accessing files available from the Florida Department of Labor and Employment Security, which contain a listing of employers and their addresses. Using the resources of the Volusia County Growth Management Department, the Volusia County GIS Department, the MPO staff, and the Consultant, the locations of 7,716 of 8,519 employers were assigned to TAZs throughout the County. The assignment process involved manual contact with employers which had out-of-county and P.O. Box addresses to ascertain the specific local address at which the company conducted its business and the number of employees actively working during the 1990 calendar year. In addition, several employers were identified which have a central office, but multiple work sites. Examples of this type business are the Volusia County School Board, banks, grocery stores, fast food restaurants, and government agencies. These agencies were contacted to identify individual work sites and the number of employees that report to these work sites on a regular basis. The Florida Department of Labor and Employment Security (DOLES) files contain data of employees covered by unemployment compensation insurance. These employees make up only 76 percent of the countywide employment. The difference between the total employment and the number of employees covered by unemployment compensation insurance is assigned by the Florida DOT based

on the existing distribution of employment throughout the County and a regression equation they have developed but held confidential to ensure that confidentiality laws are not violated.

Information related to school enrollment was provided by the Volusia County School Board. Table 7-1 summarizes the 1990 socio-economic data for Volusia County, and a TAZ by TAZ listing of the 1990 ZDATA files is also provided in Appendix 7-B of this report. Figures 7-2 and 7-3 illustrate the distribution and density of population and employment, respectively, throughout Volusia County.

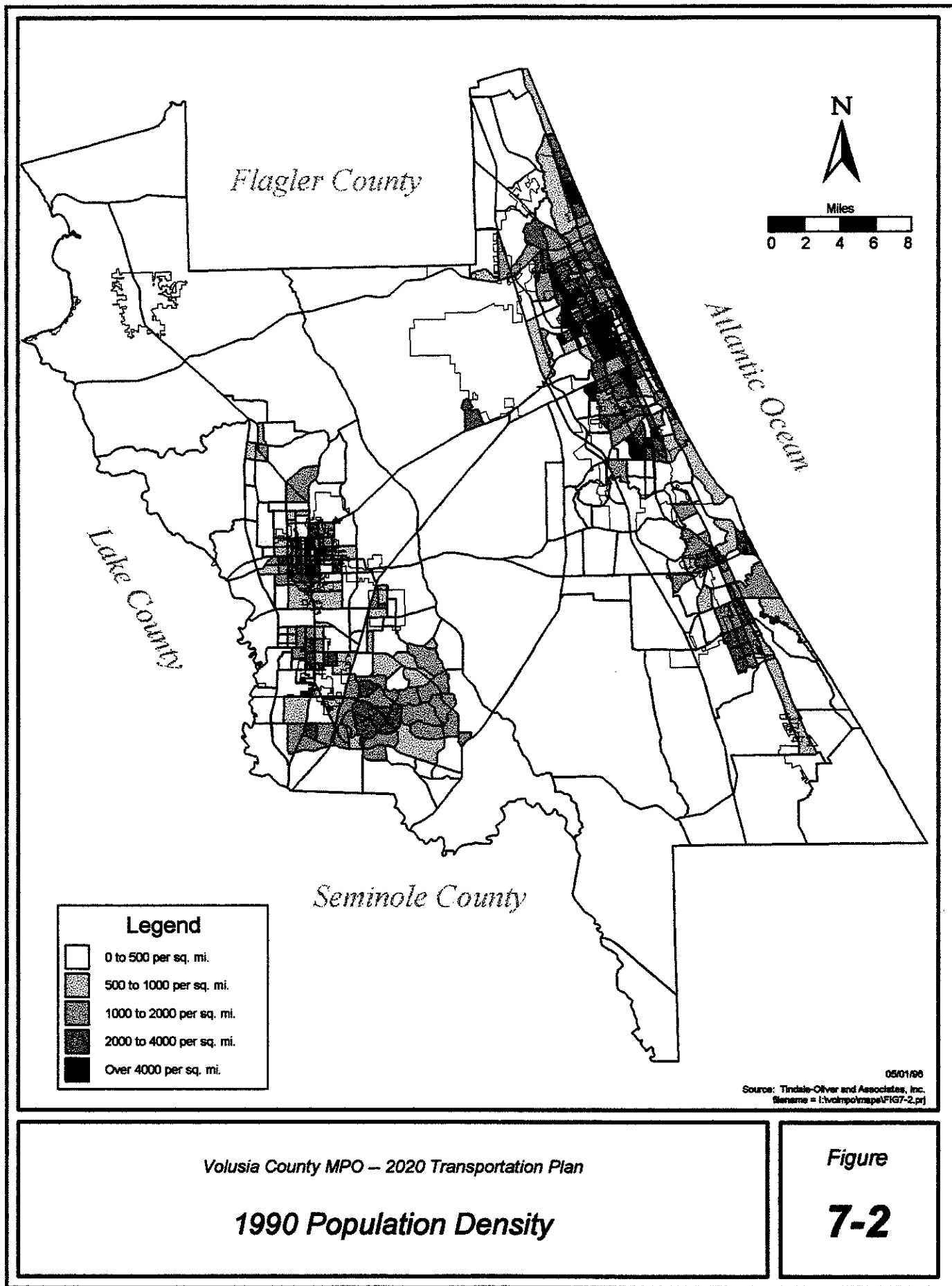
Table 7-1 1990 Land Use Data Summary				
Planning Region	Population	Dwelling Units⁽¹⁾	Employment	School Enrollment
Northeast	181,385	94,408	92,565	33,139
Southeast	45,217	26,175	12,574	5,963
Central	10,547	3,755	1,248	192
Northwest	8,233	2,529	3,469	1,450
Central-west	44,602	19,667	29,877	10,367
Southwest	77,888	34,084	13,658	10,747
Total:	367,872	180,618	153,571	61,858

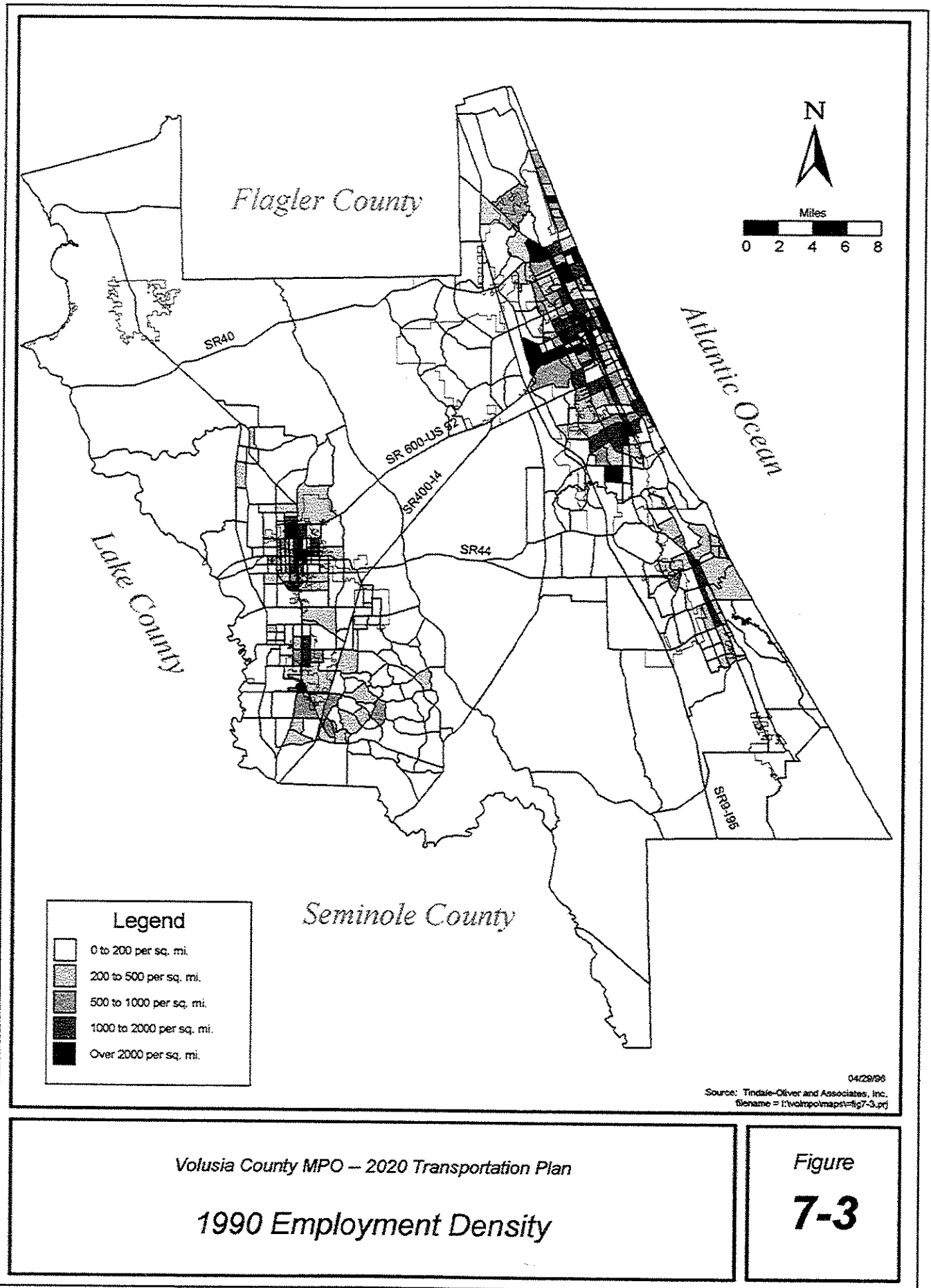
Notes: (1) Vacant and occupied single-family and multi-family units only, excludes hotel/motel units.

7.2 Future Year Socio-Economic Data

Future year socio-economic data for three horizon years, 2000, 2010, 2020, was developed on a TAZ by TAZ basis. These projections form the basis of the future travel demand estimates for the transportation plan. These land use projections are based on a variety of sources, including:

- the current adopted land use plans of Volusia County and the various communities therein;
- projections of countywide population prepared by the University of Florida Bureau of Economic and Business Research (BEBR);
- projections of population by subarea within Volusia County prepared by the Volusia County Growth Management Department; and





- a gravity model-based growth allocation spreadsheet.
- review and comments by local government planning staffs.

The role of each of these components, and the results of each step of the projection process are described in the following paragraphs.

The first step in developing the future year socio-economic data was to establish the countywide total population, housing, and employment for each of the plans. Countywide population projections are prepared annually for all counties in Florida by the University of Florida's BEBR. They prepare a low-, medium-, and high-range projection for each county. The BEBR's projections are generally accepted as authoritative and their mid-range projections are used by many counties as the basis for their Comprehensive Plans.

1970, 1980, 1985, and 1990 population, and the mid-range future population projections for Volusia County are summarized in Table 7-2. The projections indicate a growth from 370,712 people in 1990 to 610,200 by 2020.¹ This number is the countywide permanent population total used in this study, which yields an annual average growth rate of 1.68 percent.

The FSUTMS model requires that the permanent population be allocated between single-family dwelling and multi-family dwelling units, and that the number of single- and multi-family dwelling units also be provided on a TAZ by TAZ basis. In 1990, 33.1 percent of the permanent population was assumed to be housed in multi-family dwellings. The average number of persons per occupied dwelling unit was assumed to be 2.51 for single-family units and 2.14 for multi-family units.² The Volusia County Planning and Zoning Department, in its growth forecasts, has indicated a trend for the proportion of population housed in single-family dwellings to remain stable through 2020, and for the average number of persons per dwelling unit to also remain stable. Based on this guidance, the parameters presented in Table 7-3 were applied to estimate the 2000, 2010, and 2020 countywide dwelling unit totals. The total number of dwelling units incorporated into the socio-economic datafiles are increased from the numbers in Table 7-3 to reflect the ambient vacancy rate recorded by the 1990 census data as reflected in the 1990 ZDATA1 socio-economic datafile.

¹University of Florida Bureau of Economic and Business Research, "Florida Population Studies", Volume 27, Number 2, Bulletin No. 111, February, 1995

²Volusia County Metropolitan Planning Organization, October, 1994.

Table 7-2 Population Projections				
Planning Region	1990 Population	2000 Population	2010 Population	2020
Northeast	181,385	211,447	241,507	270,526
Southeast	45,217	58,654	72,111	85,219
Central	12,257	30,909	50,266	66,466
Northwest	8,233	8,370	8,508	8,611
Central-west	44,602	52,611	60,640	68,398
Southwest	77,888	89,061	100,227	610,213
Total:	369,582	451,052	533,267	110,993

Sources: University of Florida Bureau of Economic and Business Research, 1995

Volusia County Growth Management Department, 1988

Tindale-Oliver and Associates, Inc. 1995

Table 7-3 Dwelling Unit Estimates				
Variable	Year			
	1990	2000	2010	2020
Permanent Population	369,582	451,052	533,269	610,213
Percent in SDU's	66.9	67.5	67.9	68.1
Persons per SDU	2.51	2.52	2.53	2.82
Total Occupied SDU's	98,355	120,893	143,095	164,980
Percent in MDU's	33.1	32.5	32.1	31.9
Persons per MDU	2.14	2.11	2.10	2.09
Total Occupied MDU's	57,167	69,459	81,427	93,121

Sources: University of Florida Bureau of Economic and Business Research, 1995

Volusia County Growth Management Department, 1988

Tindale-Oliver and Associates, Inc. 1995

Table 7-4 summarizes countywide employment for the same years. The source of the historic employment statistics (1970 through 1990) is the U.S. Department of Commerce Bureau of Economic Analysis (BEA). This source provides the most comprehensive source of employment available, supplementing State of Florida DOLES data with Federal records identifying employees not covered by Unemployment Compensation Insurance.

Table 7-4 Employment Projection							
Year	Total Population (1)	Total Employment (2)	Emp/Pop Ratio	Estimated Employment (3)	Percent Industrial	Percent Commercial	Percent Service
1970	171,060	62,095	0.363		18.5%	24.4%	57.1%
1980	261,114	105,406	0.404		18.8%	25.2%	56.0%
1985	309,043	131,373	0.425		18.4%	26.4%	55.2%
1990	370,712	153,727	0.415		18.4%	26.4%	55.2%
2000	450,800		0.420	189,336	18.2%	26.5%	55.4%
2010	531,100		0.420	223,062	17.9%	26.5%	55.5%
2020	610,200		0.420	256,284	17.7%	26.6%	55.7%

Sources: 1. University of Florida Bureau of Economic and Business Research, 1995
2. U.S. Department of Commerce, Bureau of Economic Analysis
3. Tindale-Oliver and Associates, Inc., 1995

Countywide employment projections were reviewed by economists of Volusia County's Growth Management Department. Stabilization of the employment to population ratio is expected. Thus, an employment to population ratio of 0.420 was applied to the population forecast as to estimate countywide employment of 256,284 by 2020. Intermediate year employment of 189,336 in 2000 and 223,062 in 2010 is also forecasted.

FSUTMS makes use of three general categories of employment: industrial, service, and commercial. The Standard Industrial Classification (SIC) codes of which these general categories are composed are provided in Appendix 7-C. The BEA data also provides a breakdown of the countywide employment by major SIC code, and the proportions of employment in each of these three categories for Volusia County is also provided in Table 7-4. As is typical of other counties in Florida, the historic data indicates a trend away from industrial employment to commercial and service employment. The Florida Long-Term Economic Forecast indicates that industrial job growth throughout the State of Florida will decline, and Volusia County is not an exception to this trend. Thus, in the distribution of forecasted employment, a declining share of employment in the industrial category and increasing shares for commercial and service-related employment was assumed.

The results of these projections in terms of numbers of employees and population is summarized in Table 7-4.

The second step in developing socio-economic data was to allocate population growth to sub-areas within Volusia County. In developing population projections for its current transportation plan, the Volusia County Growth Management Department allocated expected population growth to municipalities and into the six planning regions for Volusia County. These estimates are documented in the County's socio-economic data projections of its concurrency transportation model. The countywide population projections for 2010 in this source was 617,486, which is one percent higher than BEBR's current 2020 projection of 610,200. Thus, the projections contained in this source were selected as a basis for the allocation of population to municipalities and the six planning regions. The projections of this source, adjusted to BEBR's current 2020 population estimate, are summarized in Table 7-5.

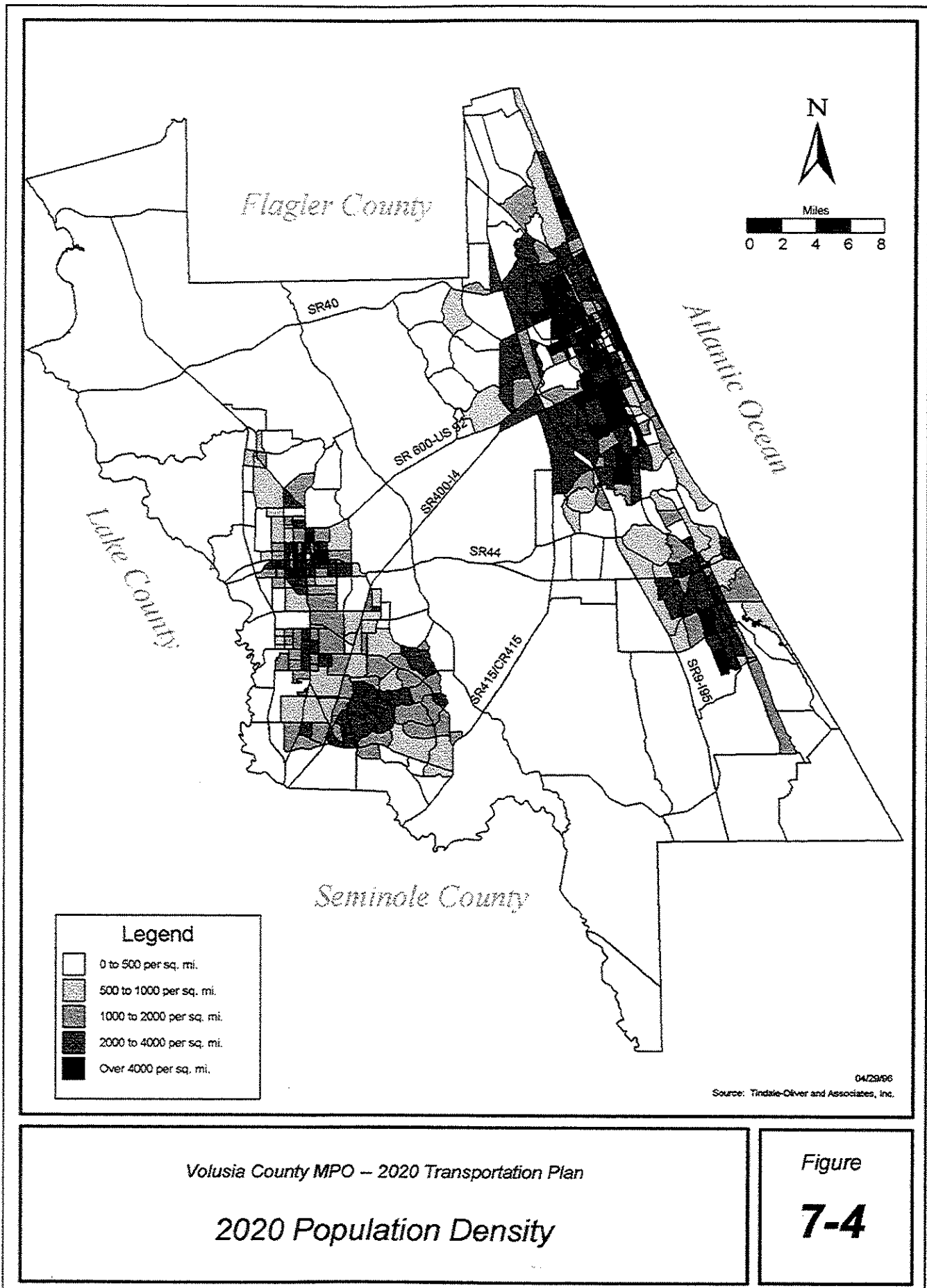
The third step was to allocate the population and employment to TAZs. This task was accomplished using two methods: a gravity model-based allocation spreadsheet which used an inventory of current adopted land use plans, typical development densities by land use plan land use category, and the location of existing (1990) development was used to initially assign expected growth to TAZs, and a series of workshop sessions was held with local government planning staff members to review and adjust the allocations of the spreadsheet. The spreadsheet assigned more growth to TAZs which are closer to existing development subject to the availability of land for development, and subject to the constraints of the planning region population projections in Table 7-2. The input of local government planning staff provided insight into growth trends, market conditions, and development plans which the spreadsheet did not adequately address. This procedure was applied to develop the socio-economic data for 2020. Intermediate year socio-economic data was estimated by interpolating between the 1990 data and the 2020 estimates to achieve the countywide and subarea control totals established in Tables 7-2 and 7-4.

The results of the growth allocation procedures are illustrated in Figures 7-4 and 7-5, and the resulting ZDATA files are provided in Appendices 7-D, 7-E, and 7-F. By comparing Figures 7-4 and 7-5 with Figures 7-2 and 7-3, a trend for expansion of the urbanized area of coastal Volusia County west of Interstate 95, filling in of the areas between Daytona Beach and New Smyrna Beach, and growth in the southwest area of the County can be observed.

7.3 Comparison with Other Studies

Several other transportation planning studies are in progress or have recently been completed with which it is beneficial to compare these projections. These studies are the Interstate Four Master Plan Study, the Central Florida Regional Transportation Authority Planning Studies, Volusia County MPO's 2015 Transportation Plan, and 2010 socio-economic data maintained by Volusia County. The former two studies make use of a regional transportation model which incorporates all of the Orlando urban area and the western portion of Volusia County. The population and employment estimates of these studies are summarized by planning region in Table 7-5 and 7-6 below, respectively.

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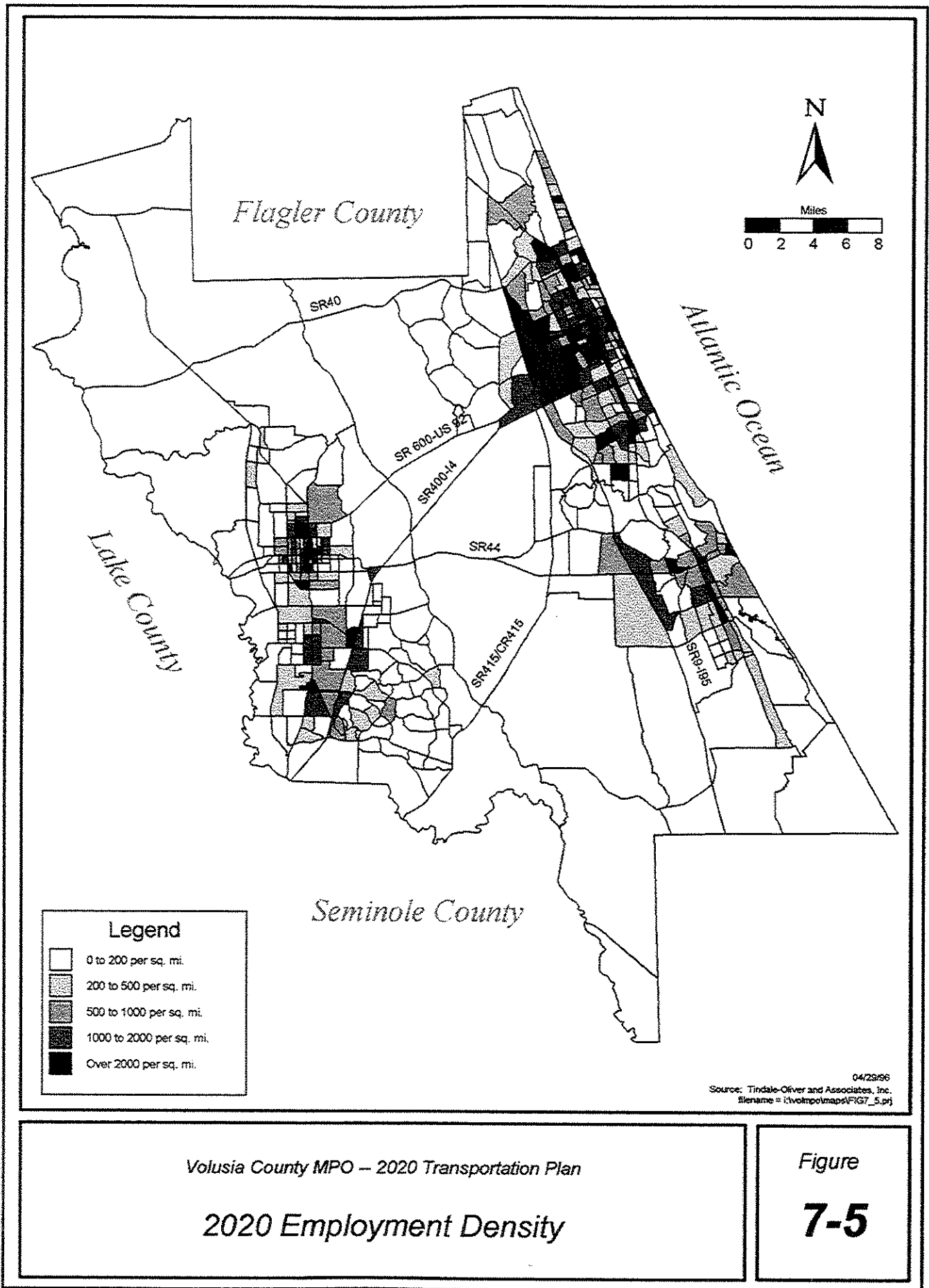


Table 7-5 Comparison with Other Studies (Population)				
Planning Region	2020 Plan	2015 MPO Plan	I-4 Master Plan	Volusia Co. 2010
Northeast	270,526	246,680	N/A	276,146
Southeast	85,219	103,395	N/A	85,789
East Subtotal:	355, 745	350,075	N/A	361,935
Central	66,466	45,589	N/A	44,961
Northwest	8,611	8,897	10,530	8,669
Central-west	68,398	75,716	82,371	68,866
Southwest	110,993	121,082	135,596	111,445
West Subtotal:	254, 468	251, 284	228, 497	233, 941
				21,610 - Unassigned
Total:	610,213	601,359	N/A	617,486

Note: Numbers in this table are preliminary, and are subject to reconfirmation.

