PRELIMINARY
ENGINEERING STUDY
COUNTY ROAD 466A
(MILLER STREET)

Prepared for:

LAKE COUNTY
123 North Sinclair Avenue
Tavares, Florida 32778-7800

and

CITY OF FRUITLAND PARK
506 West Berckman
Fruitland Park, Florida 34731

Engineer:

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Certificate of Authorization #1841

November 2004

PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Jones, Edmunds & Associates, Inc., a Florida Corporation, authorized to operate as an engineering business, EB#1841 by, the State of Florida Department of Professional Regulation, Board of Engineers, and that I have prepared or approved the evaluation, findings, opinions, conclusions, or technical advice (per my scope of work) hereby reported for:

Project: CR466A Improvements
(Preliminary Engineering Report)

I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through professional judgment and experience.

SIGNATURE: _____

11/30/05

NAME Stanley F. Ferreira, Jr., P.E.

P.E. No.: 40974

DATE:

CERTIFICATION

I hereby certify that I am an Environmental Professional practicing with EMS Scientists, Engineers, Planners, Inc., and that I have prepared or approved the evaluation, findings, opinions, conclusions, or technical advice (per my scope of work) hereby reported for:

Project: CR466A Improvements, Environmental Documents and supporting reports prepared by EMS Scientists, Engineers, Planners, Inc. only.

I acknowledge that the procedures and references used to develop the results contained in these documents are consistent with the FDOT Project Development and Environment Manual.

SIGNATURE: Kevin Muldrew

NAME: Kevin Muldrew
Senior Environmental Specialist

DATE: March 3, 2005

PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Tindale Oliver and Associates, a Florida Corporation, authorized to operate as an engineering business, EB#5249 by, the State of Florida Department of Professional Regulation, Board of Engineers, and that I have prepared or approved the evaluation, findings, opinions, conclusions, or technical advice (per my scope of work) hereby reported for:

Project: CR466A Improvements
(Preliminary Engineering Report)

I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through professional judgment and experience.

SIGNATURE: 

NAME William E. Oliver, P.E.

P.E. No.: 31157

DATE: 01-26-05

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1.0 SUMMARY

1.1 INTRODUCTION

This study investigates improvements to County Road 466A (Miller Street) from the Lake/Sumter County Line to US 27/441, a distance of approximately 3.03 miles. These limits represent the "logical termini" of this project since the eastern limit ties into US 27/441, a major north/south roadway within the City of Fruitland Park and the western limit is at the County line. This project also includes a recommendation for realignment of an additional portion of roadway from the County line to Morse Boulevard in Sumter County. Roadway improvements in Sumter County involve a four-lane section from the County line to US 301 being developed by The Villages, a major development in the County and being designed by others. Sumter County and The Villages' developer have agreed to coordinate with Lake County regarding the roadway segment from Morse Boulevard to the Lake/Sumter County line, a distance of 0.62 mile. The realignment of this segment is desired in order to upgrade to four lanes and improve horizontal and vertical sight distance in this area. Construction of CR 466A improvements in Sumter County is anticipated to begin within the next two years. Information on possible realignment in Sumter County is included herein only to provide information for coordination between Lake and Sumter Counties. The scope of this Project Development and Environmental (PD&E) analyses (cost and impacts) is therefore limited to the 3.03-mile section located within Lake County.

The objective of this Preliminary Engineering Study is to document the environmental and engineering analyses to assist the selection of the type, location, and nature of improvements to CR 466A. Future traffic demands require improvement of the facility in order to handle the traffic safely and efficiently. CR 466A is recommended for improvement from two-lane undivided to four-lane divided though the project limits. The project limits are shown graphically in Figure 1.

Figure 1-1 Project Limits

1.2 RECOMMENDATIONS/COMMITMENTS

Based upon the traffic analyses, two alternative alignments for the four-lane CR 466A were developed and documented in Section 8.0 of this report. After a technical analysis and public and agency involvement, the study recommended the optimized alignment (Alignment 1).

The typical section proposed is a four-lane divided section. For the segment from the Lake/Sumter County Line to Lake Josephine Drive, a suburban typical section has been recommended; for the segment from Lake Josephine Drive to US 27/441, an urban typical section has been recommended.

The suburban typical section has 12-foot travel lanes, a 30-foot raised median section, and 4-foot bike lanes in each direction, with room provided for the addition of 5-foot sidewalks (with a 5-foot buffer strip) at a later date. The proposed design speed for the suburban typical section is 50 mph (intended posted speed of 45 mph). The suburban typical section requires a minimum of approximately 114 feet of right-of-way.

The urban typical section has 11-foot travel lanes, a 22-foot raised median section, 4-foot bike lanes in each direction, and 5-foot sidewalks (with a 2-foot buffer section) on each side of the road. The proposed design speed for the urban typical section is 40 mph (intended posted speed of 35 mph). The urban typical section requires a minimum of approximately 94 feet of right-of-way.

The City of Fruitland Park commits to the following items to ensure there are no adverse impacts from the construction of the proposed improvements:

1. Prior to construction, a gopher tortoise permit will be applied for to ensure the proper mitigation is granted to the Florida Fish and Wildlife Conservation Commission (FFWCC) for the relocation and/or "taking" of gopher tortoises and commensal species.

2. During construction, the City of Fruitland Park will monitor active eagles' nests within 500 feet of the roadway to ensure no adverse impacts to nesting eagles. Monitoring will be provided according to the approved protocol of the U.S. Fish and Wildlife Service (USFWS).

1.3 RESIDENTIAL/BUSINESS IMPACTS

The recommended alternative will potentially impact seven business, 42 residential, and 16 unimproved parcels, with the potential for three business relocations and 16 residential relocations.

1.4 PROJECT COSTS

Estimated construction costs for the recommended alternative are $18.1 million, including pond construction costs, but not including any utility relocation costs. Estimated right-of-way costs are $8.6 million, including $7.0 million in roadway right-of-way costs and $1.6 million in pond right-of-way costs. Other costs will include an estimated $2.4 million for construction engineering and inspection and $2.4 for engineering design, for a total of $31.5 million. All costs presented are 2003 dollars.

1.5 SUPPORTING DOCUMENTS

Several supporting documents were prepared in support of this Preliminary Engineering Study to evaluate potential adverse environmental and cultural impacts for the proposed alternative alignment and pond locations. These documents include a Cultural Resource Assessment Survey, Wildlife and Habitat Impact Assessment, Wetland Evaluation Report, Section 4(f) Determination, Contamination Screening Evaluation Report, Air Quality Study Report, and Noise Study Report.

1.5.1 Cultural Resource Assessment Survey

Based upon the December 2003 Phase I Cultural Resource Survey conducted along the approximately three-mile-long CR 466A project corridor, it is the opinion of the Principal Investigator that the proposed widening of CR 466A and the development of its proposed ponds will have no effect upon any cultural resources listed or eligible for listing on the National Register of Historic Places (NRHP).

1.5.2 Contamination Assessment

A Contamination Screening Evaluation Report (CSER) was conducted in accordance with the Florida Department of Transportation (FDOT) PD&E Manual for areas within the project requiring additional right-of-way and proposed pond sites. A comprehensive review of agency records for petroleum products and other hazardous materials was conducted at Lake County and the local Florida Department of Environmental Protection (FDEP) office in Orlando. A database report was reviewed to determine the number of sites within the project corridor that might generate, handle, transport, or dispose of hazardous material. Only one site within the project corridor had a contamination rating of either moderate or high. Information for this site can be found in the CSER, as well as section 9.12.12. Soil sampling analysis is recommended at the edge of the right-of-way adjacent to any of the sites listed in the CSER with a "moderate" or "high" rating.

1.5.3 Environmental Constraints

Seven wetlands are located within the project corridor. Sufficient field data were collected to respond to the appropriate section of the U.S. Army Corps of Engineers (USACOE) Wetland

Rapid Assessment Procedure (WRAP). A brief description of each wetland and an assessment of its value are included in the Wetland Evaluation Report (WER).

Besides the No-Build alternative (no wetland impacts), two different Build alternatives have been proposed for the CR 466A roadway project. At present, two wetland impacts are expected. The first impact would be to Wetland 2 if pond location 6A were chosen. The second impact would be to Wetland 6 if pond location 1C were chosen. In both alternatives, less than one acre of wetland impact is anticipated to either of these wetlands. Neither of these pond alternatives is the preferred alternative for that basin.

A field survey was conducted along the CR 466A project corridor and proposed pond sites to determine the potential for, or occurrence of, federally or state listed plant or animal species. Prior to this assessment, species lists were compiled by reviewing current scientific literature and through published reference material, as recommended by the PD&E Manual for a Wildlife and Habitat Impact Assessment report.

A habitat and land use map was produced using numerical codes described in the FDOT Florida Land Use, Cover and Forms Classification System (FLUCFCS). Twenty different FLUCFCS codes were observed and mapped within the project corridor. A detailed description of each of these habitats and maps are included in the report. Upon review of the USFWS Critical Habitat maps, it has been determined that there are none within the project corridor.