Table 7-6 Comparison with Other Studies (Employment)				
Planning Region	2020 Plan	2015 Plan	I-4 Master Plan	Volusia Co. 2010
Northeast	142,524	117,242	N/A	125,991
Southeast	32,110	20,864	N/A	16,947
East Subtotal:	174 634	138,106	N/A	142,938
Central	12,021	6,467	N/A	6,393
Northwest	3,678	2,331	2,188	1,881
Central-west	39,612	37,766	42,163	29,393
Southwest	26,757	17,318	17,741	14,790
West Subtotal:	82, 068	63,882	62,104	52,457
				15,537 - unassigned
Total:	256,702	201,988		210,932

Sources: University of Florida Bureau of Economic and Business Research, 1995

Volusia County Growth Management Department, 1988

Tindale-Oliver and Associates, Inc. 1995

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CHAPTER EIGHT

EXISTING CONDITIONS

8.0 Introduction

The purpose of this chapter is to summarize the condition of the transportation system existing in Volusia County in 1993. The transportation system has been evaluated relative to the Measures of Effectiveness defined in Chapter Five, and these measures will serve as a reference point against which estimated future year conditions can be compared.

The existing conditions of the transportation system are divided into three major sections. The first deals with the existing facilities and programs that deliver transportation services and administrative practices and policies. The second section summarizes some existing policies and administrative practices of Volusia County relevant to the delivery of transportation facilities and services. Lastly, other relevant planning studies in progress or completed at the time this Plan was prepared which influenced the 2020 Plan are briefly reviewed.

8.1 Facilities and Programs

The current condition of the roadways, transit system, bicycle facilities, and pedestrian facilities are the focus of this section. In addition, existing intermodal facilities served by these facilities are also reviewed. The section on roads describes the operating conditions on existing roads in Volusia County by comparing the level of service to the adopted performance standards and by comparing existing traffic volume to the physical capacity for a given road. The section on transit describes the current operating conditions of public transportation by describing the types of services provided to the public and by comparing the service to other transit agencies in the state of Florida.

The bicycle and pedestrian facilities section describes the facilities that are currently in place and the policies regarding their future implementation. Lastly, the intermodal facilities section describes the types of facilities considered in this study and the operating conditions of the major roads used to access them.

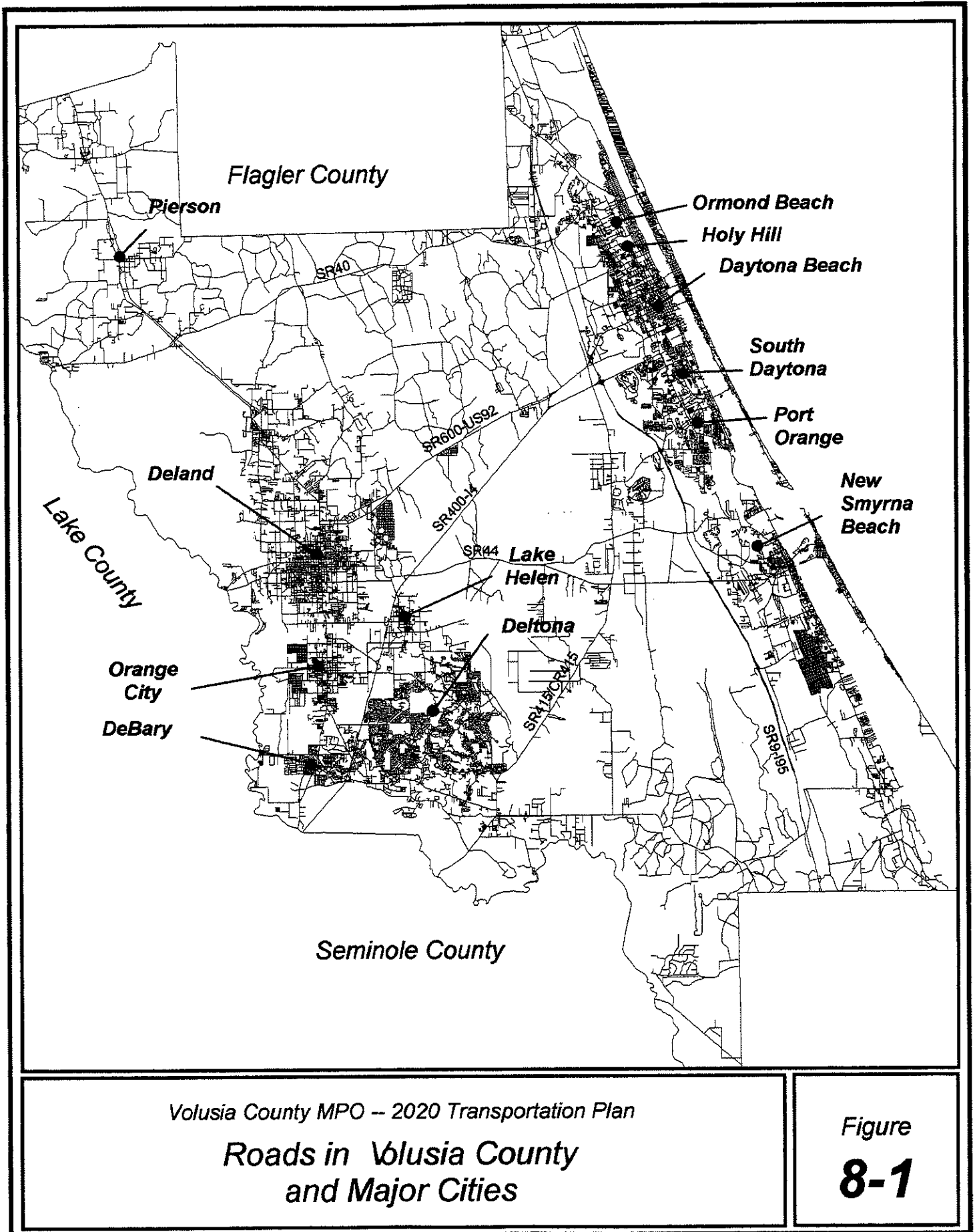
8.1.1 Roads

As is typical of many coastal counties, the network of transportation facilities in Volusia County is significantly influenced by the County's topology. The majority of urban development and transportation facilities are concentrated on the east coast of the County. The western portion of the County is urbanized, and wetlands are predominant in the central portion of the County (Figure 8-1). Five roadway corridors have been established to cross the environmentally sensitive areas

which link the western and coastal area. They are: SR 40, SR 600/US 92, Interstate 4, SR 44, and SR 415. The major state-maintained thoroughfares in the County are described below.

State Road 40 - SR 40 is an east-west corridor located in the northern portion of the County extending from Lake County on the west to the Atlantic Ocean on the east. It accommodates travel to and from Lake County. SR 40 connects the following north/south facilities: SR 15/US 17, SR 11, I-95, SR5A, SR 5/US 1, and finally terminates at SR A1A near the Atlantic Ocean in the City of Ormond Beach. Currently, SR 40 is a rural two-lane facility from the Lake County line to SR 9/I-95. East of SR 9/I-95, it becomes an urban facility with four lanes up to SR 5A/Nova Road, two lanes from SR 5A/Nova Road, to SR 5/US 1 and four lanes from SR 5/US 1, SR A1A/Atlantic Avenue.

State Road 600/US 92 - This facility is an east-west corridor located in the central portion of the County. It connects the City of DeLand in the west to Daytona Beach in the east. The facility also serves as a major route for travel to and from the DeLand Municipal Airport. In the Daytona Beach area, it serves as a principal arterial route linking Interstate 4 and Interstate 95 to the beaches, the Daytona Beach International Airport, and the Daytona International Speedway. Currently it is a four lane facility from DeLand to Interstate 95 and thereafter becomes a six lane facility with continuous right turn lanes on both sides of the road to Clyde Morris Boulevard. From there to SR 5A/Nova Road, it is a six-lane arterial, then converts back to a four lane road for the remainder of its length.



Interstate 4 - This facility originates in Hillsborough County (on the West coast of Florida), continues through the Orlando metropolitan area, and terminates at Interstate 95 in eastern Volusia County. In Volusia County, Interstate 4 connects DeBary, Deltona, Orange City, and Lake Helen in the southwestern portion of the county to the Daytona Beach area in the East. Interstate 4 serves as the primary connection between Orlando and the Daytona Beach area. It is currently a four lane facility.

State Road 44 - This east-west corridor extends from the Lake County line through downtown DeLand in the west to the City of New Smyrna Beach on the East Coast. This facility is the only major road that directly links the southern portion of East Volusia County to the western portion of the County. This facility is currently a two-lane facility from the Lake County line to SR 5/US 1. SR 44 splits into two routes (SR 44/Canal Street and SR 44/Lytle Avenue) in the City of New Smyrna Beach. Each route is a two lane facility.

State Road 415, County Road 415 - This facility is a rural two-lane highway that runs from the Seminole County line to SR 600/ US 92. This north-south corridor connects the rural areas of southwestern Volusia County to the rural area of Samsula just to the west of the City of New Smyrna Beach, the City of Port Orange, and the City of Daytona Beach.

State Road 15-600/US 17-92 - This facility enters Volusia County from Seminole County line in the southwestern portion of the County near Interstate 4. In the northern portion of the City of DeLand, it splits into two roads, SR 15/US 17 and SR 600/US 92. SR 15/US 17 extends into Putnam County to the North, and SR 600/US 92 turns eastward to the East Coast of Volusia County. It is currently a two-lane facility from the Seminole County line to Enterprise Road in DeBary. North of Enterprise Road this facility becomes a four-lane roadway to Beresford Avenue in the City of DeLand. Thereafter, SR 15-600/US 17-92 is a two-lane roadway through the City of DeLand. At Pennsylvania Avenue, it widens to a four-lane roadway until it splits at International Speedway Boulevard.

State Road 15A - This is an urban highway which originates in the City of DeLand and serves as a parallel alternative facility to the west of SR 15-600/US 17-92. It is a two-lane facility except in downtown DeLand where it is a four-lane roadway.

Interstate 95/SR 9 - Interstate 95 is a north-south facility located in the eastern portion of the County. It extends along the entire Eastern Coast of the United States. In Volusia County, it is currently a four-lane facility which serves the traffic coming into and out of the County.

State Road 5/US 1 - This is a major north-south urban principal arterial located on the East Coast of Volusia County. The route passes through (from South to North) Oakhill, Edgewater, New Smyrna Beach, Port Orange, South Daytona, Daytona Beach, Holly Hill, and Ormond Beach. It is currently a four lane facility from the Brevard County line in the south to the Flagler County line in the North.

State Road 5A/Nova Road - This facility runs parallel to SR 5/US 1 beginning south of the City of Port Orange, extends through the cities of Port Orange and Daytona Beach, and connects back into SR 5/US 1 in the City of Ormond Beach. It is a two-lane facility from SR 5/US 1 in the South to SR 400/Beville Road. It then becomes a six-lane facility from SR 400/Beville Road to Flomich Street. Thereafter, it converts back to a two-lane facility until it connects into SR 5/US 1 in the City of Ormond Beach.

State Road 483/Clyde Morris Boulevard - This facility runs parallel to SR 5/US 1, SR 5A/Nova Road, and SR 9/I-95. This facility is a four-lane facility from SR 400/Beville Road in the South to SR 430/Mason Avenue.

State Road 430/Mason Avenue - This facility is an east-west facility from Clyde Morris Boulevard to SR A1A/Atlantic Boulevard. It is a four-lane facility from Clyde Morris Boulevard to Seabreeze Circle. Thereafter it is a two-lane facility.

State Road 400/Beville Road - Beville Road runs parallel to and south of SR 600/US 92 in the City of Daytona Beach. It is a four-lane facility from SR 9/I-95 to SR 5/US 1. It's alignment is an extension of the Interstate 4 alignment from Interstate 95 to SR 5/US 1.

State Road 421/Dunlawton Avenue - This facility is an east-west facility which runs from I-95 to SR 5/US 1 and is situated in the City of Port Orange. It is a six-lane facility from SR 9/I-95 to SR 5A/Nova Road and a four-lane facility thereafter. At SR 5A/Nova Road the facility changes names to SR A1A/Dunlawton Avenue, but still remains a four-lane facility.

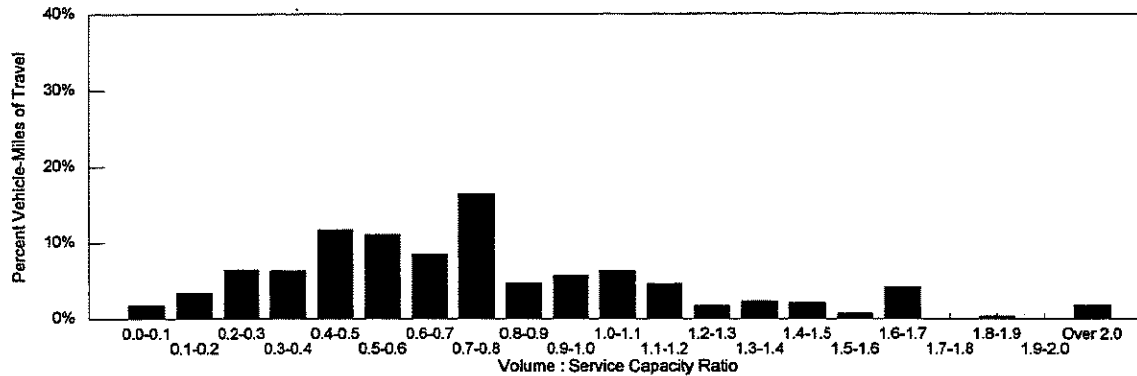
State Road A1A/Atlantic Ocean - This is a north-south facility which is located on the peninsula bordering the Atlantic Ocean. It is a four-lane facility from SR A1A/Dunlawton Avenue in the City of Port Orange to SR 40/Granada Boulevard in the City of Ormond Beach. The facility changes names to SR A1A/Ocean Shore Boulevard and becomes a two-lane facility from SR 40 to Flagler County. This road is predominantly characterized by intense, urban, tourist-oriented development.

The existing transportation system in Volusia County was reviewed for the quality of service provided. Table 8-1 contains a “report card” which summarizes pertinent information of the coverage and conditions of the road network by jurisdictional responsibility. The measures indicated in the “report card” reflect the goals, objectives, and measures of effectiveness adopted by the Volusia County MPO to guide the development of the 2020 Transportation Plan.

Each road in the county is assigned to a jurisdiction which is responsible for the maintenance and operation of that road. In 1993, 960 miles were considered “significant” enough to warrant monitoring. Of these major roads, 357 miles (37.2 %) are the responsibility of the State, 557 miles (58%) are the responsibility of the County, and 46 miles (4.8%) are maintained by the fifteen municipalities. A graphic illustrating the jurisdictional responsibility of the roads on the major road network is provided in Figure 8-2. This roadway system accommodated 861,139 peak hour vehicle miles of travel, of which 660,518 were on the State system. Thus, while the State road system

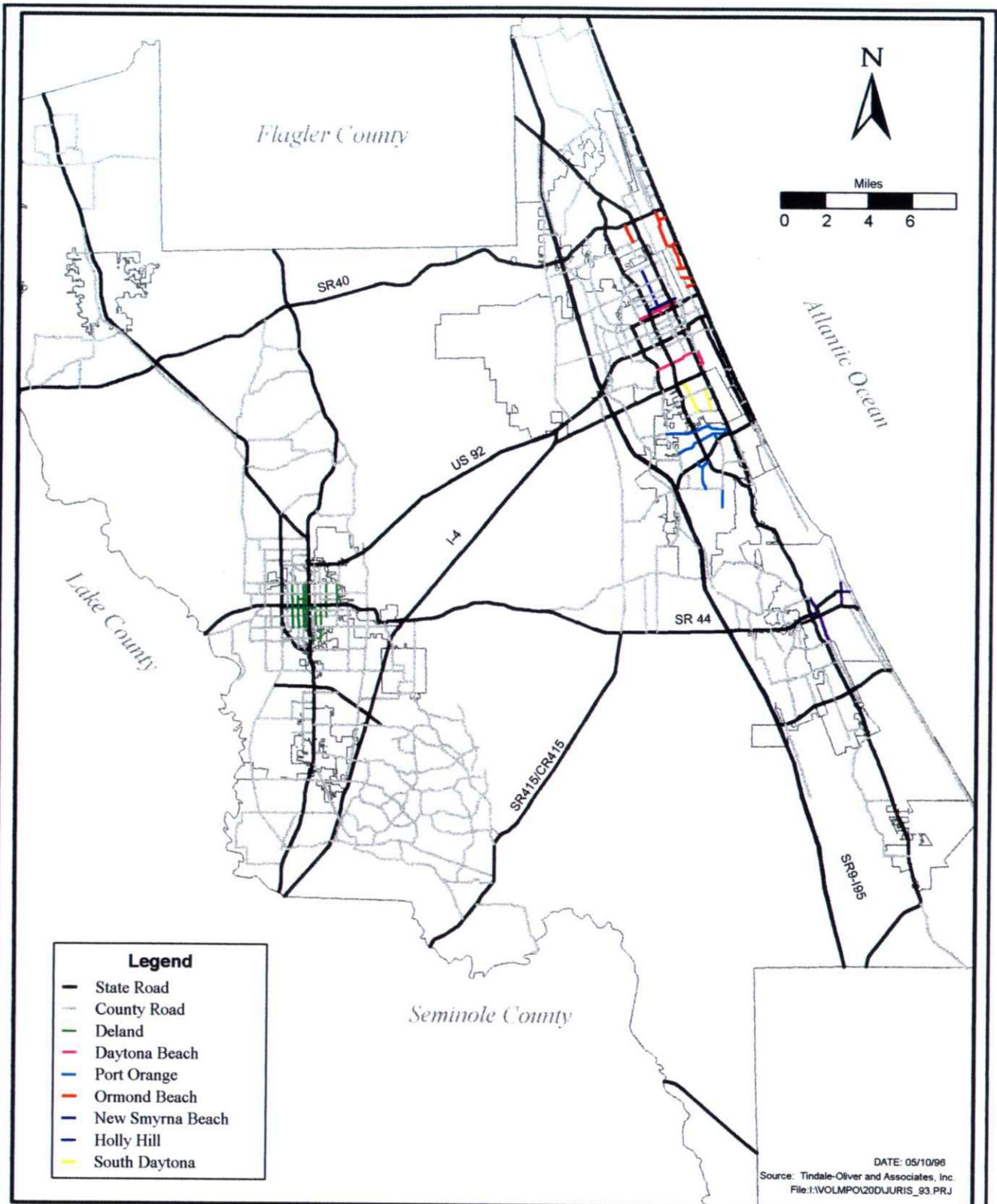
Table 8-1
1993 Existing Conditions Report Card

	Total System	State System	County System	Other System
Inventory:	960.33 mi.	357.47 mi.	556.94 mi.	45.92 mi.
Pk Hr Vehicle-Miles of Travel (VMT):	861,139 veh-mi.	660,518 veh-mi.	197,100 veh-mi.	3,521 veh-mi.
With LOS Data:	870 mi.	357.47 mi.	501.84 mi.	10.74 mi.
Percent Coverage:	90.6 %	100.0 %	90.1 %	23.4 %
Weighted Saturation of VMT:	0.753	0.854	0.422	0.293
Weighted Sat of Truck Routes:	0.70			
Weighted Sat of Economic Routes:	0.76			
Weighted Sat of Transit Routes:	0.80			
Percent Population Served by Transit:	38.7 %			
Sidewalks:	194 mi.	n/a mi.	n/a mi.	n/a mi.
Bicycle-Suitable Facilities:	281 mi.	97.79 mi.	182.03 mi.	1.03 mi.
Proportion of Trips by non-SOV:	n/a %			



Weighted Saturation Level = 0.753

Source: Tindale-Oliver and Associates, Inc.
Date: 06-May-95



Volusia County MPO – 2020 Transportation Plan

**Jurisdictional Responsibility
for Major Road Network**

Figure

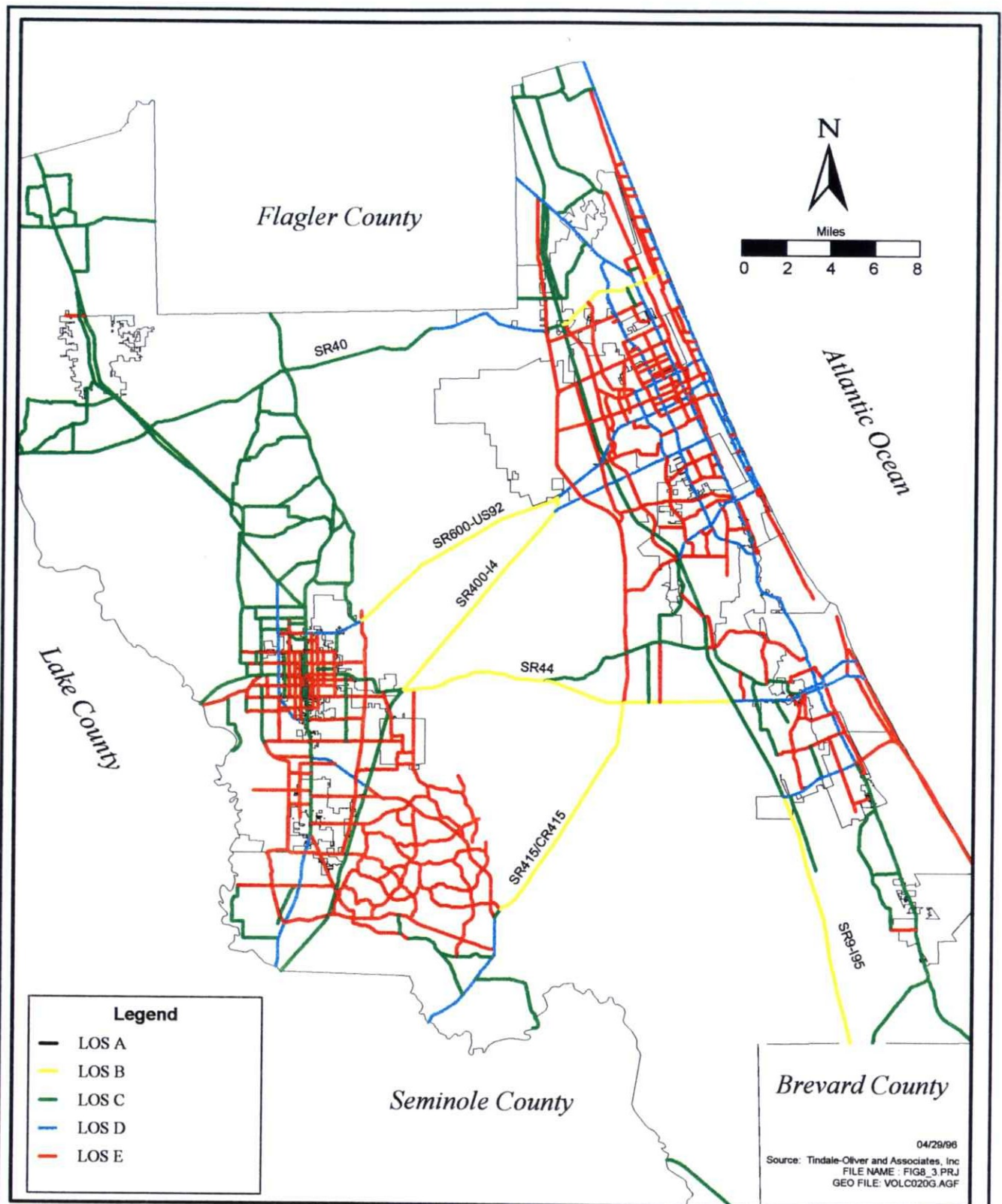
8-2

comprises only 37% of the mileage on the major road system, it carried 77% of the peak hour vehicle miles of travel.

A standard of performance for each road is established in the current adopted Comprehensive Plan Traffic Circulation Elements of Volusia County and its municipalities. The adopted performance standard for each road segment is illustrated in Figure 8-3, and segment-by-segment listings of the performance standard is provided in Appendix 6-D. The Florida DOT has designated level of service C and D as its standard for roads in rural and urban areas, respectively. If a road is part of the Florida Intrastate Highway System (FIHS), the performance standard is one letter-grade higher (B rural and C urban). Level of service E has been adopted as the performance standard for most non-State roads. Unique performance standards have been adopted for “constrained” roads which have been recognized as difficult or undesirable to improve (see discussion of “constrained” roads below).