Results concluded that only two animal species, and no plant species, have the potential for impacts if this project is to be constructed. Gopher tortoise burrows were observed within two of the habitat areas. This Species of Special Concern will require a further survey prior to any construction. No adverse effect to this species is anticipated, provided the appropriate mitigation for gopher tortoises is performed during construction. The FFWCC has documented a bald eagle nest within the project limits. This nest has been observed to be active, and the protective zones for the nest involve a portion of the proposed project limits. Following the USFWS approved guidelines will minimize potential impacts.

2.0 INTRODUCTION

This Preliminary Engineering Report is part of the Project Development and Environmental (PD&E) Study for a 3.03-mile section of County Road 466A. The limits of the project are the Lake/Sumter County line and US 27/441.

2.1 PURPOSE

The purpose of this engineering document is to present the studies conducted, describe the results of the evaluation, and document the justification for the recommended improvements. This document describes the determinations made regarding potential corridors, typical roadway cross sections, public involvement activities and input, a summary of existing and future traffic conditions, and analysis of the considered improvement alternatives that would satisfy the future transportation demands.

Potential alternatives were developed and evaluated based upon collected engineering and environmental information, public input, and application of current design standards. This document provides analyses that will assist Lake County in selecting the location and conceptual design for improvements to CR 466A.

This report documents the need for the project and presents the procedures used to develop and evaluate the Build and No-Build alternatives as they relate to the proposed project. Comparison of the alignments developed for the Build alternative versus the No-Build alternative will be based on a variety of parameters using a matrix format and described in Section 8.0 of this document. This process identifies the effects that each alternative has on the community.

2.2 PROJECT DESCRIPTION

The CR 466A corridor is an east/west facility with a functional classification of Rural Major Collector. The project is located in Sections 4 through 6 of Township 19 South, Range 24 East in Lake County.

CR 466A is currently a two-lane undivided rural roadway through the project limits. The existing posted speed is 55 mph from the county line to Cutoff Road, and 35 mph from Cutoff Road to US 27/441.

Primary land uses along CR 466A include individual residences, agriculture, Fruitland Park Elementary School, the Community United Methodist Church, and small businesses.

3.0 NEED FOR IMPROVEMENT

3.1 DEFICIENCIES

The analysis of existing conditions, documented in Sections 6.5 and 6.6 of this report, indicates that CR 466A is currently operating at acceptable levels of service, without capacity deficiencies. The analysis of future conditions, documented in Sections 6.8 and 6.9 of this report, indicates that if improvements are not made to CR 466A and growth occurs as anticipated, CR 466A is estimated to operate at Level of Service F by 2012. Furthermore, service capacities are anticipated to be exceeded by 8 percent to 38 percent by 2012, and by 33 percent to 72 percent by 2032.

3.2 SAFETY

The crash analysis performed for CR 466A, documented in Section 4.1.8 of this report, indicates that CR 466A has experienced a low frequency of crashes and has been a relatively safe road. However, as traffic volumes and volume-to-capacity ratios increase, the potential for crashes also increases. Therefore, capacity improvements will need to be implemented concurrent with anticipated traffic volume growth to preserve the traffic safety of CR 466A.

3.3 CONSISTENCY WITH THE TRANSPORTATION PLANS

The proposed CR 466A improvements are consistent with the goals, objectives, and policies of the City of Fruitland Park Comprehensive Plan, the Lake County Comprehensive Plan, and the Lake County 2020 Long Range Transportation Plan. However, these plans currently do not include this specific project and will need to be amended appropriately. The improvements are identified in the Lake County Transportation Program FY 2003/2007.

In addition, the "logical termini" of this project are the Lake/Sumter County line to the west and US27/441 on the east. The eastern terminus represents a major north/south roadway in the City of Fruitland Park, whereas the western terminus will tie into a four-lane section that extends from US 301 to the Lake/Sumter County line. The work in Sumter County is being performed by others and is referenced herein for coordination purposes only.

3.4 SOCIAL/ECONOMIC DEMANDS

CR 466A will serve to connect the City of Fruitland Park and Northwest Lake County to the proposed Villages of Sumter development in Sumter County. Travel demand generated by The Villages of Sumter will be substantial, as documented in Section 6.7 of this report, and necessitate the improvement of CR 466A. The Villages of Sumter development is estimated to account for approximately 9,000 vehicles per day on CR 466A in 2012 and approximately 18,000 vehicles per day on CR466A in 2032. These traffic volumes are attributable to population and employment forecasts for The Villages of Sumter of about 40,000 persons and 4,000 jobs in 2012 and 75,000 persons and 8,000 jobs in 2032.

4.0 EXISTING CONDITIONS

4.1 EXISTING ROADWAY CHARACTERISTICS

4.1.1 Functional Classification

CR 466A is currently classified as a Rural Major Collector. With the improvements proposed (and similar improvements in Sumter County) and the expected change in character of the area over time from rural to more urban, it is possible that the functional classification will be changed to Urban Minor Arterial.

4.1.2 Typical Cross Sections

The roadway cross section through the project limits is consistent, with two 11-foot wide lanes, no discernible shoulder, and an open drainage system.

4.1.3 Pedestrian and Bicycle Facilities

Currently, limited pedestrian facilities and no bicycle facilities are on CR 466A. Sidewalk within the project limits is limited to one segment of 4-foot wide concrete walk on the north side of the road, between Dixie Avenue and Spring Lake Drive.

4.1.4 Right-of-Way

The existing right-of-way width varies through the project limits. The width is generally 80 feet in the project segment from the county line to Lake Josephine Drive. Existing right-of-way width in the segment from Lake Josephine Drive to US 27/441 varies from 40 feet to 100 feet.

4.1.5 Horizontal Alignment

The existing horizontal alignment of CR 466A is generally tangent, with two curves near the county line. Based on aerial mapping, these curves are estimated to be 3-degree and 5-degree curves. Provided that proper superelevation exists on these curves, they meet criteria for a design speed of 60 mph.

4.1.6 Vertical Alignment

The vertical alignment of CR 466A within the project limits is generally rolling. Two areas of interest were noted for further consideration in final design. The alignment of CR 466A near US 27/441 is quite steep. Also, the segment of CR 466A near the county line has an undesirable combination of horizontal and vertical curves. Once a survey is performed, attention should be paid to these areas to determine if the existing geometry presents a sight-distance deficiency.

4.1.7 Drainage

The project area is characterized by mostly closed hydrologic drainage basins served by sinks or other low areas, except for the eastern-most basin that discharges toward Lake Griffin. The roadway is currently drained by a swale/ditch system with some intermittent piping that collects the stormwater runoff from the roadway and discharges it to the adjacent lakes and low areas. Soils within the existing drainage basins are predominantly in hydrologic soil group A, so runoff potential from the pervious areas is low. Since the current alignment of the roadway generally follows along a ridge line, there are few culvert connections under this segment of the roadway.

4.1.8 Crash Analysis

A crash analysis was performed for CR 466A within the project limits using crash reports provided by Lake County for the period from July 1999 through September 2002. Table 4-1 summarizes the 39-month crash history of CR 466A as documented in these crash reports. Summaries of crash history at individual intersections have been provided in Appendix A of the CR 466A (Miller Street) Design Traffic Study along with collision diagrams illustrating crash patterns on CR 466A.

Table 4-1 CR 466A Crash History, Lake/Sumter County Line to US-27/441 (07/99 – 09/02)

Crash Statistic		1999*	2000	2001	2002*	Total
Total Crashes		4	5	6	12	27
Light Condition	Daylight	3	5	5	9	22
	Dusk	1	0	0	0	1
	Dawn	0	0	0	1	1
	Dark (St. Light)	0	0	0	1	1
	Dark (No St. Light)	0	0	1	1	2
Type	Bicycle	0	0	0	0	0
	Parked Vehicle	0	0	0	0	0
	Backing	0	0	0	1	1
	Head On	0	1	0	0	1
	Fixed object	1	3	2	1	7
	Sideswipe	0	0	1	0	1
	Movable Object	1	0	0	0	1
	Animal	0	0	0	0	0
	Other	0	0	0	1	1
	Pedestrian	0	0	0	0	0
	Left Turn	1	0	1	7	9
	Angle	0	0	0	0	0
	Rear End	1	0	1	1	3
	Right Angle	0	1	1	0	2
	DUI	0	0	0	1	1
Vehicles Involved		7	7	10	22	46
Injuries		1	2	1	5	9
Fatalities		0	0	0	0	0

*Crash summary from July 1999 through September 2002.

As shown in Table 4-1, a total of 27 crashes have occurred on CR 466A within the project limits during the analysis period, involving a total of 46 vehicles. As a result of these crashes, there were 9 injuries and no fatalities. The most frequent type of crash experienced on CR 466A was the left-turn type, with 9 crashes. The low frequency of crashes on CR 466A within the analysis period indicates that CR 466A has been a relatively safe road. However, a crash rate analysis was also performed to identify safety deficiencies.