Generally, road operating conditions in Volusia County are good, with an average saturation level of 75.3%. This means that the typical travel occurred on roads that were 75% saturated, where 100% saturation is the limit of the adopted performance standard. Table 8-1 includes a graphical illustration of the degree of roadway saturation experienced in 1993. The presence of vertical bars in the graph in Table 8-1 indicating travel at degrees of saturation greater than 1.00 means that there are roads which are more congested than the performance standards allow. Examples of such roads are US 17/92 in the DeLand/Debary area, and US 1, SR 40, and SR 5A/Nova Road in the Daytona Beach area. Several road improvements are in place, or are being planned, by State and local government officials to alleviate this congestion. The FDOT has recently completed improvements to International Speedway Boulevard between Interstate 95 and Nova Road, and they are studying future improvements to SR 40.

In general, the western portion of the county is operating better than the eastern portion. In the West there are only two major roadway corridors that experience level of service problems, SR 15/US 17 through the Debary and Deland areas and Debary/Dirksen Ave in the southern portion of West Volusia County. The portions of SR 15/US 17 roadway corridor where performance is poor provide



Volusia County MPO -- 2020 Transportation Plan

Adopted Roadway Performance Standards

Figure

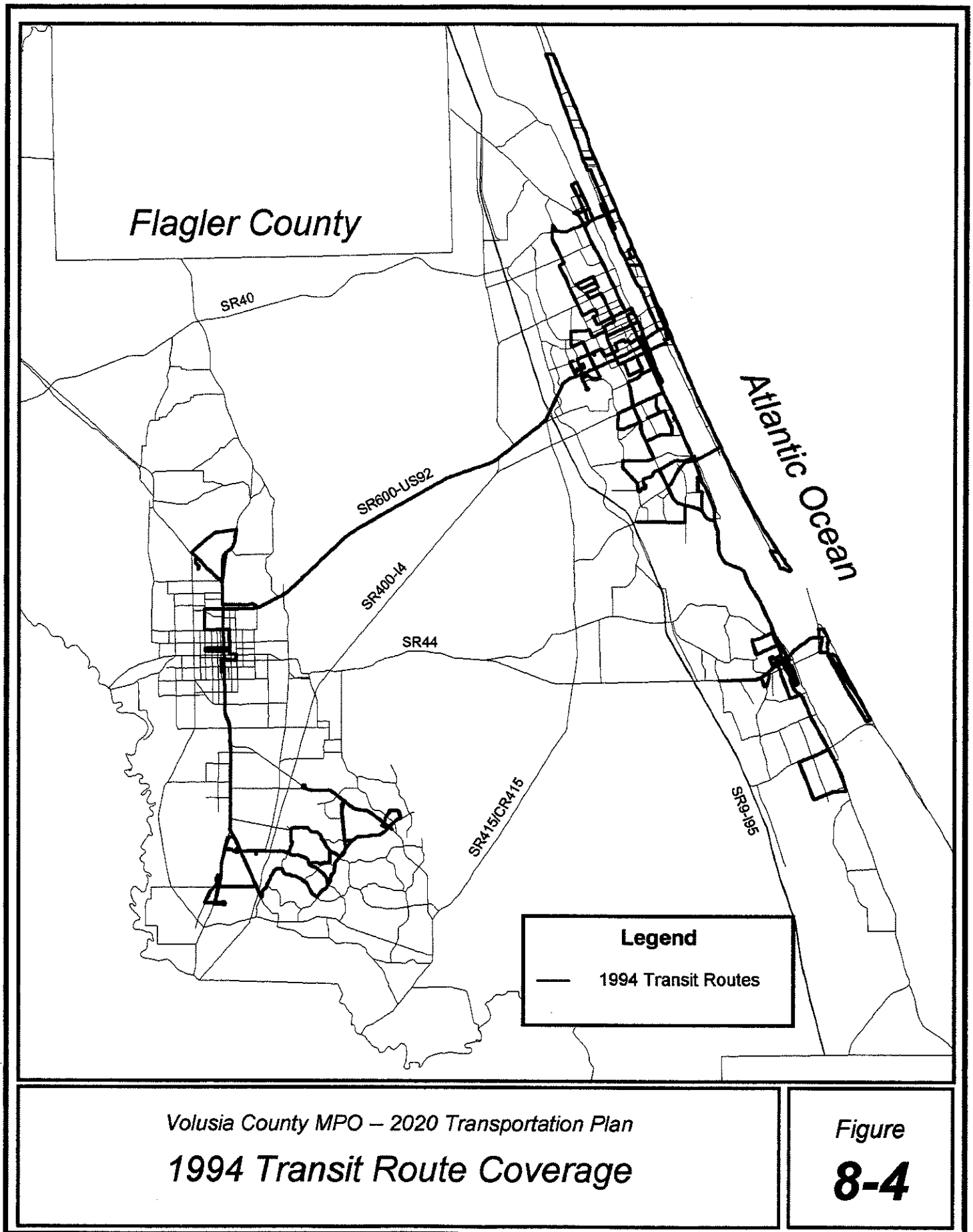
8-3

access to an urbanized DeLand area. The poor level of service performance on SR 15/US 17 is due to heavy traffic demands in the area. The Debary/Dirksen Avenue corridor is also experiencing heavy volumes between I-4 and Main Street. This road is the first major east-west corridor when entering Volusia County from the Orlando area, and it is heavily used by residents in the Debary area to get to and from Interstate 4.

The eastern portion of the county is more congested than the west. Congested areas are generally in the central and northern portions of East Volusia County. International Speedway Boulevard which is the major east/west road leading to the beaches, is currently experiencing congestion. The two major north/south roadway corridors, SR 5A/Nova Road and SR 5/US1, are currently experiencing poor level of service. SR 5A/Nova Road from US 1 to SR 400/Beville Road, a 2-lane facility, currently carries traffic volumes of approximately 20,000 vehicles per day. SR 5A/Nova Road in the northern portion of East Volusia County from 11th St/LPGA Boulevard to SR 5/US 1, a 2-lane facility, carries traffic volumes in excess of 22,000 vehicles per day. SR 5/US 1 corridor from Reed Canal Road to 11th St/LPGA Boulevard, a 4-lane facility, carries traffic volumes of approximately 36,000 vehicles per day. Another major east/west corridor operating below the adopted performance standard is SR421/Dunlawton Avenue. This is a 2-lane facility carrying traffic volumes between 18000 and 25000. These three corridors are currently carrying heavy traffic volumes and are proposed to be improved in the 2010 interim year Plan.

8.1.2 Transit

The fixed route transit system and trolley service in the County is operated by VOTRAN, Volusia County's public transportation authority. In 1994, VOTRAN provided 1,564,634 miles of service on twenty routes with a minimum of one-hour headways using a fleet of 41 vehicles. The twenty routes provide 180 miles of coverage. A map illustrating the existing transit route coverage is provided in Figure 8-4. The ridership on the twenty routes in 1994 was an average of 10,000 passenger trips per day at a total annual expense of \$5,174,792.



Ridership has increased by 51 percent between 1988 and 1993, with the number of passenger trips increasing from 2,149,420 in 1988 to 3,247,410 in 1993. Revenue miles of service provided also increased, but by only seven percent over the same six-year time period, from 1,391,480 in 1988 to 1,491,130 in 1993.

VOTRAN provides transit service in a relatively cost-effective manner. The efficiency and effectiveness of the transit service has been compared with similarly sized “peer” transit systems in Florida and in the southeastern United States in a report prepared by the Center for Urban Transportation Research (CUTR). Table 8-2 compares VOTRAN’s performance with that of its peer systems, and indicates that VOTRAN provides above average vehicle miles of service per service area population, and attracts an above-average number of passengers. It does this while maintaining below average unit operating expenses.

Table 8-2 Peer Analysis - Transit Service Operating Characteristics, FY 1993		
Effectiveness / Efficiency Measure	VOTRAN	Peer Group Mean
Vehicle Miles per Capita	7.98	7.33
Passenger Trips per Capita	16.46	13.21
Passenger Trips per Revenue Mile	2.18	1.65
Operating Expense per Capita	\$20.05	\$20.14
Operating Expense per Passenger Trip	\$1.22	\$2.17
Operating Expense per Revenue Mile	\$2.65	\$2.77
Farebox Recovery Ratio	23.82%	23.52%*

*Space Coast Area Transit (Brevard County) did not provide data to calculate its farebox recovery ratio, and, therefore, is not included in the peer group mean for this measure.

Source:Center for Urban Transportation Research

8.1.3 Bicycle Facilities

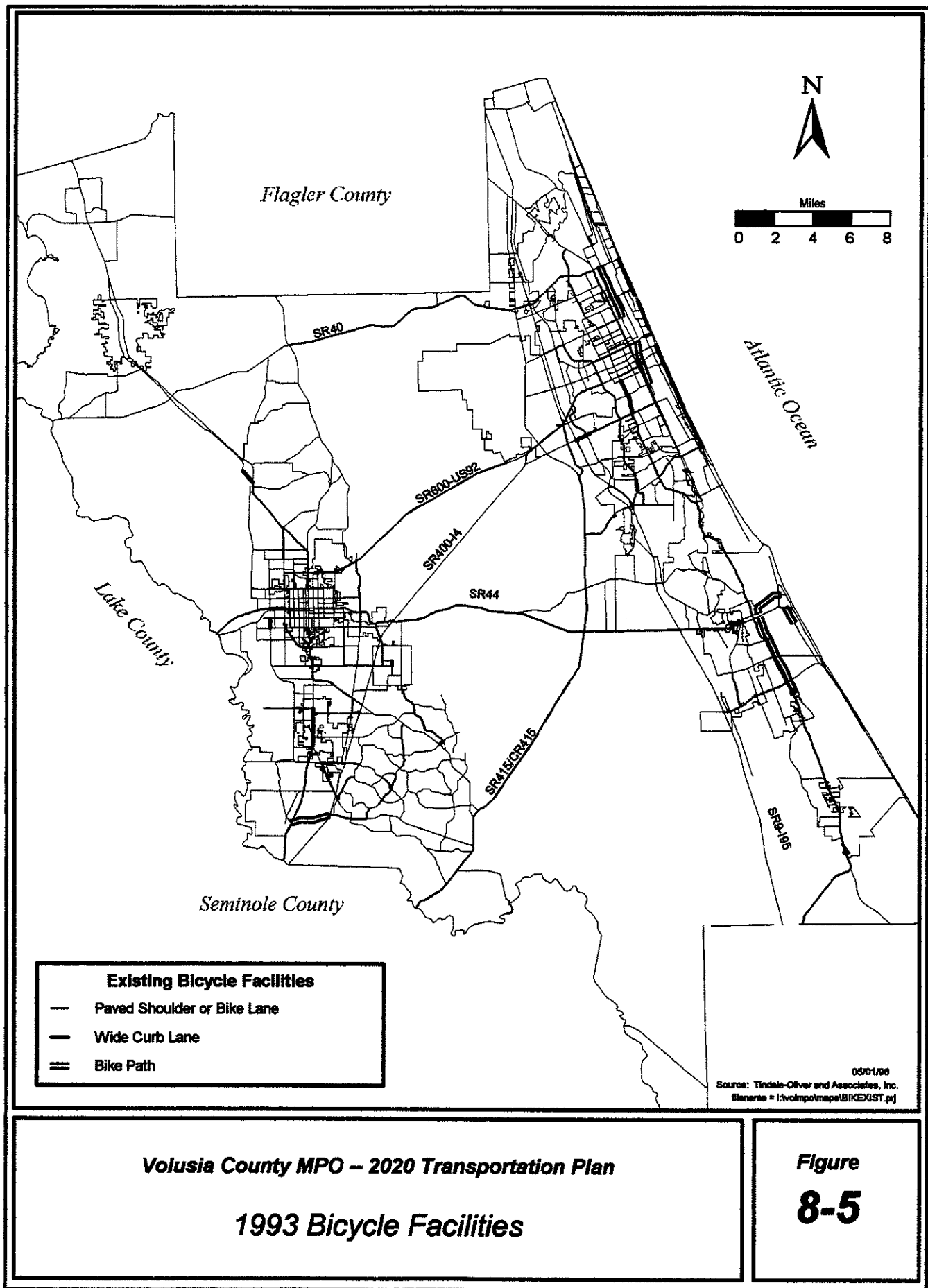
The MPO currently sponsors a Bicycle/Pedestrian Advisory Committee (B/PAC) and the MPO staff participates in Community Traffic Safety Programs (CTSP’s), which considers bicycle safety as well as other traffic safety issues. Bicyclists use the roadway network in Volusia County and this is evident by the number of bicycle crashes which occur in the county. The Florida Department of Highway Safety and Motor Vehicles Special Report, “Bicycle Crashes in the State of Florida” (June

1993) reported that in 1991 Volusia County had the fourth highest bicycle crash rate in the State of Florida. Volusia County experienced a total of 281 bicycle crashes during 1991 with a crash rate of 74.6 crashes per 100,000 population. The crash rates are more disturbing when one considers that the State of Florida has the highest bicycle crash rate in the United States.

At the present time the community has relatively few bicycle facilities, as shown in Figure 8-5. The existing facilities include bicycle lanes on portions of SR 400/Beville Road in East Volusia County and French Avenue in the West. There are existing bicycle paths along the North Causeway in New Smyrna Beach and the DeBary Greenway in the town of DeBary. Most other bicycle facilities in the county are paved shoulders on rural roads or wide outside roadway lanes in urban areas.

Although there are relatively few facilities available to cyclists in the County, it is the policy of the Florida DOT to consider adding bicycle facilities to arterials, and wide curb lanes to collectors when the roads are improved within urbanized areas. Consideration is also given to adding paved shoulders in the rural areas. Bicycle facilities will potentially be constructed on the roads identified below using enhancement funds and other funding sources. These projects represent long term objectives of the communities in which they are located and create facilities to provide bicycle network continuity. The follow examples describe community specific projects under development:

- Extension of the DeBary Greenway to Enterprise and Osteen. These improvements represent the currently unfunded Phases II and III of the County's Greenway project and will consist of a paved bicycle trail.
- Addition of bike lanes to Highbanks Road from the St. Johns River to Enterprise Road to address needs of the DeBary Community.
- Development of the County's West Side Corridor, which will add Bike Lanes beginning at Hazen Road north of SR44 and continuing north along Mercers Fernery Road, Glenwood Road, Grand Avenue, and County Road 3.

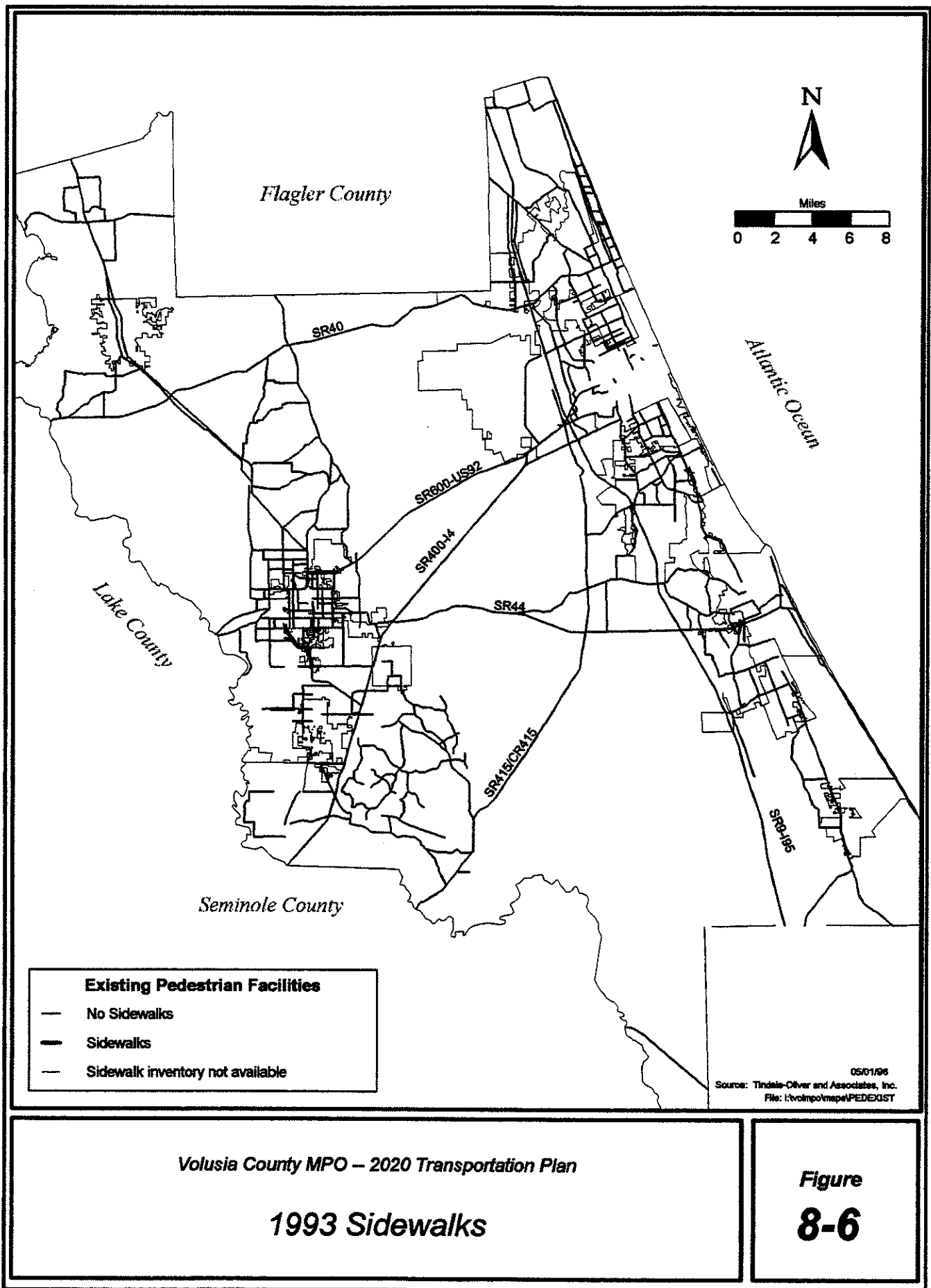


- The creation of bicycle lanes on portions of SR44 and US 17/92 through the City of DeLand. On roads these roads bike lanes can be provided via the addition of pavement markings, signage, and minor lane widening at specific intersections.
- Addition of bike lanes on State Road A1A through the communities of Port Orange, Daytona Beach Shores, Daytona Beach, Ormond Beach, and the unincorporated area north of Ormond Beach.

8.1.4 Pedestrian Facilities

Information regarding sidewalks has been assembled by the Volusia County Metropolitan Planning Organization (MPO). Currently, 194 miles of sidewalks exist on 157 miles (16 percent) of the major road network in Volusia County. Figure 8-6 indicates the locations of the existing sidewalk facilities. The Volusia County Metropolitan Planning Organization is responsible for planning pedestrian facilities. As a part of this responsibility, the MPO has reviewed the road network and has proposed sidewalk construction on one or both sides of urban roadways, and for no sidewalks on rural roads. The entire network of 1,018 miles of road on the 2020 Plan was reviewed, and recommendations were made to build 982 miles of sidewalks on 591 miles (58 percent) of roads in urban and suburban areas. These recommendations are not funded facilities. These recommendations, however, can be used as a guide when constructing a new road or improving an existing road.

Section 14 - 1.2 of the Florida DOT's Preliminary Design and Engineering (PD&E) manual states that "It is the policy of the Florida Department of Transportation to give special emphasis to the needs of bicyclists and pedestrians in and within one mile of urban areas. This means the Department will generally provide sidewalks for pedestrians in conjunction with other planned roadway improvements."



8.1.5 Intermodal Facilities

Intermodal facilities are those transportation elements that accommodate and interconnect different modes of transportation and serve intrastate, interstate, and international movement of people and goods. Various types of facilities considered to be intermodal include , but are not limited to, ports, airports, bus stations, and train terminals. Presently commercial ports do not exist in Volusia County. The objective of this section is to recognize the major intermodal facilities existing in the County, and to review the routes leading to them. The Intermodal Surface Efficiency Act (ISTEA) legislation encourages the provision of efficient access to these intermodal facilities. A graphic illustrating the location of these intermodal facilities and key access routes to these facilities is provided in Chapter 5, Figure 5-2.

Four airports exist which serve the various areas of the county. These airports are: the Daytona Beach International Airport, the Ormond Beach Municipal Airport, the New Smyrna Beach Municipal Airport, and the DeLand Municipal Airport. The two major routes leading to the Ormond Beach Municipal Airport, SR 5/US 1 and Airport road are currently operating at LOS C or better. SR600/International Speedway Boulevard, Clyde Morris Boulevard, and Bellevue Avenue are the three major routes serving the Daytona Beach International Airport. Clyde Morris Boulevard and Bellevue Avenue are currently operating at LOS D or better. In 1993, International Speedway Boulevard was operating below its adopted performance standard, but recent improvements have significantly improved the level of service. The western portion of International Speedway Boulevard leading to the DeLand Municipal Airport is operating at LOS C or better. SR 5/US 1, which is the major access route to the New Smyrna Beach Municipal Airport, is operating below the adopted LOS standard; however, improvements are planned by 2010. The northern portion of SR5/US 1, serving the Ormond Beach Municipal Airport, is operating at LOS C.

The County is also serviced by Greyhound Transportation Services with bus terminals at various locations (DeLand, DeBary, Daytona Beach, etc.). The major route serving the bus station in Daytona Beach, SR 5/US 1, is currently operating at a poor level of service. However, this portion of the route is planned to be improved by the year 2010. In the DeLand and DeBary area, the major routes of service to the bus stations are the portion of SR 15/US 17 in downtown DeLand and SR 44/New York Avenue and the southern portion of SR 15/US 17, respectively. SR 44 does not pose any performance problems as it is operating above LOS C. However, the leg of SR 15/US 17 through DeLand is operating at a poorer level of service than the adopted performance standard. The portion of SR 15/US 17 through DeBary also operates at a level of service below the adopted performance standard. It is planned for improvement by the year 2010. Finally, SR 44 and Old

New York Avenue leading to the CSX train depot in DeLand are both operating at or better than LOS C.

As stated earlier, some of the routes providing access to the intermodal facilities operate below their respective adopted performance standards. These routes include SR5/US1 (in New Smyrna Beach), and SR 15/US 17 in DeLand. In 1993, the major roads leading to the intermodal facilities operated at 76% saturation level which is comparable with the total highway system which has a saturation level of 75.3%.

8.2 Policies and Administrative Procedures

In the State of Florida, local governments must follow administrative rules regarding local government planning established by the Florida Department of Community Affairs (DCA) Rule 9J-5. These rules are used to review Local Comprehensive Plans and to make a Determination of Compliance. This section describes the policies which are set by Volusia County regarding the performance of the existing roads.

8.2.1 Performance Standards

For the purpose of the issuance of development orders and development permits within their respective jurisdictions, local governments must adopt a level of service standard for public facilities. Level of service standards are established for the peak-hour periods and approval of all development occurring in the area can only be allowed if adequate services can be maintained. Volusia County has established level of service performance standards as stated in Chapter 2, Traffic Circulation Element of the Volusia County Comprehensive Plan. Figure 8-3 illustrates how the level of service performance standards for roads in Volusia County.

The Florida DOT has designated level of service C and D as its standard for roads in rural and urban areas, respectively. If a road is a part of the Florida Intrastate Highway System (FIHS), the performance standards are one letter-grade higher (B for rural and C for urban). Level of service E has been adopted as the performance standard for most non-state roads. Unique performance standards have been adopted for “constrained” roads which have been recognized as difficult or undesirable to improve (see discussion of “constrained” roads below).