Crash rates were calculated for CR 466A within the project limits and for each intersection located therein. These crash rates were analyzed using a procedure developed by FDOT to identify high crash locations. The FDOT's procedure involves comparing observed crash rates for a specific location to critical crash rates based on statewide average crash rates for similar facilities. High crash locations are considered as those locations where the observed crash rate is greater than the critical crash rate. However, the statewide average crash rates used in the FDOT procedure are calculated based on crashes reported on long-forms only. Crashes reported on long-forms are typically those involving an injury, fatality, or criminal offense. For use in this study, statewide average crash rates were doubled based on a general rule-of-thumb that assumes crashes involving an injury, fatality, or criminal offense comprise approximately 50 percent of total crashes. Table 4-2 summarizes the crash rates calculated for CR 466A and the comparison to FDOT critical crash rates as discussed above.

As shown in Table 4-2, CR 466A is not considered to be hazardous according to the FDOT procedure, confirming that CR 466A does not have an abnormally high frequency of crashes and has been a relatively safe road.

4.1.9 Intersections and Signalization

There is currently one signalized intersection on CR 466A within the project limits that operates in a steady state. This signal is located at the CR 466A/Dixie Avenue intersection. There is a flashing signal at the CR 466A/CR 468 intersection which flashes red for traffic on CR 468 and green for traffic on CR 466A. The analysis of these intersections, along with other intersections within the CR 466A corridor, is summarized in Section 6.0.

4.1.10 Lighting

No continuous street lighting systems are on CR 466A within the project limits; however, limited lighting is provided at select intersections and other locations.

Table 4-2 Crash Rate Summary

Intersection	Crash Frequency					Daily Entering Volume Estimate†				Crash Rate	Critical Rate	Safety Ratio	High Crash Location?
	1999*	2000	2001	2002*	Total	EB	WB	NB	SB	(per MEV,MVM)	(per MEV,MVM)		
Micro Racetrack Road	1	0	1	0	2	1,625	3,443	0	836	0.29 MEV	4.94 MEV	0.06	NO
Poinsettia Avenue	0	1	0	0	1	1,807	3,443	0	566	0.14 MEV	4.96 MEV	0.03	NO
Iona Avenue	0	1	0	0	1	2,150	2,881	0	0	0.17 MEV	5.07 MEV	0.03	NO
Dixie Avenue	1	1	4	0	6	2,150	1,787	2,597	2,460	0.56 MEV	4.64 MEV	0.12	NO
US 27/441	0	0	0	8	8	1,895	0	17,625	16,009	0.19 MEV	2.40 MEV	0.08	NO
Midblock	2	2	1	4	9								
County Line to US 27/441	4	5	6	12	27	AADT>>>			4,551	1.67 MVM	2.70 MVM	0.62	NO

*Crash summary from July 1999 through September 2002.
†Volumes on minor cross streets are not included in crash rate calculation as volume contributions are not considered significant.
MEV: Million Entering Vehicles
MVM: Million Vehicle Miles
AADT: Annual Average Daily Traffic

4.1.11 Utilities

Utility companies known to have facilities within the project limits were contacted and asked to provide information about existing and future utilities in the project area. The following companies were contacted:

City of Leesburg Electric Department 2010 Griffin Road Leesburg, FL 34748	City of Leesburg Gas Department 306 South 6th Street Leesburg, FL 34748
Comcast (CATV) 8130 CR 44 Leg-A Leesburg, FL 34788	Sumter Electric Co-Op. 330 South U.S. 301 P.O. Box 301 Sumterville, FL 33585
Sprint P.O. Box 490048 Leesburg, FL 34749-0048	City of Fruitland Park 202 W. Berckman Street Fruitland Park, FL 34731
Florida Power 2801 West State Road Oviedo, FL 32765	Progress Energy 515 Independence Highway Inverness, FL 32650

For those utilities responding to this request and having facilities within the project limits, information about existing and proposed utilities is shown in Table 4-3.

Table 4-3 Utility Information

Utility Owner	Facility Type	Existing or Future?	Location	Limits
City of Fruitland Park Sewer	Sewer force main	Future	South side of CR 466A	East of Rose Ave. to West of Dixie Ave.
City of Fruitland Park Sewer	Sewer force main	Future	West of Dixie Ave.	Within project limits (crosses CR 466A)
City of Fruitland Park Sewer	Sewer force main	Future	North side of CR 466A	East of Dixie Ave. to US 27/441
City of Fruitland Park Sewer	Sewer force main	Future	West side of Villa Ave.	CR 466A to south (crosses CR 466A from force main on north side)
City of Fruitland Park Sewer	Sewer force main	Future	West side of US 27/441	Within project limits (crosses CR 466A)
City of Leesburg Gas	Gas line	Existing	East side of Cutoff Road	Within project limits (crosses CR 466A)
City of Leesburg Gas	Gas line	Existing	North side of CR 466A	West of Spring Lake Rd. to east of Sunny Ct.
City of Fruitland Park	Water line	Existing	Both sides of CR 466A	Cutoff Road to US 27/441
City of Leesburg Gas	Gas line	Existing	West side of Spring Lake Dr.	CR 466A to north

Table 4-3 Utility Information

Utility Owner	Facility Type	Existing or Future?	Location	Limits
City of Leesburg Gas	Gas line	Existing	East side of Janice Dr.	CR 466A to north
City of Leesburg Gas	Gas line	Existing	East side of Poinsettia Ave.	CR 466A to north
City of Leesburg Gas	Gas line	Existing	East side of Rose Ave.	CR 466A to south (crosses CR 466A from gas line on north side)
City of Leesburg Gas	Gas line	Existing	East side of College Ave.	Within project limits (crosses CR 466A)
City of Leesburg Gas	Gas line	Existing	East side of Sunny Ct.	CR 466A to north
City of Leesburg Gas	Gas line	Existing	East side of Dixie Ave.	CR 466A to north
City of Leesburg Gas	Gas line	Existing	North side of CR 466A	East of Dixie Ave. to approx. 150' east, then across CR 466A
City of Leesburg Gas	Gas line	Existing	South side of CR 466A	East of Dixie Ave. to west of Villa Ave.
Progress Energy	Electrical Distribution	Existing	No facilities within project limits	
Sprint	Fiber Optic - underground	Existing	North side of CR 466A	County Line to Marguerite Ave.
Sprint	Fiber Optic - underground	Existing	West side of Cutoff Road	CR 466A to south
Sprint	Telephone Cable - underground	Existing	West side of Cutoff Road	CR 466A to south
Sprint	Telephone Cable - underground	Existing	East side of Cutoff Road	CR 466A to south
Sprint	Telephone Cable - underground	Existing	North side of CR 466A	West of Oliver Lane to West of US 27/441
Sprint	Telephone Cable - underground	Existing	South side of CR 466A	Marguerite Ave. to Spring Lake Dr.
Sprint	Telephone Cable - underground	Existing	West side of Spring Lake Dr.	CR 466A to north
Sprint	Telephone Cable - underground	Existing	East side of Janice Dr.	CR 466A to north
Sprint	Telephone Cable - underground	Existing	West side of Poinsettia Ave.	CR 466A to north
Sprint	Telephone Cable - underground	Existing	East side of Rose Ave.	CR 466A to south
Sprint	Telephone Cable - underground	Existing	West side of College Ave.	CR 466A to north
Sprint	Telephone Cable - underground	Existing	West side of Sunny Ct.	CR 466A to north
Sprint	Telephone Cable - underground	Existing	Century Ave. - both sides	Within project limits

Table 4-3 Utility Information				
Utility Owner	Facility Type	Existing or Future?	Location	Limits
Sprint	Telephone Cable - underground	Existing	Dixie Ave. - both sides	CR 466A to north
Sprint	Telephone Cable - underground	Existing	West side of US 27/441	Within project limits
Sumter Electric Cooperative	Electric distribution - overhead	Existing	South side of CR 466A	County Line to Oliver Ln.
Sumter Electric Cooperative	Electric distribution - overhead	Existing	North side of CR 466A	Oliver Ln. to East of Micro Racetrack Rd.
Sumter Electric Cooperative	Electric distribution - overhead	Existing	South side of CR 466A	East of Micro Racetrack Rd. to East of Lake Josephine Dr.

4.1.12 Pavement Conditions

Lake County utilizes the University of Wisconsin PASER system for evaluating pavement condition. For the project area, the Lake County-provided pavement condition ratings are shown in Table 4-4.

Table 4-4 Pavement Condition Ratings	
Pavement Segment	Pavement Condition Rating
Lake/Sumter County Line to Spring Lake Road	4
Spring Lake Road to Dixie Avenue (CR 25A)	6
Dixie Avenue (CR 25A) to US 27/441	5

These pavement ratings are described below:

- *Rating 4: Structural improvement needed* – Roads show first signs of needing strengthening by overlay or recycling. They have very severe surface raveling that should no longer be sealed. Many longitudinal and transverse cracks are raveling slightly. Over 50 percent of the surface may have block cracking. Patches are in fair condition. They may have rutting less than ½-inch deep or slight distortion.