8.2.2 Constrained Facilities

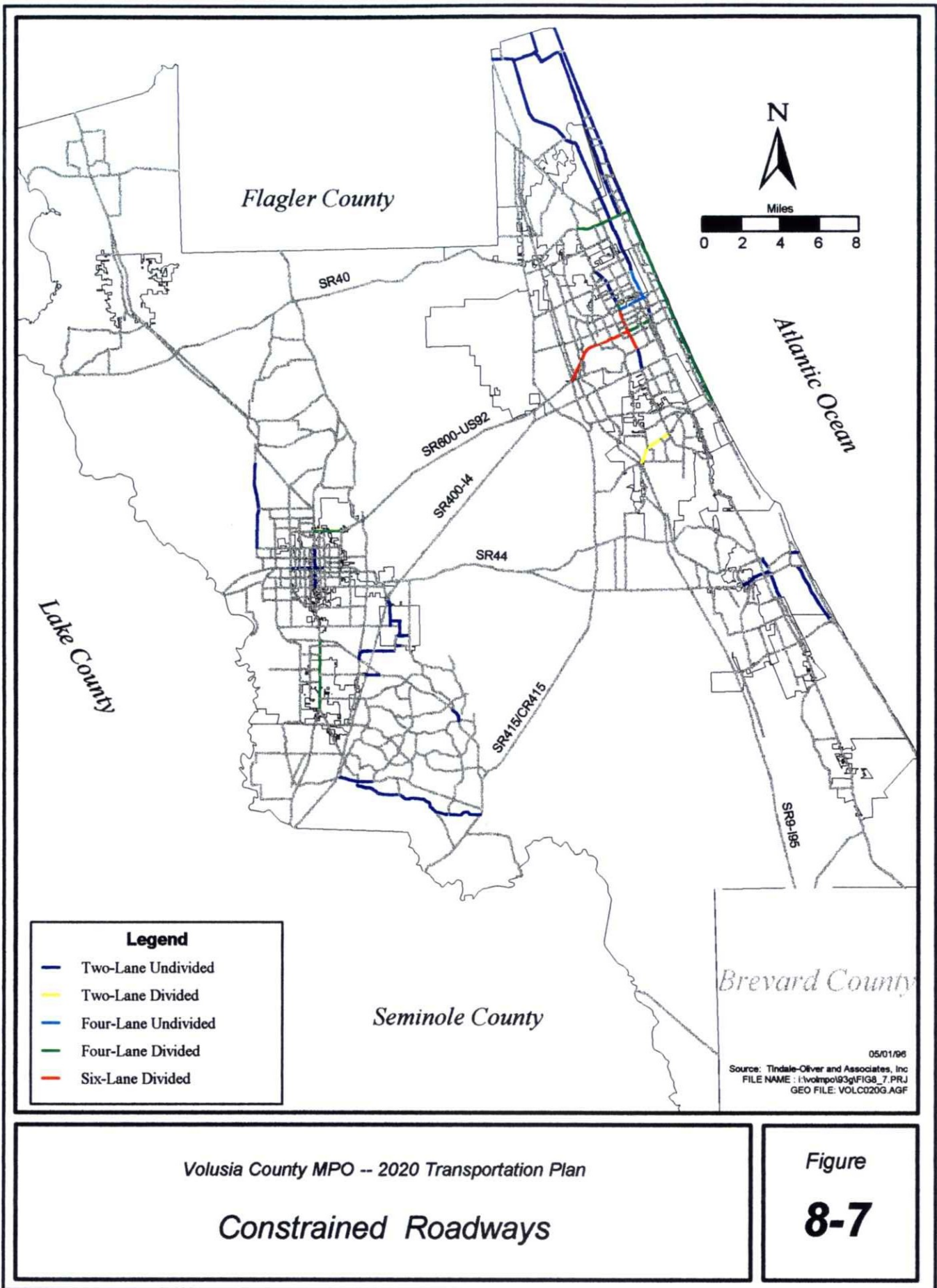
Constrained facilities are described as those facilities which, after reaching saturation (the adopted level of service performance standard), cannot be widened to facilitate additional traffic for various reasons. Volusia County and municipalities within the county have identified roads which are

constrained due to physical limitations of right-of-way, financial limitations, policy constraints, and concern of diminishing scenic quality of the area. For example, US 17/92 in DeLand has been restricted to a two-lane roadway because of the substantial community impacts and costs that would be incurred if this road were to be widened. Similar constraints have been identified for other roads in Volusia County as well, including SR A1A along the beaches.

The Florida DOT has established a maximum number of allowable lanes on roads as a policy. On arterial roads, no more than six lanes are permitted, on urban Interstate highways no more than ten lanes (six general use lanes plus four HOV lanes), and on rural Interstate highways no more than six general use lanes. In some cases, two auxiliary lanes are provided on State arterial roads to enhance the capacity of six-lane arterials. The maximum allowable number of lanes on each major road in Volusia County is identified in tables included in Appendix 6-E and a map identifying these constraints is provided in Figure 8-7.

8.3 Related Studies

Concurrent with the Volusia County 2020 Transportation Plan Update, several transportation planning studies have been undertaken or are in progress which influenced development of this Plan. Brief descriptions of these studies are provided below:



- 2020 Florida Transportation Plan - This Plan was adopted in March 1995 and establishes a policy framework for the establishment of a statewide multi-modal transportation system. Ports, airports, high speed rail, the Florida Interstate Highway System, and public transportation systems serving interstate and inter-regional movement are recognized as key state responsibilities. MPOs and local governments are identified as having primary responsibility for regional and local mobility. Within Volusia County, highway improvements to I-95 are identified.
- I-4 Multi-Modal Master Plan - In order to meet the estimated future travel demands, the Florida DOT began preparing a Multi-Modal Master Plan for the I-4 corridor in 1992. This plan will define the improvements needed in the I-4 corridor by the year 2020, along with strategies for phasing and financing the improvements. After the Florida DOT began the I-4 Multi-Modal Master Plan study, federal regulations were issued which call for Major Investment Studies (MIS) to be performed on federally funded transportation improvements of this nature. At the same time, the Central Florida Regional Transportation Authority (CFRTA)/LYNX(Orlando Area Transit) completed its regional systems plan and identified I-4 as the region's primary corridor for high capacity transit investment. In response to these federal regulations, the Florida DOT revised and expanded its I-4 Multi-Modal Master Plan study to satisfy the requirements of an MIS. One of the determinations of the MIS was the feasibility of six-laning I-4 from Seminole County to I-95, plus the addition of two HOV-lanes from Seminole County to SR 472. This improvement to I-4 was taken into consideration in developing the 2020 Transportation Plan for Volusia County.
- Florida High Speed Rail Study - Under the authority of the 1992 High Speed Transportation Act, Florida Department of Transportation (FDOT) is pursuing the establishment of a high speed intercity passenger transportation system connecting major urban areas. The Daytona Beach area is included as a destination in most of the studies on High Speed Rail Transportation in Florida, but not for initial service. The conceptual plan for high speed rail in Volusia County is illustrated in Figure 10-1. Future expansion of the high speed rail service to Jacksonville, Florida may come through Volusia County, but its timeframe is uncertain. The desire and intent of the MPO to encourage and support High Speed Rail is recognized in this Plan and further planning studies to define steps that can be taken by the MPO and others to improve for this system are scheduled in upcoming years.

8.5 Conclusion

As the demand for travel facilities increases, it is becoming apparent that roads can be utilized more effectively to facilitate other modes of transportation. The ISTEA legislation has focused attention on the need to give attention to other modes of transportation (i.e., public transportation, bicycle, and pedestrian facilities) and to make them more accessible to the public. The intent of this chapter was to outline the current condition of the existing facilities.

In summary, the overall highway network in Volusia County is operating at a relatively good performance level without severe congestion problems. The transit system is growing as can be seen from the 1988 to 1993 trends. Pedestrian and bicycle facilities are limited in the urban and suburban areas, however, this Plan contains recommendations for providing these facilities more extensively throughout the county. The roadways providing access to the various intermodal facilities in Volusia County are operating at approximately the same saturation level as the total highway network.

The policies regarding performance standards and constrained facilities were essential as they were the parameters against which the quality of service was measured. As this Plan was being updated, it was coordinated with other studies being conducted. The I-4 Multi-Modal Master Plan Update has concluded that the I-4 corridor from Seminole County Line to SR 472 should be six-laned with provision for two HOV lanes. The Florida High Speed Rail Study will continually be monitored.

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CHAPTER NINE

REVENUE PROJECTIONS

9.0 Introduction

To enable Volusia County to address future capital needs funding, an estimate of the revenues that may be generated by current revenue sources was prepared. This task involved a review of revenues generated by current revenue sources for transportation services and a projection of these revenues into the future. Federal, state, and county revenue sources were considered. By act of the Florida State Legislature, municipal roads are defined as local and urban collector roads, which make up less than five percent of the major road networks considered in this planning study. Municipal revenues are primarily allocated to the maintenance and operation of these streets, and thus will not be considered to be available to implement the major road network plan. The revenue estimates were divided into two major categories: revenues allocated for capital improvements and revenues allocated for maintenance and operating expenditures. The results of this review are provided in this chapter. Revenues were estimated for the years 2001 through 2020, as revenues for the years 1995 through 2000 are represented in the currently adopted TIP.

9.1 State Revenues

For state facilities within Volusia County, the primary revenue sources are federal and state fuel taxes. The federal fuel tax is equivalent to \$0.14 per gallon of gasoline and state fuel tax, which is comprised of a fuel sales tax and a “comprehensive enhanced transportation tax”, is equivalent to \$0.12 per gallon of gasoline. The federal sources are exclusively used for capital improvements with the exception of maintenance for the Interstate Highway System and operating expenses for transit-related services. The revenues from these sources are distributed through the Florida DOT and have traditionally been used for transit services and for improvements to state facilities only within Volusia County.

With passage of ISTEA, additional flexibility has been provided which allows the application of portions of the revenues traditionally used exclusively for the State road system to non-State roads. Thus, the revenue projections are divided into the following categories:

- Interstate Highway System Funds;
- Other Florida Intrastate Highway System (FIHS) Funds;

- Transit Capital Funds;
- Transit Maintenance and Operating Funds;
- Other Federal-Aid Highway System (FAHS) Funds.

The Florida DOT staff has prepared revenue estimates for the above categories for Volusia County. These estimates are referenced in a document titled “FDOT District Five, Projected State and Federal Revenues for Planning Transportation Improvements,” dated April 11, 1995. This document indicates that approximately \$420.3 million are earmarked for capital-related improvements; \$134.5 million for the Interstate System, \$22.3 million for FIHS roadways, and \$230.3 million for other FAHS roads, and \$33.2 million for transit improvements. These revenues are for the acquisition of right-of-way, construction, and implementation of transit system purposes. Additional funding to address necessary planning studies, preliminary engineering and design, construction observation, and maintenance and operation expenses have been set aside by the Florida DOT, have not been provided to the MPO, and are not reflected in the above amounts.

The ISTEA has provided for considerable flexibility regarding the application of these funds. The funds are “upwardly flexible”, meaning that the “other FAHS” funds may be applied “upwardly” to the Interstate or other FIHS road systems, or to further increase transit programs. Similarly, the “Other FIHS” funds may be applied “upwardly” to Interstate Highway system improvements.

The revenue estimates indicated above for the Interstate Highway System are subject to modification as the Interstate Four Master Plan study advances, and the revenues allocated to the Interstate Highway System are likely to change. It has not been determined at the present time if these changes will, under the flexibility provisions described above, result in changes to the amounts in the other revenue categories.

9.2 County Revenues

Revenue sources at the County level for transportation involve several state and local funding sources. These sources include the following:

- Constitutional Gas Tax
- County Gas Tax
- “Ninth Cent” Gas Tax
- Local Option Gas Tax

- Ad Valorem Tax
- Impact Fees
- Other Local Taxes and Fees

Projections for these revenues through 2020, and their applicability to capital needs are discussed in the following sections.

9.2.1 Constitutional Gas Tax

The Constitutional Gas Tax of \$0.02 per gallon tax on “gasoline and other like products of petroleum.” Proposed in 1941 as an amendment to the Florida Constitution by the Florida Legislature and passed in 1943, the tax was originally called the “Second Gas Tax” and was intended to cover the costs of state road construction. The Governor, State Treasurer, and State Comptroller formed the State Board of Administration to manage, control and supervise the revenues from this tax.

Presently, this tax is called the “Constitutional Gas Tax” and is intended to be a state-shared revenue source for counties only. The State Board of Administration still governs the revenues. This tax covers a portion of transportation-related debt service managed by the State Board of Administration for all counties. After covering the debt service, a county’s surplus funds are distributed to the board of county commissioners. All counties are eligible for this revenue.

The distribution factor for each county is calculated as follows:

$$\frac{1 \text{ County Area}}{4 \text{ State Area}} + \frac{1 \text{ County Population}}{4 \text{ State Population}} = \frac{1 \text{ \# Motor Fuel Gallons Sold in Cty}}{2 \text{ \# Motor Fuel Gallons Sold Statewide}} = \text{Cty's Dist. Factor}$$

The monthly allocation for each county is calculated as follows:

$$\text{Monthly Statewide Constitutional Gas Tax Receipts} * \text{County's Distribution Factor} = \text{County's Monthly Allocation}$$

The distribution of proceeds for each county is calculated as follows:

$$\text{Monthly Allocation} * 80 \text{ percent} = \text{Amount First to Meet Debt Service Requirement, then Transferred to County}$$

*Monthly Allocation * 20 percent = Amount Transferred to County*

The amount of Constitutional Gas Tax transferred to the counties must be used for construction and maintenance of roads. Maintenance refers to periodic and routine maintenance, and may include the construction and installation of traffic signals, sidewalks, bicycle paths, and landscaping, as necessary for the safe and efficient operation of roads. Each penny of the Constitutional Gas Tax yielded \$1.9 million per year in 1995. Volusia County's Capital Improvement Program (CIP) 1995/95 - 1988/99, indicates all of the Constitutional Gas Tax revenue returned to Volusia County is allocated to maintenance and operations, and thus, none is allocated to capital.

9.2.2 County Gas Tax

The County Gas Tax is a \$0.01 per gallon tax on motor fuel, imposed at the wholesale level. Enacted in 1941, the tax was originally called the "Seventh Cent Tax" and was intended to reduce a county's reliance on ad valorem taxes.

Presently, this tax is called the "County Tax on Motor Fuel" and is still intended to reduce a county's reliance on ad valorem taxes. The Department of Revenue administers the tax and distributes the net tax proceeds to the counties on a monthly basis, using the same distribution on factor used to distribute the Constitutional Gas Tax proceeds. This tax yielded \$1.4 million per year in 1995. This tax may be used by the counties for transportation related expenses, including the reduction of bond indebtedness incurred for transportation purposes. All counties are eligible to receive this revenue. After reviewing Volusia County's CIP 1994/95 -1988-99, it was determined that 19 percent of the funds, or \$280,000 per year, was allocated to TSM improvements, and the balance was allocated to maintenance (resurfacing streets).

9.2.3 "Ninth Cent" Gasoline Tax

The "Ninth Cent" gasoline tax is a local option gasoline tax approved by local voters in 1982. It is currently authorized indefinitely. This gasoline tax generated \$2.06 million for the County in 1995, and is allocated to maintenance and operations.

9.2.4 Local Option Gas Tax

As a result of legislation enacted in 1983, local governments are authorized to levy the "original" Local Option Gas Tax (LOGT). In 1983, Volusia County adopted by a majority vote of the governing body, or by referendum, a \$0.06 tax on every gallon of motor and special fuel sold at

retail in the County. This authorization extends through 2013, and is expected to be renewed indefinitely. Each penny of this tax generated \$1.3 million in 1995. After reviewing Volusia County's CIP, it was determined that an average of 49 percent of the LOGT revenue was allocated for maintenance/operations and 51 percent was allocated for capital. This amounts to \$4.0 million per year capital in 1995. The proceeds are used to fund transportation expenditures such as the following:

- Public transportation operations and maintenance;
- Roadway and right-of-way maintenance and equipment and structure used primarily for the storage and maintenance of such equipment;
- Roadway and right-of-way drainage;
- Street lighting;
- Traffic signs, traffic engineering, signalization, and pavement markings;
- Bridge maintenance and operation; and
- Debt service and current expenditures for transportation capital projects in the foregoing program areas, including construction or reconstruction of roads.

9.2.5 Ad Valorem Tax/Special Assessments

Ad valorem, literally "according to the value", is a property tax according to the value of the property. The portions of ad valorem taxes and special assessments allocated to the County's transportation budget are used for maintenance and operations. The annual average revenue allocated to transportation in Volusia County by these ad valorem-based taxes is \$3.5 million. Since these revenue sources are allocated to maintenance/operations, ad valorem tax will not be considered a current ongoing revenue source for capital transportation projects. However, ad valorem taxes could be considered as a potential additional revenue source when evaluating the need for additional revenues.

Currently, ad valorem taxes are also used to finance the operating expenses of VOTRAN, the County's public transportation agency. Currently, 0.32 mill is being assessed, which generates \$3.8 million annually. Increases in the millage rate can be accomplished through the County Council's action.

9.2.6 Impact Fees

Volusia County has adopted transportation impact fees as a revenue source for transportation, specifically for improvements that increase the capacity of the transportation system. Impact fees are assessed on new development and annual revenues are dictated by the rate of growth. The

County's CIP indicates that \$7.2 million per year are expected from transportation impact fees; however, County staff has recommended that a lower annual impact fee revenue rate of \$6.0 million per year, starting in fiscal year 1995/96, be used for budgeting purposes.

9.2.7 County Revenue Projections

The first step in estimating the revenues generated at the County level that will be available for the various transportation purposes between 2001 and 2020 was to establish the County's current funding program. To do this, each itemized expenditure in the current TIP and operating budget was reviewed and assigned to a program area. Expenditures by year were compared to incoming revenues each year. Table 9-1 provides a summary of this analysis. Expenditures budgeted in the first year (\$38.8 million) are significantly greater than expenditures in the subsequent years, which average \$27.5 million. Contact with County budget office staff confirmed that the relatively high first year expenditure was the result of budget carryovers from prior years and not a reallocation of revenues from maintenance and operations to capital programs. The carryovers are being used to fund major road widening projects.

Several program areas are funded through the County's capital program which correspond to ISTEAs initiatives. Table 9-1 also provides a summary of the allocation of the County transportation budget to each program area in the five-year period of the TIP. In transportation, it is difficult to allocate projects to specific program areas because they often provide multiple benefits. For example, the construction of left-turn storage lanes at an intersection improves its safety as well as its capacity and efficiency. Construction of bicycle facilities not only encourages use of alternative modes of transportation, it also improves the safety of the road system. A third example is that as roads are widened in urban areas, by policy, bicycle and pedestrian facilities will be included. However, the costs of the bicycle and pedestrian facilities are not isolated to the bicycle and pedestrian program, but are included with the road construction costs. Thus, some judgement was necessary to infer a project's appropriate program area.

Table 9-1 Summary of County Transportation Revenue Allocation Program (In \$1,000's)								
	FY 95	FY 96	FY 97	FY 98	FY 99	5-Yr. Totals	FY 96-99 Totals	Percent Alloc.
Advanced ROW	\$300	\$0	\$100	\$0	\$0	\$400	\$100	0.1%
Landscaping	\$117	\$50	\$50	\$50	\$50	\$317	\$200	0.2%
Adding Lanes	\$16,764	\$10,232	\$9,510	\$9,400	\$10,250	\$56,156	\$39,392	35.8%
Countywide SW/Bikepaths	\$200	\$200	\$500	\$500	\$500	\$1,900	\$1,700	1.5%
Other SW/Bikepaths	\$542	\$0	\$50	\$100	\$0	\$692	\$150	0.1%
Signal Installation	\$180	\$250	\$200	\$340	\$300	\$1,270	\$1,090	1.0%
Turn Lanes	\$145	\$0	\$0	\$0	\$0	\$145	\$0	0.0%
Widening	\$730	\$370	\$0	\$850	\$0	\$1,950	\$1,220	1.1%
Intersections	\$280	\$600	\$0	\$0	\$0	\$880	\$600	0.5%
Miscellaneous Safety	\$150	\$150	\$200	\$250	\$300	\$1,050	\$900	0.8%
Resurfacing Contract	\$981	\$1,100	\$1,230	\$1,150	\$1,200	\$5,661	\$4,680	4.3%
Major Bridge Repair	\$640	\$300	\$210	\$300	\$300	\$1,750	\$1,110	1.0%
Clay/Shell Pit Purchase	\$300	\$0	\$0	\$0	\$0	\$300	\$0	0.0%
Public Transit	\$3,250	\$3,609	\$3,935	\$4,183	\$4,395	\$19,372	\$16,122	14.7%
Trans Demand Mgmt.	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.0%
Road Operations	\$14,200	\$14,000	\$13,800	\$13,600	\$13,400	\$56,900	\$42,700	38.8%
TOTAL	\$38,779	\$30,861	\$29,785	\$30,723	\$30,695	\$148,743	\$109,964	100.0%

Source: Volusia County TIP - Adopted May 1995

The majority of County transportation funds (39%) are allocated to maintaining and operating the public road system. This is typical and appropriate, as the roads facilitate goods movement, transit, sidewalks, and bicycle facilities. Next in order of magnitude is the allocation of funds to roadway system expansion (36%), and the public transit allocation is the third largest at 15%.

To project County revenues into the future, the following assumptions were made:

- Countywide fuel sales (and thus tax revenue per penny of tax) would grow proportionately to vehicle-miles of travel on the road system, at an annual rate of 1.6% per year;
- Based on information provided by the Florida DOT, road improvement costs will grow by 3.3% per year;
- Allocation of road system funds by program area will initially remain as indicated by the allocation of funds in the last four years of the capital program;
- Public transit operating subsidies funded by the ad valorem tax will increase gradually as needed, to fund the planned expansion of service through 2020;
- The ad valorem tax base will increase in value at a rate of 1.5% per year, based on information from the Volusia County Office of Management and Budget.

Based on these assumptions, the projections of revenue by program area are provided in Table 9-2. In this scenario, funding for public transit increases from 14.7% of the County's transportation budget to 39.8%, reflecting the increased millage assessment rate required to fund the expanded system. The proportional relationship between other program areas also changes, but to a lesser degree. This is a result of the difference between the inflation rate and the rate at which the revenue source is estimated to grow. For example, motor fuel-based revenues are expected to grow along with increases in travel demand, however, annual Impact Fee revenues are expected to remain stable, as a stable rate of growth and no rate schedule changes have been assumed in this analysis. Since impact fee revenues fund road construction, and because they are not expected to grow as motor fuel-based taxes are, the proportion of the budget allocation to road construction projected herein declines.

Table 9-2 Projected County Transportation Budget (In \$1,000's)				
Program	2001-2010	2011-2020	Total	Percent
Road Construction	\$62,290	\$48,880	\$111,170	20.8%
Public Transit	\$84,200	\$130,727	\$214,927	40.2%
Bicycles/Sidewalks	\$4,830	\$3,791	\$8,621	1.6%
Transportation System Management	\$2,459	\$1,929	\$4,388	0.8%
Safety	\$4,567	\$3,583	\$8,150	1.5%
Road Maintenance/ Operations	\$101,371	\$85,398	\$186,769	35.0%
Transportation Demand Management	\$0	\$0	\$0	0.0%
TOTALS:	\$259,717	\$274,300	\$534,025	100.0%

9.3 Combined Transportation Budget

Table 9-3 presents revenue projections from 2001 to 2010 and federal, state, and Volusia County sources for the time period 2011 to 2020, in accordance with the anticipated plan staging. These revenue projections, and allocation of funds by program area, served as the basis for transportation plan development. Funds available from 2001 to 2010 were assumed to be 56 percent of those available from 2001 to 2020, in recognition of the differential between transportation cost inflation and the expected growth rate of transportation revenues.

Table 9-3 Summary of Estimated Revenues for Facility and Service Expansion (In \$1,000's)				
Program Area	2001 - 2010	2011 - 2020	Total	Percent
<u>Road Capacity</u>				
Interstate ⁽¹⁾	\$30,000	\$104,507	\$134,507	14.5%
Other FIHS ⁽¹⁾	\$12,495	\$9,805	\$22,300	2.4%
Other FAHS ⁽¹⁾	\$129,060	\$101,274	\$230,334	24.8%
County Roads	\$62,290	\$48,880	\$111,170	12.0%
<u>Transit</u>				
County Ad Valorem	\$54,884	\$75,804	\$130,688	14.1%
State General Funds	\$11,152	\$12,353	\$23,505	2.5%
Farebox	\$18,626	\$24,864	\$43,490	4.7%
<u>TSM</u>	\$2,459	\$1,929	\$4,388	0.5%
<u>Bike/Pedestrian</u>	\$4,830	\$3,791	\$8,621	0.9%
<u>Safety/TDM</u>	\$4,567	\$3,583	\$8,150	0.9%
<u>Road/Operations</u> ⁽²⁾	\$103,529	\$89,007	\$192,536	20.7%
Resurfacing	\$10,480	\$8,224	\$18,704	2.0%
TOTALS:	\$444,372	\$484,021	\$928,395	100.0%

Note: 1.Funds for right-of-way acquisition and construction only. Funds for P, D, & E, design, and other support services on State roads are not included in these funds.

2.County road system only. Florida DOT programs maintenance and operations separately. Few municipal streets are on the "major" road network examined in this study.

9.4 Potential Additional Revenue Sources

Indications of the transportation planning analysis are that additional revenues will be required to finance the programs and facilities to serve future demands within the established levels of performance. This section considers the revenues that would be generated by additional motor fuel taxes, ad valorem taxes, and sales taxes.

One penny per gallon of motor fuel taxes generates approximately \$1.9 million per year in 1995. Vehicle travel is expected to increase at a rate of 1.6% per year through 2020, but transportation costs are expected to grow at a rate of 3.3% per year. Each penny of motor fuel tax is, therefore,

expected to generate \$29.3 million (1995 dollars) over the 2001 to 2020 interval. State legislation has been passed enabling the County Council to assess up to five additional pennies per gallon of motor fuel sold, by either a countywide referendum or a “super majority” council vote.

One mill of ad valorem (property) tax generates \$11.9 million per year in 1995. County planners have projected that the value of the tax base will increase at a rate of 1.5% per year, and this projection was applied to the estimate of revenues that will be generated there from. Offsetting this rate of increase is the estimated inflation of transportation costs of 3.1% per year. The yield of one mill of ad valorem assessment between 2001 and 2020 is therefore \$180.6 million, in 1995 dollars.