- *Rating 5: Preservative treatment required* – Roads are still in good structural condition but clearly need sealcoating or overlay. They may have moderate to severe surface raveling with significant loss of aggregate. First signs of longitudinal cracks near the edge. First signs of raveling along cracks. Block cracking up to 50 percent of surface. Extensive to severe flushing or polishing. Any patches or edge wedges are in good condition.

- *Rating 6: Consider preservative treatment* – Roads are in sound structural condition but show definite signs of aging. Sealcoating could extend their useful life. There may be slight raveling. Transverse cracks can be frequent. Cracks may be sealed or open ¼-inch to ½-inch. First signs of block cracking. May have slight or moderate bleeding or polishing and patches are in good condition.

4.2 ENVIRONMENTAL CHARACTERISTICS

4.2.1 Land Use Data

4.2.1.1 Existing Land Use

Existing primary land uses along CR 466A include individual residences, agriculture, Fruitland Park Elementary School, the Community United Methodist Church, and small businesses. See Figure 4-1 for existing land use information based upon Lake County GIS data.

4.2.1.2 Future Land Use

Future land use information was obtained from Lake County's GIS department and is reflected in Figure 4-2. In general, the area is projected to become more urbanized, with urban and suburban land use types spreading into areas now classified as agricultural.

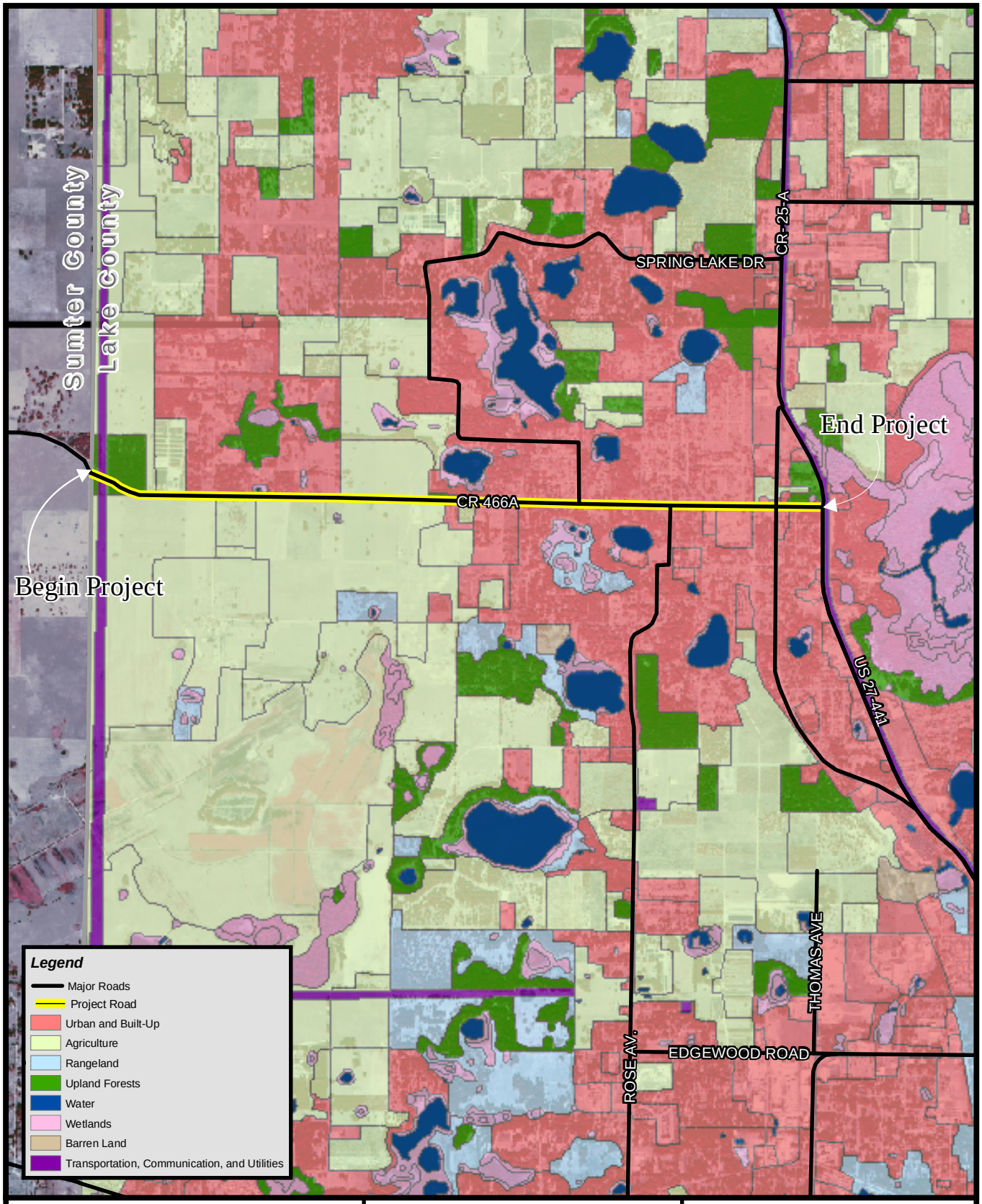
4.2.2 Cultural Features and Community Services

4.2.2.1 Cultural Resource Assessment Survey

Based upon the December 2003 Phase I Cultural Resource Survey conducted along the approximately three-mile-long CR 466A project corridor, it is the opinion of the Principal Investigator that the proposed widening of CR 466A and the development of its proposed ponds will have no effect upon any cultural resources listed or eligible for listing on the National Register of Historic Places (NRHP).

The architectural survey resulted in the discovery of eight historic buildings. All of these are residential structures and are of styles commonly found in Florida dating from the first half of the 20th century. None of these buildings is eligible for listing on the NRHP individually or as contributing resources to a potential district.

During the field survey, 115 shovel tests were excavated and a surface survey was conducted throughout the project area. One lithic flake was encountered during the survey with ST44. Testing around this positive test failed to produce additional cultural material. Due to the unexceptional nature of this artifact, it is not eligible for listing on the NRHP. Details of the architectural and field survey can be found in the Phase I Cultural Resource Survey Report. No further cultural resource study is recommended.



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CONSULTING ENGINEERS AND SCIENTISTS

Figure 4-1
Existing Land Use

0 1,500 3,000
Feet

N

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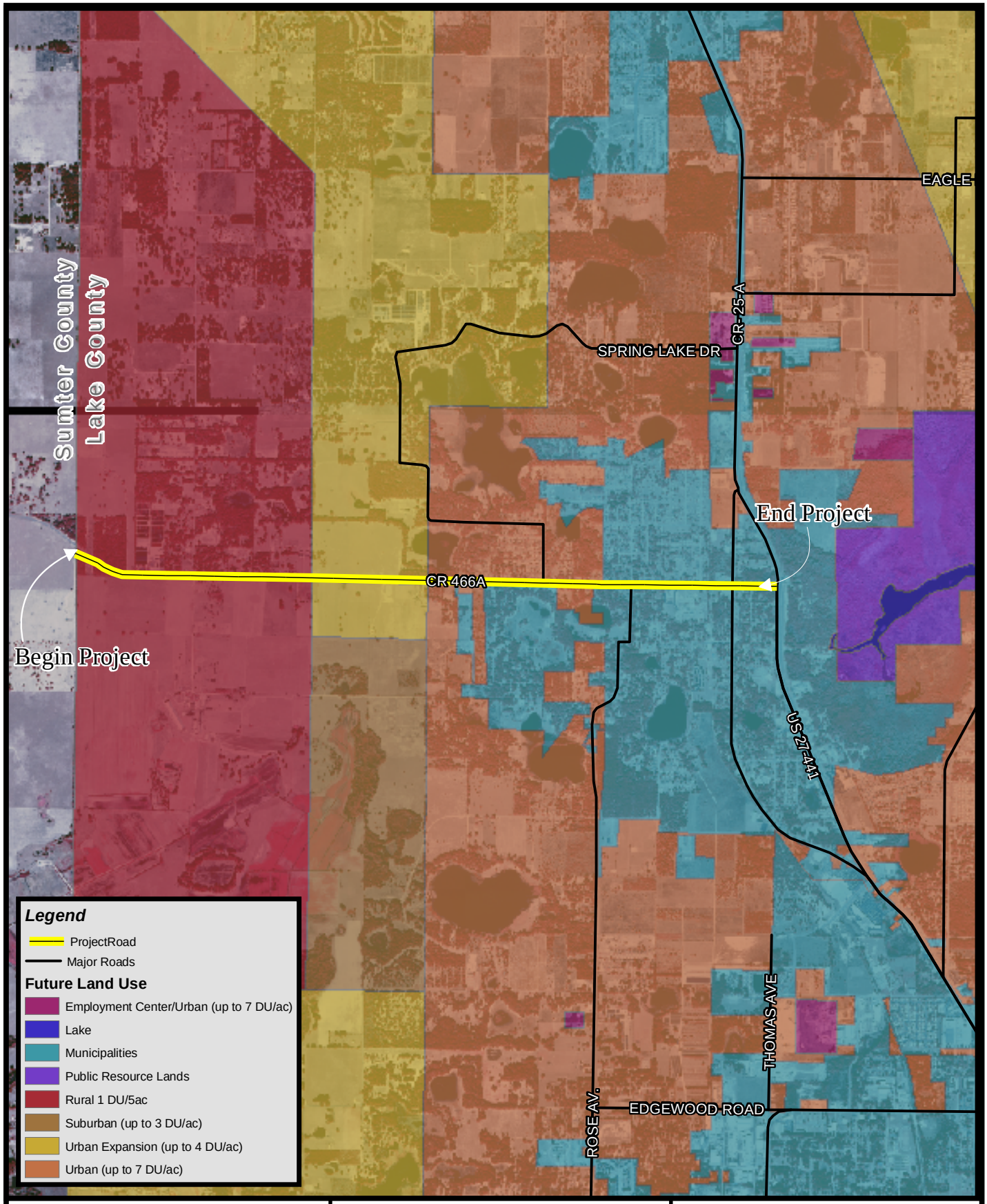

Jones Edmunds & Associates, Inc. JEA
CONSULTING ENGINEERS AND SCIENTISTS

Figure 4-2
Future Land Use

0 1,500 3,000
Feet

N

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4.2.2.2 Cultural Features and Community Services

- *Schools* – One public elementary school is located within the project limits, Fruitland Park Elementary at 304 West Fountain Street. The entrance to the school is on Fountain Street (outside the project limits), but the school property adjoins the CR 466A right-of-way where there is a rear entrance used primarily for pick up and drop off. Schools within or near the study area are shown on Figure 4-3.

- *Churches* – One church is within the project limits, Community United Methodist Church, located at 309 College Avenue. The church property is adjacent to the CR 466A right-of-way. Churches within or near the study area are shown on Figure 4-3.

- *Community Centers* – No community centers are present within the project limits.

- *Hospitals* – No hospitals are within the project limits on CR 466A. The closest hospital is Leesburg Regional Medical Center, located at 700 N Palmetto Street in Leesburg.

- *Cemeteries* – No cemeteries are located on CR 466A within the project limits. The closest cemetery is Shiloh Cemetery. The cemetery is fenced and is bounded on the north by Shiloh Street, on the west by College Avenue, and on the east by the Cales Recreation Complex. The cemetery is owned and maintained by the City of Fruitland Park and has markers dating back as far as 1896.

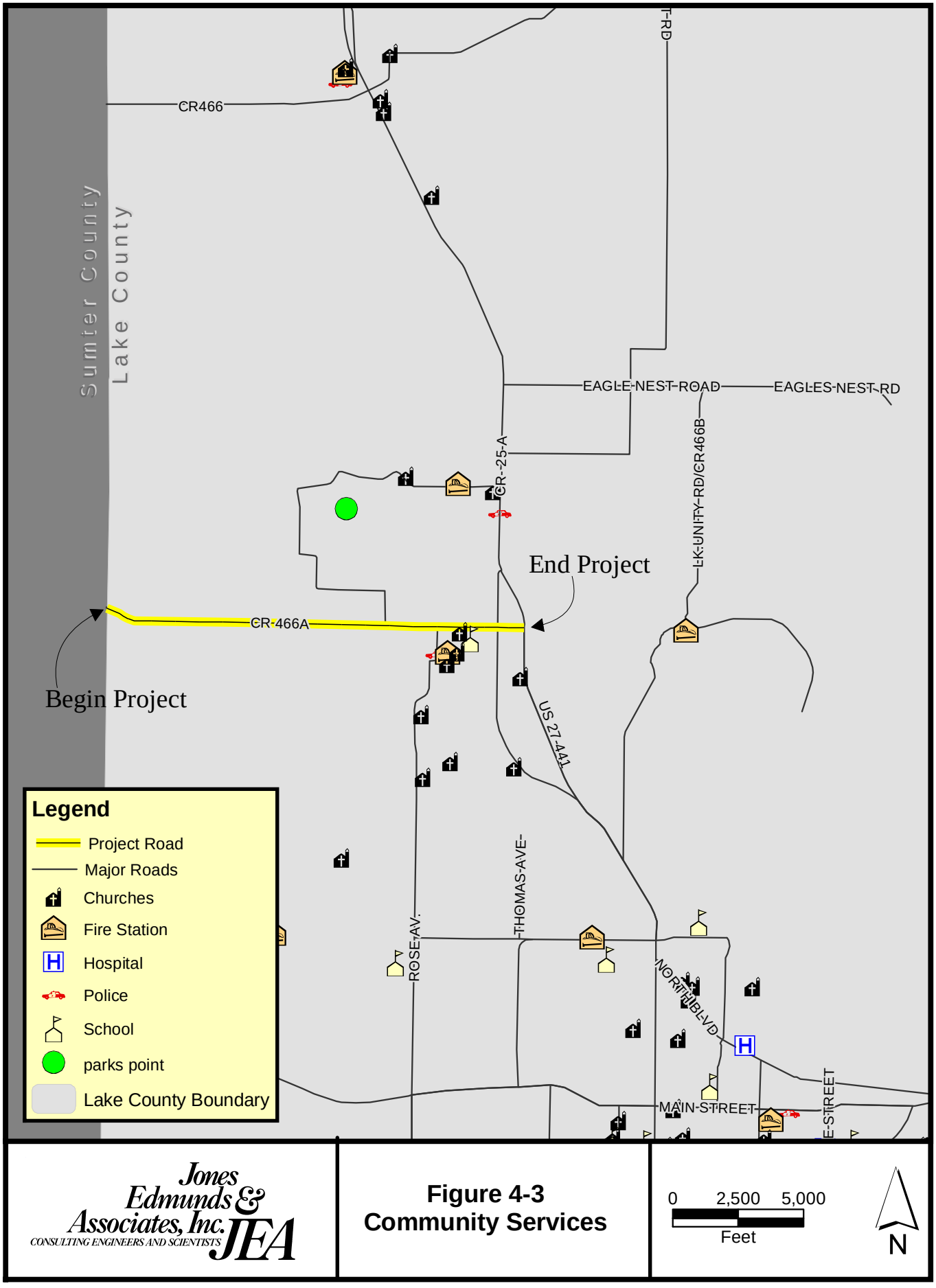
- *Parks* – No parks are located on CR 466A within the project limits. The closest park is Lake Griffin State Recreational Area, located at 3089 U.S. 441-27 south of the project area.

- *Fire Protection* – No fire stations are located on CR 466A the project limits. The City of Fruitland Park is served by the Fruitland Park Volunteer Fire and Rescue Department located at 506 West Berckman Street, south of the project area. Fire department location is shown on Figure 4-3.

- *Police Protection* – No police stations are located on CR 466A the project limits. The City of Fruitland Park is served by the Fruitland Park Volunteer Police Department located at 506 West Berckman Street, south of the project area. Police department location is shown on Figure 4-3.

4.2.2.3 Section 4(f) Lands

In order to be considered a Section 4(f) resource, a property must function or be designated as a significant public park, recreation area, wildlife and waterfowl refuge, or historic site. Section 4(f) does not typically apply to archaeological sites regardless of the ownership. To determine the applicability of Section 4(f), it must first be determined whether the property represents a Section 4(f) resource, and then if the proposed project entails a "use" of that property within the



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meaning of Section 4(f). Use of Section 4(f) property can occur directly (i.e., acquisition) or indirectly (i.e., constructive use). The Federal Highway Administration (FHWA) makes the determination of the applicability of Section 4(f) to any particular property.

For the proposed widening of CR 466A from SR 500 to the Sumter/Lake County line in Lake County, Florida, it was determined that four potential Section 4(f) resources may be affected by this project. These four resources are Lake Griffin State Recreation Area, Fruitland Park Elementary School, Speedway Park, and Windy Acres Farms Penning. Details of these potential resources can be found in the Request for Determination of Section 4(f) Applicability report. Only the State Recreation Area appears to meet criteria established in Chapter 13 of the PD&E Manual. The main function of each resource will not be changed or limited by the widening of CR 466A.

Public meetings have been held with various agencies and the public to discuss alternatives for the widening of CR 466A. No comments have been received from the owners of the potential Section 4(f) resources. The City of Fruitland Park requests a determination of non-applicability be granted for the widening of CR 466A from the Sumter/Lake County line to SR 500 (US 441).