Sales tax revenues are also sometimes used to finance transportation. In 1995, a one percent tax rate generated \$33.2 million in Volusia County. Using the 1.5% per year growth rate and 3.3% per year transportation cost inflation rate used above, commitment of one percent of the sales tax would generate an estimated \$503.8 million between 2001 and 2020 in 1995 dollars.

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CHAPTER TEN

THE TRANSPORTATION PLAN

10.0 Introduction

The Transportation Plan was developed by testing a series of alternative transportation systems and evaluating their relative effectiveness in meeting the adopted goals and objectives. These tests involved different levels of commitment to road improvements, transit service, and transportation demand management (TDM) strategies. The levels of countywide development with which these tests were made are documented in Chapter Seven--Land Use Data.

Alternative transportation systems were tested in three rounds. The purpose of the first round of testing was to evaluate the potential effectiveness of bus transit service enhancements and TDM strategies to move people and to evaluate the extent to which the MPO's 2015 transportation plan road network was effective in meeting 2020 traffic demands. The purpose of the second round of testing was to test and refine alternative highway networks with the appropriate level of transit service and TDM program implementation determined in the first round. The third round of analysis was to finalize the 2020 transportation system plan and to stage its implementation. Eleven different system alternatives were tested in this process. Documentation of the alternatives tested, and their results, are provided in Appendices 10-A through 10-J.

In the sections that follow, the results of these tests are discussed relative to the adopted Transportation Plan for each mode of transportation. These sections are:

- The Rail Plan
- The Highway Plan
- The Public Transportation Plan
- The Bicycle Plan
- The Pedestrian Plan
- The Congestion Management Plan
- The Goods Movement Plan

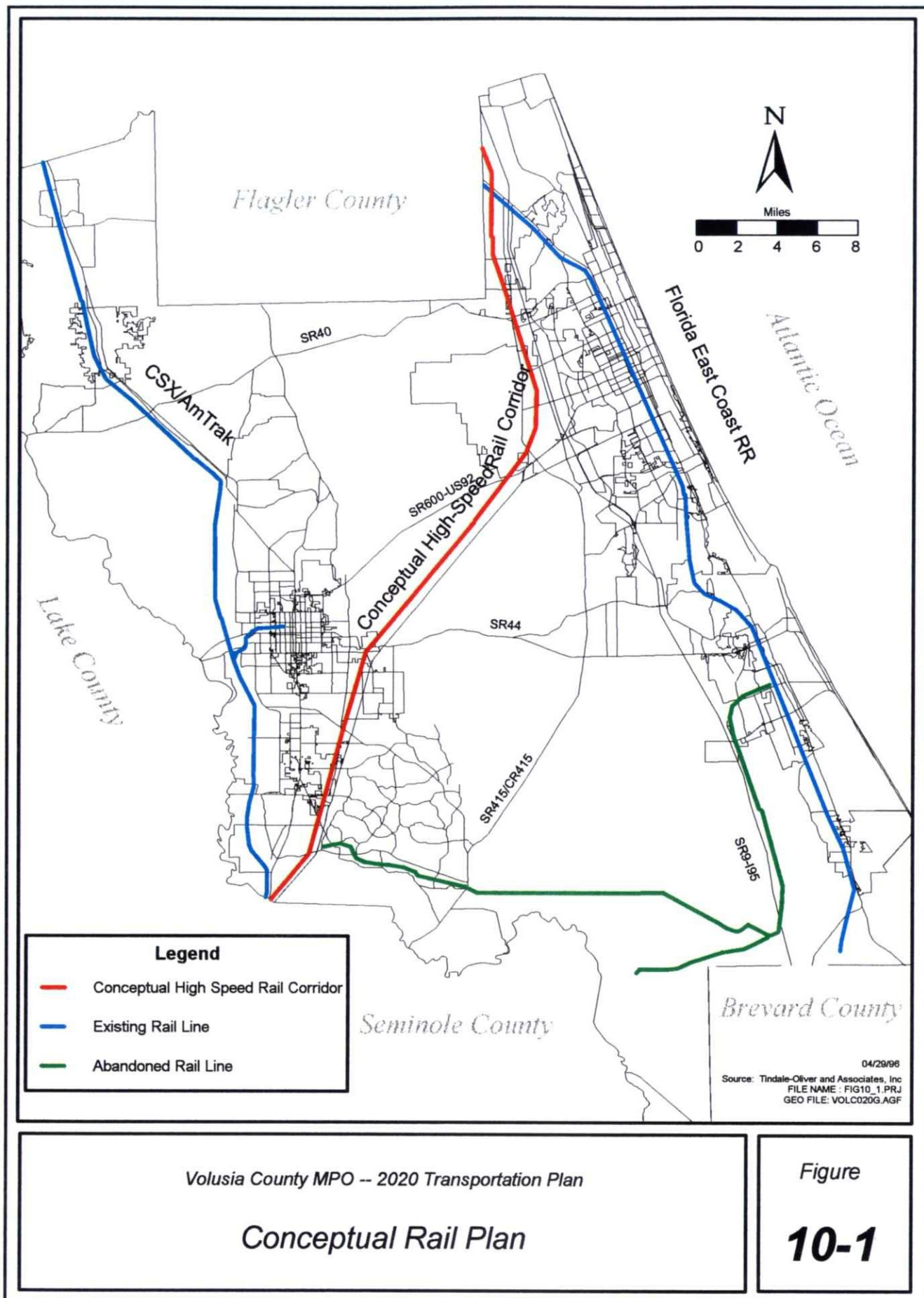
10.1 The Rail Plan

Rail systems are an important consideration in the Volusia County MPO's priorities. Three levels of rail service are of relevant concern: high-speed state-wide rail service, regional commuter rail service, and localized light rail service.

A high-speed rail connection to Volusia County creates potential for significant benefits because of Daytona Beach's popularity as a tourist destination. Addition of Volusia County as a destination on the high-speed rail system will increase system ridership and contribute to Volusia County's economy. At the time of Plan preparation, Fall 1995, the Florida DOT was receiving and beginning to evaluate proposals by private consortiums to implement high-speed rail systems to link Florida's major communities (e.g. Miami, Orlando, Jacksonville, and Tampa). Alternative routes for rail service are under study and are not sufficiently funded to allow commitment of necessary local transportation linkages. The Florida DOT has indicated initial high-speed rail service could begin in the 2001-2005 time period between Miami, Orlando, and Tampa, with service to Jacksonville within two years following the initial service.

The Volusia County MPO recognizes that high-speed rail must play a key role in meeting regional and state-wide transportation needs. By including a schematic illustration of conceptual high-speed rail routes through Volusia County, (Figure 10-1) and through policy statement, the MPO recognizes and affirms that when specific routes and service schedules for high-speed rail service are defined, it will be necessary to amend its transportation plan to provide coordinated linkages between the rail, highway, and public transportation systems.

In coordination with the high speed rail efforts of the Florida DOT, rail considerations have been included in a major investment study of I-4. The "Interstate-4 Multi-Modal Master Plan/Major Investment Study," directed by the Florida DOT, has recommended that improvements be made to I-4 by 2020 to include the preparation of an envelope to accommodate high speed and commuter rail lines from the Orlando urban area. In its recommendations, this study has acknowledged it is not



likely that commuter rail service will be extended into Volusia County until after 2020, the horizon year of this plan. This recognition has been incorporated as a basic assumption of the 2020 Transportation Plan.

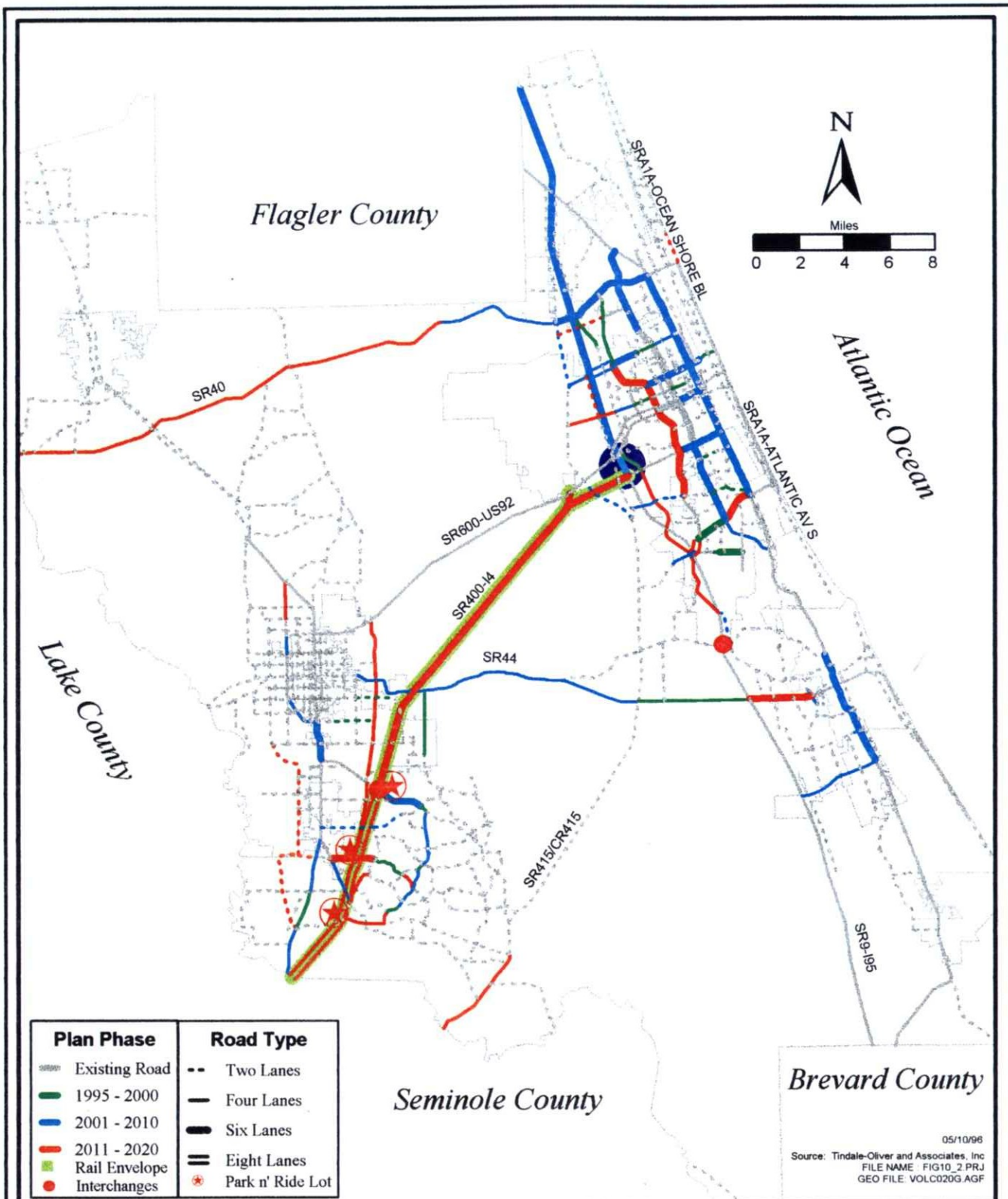
To encourage the extension of rail service (high speed and commuter rail) and to evaluate the potential for local light rail service, the MPO has scheduled a rail feasibility study, to begin in 1996. The findings of this study have the potential of leading to amendments to the Transportation Plan presented herein.

10.2 The Highway Plan

The approach used to develop the Highway Network Plan was to select road improvements that would minimize the level of congestion and “below standard” travel within the constraints of affordability. Local government agencies, through their Comprehensive Plan Traffic Circulation Elements, have established level of service standards for all major roads within their jurisdictions. The Florida DOT has also established level of service standards for Interstate Highways and roads on the Florida Intrastate Highway System. These standards served as the basis to decide which roads need to be improved by 2020, when they should be improved, and to what extent they should be improved.

By testing several alternative highway network plans, the highway network plan illustrated in Figure 10-2 has been developed to respond to the majority of transportation demands by 2020. Figure 10-2 illustrates the location, phasing, and number of lanes adopted for the highway plan. In this figure, roadways scheduled for improvement between 1995 and 2000 in the current TIP are illustrated in green, roads to be improved between 2001 and 2010 in blue, and roads to be improved between 2011 and 2020 in red. Existing roads that will not be improved are indicated in gray. A listing of the roadway improvements and their estimated cost is also provided in Table 10-1.

Table 10-2 provides a “report card” summarizing the performance of the Road Network Plan. By 2020, the total p.m. peak hour VMT is expected to grow from 861,139 in 1993 to 1,621,700 vehicle



Volusia County MPO -- 2020 Transportation Plan

2020 Highway Plan

Figure

10-2

Table 10 - 1
Roadway Improvements From 2001 - 2020

Project Number	On Street	From	To	Length (Mi)	Juris	2000 Road	2010 Road	2020 Road	Cost (1,000's)	Source
State Roads: Phase 2 (2001 to 2010)										
1	SR15-600-US17-92	Seminole County	Dirksen Dr	2.03	SR	2 U	4 D	4 D	\$5,591	STP
2	SR15-600-US17-92	Highbanks Rd	Enterprise Rd	2.38	SR	2 U	4 D	4 D	\$4,378	STP
3	SR15-600-US17-92	SR 472	Taylor Rd	1.70	SR	4 D	6 D	6 D	\$2,035	STP
4	SR15A	SR 15-600/US 17	Beresford Ave	1.76	SR	2 U	4 D	4 D	\$11,167	STP
5	SR15A	Plymouth Ave	CR92/Int.Spdwy	0.81	SR	2 U	4 D	4 D	\$1,431	STP
6	SR40	Cone Rd	Tymber Creek Rd	5.35	SR	2 U	4 D	4 D	\$9,486	FIHS
7	SR40	Tymber Creek Rd	SR 5-US 1-Yonge	4.73	SR	4 D	6 D	6 D	\$7,482	FIHS
	SR400-Beville Rd	@ I-95	Widen WB Bridge	0.38	SR	1 F	2 F	2 F	\$2,490	INT
8	SR400-Beville Rd	SR 483-Clyde Mo	SR 5-US 1	2.02	SR	4 D	6 D	6 D	\$7,061	STP
14	SR430-Mason Ave	SR 483-Clyde Mo	Seabreeze Cr	2.57	SR	4 U	6 D	6 D	\$8,186	STP
15	SR44	Blue Lake Ave	SR 415/CR 415	13.31	SR	2 U	4 D	4 D	\$19,721	STP
17	SR442-Indian River Blv	SR 9/I-95	SR 5/US 1	3.65	SR	2 D	4 D	4 D	\$7,124	STP
18	SR472	SR400-I4	Howland Blvd/CR	0.76	SR	0 0	6 D	6 D	\$2,529	STP
20	SR5-US1	SR 442-Indian R	Turnbull Bay Rd	5.30	SR	4 D	6 D	6 D	\$10,468	STP
21	SR5-US1	SR 421-Dunlawto	SR 40-Granada B	10.64	SR	4 D	6 D	6 D	\$19,377	STP
22	SR5A-Nova Rd	SR 5-US1-Ridgew	SR 421-Dunlawto	2.49	SR	2 U	4 D	4 D	\$4,623	STP
23	SR5A-Nova Rd	SR 421-Dunlawto	SR 400-Beville	3.59	SR	2 U	6 D	6 D	\$7,191	STP
24	SR5A-Nova Rd	Flomich St	SR 5-US 1-Yonge	3.95	SR	2 U	6 D	6 D	\$12,247	STP
25	SR600-US92	SR 5A-Nova Rd	SR 5/US 1	1.14	SR	4 D	6 D	6 D	\$1,365	STP
26	SR9-I95	SR 400-Beville	SR40/Granada Bl	7.42	SR	4 F	4 F	6 F	\$12,629	INT
62	SR9-I95	SR 40/Granada B	Flagler County	10.50	SR	4 F	4 F	6 F	\$17,871	INT
				29.51				Subtotal:	\$174,452	

State Roads: Phase 3 (2011 to 2020)

60	SR15A	Mercers Fernary	SR15/US 17	1.63	SR	2 U	2 U	4 D	\$10,451	STP
61	SR40	Lake County	Cone Rd	20.28	SR	2 U	2 U	4 D	\$31,681	FIHS
9	SR400-I4	Seminole Co	SR 472	9.30	SR	4 F	4 F	8 F	\$209,000	INT
10	SR400-I4	SR 472	SR 9/I-95	18.86	SR	4 F	4 F	6 F	\$44,000	INT
11	SR415/CR415	Seminole County	Doyle Rd	4.53	SR	2 U	2 U	4 D	\$6,321	STP
12	SR421-Dunlawton Ave	SR 9/I-95	Clyde Morris Bl	0.65	SR	6 D	6 D	8 D	\$778	STP
13	SR421-Dunlawton Ave	SR 5A-Nova Rd	SR 5/US 1	1.61	SR	4 D	4 D	6 D	\$1,927	STP
16	SR44	SR 9/I-95	Canal St	2.81	SR	4 D	4 D	6 D	\$1,812	STP
	SR483-Clyde Morris	SR 400-Beville	SR 430-Mason Av	3.38	SR	4 U	4 U	6 D	\$8,086	STP

Table 10 - 1
Roadway Improvements From 2001 - 2020

Project Number	On Street	From	To	Length (Mi)	Juris	2000 Road	2010 Road	2020 Road	Cost (1,000's)	Source
	SR9-I95	Interchange	@ Pioneer Trail						\$30,000	INT
63	SRA1A-Ocean Shore Bl	SR 40-Granada B	Ocean Terr	1.32	SR	2 U	2 U	2 D	\$945	STP
Subtotal:									\$345,001	

County Roads: Phase 2 (2001 to 2010)

64	11th St	Tymber Creek	I-95	1.14	CR	2 D	2 U	4 D	\$2,600	VC
28	11th St	SR 9/I-95	Clyde Morris Bl	1.08	CR	2 U	6 D	8 D	\$4,594	VC
65	11th St	Clyde Morris Bl	Jimmy Ann Dr	1.12	CR	4 D	4 D	6 D	\$1,569	VC
29	11th St	SR5A/Nova Rd	SR 5/US 1	1.09	CR	2 U	4 D	4 D	\$2,705	VC
27	11th St	Tomoka Farms	US 92	2.71	CR	0 0	2 U	2 D	\$7,398	VC
36	East Coast Beltline	I-95	Pioneer Tr	1.59	CR	0 0	2 U	2 U	\$2,343	VC
37	Enterprise Rd	Deltona Blvd	Saxon Blvd	2.06	CR	2 U	4 D	4 D	\$5,525	VC
68	Howland Bl/CR4145	SR 472	Catalina Blvd	1.35	CR	4 D	4 D	6 D	\$1,975	VC
69	Madeline Ave	Tomoka Farms	Williamson	1.08	CR	0 0	2 D	4 D	\$4,641	VC
41	Madeline Ave	Williamson Blvd	Clyde Morris Bl	1.33	CR	0 0	2 D	2 D	\$3,000	VC
42	Old Mission Rd	Old Mission Rd	SR 44	0.51	CR	2 U	4 D	4 D	\$2,474	VC
70	Old Mission Dr	SR 44	Pioneer Trail	0.26	CR	0 0	4 D	4 D	\$1,260	VC
43	Park Ave	Hart Ave	SR 5/US 1	0.25	CR	2 U	4 D	4 D	\$763	VC
46	Providence Blvd	Tyler Ave	Tivoli Dr	1.87	CR	2 U	4 D	4 D	\$4,083	VC
44	Providence Blvd	Ft Smith Blvd	Howland Blvd	2.46	CR	2 D	4 D	4 D	\$5,493	VC
47	Rhode Island Rd	US17-92	Catalina	3.74	CR	0 0	2 U	2 D	\$9,704	VC
72	Taylor Rd (CO)	Fern Park Dr	Summertree Rd	0.62	CR	2 U	2 U	4 D	\$1,351	VC
51	Taylor Rd (CO)	Summertree Rd	Airport Rd	0.27	CR	2 U	4 D	4 D	\$559	VC
52	Taylor Rd (CO)	Airport Rd	SR 9/I-95 SB Ra	0.15	CR	2 U	6 D	6 D	\$432	VC
54	Tymber Creek Rd	11th St	Riverbend Rd	2.78	CR	0 0	0 0	2 U	\$2,381	VC
Subtotal:									\$64,850	

County Roads: Phase 3 (2011 to 2020)

66	Airport Rd (PO)	Cypress Head Pk	Taylor Rd	1.71	CR	2 U	2 U	4 D	\$3,537	VC
31	Clyde Morris Blvd	Mason Ave	11th St	2.00	CR	4 D	4 D	6 D	\$2,800	VC
32	Clyde Morris Blvd	Madeline Ave	Beville Rd	2.01	CR	4 D	4 D	6 D	\$3,104	VC
33	Debary Av/CR4162	Deltona Blvd	Providence Blvd	1.74	CR	2 U	2 U	4 D	\$4,449	VC
34	Deltona Bl	Enterprise Rd	Normandy Blvd	1.62	CR	2 U	2 U	4 D	\$4,948	VC
35	Dunn Ave	LPGA Blvd	Bill France Blv	3.09	CR	0 0	0 0	4 D	\$11,420	VC
38	Hand Ave	Tymber Creek Rd	Clyde Morris Bl	2.13	CR	0 0	2 U	2 U	\$3,639	VC

Table 10 - 1
Roadway Improvements From 2001 - 2020

Project Number	On Street	From	To	Length (Mi)	Juris	2000 Road	2010 Road	2020 Road	Cost (1,000's)	Source
39	Kentucky Ave/CR 413	Graves Ave/CR 4	SR 472	0.79	CR	2 U	2 U	4 D	\$1,765	VC
40	Kepler Rd/CR4101	Beresford Ave	SR 600/US 92	3.45	CR	2 U	2 U	4 D	\$8,815	VC
71	Pioneer Tr/CR4118	I-95	Turnbull Bay R	0.25	CR	2 U	2 U	4 D	\$517	VC
45	Providence Blvd	Doyle Rd	Anderson Dr	0.57	CR	2 U	2 U	4 D	\$1,245	VC
48	Saxon Blvd	West Bypass	US17/92	0.81	CR	0 0	0 0	2 U	\$1,592	VC
49	Saxon Blvd	Enterprise Rd	Normandy Blvd	1.97	CR	4 D	4 D	6 D	\$4,170	VC
50	Saxon Blvd	Tivoli Dr	Providence Blvd	0.81	CR	2 U	2 U	4 D	\$1,768	VC
53	Tomoka Farms Rd	Dunn	LPGA/11th St	1.83	CR	0 0	0 0	2 D	\$4,997	VC
55	W Volusia Beltline	Saxon Bl	Graves Ave	2.65	CR	2 U	2 U	4 D	\$6,024	VC
56	W Volusia Beltline	Cassadaga Rd	Kepler Ave	3.44	CR	2 U	2 U	4 D	\$8,312	VC
57	Western Bypass	US17/92	Beresford Rd	9.77	CR	0 0	0 0	2 U	\$16,046	VC
58	Williamson Blvd	I-95	Airport Rd	1.40	CR	0 0	0 0	4 D	\$7,454	VC
59	Williamson Blvd	Taylor Rd	Bellevue Ave Ex	5.68	CR	0 0	2 U	4 D	\$13,557	VC

Subtotal: **\$110,159**

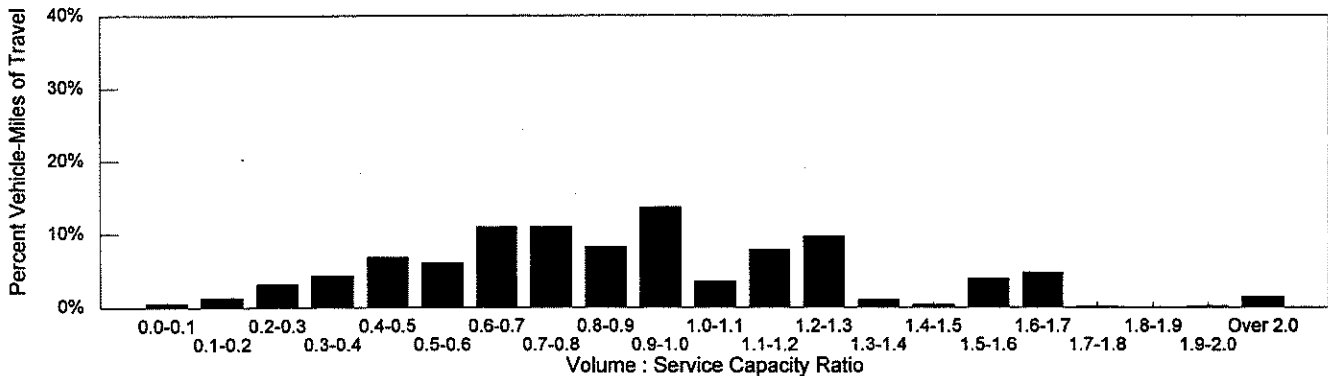
Other Improvements/Recommendations:

Bellevue Road Realignment
Weekend/Beach Traffic Study

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Table 10-2
Adopted Plan Report Card

	Total System	State System	County System	Other System
Inventory:	1010.30 mi.	358.23 mi.	603.32 mi.	48.75 mi.
Pk Hr Vehicle-Miles of Travel (VMT):	1,621,703 veh-mi.	1,174,659 veh-mi.	417,595 veh-mi.	29,449 veh-mi.
With LOS Data:	987 mi.	358.23 mi.	587.16 mi.	41.72 mi.
Percent Coverage:	97.7 %	100.0 %	97.3 %	85.6 %
Weighted Saturation of VMT:	0.843	1.102	0.571	0.741
Weighted Sat of Truck Routes:	0.949			
Weighted Sat of Economic Routes:	1.015			
Wtd Sat of Roads to Airports:	0.987			
Weighted Sat of Transit Routes:	0.861			
Percent Cong. Roads w/ Transit Route:	33.2 %			
Percent Population Served by Transit:	%			
Sidewalks:	n/a mi.	n/a mi.	n/a mi.	n/a mi.
Bicycle-Suitable Facilities:	mi.	mi.	mi.	mi.
Proportion of Trips by non-SOV:	%			



Weighted Saturation Level = 0.893

Capital Cost (\$1,000's):	\$766,046	489549	175009	
Road Capital Costs:	\$708,525	\$529,193 (1.)	\$179,332	\$0
Transit Capital Costs:	\$45,917			
Bike Costs:	\$11,604			
Pedestrian Costs:				
Road Mtce/Operating Costs:	\$359,039			
Transit Mtce/Operating Costs:	\$293,908			
Percent \$ to Auto:Transit:Bike:Ped:	75:24:1:0			
Safety:				
Total Accidents:	151.72 /day			
Injuries:	26.63 /day			
Fatalities:	0.41 /day			
Daily Fuel Consumption:	1,558,475 gal/day			

Note: 1. Includes construction cost only. Right-of-way, design, and CEI are not included in the above SR costs. Also, Interstate 4 and Interstate 95 improvement costs of \$356,987,000 are included.