4.2.3 Natural and Biological Features

4.2.3.1 Wetlands

A general survey was conducted to determine the presence of wetlands within the project corridor which, for the purposes of this investigation, encompasses the area extending 1,500 feet to either side of the existing CR 466A centerline (where present) and on 8 proposed pond sites and alternatives. The general wetland survey included vehicular reconnaissance, hydric soil confirmation, and vegetation surveys. Maps and available resource information were utilized.

Seven wetlands are located within the project corridor. Sufficient field data were collected to respond to the appropriate section of the USACOE WRAP. A brief description of each wetland and an assessment of its value are included in the WER.

Besides the No-Build alternative (no wetland impacts), two different Build alternatives have been proposed for the CR 466A roadway project. At present, two wetland impacts are expected. The first impact would be to Wetland 2 if pond location 6A were chosen. The second impact would be to Wetland 6 if pond location 1C were chosen. In both alternatives, less than one acre of wetland impact is anticipated to either of these wetlands. For both alternatives, the pond locations with wetland impacts are not the preferred alternatives.

A pre-application jurisdictional determination should be requested from the USACOE and the St. Johns River Water Management District (SJRWMD) for the wetlands within the project area. Unavoidable wetland impacts that will result from the construction of this project, will be mitigated pursuant to Section 373.4137 F.S. to satisfy all mitigation requirements of Part IV, Chapter 373, F.S. and 33 U.S.C. s. 1344.

4.2.3.2 Wildlife Habitat Survey

A field survey was conducted along the CR 466A project corridor and proposed pond sites to determine the potential for, or occurrence of, federally or state listed plant or animal species. Prior to this assessment, species lists were compiled by reviewing current scientific literature and through published reference material, as recommended by the PD&E Manual for a Wildlife and Habitat Impact Assessment report.

A habitat and land use map was produced using numerical codes described in the FDOT Florida Land Use, Cover and Forms Classification System (FLUCFCS). Twenty different FLUCFCS codes were observed and mapped within the project corridor. A detailed description of each of these habitats and maps are included in the report. Upon review of the USFWS Critical Habitat maps it has been determined that there are none within the project corridor.

Results concluded that only two animal species, and no plant species, have the potential for impacts if this project is to be constructed. Gopher tortoise burrows were observed within two of the habitat areas. This Species of Special Concern will require a further survey prior to any construction. No adverse effect to this species is anticipated, provided the appropriate mitigation will be required for gopher tortoises. The FFWCC has documented a bald eagle nest within the project limits. This nest has been observed to be active, and the protective zones for the nest involve a portion of the proposed project limits. Following the USFWS approved guidelines will minimize potential impacts.

4.2.3.3 Outstanding Florida Waters and Aquatic Preserves

No Outstanding Florida Waters or Aquatic Preserves are within the project limits of CR 466A.

4.2.3.4 Floodplains/Floodways

The extent of the floodplain in relation to the roadway can be seen on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panels 12069C0307 D, 12069C0306 D, and 12069C0305 D dated July 3, 2002, as shown in Appendix A. Only two areas are in proximity to the road right-of-way; they are located west of Lake Josephine Drive (Lake Josephine Floodplain) and in a low area east of Micro Racetrack Road. Both are identified as special flood hazard areas designated as Zone A, which are defined as areas of the 100-year flood with the base flood elevations not determined. No floodways are within the proposed project area.

4.2.3.5 Farmlands

No farmlands, as defined by the *Farmland Protection Policy Act* (FPPA) of 1984, were observed within the CR 466A project corridor. A confirmation letter was mailed to Mr. Warren

Henderson of the Natural Resources Conservation Service in Gainesville (December 4, 2003) for a confirmation of no findings and his concurrence letter, dated December 9, 2003, was received.

4.2.4 Contamination Assessment

A CSER was conducted in accordance with the FDOT PD&E Manual for areas within the project requiring additional right-of-way and proposed pond sites. A comprehensive review of agency records for petroleum products and other hazardous materials was conducted at Lake County and the local FDEP office in Orlando. A database report was reviewed to determine the number of sites within the project corridor that might generate, handle, transport, or dispose of hazardous material. Only one site within the project corridor had a contamination rating of either "moderate" or "high." Information for this site can be found in the CSER, as well as in Section 9.12.12. Soil sampling analysis is recommended at the edge of the right-of-way adjacent to any of the sites listed in the CSER with a "moderate" or "high" rating.

5.0 DESIGN CRITERIA

The proposed roadway improvements must adhere to specific design standards. For this roadway, which is neither a state road nor part of the Florida Intrastate Highway System, the applicable criteria are detailed in the *Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways* (commonly known as the *Florida Greenbook*). The current edition at the time of this document was May 2002. Table 5-2 and Table 5-3 detail the design criteria applicable to this project for the suburban and urban roadway sections, respectively. The following sections describe components of the criteria shown in the tables.

5.1 FUNCTIONAL CLASSIFICATION

CR 466A is currently classified as a Rural Major Collector. With the improvements proposed (and similar improvements in Sumter County) and the expected change in character of the area over time from rural to more urban, it is possible that the functional classification will be changed to Urban Minor Arterial.

5.2 DESIGN SPEED

The *Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highways* (FDOT, 2002) provides recommended minimum design speed values, as summarized in Table 5-1.

Table 5-1 Recommended Minimum Design Speeds Per the FDOT

Type of Roadway	Urban		Rural	
	Speed Restrictions		Speed Restrictions	
	With	Without	With	Without
Freeway or Expressway	50 mph	60 mph	n/a	70 mph
Arterial (Major)	40 mph	55 mph	55 mph	70 mph
Arterial (Minor)	35 mph	50 mph	55 mph	70 mph
Collector (Major)	35 mph	45 mph	50 mph	65 mph
Collector (Minor)	30 mph	40 mph	40 mph	60 mph
Local	20 mph	30 mph	30 mph	50 mph

As shown in Table 5-1, the recommended design speed for a given section of road is based primarily on the road's functional classification and area type. In addition, the presence of speed restrictions (features of a roadway that limit operating speeds) can also affect the recommended design speed. These features can include closely spaced traffic control devices and the nature of surrounding development.

CR 466A is currently defined as a Rural Major Collector by the City of Fruitland Park's Comprehensive Plan. However, it is possible that its functional classification will change to that of a Minor Arterial as a result of the improvements, depending on the specific nature of the improvements. In addition, the road's area type likely will begin to transition from rural to urban as development is attracted to the corridor. In consideration of this, it is recommended that the current 35 mph posted speed on the eastern end of the corridor be maintained, resulting in a design speed of 40 mph east of Lake Josephine Drive and a design speed of 50 mph (45 mph posted speed limit) established west of Lake Josephine Drive. These design speeds exceed the FDOT's minimum recommendations for an Urban Major Collector with and without speed restrictions, respectively, and would also exceed the minimum recommendations for an Urban Minor Arterial, should the functional classification be changed.

5.3 SUBURBAN ROADWAY DESIGN CRITERIA

The criteria to be used in the design of the suburban roadway segment, from the county line to Lake Josephine Drive, are shown in Table 5-2. Controlling criteria are shown in bold type.

Table 5-2 Suburban Roadway Design Criteria

Criteria (items in bold are controlling criteria)	Value	Units	Min, Max or Des?	Notes/Sources
Design Speed				
Selected Design Speed	**50**	**mph**	**-**	**Note: Design speed selected based on intended posted speed, per Lake County Direction.**
Intended Posted Speed	45	mph	-	
Cross-Section Widths				
Traveled Lanes	**11**	**ft**	**min**	**FDOT Greenbook Table 3-7**
Bicycle Lanes	4	ft	min	Lake County Design Standards, II.D.1.d.
Sidewalks	4	ft	min	FDOT Greenbook
	5	ft	min	Lake County Design Standards, II.D.1.e.
Sidewalk-Curb buffer strip	2	ft	min	FDOT Greenbook
	5	ft	des	Clear zone width - (sidewalk + 2' strip behind walk - 2' curb and gutter - bike lane)
Border Width	10	ft	des	FIDG Table 3-7 (from PPM); Measured from shoulder point or flange to R/W; assumes bike lane at curb; can be 2' minimum where right-of-way is severely restricted.
	18	ft	des	Clear zone width, per PPM Suburban criteria - measured from ETW
Grades				
Design Profile Grade	**8**	**percent**	**max**	**AASHTO, rolling terrain, can be up to 10% for short (500 ft) segments**
-	7	percent	des max	FDOT Greenbook, Table 3-4, rolling terrain
-	4	percent	des max	FDOT Greenbook, Table 3-4, industrial roadway (significant (>15% trucks), rolling terrain)

Table 5-2 Suburban Roadway Design Criteria

Criteria (items in bold are controlling criteria)	Value	Units	Min, Max or Des?	Notes/Sources
Gutter Grade (if applicable)	0.3	percent	min	Lake County Design Standards (FDOT specified 0.5% desirable minimum for rolling terrain)
Intersection approach grade	3	percent	max	within 100 ft. of intersection, Lake County Design Standards
Cross Slope				
Design cross slope for unsuperelevated section	**2**	**percent**	**des**	**FDOT Greenbook, 3.C.7.b.2**
	1.5	**percent**	**min**	**FDOT Greenbook, 3.C.7.b.2**
	4	**percent**	**max**	**FDOT Greenbook, 3.C.7.b.2**
Shoulder cross slope	3	percent	min	FDOT Greenbook, 3.C.7.c.2
	8	percent	max	FDOT Greenbook, 3.C.7.c.2
Shoulder Rollover	7	percent	max	algebraic difference in grade, FDOT Greenbook, 3.C.7.c.2
Superelevation				
Maximum Superelevation Rate	**5**	**percent**	**max**	**FDOT Design Standard #511**
Horizontal Alignment				
Min. radius with max Superelevation	**6.5**	**degree**	**max**	**FDOT Design Standard #511**
	881.474	**ft**	**min**	
Min. radius with normal cross slope	**2**	**degree**	**max**	**FDOT Design Standard #511, 4.75 degree for RC**
	2864.79	**ft**	**min**	
Lateral Clearance Required at Min. radius Curvature for Horizontal Sight Distance	23	ft	min	FDOT Greenbook, Table 3-3
Vertical Alignment				
Minimum Crest K	84	-	min	AASHTO
	120	**-**	**min**	**FDOT Greenbook, Table 3-6**
Minimum Sag K	**96**	**-**	**min**	**AASHTO**
	90	-	min	FDOT Greenbook, Table 3-6
Minimum Length of Curve	**150**	**ft**	**min**	**FDOT Greenbook, Table 3-6, notation**
Curve required if deflection exceeds	0.6	percent	max	algebraic difference in grade, FDOT Greenbook, Table 3-5
Maximum K for drainage	167	-	max	along curb and gutter
Stopping Sight Distance	**400**	**ft**	**-**	**FDOT Greenbook, Table 3-6 (assumes eye height of 3.5' and a 6" object height), grades of 2% or flatter**
	425	**ft**	**-**	**AASHTO, computed for design, grades of 2% or flatter**
Horizontal Clearance				
Lateral Clearance (with curb and gutter)**	**1.5**	**ft**	**min**	**Measured from face of curb to obstruction (non-breakaway)**
	4	ft	des min	FDOT Greenbook, Table 3-12

Table 5-2 Suburban Roadway Design Criteria

Criteria (items in bold are controlling criteria)	Value	Units	Min, Max or Des?	Notes/Sources
Clear Zone	18	ft	min	FDOT Greenbook, Table 3-12
Median				
Width	19.5	ft	min	FDOT Greenbook,Table 3-11, Urban Street
	22	ft	des	PPM standard; required width to store crossing P-vehicle
	30	ft	des	FIDG/Median Handbook; required width for U-turn within roadway width
Cross slope	10:1		des	FDOT Greenbook, 3.C.7.e.3
	6:1		max	FDOT Greenbook, 3.C.7.e.3
Roadside Ditches				
Depth below roadway shoulder	2	ft	min	Lake County Design Standards
Bottom width	4	ft	min	FDOT Greenbook 3.C.7.f.2, Lake County Design Standards states 3' min
Front slope	3:1	-	max	Lake County Design Standards - clear zone requirements control
Back slope	2:1	-	max	Lake County Design Standards - clear zone requirements control
Storm Sewer				
Pipe size	15	in	min	or equivalent, Lake County Design Standard
Cover	1.5	in	min	below base, Lake County Design Standard
Turn Lanes				
Deceleration Length	240	ft	min	FDOT Standard #301, includes taper length
Taper Length	50	ft	min	FDOT Standard #301, single left turns
	100	ft	min	FDOT Standard #301, double left turns
Right turn - length of taper	230	ft	des	Lake County Design Standards - 55 mph (no standard for speeds above 55 mph)
Right turn - length of storage in stop condition	195	ft	min	Lake County Design Standards
Right turn - length of storage in free-flow condition	170	ft	min	Lake County Design Standards
Left turn - length of taper	230	ft	des	assumes through-traffic shift of 6', Lake County Design Standards
Left turn - length of storage	195	ft	min	Lake County Design Standards
Intersections				
Intersection Angle	60	degrees	min	Lake County Design Standards
Corner radii	35	ft	min	without side parking, Lake County Design Standards
Length of tangent prior to stop bar on curved roadway	100	ft	min	Lake County Design Standards
Design vehicle	WB-50	-	-	Accommodate fully

5.4 URBAN ROADWAY DESIGN CRITERIA

The criteria to be used in the design of the urban roadway segment, from Lake Josephine Drive to US 27/441, are shown in Table 5-3. Controlling criteria are shown in bold type.

Table 5-3 Urban Roadway Design Criteria

Criteria (items in bold are controlling criteria)	Value	Units	Min, Max or Des?	Notes/Sources
Design Speed				
Selected Design Speed	**40**	**mph**	**-**	**Assumes maintenance of existing 35 mph posted speed limit**
Intended Posted Speed	35	mph	-	
Lane Widths				
Traveled Lanes	**11**	**ft**	**min**	**FDOT Greenbook; AASHTO allows 10'**
Turn Lanes	**11**	**ft**	**min**	**FDOT Greenbook; AASHTO allows 10'**
Bicycle Lanes	4	ft	min	Lake County Design Standards, II.D.1.d.
Sidewalks	4	ft	min	FDOT Greenbook
	5	ft	min	Lake County Design Standards, II.D.1.e.
Sidewalk-Curb buffer strip	2	ft	min	FDOT Greenbook
Border Width	10	ft	des	FIDG Table 3-7 (from PPM); Measured from shoulder point or flange to R/W; assumes bike lane at curb; can be 2' minimum where right-of-way severely restricted.
Shoulder Widths				
Outside	4	ft	min	for bike lane; not controlling, as this is an urban section
Median-side	NA	ft	min	urban section
Grades				
Design Profile Grade	**10**	**percent**	**max**	**AASHTO, rolling terrain, urban collector, can be up to 12% for short (<500 ft.) segments**
-	8	percent	des max	FDOT Greenbook, Table 3-4, rolling terrain for 40 mph design speed (collector)
-	5	percent	des max	FDOT Greenbook, Table 3-4, industrial roadway (significant (>15% trucks), rolling terrain)
Gutter Grade (if applicable)	0.3	percent	min	Lake County Design Standards (FDOT specified 0.5% desirable minimum for rolling terrain)
Intersection approach grade	3	percent	max	within 100 ft. of intersection, Lake County Design Standards
Cross Slope				
Design cross slope for unsuperelevated section	**2**	**percent**	**des**	**FDOT Greenbook, 3.C.7.b.2**
	1.5	**percent**	**min**	**FDOT Greenbook, 3.C.7.b.2**
	4	**percent**	**max**	**FDOT Greenbook, 3.C.7.b.2**
Shoulder cross slope	3	percent	min	FDOT Greenbook, 3.C.7.c.2
	8	percent	max	FDOT Greenbook, 3.C.7.c.2

Table 5-3 Urban Roadway Design Criteria

Criteria (items in bold are controlling criteria)	Value	Units	Min, Max or Des?	Notes/Sources
Shoulder Rollover	7	percent	max	algebraic difference in grade, FDOT Greenbook, 3.C.7.c.2
Superelevation				
Maximum Superelevation Rate	**5**	**percent**	**max**	**FDOT Design Standard #511, for Urban Highways and Streets**
Horizontal Alignment				
Min. radius with Superelevation	**10.75**	**degree**	**max**	**FDOT Design Standard #511 p.1**
	532.98	**ft**	**min**	
Min. radius with normal cross slope	**3.75**	**degree**	**max**	**FDOT Design Standard #511 p.1**
	1527.89	**ft**	**min**	
Vertical Alignment				
Minimum Crest K	44	-	min	AASHTO
	60	**-**	**min**	**FDOT Greenbook, Table 3-6**
Minimum Sag K	**64**	**-**	**min**	**AASHTO**
	60	-	min	FDOT Greenbook, Table 3-6
Minimum Length of Curve	**120**	**ft**	**min**	**FDOT Greenbook, Table 3-6, notation**
Curve required if deflection exceeds	0.8	percent	max	algebraic difference in grade, FDOT Greenbook, Table 3-5
Maximum K for drainage	167	-	max	along curb and gutter
Stopping Sight Distance	**275**	**ft**	**-**	**FDOT Greenbook, Table 3-6 (assumes eye height of 3.5' and a 6" object height), for grades of 2% or flatter**
	305	**ft**	**-**	**AASHTO, for grades of 2% or flatter**
Horizontal Clearance				
Lateral Clearance (with curb and gutter)**	**1.5**	**ft**	**min**	**Measured from face of curb to obstruction (non-breakaway)**
	4	ft	des min	FDOT Greenbook, Table 3-12
Clear Zone	10	ft	min	FDOT Greenbook, Table 3-12
Median				
Width	15.5	ft	min	FDOT Greenbook,Table 3-11
	22	ft	des	PPM standard; required width to store crossing P-vehicle
	30	ft	des	selected value, FIDG/Median Handbook; required width for U-turn within roadway width
Cross slope	10:1		des	FDOT Greenbook, 3.C.7.e.3
	6:1		max	FDOT Greenbook, 3.C.7.e.3
Roadside Ditches				
Depth below roadway shoulder	2	ft	min	Lake County Design Standards
Bottom width	4	ft	min	FDOT Greenbook 3.C.7.f.2, Lake County Design Standards states 3' min
Front slope	3:1	-	max	Lake County Design Standards - clear zone requirements control