Source: Tindale-Oliver and Associates, Inc.

Date: 06-May-95

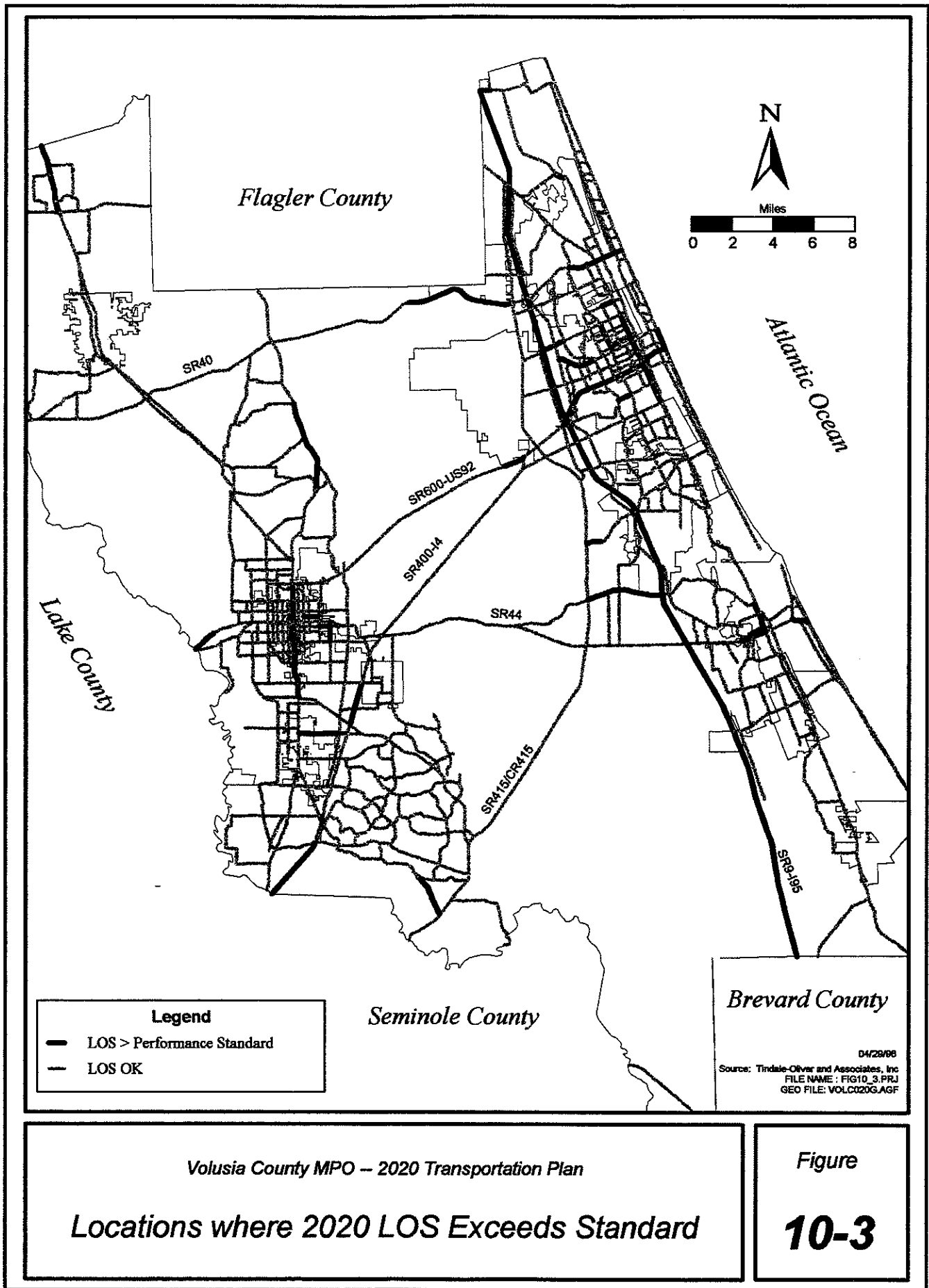
miles, 72.4 percent of which will be on the State road system. Thus, the demand for travel is expected to grow more on the County road system. While the State road system carries the majority of travel and many improvements are planned to the State road system, many State roads are reaching their maximum allowable lane configuration. Therefore, one of the strategies pursued in the highway component of the Transportation Plan was to improve the network of major County roads to provide arterial roads parallel to State roads to alleviate congestion on the State road system. Examples of this include development of the West Volusia Bypass beginning in southwest Volusia County to the west side of Orange City and the City of DeLand, development of the West Volusia Belt Line, which is located between US 17 and I-4, improvements to Clyde Morris Road, Williamson Boulevard, and Tomoka Farms Road/LPGA Boulevard in East Volusia County.

The average saturation level of travel increases from 75.3% in 1993 to 89.3% in 2020. This is an indication that the demand for travel is growing at a rate faster than capacity is being added to the road system, but an increase in the proportion of travel carried by the non-State road system has also been achieved.

Not every road in Volusia County will operate at or better than the level of service standard adopted by local governments, as is indicated by the saturation distribution graph of 2020 conditions in Table 10-2. This issue has not been completely resolved in this planning effort. Three options are typically considered to resolve such situations:

- Increase revenues to provide additional and/or alternative transportation systems or services;
- Modify the standard of acceptable level of service;
- Modify growth patterns by the current level of service standards.

These issues must be considered by the local governments as they update their Comprehensive Plans. Coordination between the MPO plan and local government comprehensive plans is required by Florida's Administrative Code. Locations on the road network where adopted performance standard is estimated to be exceeded by 2020 are illustrated in Figure 10-3.



The highway component of the Transportation Plan was also developed recognizing the constraints to improvements on some roads, which are identified in Chapter 8; however, improvements are recommended to certain roads beyond the adopted constraints. The roads where the recommended number of lanes in the 2020 Plan exceeded the adopted constraint are identified in Table 10-3.

Table 10-3 Locations Where Planned Road Exceeds Constraint				
On St.	From	To	Maximum Road Type	Planned Road Type
Debary Ave/CR4162	Deltona Blvd.	Providence Blvd.	2U	4D
SR 40	SR 5A-Nova Rd.	SR 5-US 1-Yonge	4D	6D
SR 421/ Dunlawton Rd.	SR 9/I-95	Clyde Morris Blvd.	6D	8D
SR 430/ Mason Ave.	SR 5A-Nova Rd.	Seabreeze Circle	4D	6D
SR 600-US 92	SR 5A-Nova Rd.	SR 5/US 1	4D	6D

In these cases, a “minimum” right-of-way cross-section was assumed which reduced project impacts and costs. The “minimum” cross-section standard was based on urban construction (closed drainage/curb and gutter) with a 16-foot median, 11 foot lanes, five-foot bicycle lanes, and ten-foot sidewalk/utility strip. On-street parking would not be provided on these roads. The “minimum” cross-section was also assumed for the following road, located in a densely developed area:

- US 1 from SR 421(Dunlawton) to SR 40 (Granada Blvd.)

During the public hearing for Plan adoption, several comments were made by MPO members and the public of which the MPO desired to include in its Transportation Plan. These comments are as follows:

- A corridor study for SR 44 from I-4 westward to US 17 should be undertaken to examine the service ability of the existing alignment for future traffic volumes;

- That the extension of Dunlawton Blvd. and SR 442 be considered in future alternative tests to promote convenient access to New Smyrna Beach and Edgewater and to serve as hurricane evacuation routes;

These issues will be considered in upcoming amendments to the 2020 Transportation Plan.

10.3Public Transportation

“High” and “low” transit initiatives were tested. The tests indicated that even under the most favorable conditions, bus transit does not compete effectively with the private automobile to attract ridership. Thus, Volusia County’s MPO is committed to bus transit as an essential alternative mode of mobility to those who do not have access to driving a private automobile and to provide an efficient alternative to the private automobile on congested corridors. Volusia County has adopted a standard that transit service will be provided to all areas contiguous to the current service area where “the demand is determined to be greater than 20 passenger trips per square mile” (The Volusia County Comprehensive Plan, Policy 3.1.3.1). The transit service plan through 2020 is intended to meet this goal.

VOTRAN will implement service changes and expand service as recommended in their five-year Transit Development Plan (TDP) approved in 1993. The transit service expansions proposed through 2020 include a continuation of improvements recommended in the TDP, as well as expansion to serve the growing community (Figure 10-4).

Specific enhancements to service include increasing the frequency of buses on existing routes, implementation of five new local routes, two express routes, and the extension of four existing routes. One new local route will serve communities along Clyde Morris Boulevard from Tomoka Farms Road south to Dunlawton Road, to Nova Road, then to US1 south to Julia Street. Other new routes proposed through FY 2010 include service from New Smyrna Beach to DeLand along SR44,

Flagler County

Atlantic Ocean

SR40

SR600-US92

SR400-14

SR44

SR9-195

SR415/CR415

Legend

- Routes Existing in 1994
- - - Route Extensions
- New Routes
- ... New Express Route

Volusia County MPO – 2020 Transportation Plan

2020 Transit System Plan

Figure

10-4

service along Williamson Road from Tomoka Road to Dunlawton Road, and service from Deltona to the Sanford Mall along US17/92. Finally, 10-minute trolley service is proposed along A1A from Dunlawton Road to the Bellair Plaza.

The two new express routes will operate from Park-n-Ride lots along I-4 at SR472, Saxon Boulevard and Dirksen Drive. They will link Volusia County to downtown Orlando and Disney with 30-minute peak service.

The route extensions are planned for Route 5 along 11th Street to US92, Route 12 along SR400 to SR40, Route 7 along Dunlawton Road, and Route 6S out to Old Tomoka Road along SR40.

Doubling the frequency of buses on all routes from one-hour intervals to 30-minute headways is also planned. This expansion of service will provide the service coverage standard set by the County at an improved frequency of service. In addition, transit routes will be provided on 33% of congested roadway corridors.

With the introduction of new service, VOTRAN will need to purchase sixty-five new buses for fixed-route service expansion in FY 2000 and 2010, and operating expenses will also increase with the larger fleet and the better quality of service. Transit systems do not cover their costs from fares collected. In addition to the farebox, they rely on other Federal and local funding sources. Currently (1995), a property tax of 0.32 mill is assessed on a countywide basis to meet operating expenses. The millage rate will have to be steadily increased through 2020 to 0.72 mill to fund the planned service expansion.

10.4 The Bicycle Plan

The Volusia County Metropolitan Planning Organization (MPO) has programs which address the needs of cyclists. The MPO staff currently sponsors a Bicycle/Pedestrian Advisory Committee (B/PAC) and participates in Community Traffic Safety Programs (CTSP's) which cover the entire county area. In 1991, Volusia County had the fourth highest bicycle crash rate with a total of 281 bicycle crashes per 100,000 population.

As part of the MPO's planning process, the MPO staff, in conjunction with the B/PAC, has rated the suitability of major roadways in the County for bicycle use. As a

continuation of the suitability mapping activities by the MPO staff, the consultant has included an evaluation of bicycle suitability for the Recommended Plan. For the purpose of forecasting bicycle suitability for 2020, the following assumptions have been made:

- Improved roads in urban areas will include marked bicycle lanes;
- Improved roads in rural areas will include paved shoulders or marked bicycle lanes;
- Improved roads will have outside lanes not less than twelve feet;
- On street parking will be removed from improved roads in areas with constrained right-of-way.

Despite the construction of roadways which include facilities for cyclists, the suitability of the road network's for bicycling will decline slightly. More roads in 2020 require a high to extremely high interaction with traffic than in the 1990 network. Figure 10-5 illustrates the suitability trend for all network roads from 1990 to 2020. Figure 10-6 maps the estimated 2020 road network bicycle suitability scores. While the suitability scores for the 2020 road network worsened, it is important to note that the 2020 road network will have more bicycle facilities which provide for the needs of cyclists. The decline in suitability in 2020 means that fewer roads in 2020 will be suitable for bicycle travel without facilities which provide for the needs of cyclists. Thus, the need for bicycle facilities as part of the transportation system is justified.

Figure 10 - 5
Bicycle Road Conditions Trend

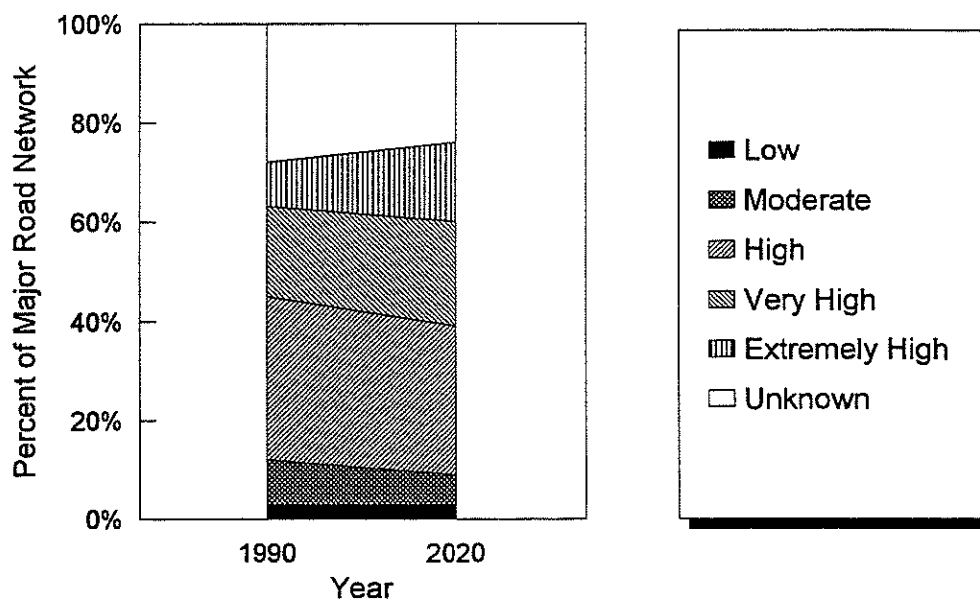
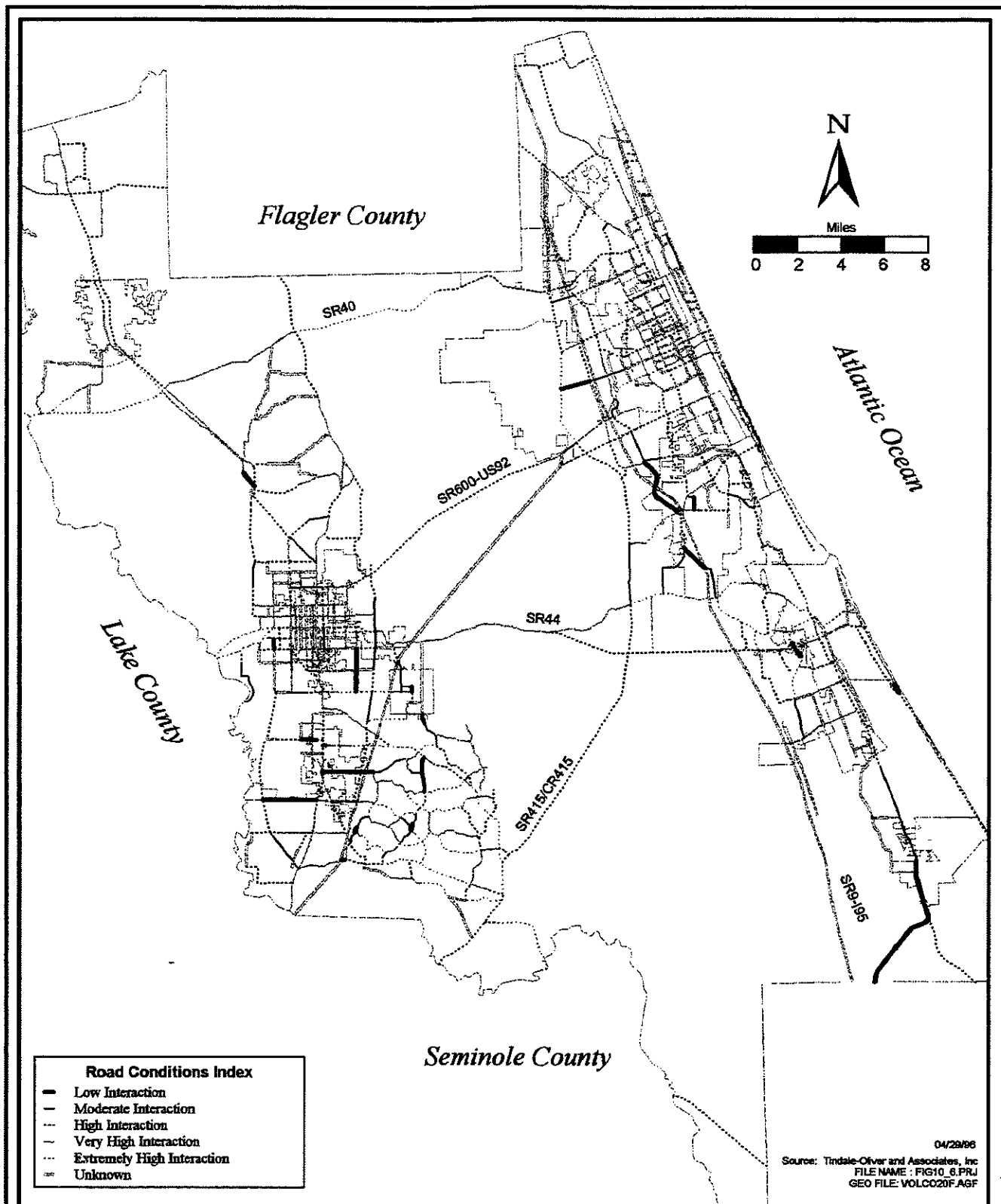


Figure 10-7 illustrates the continuity of a network of the roads more suitable for bicycling and roads where improvements will be made where bicycle facilities can be built over the next 25 years. The figure also illustrates how the additional funding of bicycle facilities on selected road segments can enhance the continuity of this network. The funding and implementation of bicycle facilities on these additional segments is recommended as a component of this Plan.

10.5 The Pedestrian Plan

Roadways throughout Volusia County have been generally constructed with little consideration given to the needs of nonmotorized travelers. The Federal Highway Administration estimates that two-thirds of all urban trips are less than five miles, which is indicative of the potential demand for non-motorized travel. In addition, increasing numbers of people walk for exercise.

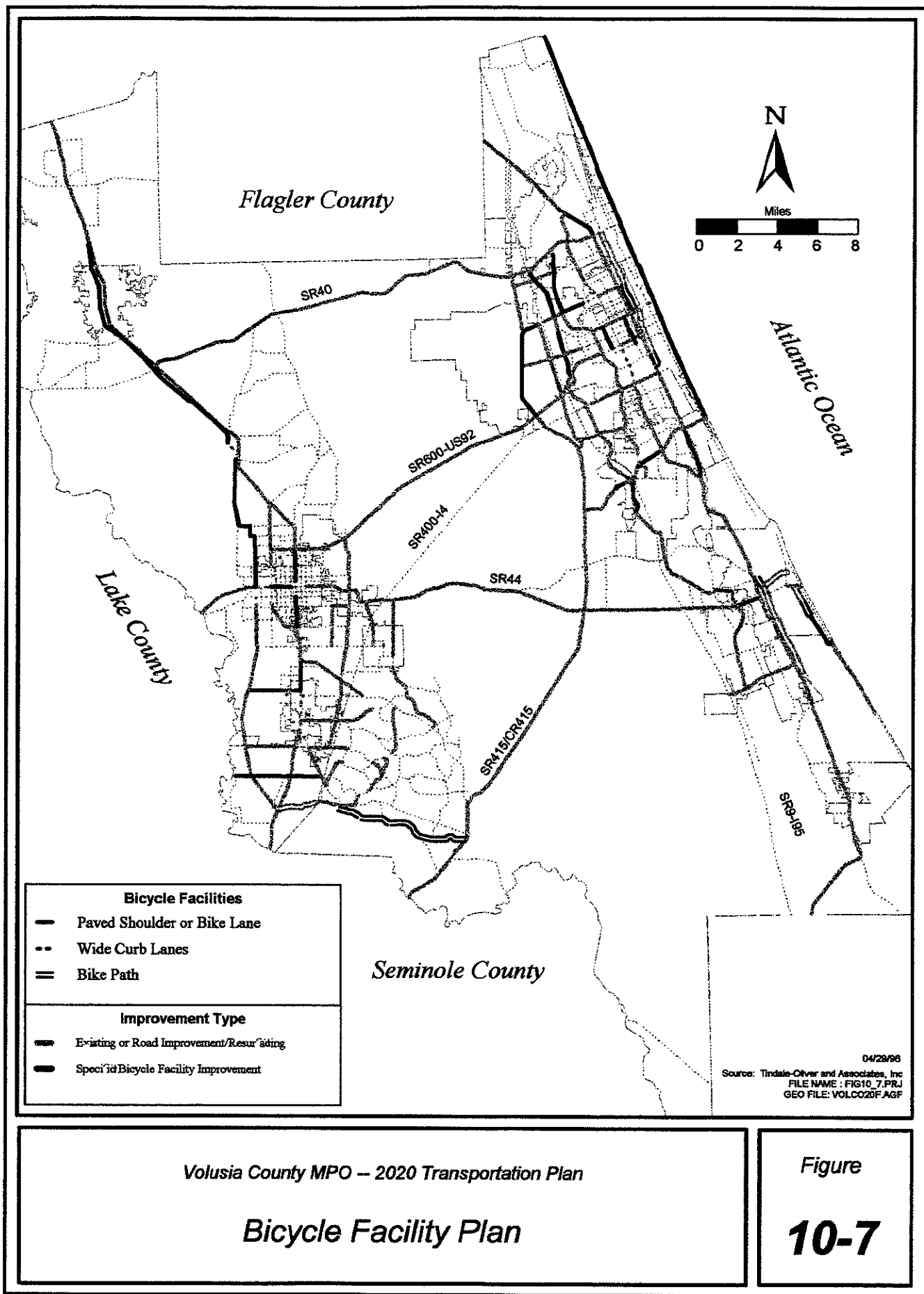


Volusia County MPO – 2020 Transportation Plan

2020 Bicycle Road Conditions Index

Figure

10- 6



Because funding for pedestrian improvements competes with funding for other roadway projects, sidewalk plans which focus on areas of high pedestrian activity, identifying existing pedestrian facilities and recommending needed improvements should be developed. Pedestrian improvements should be emphasized around:

- schools;
- transit stops;
- parks;
- shopping malls;
- connecting existing sidewalks;
- elderly and handicapped sites.

To realize this potential, road designs and site plans must be developed with pedestrian needs in mind. Therefore, a major recommendation of the 2020 Transportation Plan is to:

- Update the Comprehensive Pedestrian Plan as a high priority. This plan should identify existing and future pedestrian corridors, areas of high pedestrian activity, and special facilities. Crash analysis should also be included in the plan to identify areas that need appropriate pedestrian safety improvements. The Pedestrian Plan should also incorporate the needs of the Transportation Disadvantaged, that is, the elderly, the handicapped, and others without the means or ability to provide their own transportation.
- Design pedestrian facilities as a routine part of all roadway improvement projects. This means all road construction and reconstruction projects should consider:
 - sidewalks;
 - crosswalks;
 - crossing signals;
 - pushbutton activators;
 - safety islands;
 - signals timed for safe crossings;
 - street lighting;
 - handicapped ramps.

- Pedestrian circulation systems must be integrated with transit and other modes. Key transit stops, shelters, and benches should be tied to sidewalks and pedestrian paths internal to major development and redevelopment projects.

An inventory of existing sidewalk facilities on the major road network in Volusia County has recently been completed. This database will serve in the future as a basis for identifying needs and implementing the pedestrian circulation plan.

10.6 The Congestion Management Plan

Several roads in the 2020 Plan will need extra capacity without resorting to full-scale widening. Congestion management (CM) strategies will be necessary to obtain this capacity. One purpose of the congestion management program is to maximize the use and efficiency of the transportation system.

Congestion management is a term that describes a systematic procedure for identifying locations in the transportation system that are inefficient, then developing and implementing solutions to alleviate “bottlenecks” and improve traffic flow. The solutions used are wide-ranging. Typically used strategies include parking pricing strategies, regulatory measures, low-cost construction of improvements, auto-free zones, and traffic signal coordination. Chapter 12, Preliminary Congestion Management System, outlines an analysis process that will annually monitor the transportation system to identify locations of congestion, identify solutions, and advance them for implementation.

Transportation Demand Management (TDM) refers to near term, relatively low cost activities designed to influence the demand for transportation by changing commuter behavior. The purpose of TDM is to maximize the movement of people, not vehicles. It encourages the use of alternatives to the single occupant automobile and more effective use of the transportation system. TDM refers to both the transportation actions which affect the time, cost and other considerations that shape travel behavior, as well as the public policies to implement these actions. Its effects are more wide-spread and rarely have a significant effect on specific “bottlenecks” in the transportation system.

Because most congestion occurs during rush hour, implementation tools for TDM are aimed at work trips. They include ridesharing, carpooling, vanpooling, buspooling, parking fees or rationing, and work hours management (flex-time, staggered work hours, and modified work weeks) to shift travel away from rush hours. An assessment of opportunities for TDM strategies was undertaken for Volusia County, and is provided in Appendix 10-K. In Volusia County, traffic congestion during the traditional peak hour periods is not severe on a widespread basis, and few large employers with consolidated worksites exist. With its orientation to tourism, much travel is discretionary and is not structured and repetitive, an environment in which TDM is most effective.

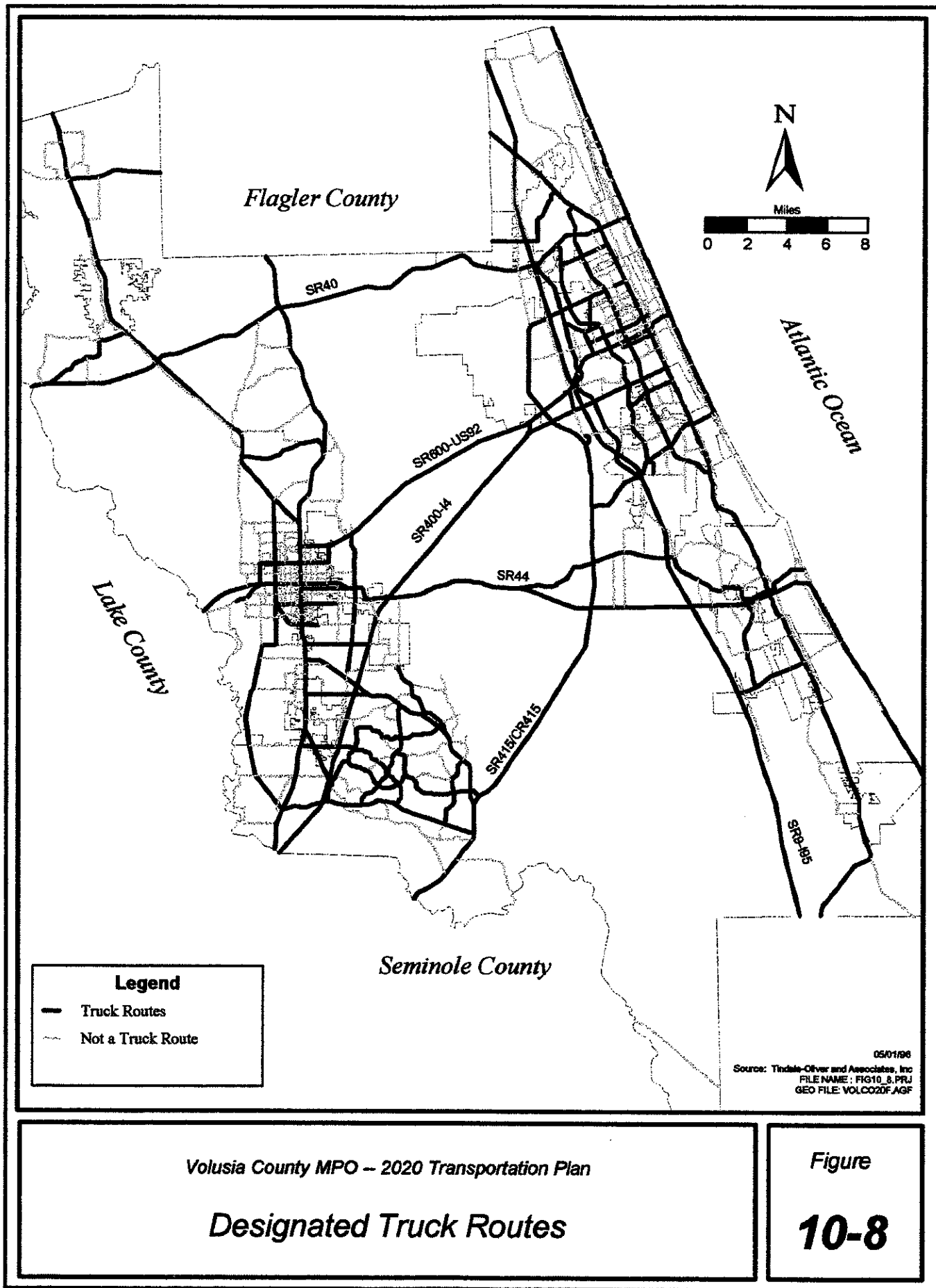
Opportunities for traditional TDM programs are not as prevalent in Volusia County as they are in other urbanized areas, however, opportunities to reduce severe traffic congestion associated with major events, such as Speed Week, Bike Week, and beach-related traffic exist. Strategies such as providing remote parking and shuttle bus service, creating auto-free zones, or time restrictions on travel across key bridges could alleviate some of the congestion experienced during these periods of peak traffic congestion. Implementation of strategies such as these will require changes to traditional activity patterns. Community support for such strategies is divided, therefore, such strategies should be carefully considered and planned before implementation. At the present time, participation in a region-wide ridesharing program is recommended for Volusia County.

10.7 The Goods Movement Plan

Because Volusia County's economy is primarily oriented towards the tourist industry and no substantial degrees of heavy industry exists in Volusia County, the movement of goods is focused primarily in trucking and dry goods for retail sales and support of the agriculture. Some industries rely on rail for receiving materials, such as aggregate, newsprint, coal, and brewing materials. These industries are served by the two private rail companies providing freight rail service to Volusia County, CSX and the Florida East Coast Railroad, via direct spur lines and sidings. No Trailer-on-Flat-Car (TOFC) service is provided by these companies in Volusia County. A concrete fabricating plant occasionally uses barges and the Intercoastal Waterway to transport pre-fabricated structural members.

A truck route system has been defined in Volusia County, which is illustrated in Figure 10-8. The roads on the designated truck route system are roads which are commonly recognized as the major roads in Volusia County. The average level of saturation on these roads in 1993 has been estimated at 70% of the adopted performance standard. By 2020, this degree of saturation will increase to 91.5%. This represents an increase in the degree of congestion that will be experienced on the designated truck routes. The majority of the truck route system is the State road system, which is approaching its maximum configuration, and this finding is consistent with that trend. This also emphasizes the need to develop the County road network to provide congestion-relieving parallel arterial facilities.

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CHAPTER ELEVEN

FINANCIAL PLAN

11.0 Introduction

The purpose of this chapter is to compare the estimated costs of the Transportation Plan with the revenues and resources available for its implementation. If appropriate, potential resources to achieve funding deficiencies are also identified. This comparison has been undertaken on a program-by-program basis in the sections below, which parallel the components of the Plan outlined in Chapter Ten. Tables 11-1 and 11-2 compare the estimated costs and revenues for the Plan, and serve as the basis for the discussions below. Phase One (1996-2000) costs and revenues are addressed in the MPO's currently adopted TIP. Table 11-1 summarizes costs and revenues for the balance of the plan period (2001-2020), and Table 11-2 summarizes the 2001-2010 time period.

11.1 The Rail Plan

Funding for the high speed rail system is allocated by the State Legislature and is not under the purview of the MPO. Two components of the implementation process for rail systems are a part of this Plan -- preparation of a rail envelope in the Interstate 4 corridor (2011-2020) and a rail feasibility study (beginning in 1996). The rail feasibility study has been funded by the Florida DOT, and preparation of the rail envelope is included in improvements to Interstate 4 and discussed below as a part of the highway network funding.

11.2 The Highway Plan

Interstate highway improvement costs are estimated to exceed currently estimated revenues by \$181 million. The majority of the costs (\$148 million) are expected to be incurred during the 2011-2020 plan phase. Included in the cost estimate is reconstruction of a bridge over the St. John's River (\$52 million) and other elements totaling over an additional \$29 million which may be funded through bridge replacement funds and other revenue sources not specifically designated to Volusia County at this time. As the "I-4 Multi-Modal Master Plan/Major Investment Study" is completed and project implementation advances, the Florida DOT will seek to more definitely identify and allocate

Table 11-1 2001-2020 Revenue/Cost Summary (in \$1,000's)			
Program	Estimated Revenue	Estimated Costs	Difference
Rail	N/A	N/A	N/A
Interstate	\$134,507	\$315,990	(\$181,483)
FIHS	\$22,300	\$41,231	(\$18,931)
Other State	\$230,334	\$162,232	\$68,102
Non-State	\$111,170	\$175,009	(\$63,839)
Maintenance/Operations ⁽¹⁾	\$211,241	\$211,241	\$0
Public Transportation	\$339,824	\$339,824	\$0
Bicycles	\$8,621	\$11,500	(\$2,879)
Pedestrian	N/A	N/A	N/A
TSM	\$4,389	\$4,389	\$0
TDM	\$2,000	\$2,000	\$0
Safety	\$8,150	\$8,150	\$0
TOTALS:	\$1,072,536	\$1,271,566	(\$199,030)

Note 1: Includes County maintenance allocation only. Florida DOT sets aside maintenance and operation funds, planning study funds, PD&E funds, and design funds and has not indicated these revenues in their projection of funds available for system improvements.

funds for this improvement. Through 2010, estimated costs and revenues for the Interstate Highway System agree to within \$2.5 million.

Table 11-2 2001-2010 Revenue/Cost Summary (in \$1,000's)			
Program	Estimated Revenue	Estimated Costs	Difference
Rail	N/A	N/A	N/A
Interstate	\$30,500	\$32,990	(\$2,490)
FIHS	\$12,495	\$9,550	(\$2,945)
Other State	\$129,060	\$135,568	\$6,508
Non-State	\$62,290	\$65,457	(\$3,167)
Maintenance/Operations ⁽¹⁾	\$114,009	\$114,009	\$0
Public Transportation	\$84,662	\$84,662	\$0
Bicycles	\$4,830	\$4,830	\$0
Pedestrian	N/A	N/A	N/A
TSM	\$2,459	\$2,459	\$0
TDM	\$1,000	\$1,000	\$0
Safety	\$4,567	\$4,567	\$0
TOTALS:	\$445,872	\$455,092	(\$9,220)

Note 1: Includes County maintenance allocation only. Florida DOT sets aside maintenance and operation funds, planning study funds, PD&E funds, and design funds and has not indicated these revenues in their projection of funds available for system improvements.

The Florida DOT has preliminarily allocated \$22.3 million to the FIHS system in Volusia County for improvements to SR 40. In this Plan, the scope of needed improvements exceed the level that the Florida DOT had planned for, identifying the need to six-lane SR 40 from Tymber Creek Road to Interstate 95. Thus, the estimated costs of improvements to the FIHS system in this Plan exceed the preliminary Florida DOT allocation by \$18.9 million through 2020, but by only \$2.9 million

through 2010. Should the Florida DOT be unable to reallocate the additional needed FIHS system funds to this improvement, use of STP program funds may be considered by the MPO.

Other State road system improvements are estimated at \$162 million, with \$230 million of Surface Transportation Program (STP) funds estimated to be available. Through 2010, STP funds available and the cost of improvements to the State road system align well, and thus, needed improvements are expected to be funded. As indicated in Chapter Ten, the State system will be approaching its maximum allowable lane configuration with these improvements. In the 2011-2020 Plan phase, a portion of the STP funds will be allocated to fund parallel non-State arterials to alleviate congestion on the State system.

The only non-state roads identified for improvement are County roads. Through 2010, revenues estimated to be available from local sources match well with the estimated costs of County roads. Between 2011 and 2020, however, additional funding will be necessary and can be met by allocating STP program funds. In its estimates of STP funds available for facility and service expansion, the Florida DOT has indicated it has set aside funds for “product support” (planning, preliminary engineering, construction engineering inspection (CEI), right-of-way support, materials testing, research, and public transportation operation functions) amounting to approximately 33 percent of construction costs. If STP funds are allocated to non-State roads, the availability of some or all of the “set-aside” to fund the design, right-of-way acquisition support and CEI functions should also be recognized to reduce the funding shortfall.

Maintenance and operational funds for the County road system have been budgeted and were allocated for this purpose before capital needs were identified. Tables 11-1 and 11-2 include only County maintenance and operations, as the Florida DOT has not provided estimates of maintenance and operations budgets or expenses. Funds for this purpose have been set aside by the Florida DOT prior to identifying revenues available for facility and service expansion.

11.3 The Public Transportation Plan

Financing for public transportation has been historically supported by the Volusia County MPO and County Council. The MPO has endorsed the concept of increasing the ad valorem tax from the 0.32 mill rate in 1995 to 0.72 mill by 2020 to meet the anticipated funding need.

11.4 The Bicycle Plan/The Pedestrian Plan

The roadway improvement cost estimates include the cost of providing bicycle facilities and sidewalks on roads being improved, so the costs of providing these facilities on new roads or roads being improved are not budgeted in this category. Volusia County has historically funded bicycle and pedestrian facilities, and the level of funding indicated herein reflects a continuation of the historical trends. Upon completion of the analysis of sidewalks, the financial plan for these facilities will be revisited.

11.5 The Congestion Management Plan

Congestion Management funding has been considered in two components. Transportation System Management (TSM) improvements have traditionally been funded by Volusia County and the Florida DOT. The transportation revenue estimates have indicated continuation of the level of funding provided in current TIPs. Implementation of the ISTEA-required Congestion Management System will identify specific improvements and programs to be implemented. Chapter 12 outlines a preliminary Congestion Management System.

Recommendations have been made to begin Transportation Demand Management programs as a part of the Florida DOT District-wide Commuter Assistance Program. At an estimated cost of \$100,000 per year, this program will be funded through Florida DOT's district-wide public transportation funding.

11.6 The Safety Plan

Improvements identified for safety-related reasons have also been traditionally funded by the Florida DOT and Volusia County. The ISTEA-mandated safety management systems have not been implemented yet, and the historical level of safety funding has been incorporated into the transportation budget.

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CHAPTER TWELVE

PRELIMINARY CONGESTION MANAGEMENT SYSTEM

12.0 Introduction

The Volusia County urban area, having a population of over 200,000 people, is designated by the Federal Highway Administration as a Transportation Management Area (TMA). As such, it is required to develop a Congestion Management System (CMS) to monitor the performance of the transportation system and to identify locations where it is not meeting adopted standards. The purpose of this monitoring process is to identify locations where congestion either exists or will exist in the near future for further study for the purpose of identifying and implementing corrective actions consistent with the long range transportation plan. The Florida DOT has reviewed the Federal requirements of a CMS and has prepared a document entitled "Florida's Mobility Management Process/Congestion Management System Work Plan", published in December, 1994, which describes the minimum elements that these systems should have. The Florida DOT document describes this process as a "Mobility Management Plan" (MMP). The MMP/CMS is to be in operation by October 1997.

Implementing the Mobility Management Plan/Congestion Management System(MMP/CMS) will not require a substantial amount of new data collection and analysis because State-mandated planning laws require that transportation system operating conditions be monitored. Responding to the MMP/CMS will reflect formalization and documentation of a data collection and analysis process that largely already occurs in Volusia County on an annual basis because the agencies responsible for transportation systems already monitor their delivery of services to the public.

This chapter outlines a preliminary MMP/CMS for the Volusia County TMA, including the identification of performance measures, a data collection and monitoring program, and identification of an initial series of improvements for further study and implementation through the TIP. The products of the MMP/CMS can be the identification of specific needed improvements, or the identification of locations in need of further study to define improvements which will then be implemented through the TIP.

12.1 MMP/CMS Process and Schedule

The steps to accomplish the MMP/CMS are conceptually illustrated in Figure 12-1. This is a process which occurs throughout the year, however, for the MMP to have an effect on funding and implementation decisions, the results of the system must be available annually prior to the time when TIP funding decisions are being made. Thus, the steps to be accomplished and a schedule for

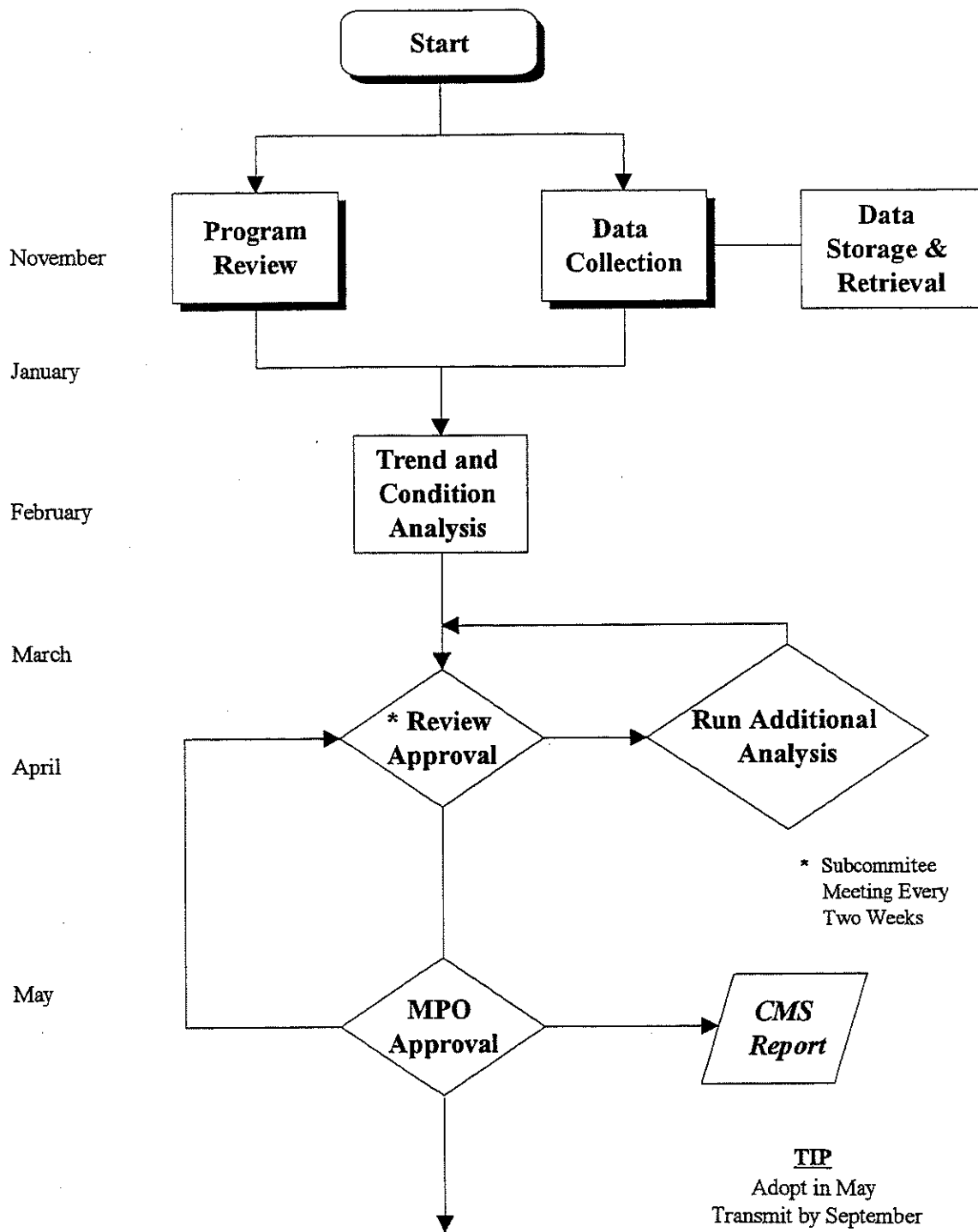
their accomplishment are outlined in this chapter for MPO staff and other agencies who may provide data to follow on an annual basis. The process is described below.

12.1.1 Program Review

This task involves a review of the effectiveness of existing programs which have been implemented to reduce congestion. Such programs include the planning process itself, services, and regulations and standards. The intent of the review is to identify to what extent the program accomplishes its intent in order that future decisions to implement similar programs can be based on case histories of actual trials.

In the review of the planning process, the need to update the long range transportation plan should be considered. For the Plan to remain a valid, responsive guide to developing the County's transportation system, it must remain current. This would include a review of the goals, objectives, and measures of effectiveness, the land use projections, the programs, funding adequacy, and facilities and priorities of the TIP. The Plan should be amended, if necessary, to reflect new information provided by subarea or corridor planning studies.

Services provided should also be reviewed. At present, VOTRAN reviews the cost effectiveness of individual routes and seeks to improve its service delivery. Information gathered in this process should also be applied when considering expansion of service into new areas. As ride-sharing programs are developed, then benefits should be continuously monitored and evaluated to improve their effectiveness.



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Volusia County MPO – 2020 Transportation Plan

CMS Process and Schedule

Figure

12-1

Regulations and standards that guide land use decisions and their effects on the transportation system should also be reviewed. Specifically, policies governing land use plan amendments, rezonings, concurrency, access management, and right-of-way preservation can encourage efficient transportation systems.

Review of every aspect of planning and implementation may not be necessary on an annual basis because the effects of decisions regarding these issues may not become evident for a number of years. Bi-annual or tri-annual reviews may serve effectively. For example, review of the planning process in one year, the services in the second year, and regulations and standards the third year may provide an adequate cycle of review for the results of changes to begin to be measurable.

12.1.2 Data Collection

The period of time over which data is collected is, for many purposes, continuous throughout the year. This data is described further in latter sections of this chapter, but typically involves routine collection of traffic count data, monitoring of transit ridership, periodic observations of vehicle occupancy, monitoring of development proposals, etc. This data allows the computation of the measures of effectiveness which document the performance of the transportation system. The data assembled must be analyzed using appropriate computations to present measures of transportation system performance in tabular and graphic summaries.

Where appropriate, data should be stored in a standardized format so it will be retrievable for future analyses, trend development, and comparison purposes. Databases and GIS mapping capabilities such as the inventory database and maps developed and described in Chapter Six, are appropriate for this purpose.

12.1.3 Trend and Condition Analysis

An important part of the MMP/CMS is an annual trend and condition analysis. The trend and condition analysis will document existing transportation system conditions, identify locations where conditions are deficient and, as the MMP/CMS is continued over time, trends in performance measures can also be analyzed. In this manner, the MMP/CMS will provide information to evaluate past decisions and to support policy decisions regarding future funding, programs, and improvements.

Depending on the nature of the deficiencies identified, recommendations then must be made regarding methods of correcting these deficiencies or the definition of further studies to identify

appropriate solutions to the deficient condition. For example, identification of congestion on a substantial length of principal arterial (e.g. US 1) would likely require substantial study, such as an Arterial Investment Study, to develop appropriate solutions within the context of the Long Range Plan. The solution to other problems, such as the need for a bicycle facility or the extension of a transit route, may not require extensive study and an appropriate solution may be readily apparent which could be advanced for design and implementation in a shorter time frame.

As a part of the trend and condition analysis, consideration should be given to whether or not the deficiency exists now and/or is projected in the future and if another improvement (e.g. a parallel road, implementation of TDM measures or transit route extension) is currently scheduled or planned in the future to alleviate the deficiency. This analysis will require annual maintenance of transportation networks for future year conditions which reflect annually updated TIPs.

Establishment of a formal hierarchy of candidate improvements is also recommended as follows:

- Tier One locations are congested today, for which no improvements are scheduled, and roadways are constrained to existing laneages. These locations would be the most dependent upon TSM, TDM or other operational strategies to reduce congestion, and investments in these strategies would not be “wasted” if improvements are scheduled in future years.
- Tier Two locations are also congested today, but are not constrained, and improvements to these facilities are scheduled beyond ten years in the future. Short-term operational improvements would serve to ease congestion until longer term improvements can be implemented.
- Tier Three locations are congested today, are not constrained, but improvements are scheduled within the next ten years. Improvements at these locations would have a limited life.
- Tier Four would be locations which are not congested today, nor are they constrained; however, congestion is anticipated in the future. Implementation of improvements at these locations is not critical in the immediate future.

The MPO and its advisory committees may find it effective to create a sub-committee to work with the MPO staff as this analysis is undertaken and to develop recommendations for consideration. An example “report card” which would be provided in the annual MMP/CMS report summarizing congestion measures is provided in Table 12-1. This summary table would be supplemented by the

inventory tables and graphics documenting the measures, identifying specific locations of deficiency, and narrative developing the recommendations.

12.1.4 Recommendations to Committees/Boards

The recommendations of the trend and conditions analysis are then forwarded to the technical and citizens' advisory committees for their review and approval. It is likely that several "question and answer" cycles may be necessary for the technical and citizens committees to endorse the recommendations to the MPO Board. During the month of June, the recommendations from the MMP/CMS would be forwarded from the CAC and TCC to the MPO for their endorsement and inclusion of specific projects in the TIP. Transmission in June will allow the MPO one cycle of meetings to question and request reconsideration by its subcommittees.

The scope of recommendations should address all modes of transportation monitored and reported on within the transportation plan -- highways, public transportation, bicycle facilities, pedestrian facilities, and transportation demand management/ridesharing programs. It is also appropriate that modifications to policies and regulations regarding land use decisions, zoning, access management, site development standards, and right-of-way preservation arising from the trend and condition analysis also be addressed, where applicable. Typically, these regulations are implemented by the

Table 12-1
Volusia County MPO
Mobility Management Plan/Congestion Management System
1994 Conditions Report Card

	Total System	State System	County System	Other System
Highways				
Inventory:	960.33 mi.	357.47 mi.	556.94 mi.	45.92 mi.
Pk Hr Vehicle-Miles of Travel (VMT):	861,139 veh-mi.	660,518 veh-mi.	197,100 veh-mi.	3,521 veh-mi.
With LOS Data:	870 mi.	357.47 mi.	501.84 mi.	10.74 mi.
Percent Coverage:	90.6 %	100.0 %	90.1 %	23.4 %
Weighted Saturation of VMT:	0.753	0.854	0.422	0.293
Percent Pk Hr VMT at V:C >1.20:				
Weighted Sat of Truck Routes:	0.70			
Weighted Sat of Economic Routes:	0.76			
Weighted Sat of Transit Routes:	0.80			
Wtd Sat of Intermodal Terminal Access Routes:				

Public Transportation:

Area needing Transit not Served:	
% Congested Roads with Transit Routes:	
% Transit Routes exceeding load factor of 1.4:	

Bicycle Facilities:

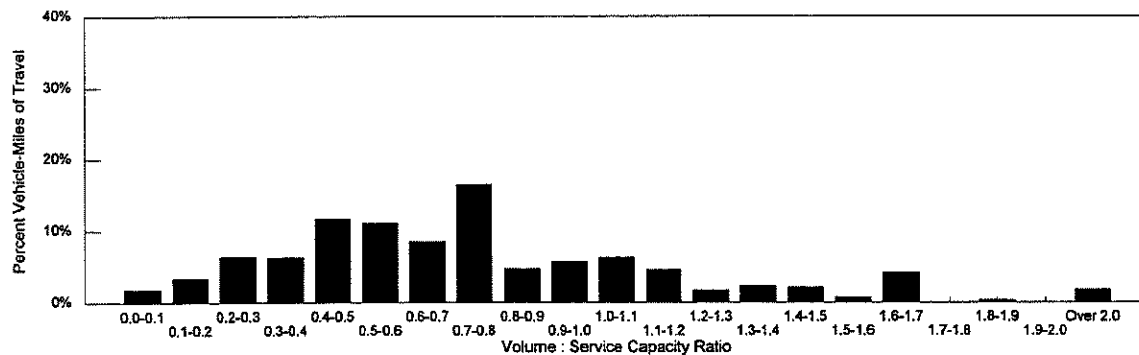
% of major roads with Bike Facilities:	
% of congested roads with Bike Facilities:	
Average suitability rating:	

Sidewalks:

% of major roads with Sidewalks:	
% of congested roads with Sidewalks:	

Ridesharing/TDM

Observed Average Vehicle Occupancy:	n/a %		
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Weighted Saturation Level = 0.753

local government agencies, and thus, the local governments must take the initiative to implement such recommendations.

12.2 Measures of Congestion or Deficiency

Measures to evaluate the transportation system have been identified in Chapter Five, Goals, Objectives, and Measures of Effectiveness. It is appropriate for the measures of effectiveness for the MMP/CMS to parallel these measures so that the MPO and the public can monitor progress towards achieving the desired transportation system. In the documentation of existing conditions, (Chapter Eight) and in the evaluation of alternative future year transportation plan scenarios, (Chapter Ten) a series of measures relating to the various modes of transportation provided in Volusia County have been used. Several of these measures are proposed as a part of the Congestion Management System, and are listed below by the mode of transportation to which they are applicable. In addition, the procedures by which these measures are determined are briefly described.

12.2.1 Highway

Total Vehicle Miles of Travel (VMT)

Total vehicle miles of travel would be defined for the major road network as the sum of the peak hour vehicle miles of travel on the major road network computed from the annually counted traffic volumes on the major road system.

Weighted Saturation of VMT

The weighted volume to capacity ratio is the overall degree of saturation at which roadways in the County operate. It is calculated by multiplying the VMT on each roadway link by the V:C ratio on the link, summing these products for all links on the major road network, and dividing the sum by the total VMT on the major road network. This provides a single number index which can be compared from year to year to determine overall trends and roadway saturation (congestion) levels.

Percent Vehicle Miles of Travel (VMT) at Volume to Capacity (V:C) ratio over 1.2

Using information provided by the roadway inventory database, the percentage of VMT at high degrees of congestion (e.g. volume to capacity ratio over 1.2) can be identified.

Level of Service and V/C Ratio on Individual Road Segments

The level of service and volume to capacity ratio of individual roadway segments should be computed and reported to identify which roadway segments fall below the adopted standards. Computational procedures would follow procedures of the current Highway Capacity Manual and/or Florida DOT Level of Service Manual.

Total Fuel Use (Gallons)

This measure would be obtained by monitoring total fuel sales in Volusia County, information which is available from the Florida Department of Revenue.

Degree of Saturation on Roads Carrying Transit Routes

Key roadway facilities serving transit routes have been identified in the transportation system database. The overall degree of saturation on this network, and locations where congestion exceeds the level of service standard can be identified through the database system.

Degree of Saturation of Designated Truck Routes

Certain roads have been designated as truck routes. Using the road inventory database system, the degree of saturation for the truck route system, as a whole, can be computed similarly to the weighted volume to capacity ratio. In addition, specific locations where congestion exceeds the level of service standard can also be identified.

Degree of Saturation on Designated Access Roads Serving Air, Bus, and Rail Terminals

Certain roadways have been designated in the transportation database which provide access to air and rail terminals. The operating condition of these roads can be identified through the transportation database system on an overall basis, and individual roads where congestion exceeds the level of service standard these can also be identified.

Degree of Saturation on Roads Designated as Access to Designated Activity Center Areas

Key roadway facilities in Volusia County designated as significant to economic development have been identified in the transportation system database. The overall degree of saturation on this network and locations where congestion is unusually high, can be identified through the database system.

12.2.2 Public Transportation

Percent of Congested Road Corridors with Transit Service

Distinguishes congested corridors currently served by transit. When used in conjunction with other capacity measures, it can aid in predicting the impact of transit service on total corridor capacity.

Number of Daily Peak Hour Trips by Transit

Ridership by route and route segment should be collected to present the existing usage as compared to capacity of the transit system along a specific corridor.

Areas Having Transit Ridership Propensity over 20 Passenger Trips per Square Mile Without Transit Service

Using existing census data, transit dependent census characteristics can be determined within a 1/4 mile buffer (normal walking distance) of a congested corridor. Transit dependent census characteristics include low income households, elderly, youth and zero car households. Based on characteristics of a similar corridor operating with transit service, correlation can be made to estimate ridership. Where estimated ridership exceeds the 20 passengers per square mile threshold, service can be initiated.

Routes with Load Factors Greater than 1.4

Based on the number of seats per bus multiplied by a standing capacity of 20 percent (1.2) and then multiplied by the number of trips per day or peak period, the existing transit capacity of the corridor can be distinguished.

12.2.3 Bicycle Facilities

Percent of Major Road Network with Bicycle Facilities

This would indicate the proportion of the major road network on which bicycle facilities are desired that have bicycle facilities, in addition, locations of deficiency can also be identified from the transportation system database.

Percent of Congested Road Corridors with Bicycle Facilities

This measure would indicate of all the roadways operating at substandard levels of service, and on which bicycle facilities are desired, the degree to which such facilities are provided.

12.2.4 Pedestrian Facilities

Percent of Major Road Network with Sidewalks

This would indicate the proportion of the major road network on which sidewalk facilities are desired that have sidewalks, and locations without sidewalks can be identified through the transportation system database.

Percent of Congested Road Corridors with Sidewalks

This measure would indicate of all the roadways operating at substandard levels of service, and on which sidewalk facilities are desired, the degree to which such facilities are provided.

12.2.5 Ridesharing

Average Vehicle Occupancy Rates

This measure would give the average number of persons per private passenger vehicle (i.e. number of persons per vehicle). This would be focused on non-transit, non-truck vehicle occupancy in vans or passenger automobiles.

12.3 Data Collection/Monitoring Program

In order to support the annual reporting of the above measures of effectiveness, the data outlined below must be assembled annually. The data to be assembled for the MMP/CMS is described below relative to each mode that it affects. A database system to facilitate storage and analysis of the data was developed for the Volusia County MPO, and is described in Chapter Six. The data collection described below is a process that currently exists in Volusia County, as much of the data is collected for concurrency purposes. Where appropriate, several new measures and new types of information have been identified for collection.

Highways

- Identify where changes have occurred in administrative classifications of roads, such as
 - jurisdictional responsibility; - truck route designations;
 - functional classification; - intermodal facility access route designation;
 - FIHS designation; - economically significant route designation
 - NHS designation; - transit route expansion/reduction

This information is typically maintained by the MPO staff.

- Assemble traffic count data from the annual count programs of the state and local government agencies.
- Identify where changes in adopted plans have occurred, including:
 - desired type of facility
 - constrained number of lanes
- Identify locations where physical or operational changes in roads have occurred, including:
 - traffic signal removal or installation
 - performance standards
 - road improvements
 - level of service analysis methodology
 - traffic signal timings
 - speed limits

This information must be assembled from local government agencies, who maintain the data on a routine basis.

Public Transportation

- Identify transit route expansion and service frequency changes in transportation system database. This data would be maintained by VOTRAN.
- Develop and maintain a database of census characteristics along existing transit corridors. Using a GIS mapping program, transit dependent census characteristics can be documented within a 1/4 buffer of existing transit service. This data can then be applied when developing ridership estimates in other new transit corridors for the implementation of new routes, or the extension of existing service.
- Using existing farebox, Section 15, and other data collected by VOTRAN, ridership data can be monitored by route and by route segment. This data can be used when the threshold for transit level of service (total ridership/seating capacity) has been exceeded, and increased service is warranted. This data can also be used in documenting the need for service extension in a corridor.

Bicycle Facilities

- Identify changes to the planned or desired bicycle facility type.
- Identify where new bicycle facilities have been developed;
- Identify where projects have improved bicycle suitability;

This data on bicycle facility plans would be maintained by the MPO staff and the Bicycle/Pedestrian Advisory Committee. Data on improvements and construction of new facilities is maintained by the implementing local or state government agency.

Pedestrian Facilities

- Identify changes to the planned or desired pedestrian facilities type.
- Identify where new sidewalks have been built and update transportation system inventory.

Transportation Demand Management

- Conduct vehicle occupancy counts at selected locations. The MPO should select a dozen representative locations throughout the County to annually observe vehicle occupancy rates.

12.4 Preliminary Short -Range Strategy

While undertaking the transportation planning study, conditions existing in 1993 were analyzed, and additions were estimated for 2000, 2010, and 2020. In addition, 15 intersections were selected by the Technical Advisory Committee and MPO staff for further detailed analysis to identify potential operational strategies to reduce existing congestion. The analysis of the 15 intersections are documented in Appendix 12A, entitled “Analysis of Selected Intersections” provided to the Volusia County MPO. These analyses permit the identification of the roads which should be focused on in the MMP/CMS process, in accordance with the tiered approach described in section 12.1.3. The roads in Tier One and Tier Two will benefit the most from TSM strategies.

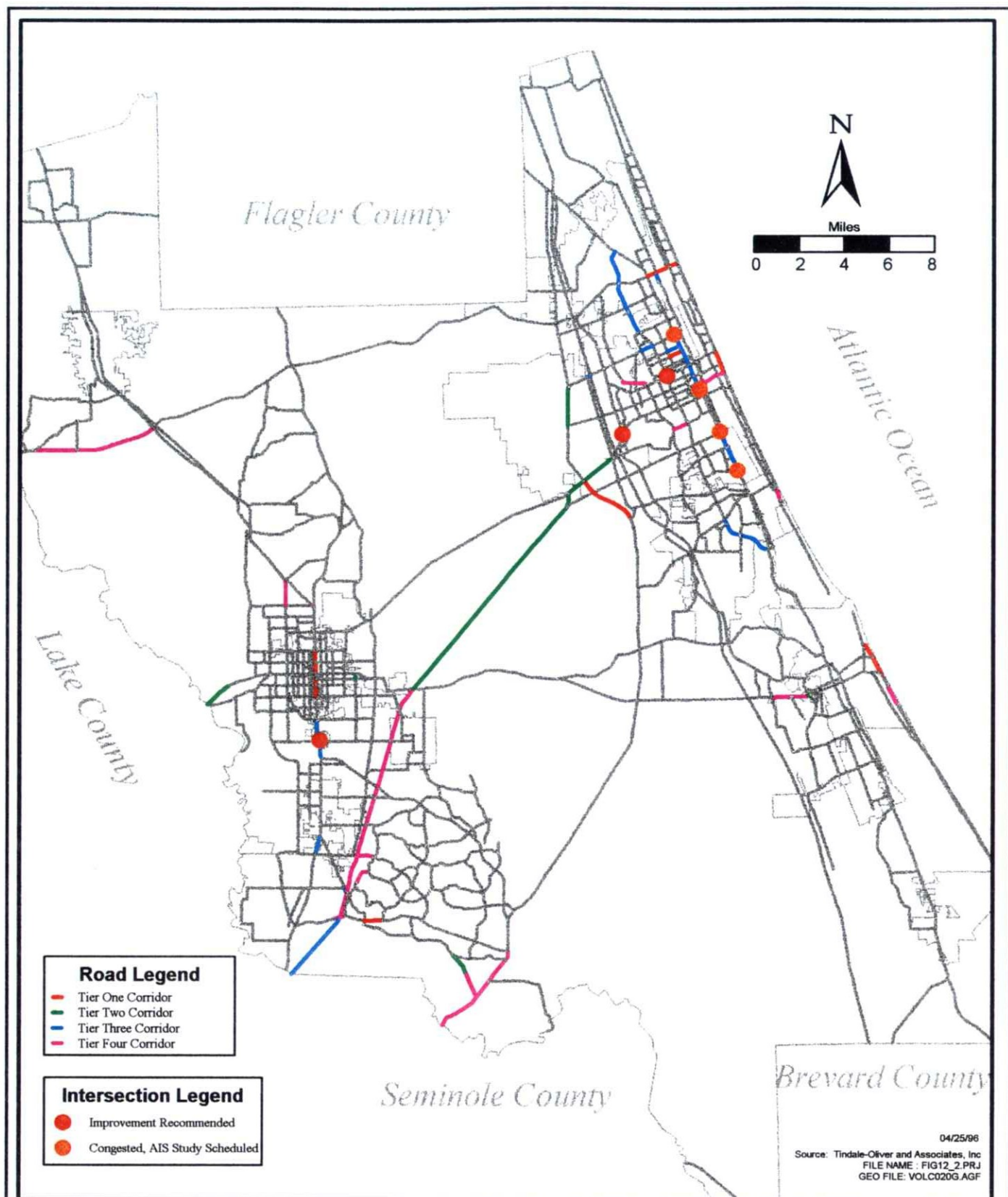
Figure 12-2 illustrates the results of the review. The figure illustrates locations which fall into Tier One, Tier Two, Tier Three and Tier Four as described in Section 12.1.3. It makes use of the 1993 level of service analysis, the analysis of year 2000 and 2010 conditions based on the year 2000 and 2010 transportation model applications, and the analysis of the 15 intersections.

Table 12-2 identifies the road segments which fall into Tiers One through Four. The corridors identified in Tiers One, Two, and Three are recommended for further study. Initially, refinement of the level of service and capacity estimates is recommended, as these road segments have been “screened” as potentially congested locations using data accepted for generalized planning

purposes. Refinement of traffic signal timing data and intersection-level traffic data will confirm which of these locations should be further advanced for congestion resolution.

Short range improvements to three of the 15 intersections are also recommended for advancement to the TIP. Congestion was identified at an additional four intersection locations; however, because the Volusia County MPO is initiating an Arterial Investment Study (AIS) of the SR5/US1 corridor, short range improvements have not been recommended pending the outcome of this study.

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Volusia County MPO -- 2020 Transportation Plan

***Candidate Corridors for
Congestion Management Study***

Figure

12-2

Table 12-2
Candidate Corridors for Congestion Management Study

ID	On Street	From	To	LOS Standard	1993		2000		2010	
					Road Type	LOS	Road Type	LOS	Road Type	LOS
Tier One -- Constrained Corridors Congested Through 2010										
V1250	Debary Av/CR4162	Main St	Broadway St	E	2 U	F	2 U	F	2 U	F
V1255	Debary Av/CR4162	Broadway St	Providence Blvd	E	2 U	F	2 U	F	2 U	F
V3845	SR15-600-US17-92	Beresford Ave	Euclid Ave	C	2 U	F	2 U	F	2 U	F
V3820	SR15-600-US17-92	Euclid Ave	Voorhis Ave	C	2 U	F	2 U	F	2 U	F
V3850	SR15-600-US17-92	Voorhis Ave	SR 44-New York	C	2 U	F	2 U	E	2 U	F
V3775	SR15-600-US17-92	SR 44-New York	Wisconsin Ave	C	2 U	F	2 U	F	2 U	F
V3825	SR15-600-US17-92	Wisconsin Ave	Pennsylvania Av	C	2 U	E	2 U	F	2 U	F
V3830	SR15-600-US17-92	Pennsylvania Av	Plymouth Ave	C	2 U	E	2 U	F	2 U	F
V3945	SR40	Beach St	John Anderson D	B	4 D	D	4 D	F	4 D	F
V3995	SR40	SR 5-US 1-Yonge	Beach St	B	4 D	D	4 D	F	4 D	F
V3990	SR40	John Anderson D	SR A1A-Ocean Sh	B	4 D	D	4 D	F	4 D	F
V4715	SRA1A-Atlantic Ave N	SR600-US92	Main St	D	4 D	E	4 D	F	4 D	E
V4720	SRA1A-Atlantic Ave N	Main St	Ora St	D	4 D	E	4 D	E	4 D	E
V4725	SRA1A-Atlantic Ave N	Ora St	SR430-Seabreeze	D	4 D	E	4 D	E	4 D	E

Tier Two -- Unconstrained Corridors Congested Through 2010

V685	Blue Lake Ave	Voorhis Ave	SR44	C	2 U	D	2 U	D	2 U	D
V3135	Orange Av (DB)	Seagrave St	SR 5/US 1	E	4 U	F	4 U	F	4 U	F
V3605	Reed Ellis Rd	Midpoint	Enterprise-Oste	C	2 U	D	2 U	E	2 U	E
V4040	SR400-I4	SR 44	SR 600-US 92	B	4 F	C	4 F	C	4 F	C
V4175	SR44	Lake County	Shell Rd	C	2 U	D	2 U	D	2 U	D
V4216	SR44	Old Mission Dr	Canal St	D	4 D	F	4 D	F	4 D	F
V4575	SR600-US92	SR 400/I-4	11th St	D	4 D	F	4 D	E	4 D	E
V4580	SR600-US92	11th St	Tomoka Farms Rd	D	4 D	F	4 D	E	4 D	E

Tier Three -- Unconstrained Corridors Congested Through 2000

V8	11th St	Tomoka Farms	I-95	E	2 U	F	2 D	F	4 D	E
V1450	Enterprise Rd	I-4	Highbanks Rd	E	2 U	F	2 U	F	4 D	C
V3770	SR15-600-US17-92	Saxon Blvd	Enterprise Rd	D	2 U	F	2 U	F	4 D	D
V3855	SR15-600-US17-92	SR472	Orange Camp Rd	C	4 D	F	4 D	F	6 D	C
V3810	SR15-600-US17-92	Orange Camp Rd	Taylor Ave	C	4 D	F	4 D	F	6 D	C
V4030	SR400-I4	Seminole Co	Debary Ave-Dirk	C	4 F	D	4 F	F	4 F	A
V4380	SR5-US1	Reed Canal Rd	Big Tree Rd	D	4 D	F	4 D	F	6 D	C
V4385	SR5-US1	Big Tree Rd	SR 400-Beville	D	4 D	F	4 D	F	6 D	C
V4400	SR5-US1	SR 600-US 92-Vo	Cypress St/Fair	D	4 D	F	4 D	F	6 D	D
V4405	SR5-US1	Cypress St/Fair	SR 430-Mason Av	D	4 D	F	4 D	F	6 D	D
V4335	SR5-US1	SR 430/Mason Av	3rd St	D	4 D	F	4 D	F	6 D	D
V4480	SR5-US1	3rd St	6th St	D	4 D	F	4 D	F	6 D	D
V4410	SR5-US1	6th St	11th St	D	4 D	F	4 D	F	6 D	D
V4510	SR5A-Nova Rd	SR 5-US1-Ridgew	Spruce Creek Rd	D	2 U	F	2 U	F	4 D	C
V4535	SR5A-Nova Rd	Spruce Creek Rd	SR 421-Dunlawto	D	2 U	F	2 U	F	4 D	C
V4530	SR5A-Nova Rd	Flornich St	Hand Ave	D	2 U	F	2 U	F	6 D	B
V4520	SR5A-Nova Rd	Hand Ave	SR 40-Granada B	D	2 U	F	2 U	F	6 D	B
V4525	SR5A-Nova Rd	SR 40-Granada B	Tomoka Oaks Blv	D	2 U	F	2 U	F	6 D	A
V4515	SR5A-Nova Rd	Tomoka Oaks Blv	SR 5-US 1-Yonge	D	2 U	F	2 U	F	6 D	A

Tier Four -- Unconstrained Corridors Congested In 2000

V495	Bellevue Ave	Clyde Morris Bl	Nova Rd	E	2 U		2 U	F	2 U	F
V975	Clyde Morris Blvd	Mason Ave	Midpoint	E	4 D	A	4 D	F	4 D	F
V980	Clyde Morris Blvd	Midpoint	Jimmy Ann Dr	E	4 D	A	4 D	F	4 D	F
V985	Clyde Morris Blvd	Jimmy Ann Dr	Bill France Blv	E	4 D	A	4 D	F	4 D	F
V1285	Deltona Bl	Abbeyville St	Diamond St	E	2 U	D	2 U	F	2 U	F
V1290	Deltona Bl	Diamond St	Normandy Blvd	E	2 U	D	2 U	F	2 U	F
V1325	Dirksen Dr/CR4162	Palm Rd	WB I-4 Ramps	E	2 U	E	2 U	F	2 U	F
V1315	Dirksen Dr	E of I4	Deltona Blvd	E	4 U	E	4 U	F	4 U	F
V1825	Glenwood Rd	SR 15/US 17	SR 11	C	2 U		2 U	F	2 U	F
V3600	Reed Ellis Rd	SR 415	Midpoint	C	2 U	A	2 U	D	2 U	E
V3920	SR15A	Glenwood Rd	SR15/US 17	D	2 U	A	2 U	E	2 U	E

Table 12-2
Candidate Corridors for Congestion Management Study

ID	On Street	From	To	LOS Standard	1993		2000		2010	
					Road Type	LOS	Road Type	LOS	Road Type	LOS
V3950	SR40	Empona Rd	SR 15-US 17	C	2 U	B	2 U	F	2 U	D
V4055	SR400-I4	Debary Ave-Dirk	Saxon Blvd	C	4 F	C	4 F	F	4 F	F
V4060	SR400-I4	Saxon Blvd	SR 472	C	4 F	C	4 F	F	4 F	E
V4035	SR400-I4	SR 472	Orange Camp Rd	C	4 F	C	4 F	D	4 F	F
V4050	SR400-I4	Orange Camp Rd	SR 44	C	4 F	C	4 F	D	4 F	E
V4065	SR415/CR415	Seminole County	Doyle Rd	D	2 U	C	2 U	F	2 U	F
V4215	SR44	Glencoe Rd	Old Mission Dr	D	4 D	B	4 D	F	4 D	F
V4630	SR600-US92	Beach St	Broadway Bridge	D	4 D	D	4 D	E	4 D	E
V4585	SR600-US92	Broadway Bridge	SR 441-Peninsul	D	4 D	D	4 D	F	4 D	E
V4625	SR600-US92	SR441-Peninsula	SRA1A-Atlantic	D	4 D	D	4 D	E	4 D	E
V4870	Saxon Blvd	SR400/I-4	Normandy Blvd	E	4 D	C	4 D	F	4 D	F