Table 5-3 Urban Roadway Design Criteria

Criteria (items in bold are controlling criteria)	Value	Units	Min, Max or Des?	Notes/Sources
Back slope	2:1	-	max	Lake County Design Standards - clear zone requirements control
Storm Sewer				
Pipe size	15	in	min	or equivalent, Lake County Design Standard
Cover	1.5	in	min	below base, Lake County Design Standard
Turn Lanes				
Deceleration Length	155	ft	-	FDOT Standard #301, includes taper length
Taper Length	50	ft	-	FDOT Standard #301, single left turns
	100	ft	-	FDOT Standard #301, double left turns
Right turn - length of taper	190	ft	des	Lake County Design Standards
Right turn - length of storage in stop condition	135	ft	min	Lake County Design Standards
Right turn - length of storage in free-flow condition	110	ft	min	Lake County Design Standards
Left turn - length of taper	190	ft	des	assumes through-traffic shift of 6', Lake County Design Standards
Left turn - length of storage	135	ft	min	Lake County Design Standards
Intersections				
Intersection Angle	60	degrees	min	Lake County Design Standards
Corner radii	35	ft	min	without side parking, Lake County Design Standards
Length of tangent prior to stop bar on curved roadway	100	ft	min	Lake County Design Standards
Design vehicle	SU	-	-	Accommodate fully - check WB-50 to turn with encroachment except at US 27/441
	WB-50	-	-	Accommodate fully at US 27/441

6.0 TRAFFIC

6.1 EXISTING INTERSECTIONS

There is currently one signalized intersection on CR 466A within the project limits that operates in a steady state. This signal is located at the CR 466A/Dixie Avenue intersection. A flashing signal at the CR 466A/CR 468 intersection flashes red for traffic on CR 468 and yellow for traffic on CR 466A. The only intersection not on CR 466A that was included in this study was the signalized intersection of Dixie Avenue with US 27/441. Figure 6-1 illustrates the existing geometry of selected intersections included in this study.

6.2 MULTI-MODAL TRANSPORTATION SYSTEM CONSIDERATIONS

The project runs through an area of northwest Lake County that is transitioning from rural to urban. The private automobile is the primary mode of transportation on CR 466A and is currently the only mode of motorized transportation available. Some limited sidewalk facilities are currently provided along CR 466A. The design of CR 466A will incorporate the provision of sidewalks and bicycle lanes within the existing and proposed right-of-way.

6.3 TRAFFIC ANALYSIS ASSUMPTIONS

6.3.1 Forecast Horizon

Based on preliminary travel demand forecasts, improvements to CR 466A were estimated to be needed prior to 2012. Therefore, 2012 was established as the opening year for the improvements to CR 466A. The design period for roadway improvements is typically 20 years after the completion of construction. Therefore, the design year was established as 2032. Worksheets documenting the establishment of the opening and design years for this study are provided in Appendix B of the CR 466A (Miller Street) Design Traffic Study.

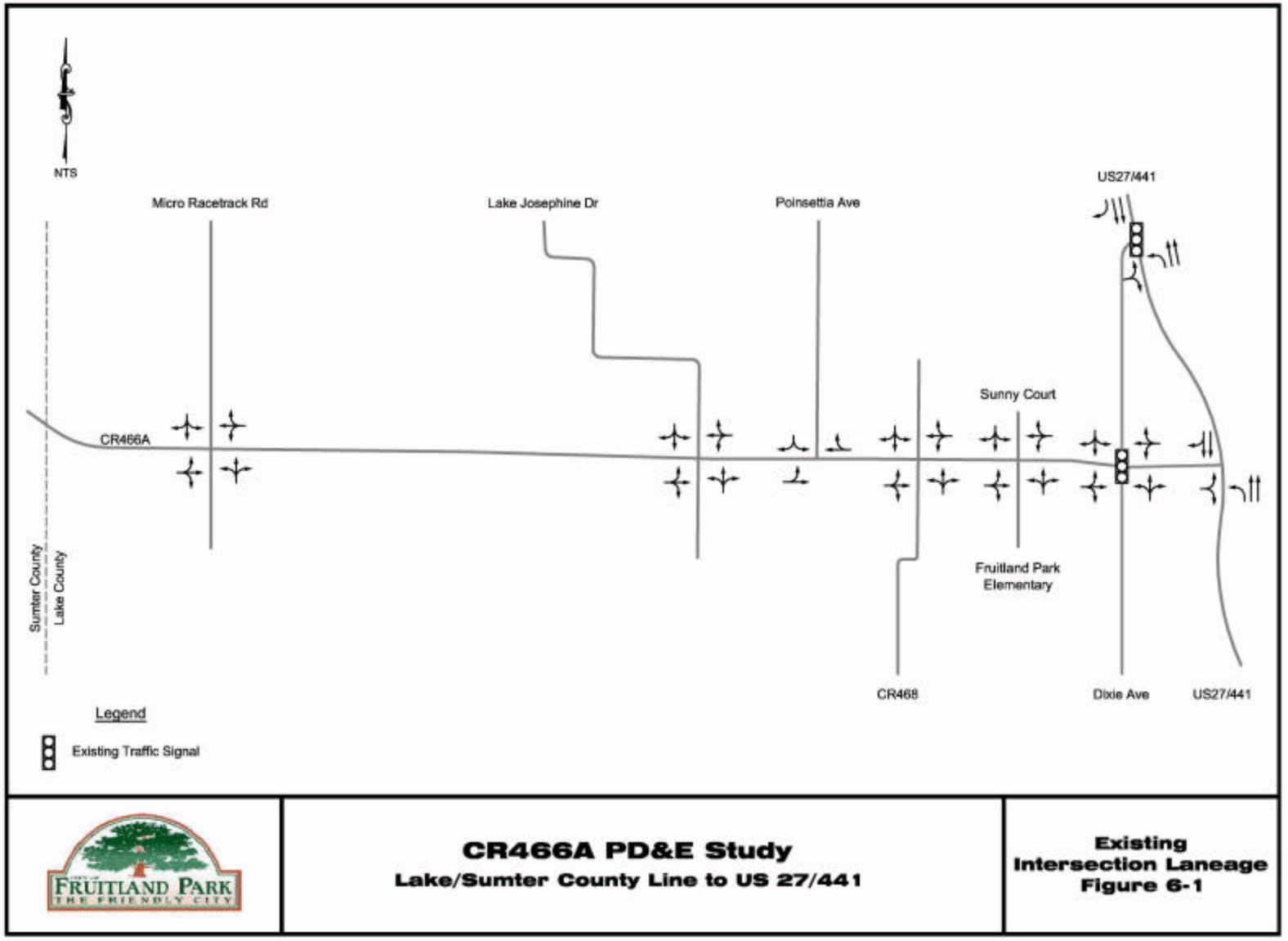
6.3.2 Design Traffic Parameters

Existing travel characteristics and information from the FDOT Roadway Characteristics Inventory (RCI) were used to determine the design traffic parameters (K30, D30, T24) for the project.

6.3.2.1 Design Hour Factor

The design hour factor (K30) used in this study was 10.15. This factor was based on 2001 traffic count data provided by the FDOT from Telemetry Traffic Monitoring Sites (TTMS) located throughout Lake County. The value of this factor was checked for reasonableness by comparing the K100 value (9.71) derived from the same FDOT count stations that the K30 factor was

Figure 6-1 Existing Intersection Laneage



derived from to the peak-to-daily ratios for the machine counts that were performed during the peak season (8.4 to 9.7). These values are generally consistent, indicating that the use of a K30 factor of 10.15 is reasonable for this study.

The K30 factor of 10.15 was used to develop design hour volumes for P.M. peak hour conditions. To develop design hour volumes for A.M. peak hour conditions, the K30 factor was adjusted based on the current ratio of P.M. peak hour traffic to A.M. peak hour traffic within the study area. The resulting A.M. design hour factor was 9.135.

6.3.2.2 Design Hour Directional Factor

The design hour directional factor (D30) used in this study was 58.08. This factor was based on 2001 traffic count data provided by the FDOT from TTMS located throughout Lake County. The value of this factor was checked for reasonableness by comparing it to the directional splits from the machine counts, which averaged approximately 60.8 percent during the A.M. peak hour and 58.3 percent during the P.M. peak hour. These values are generally consistent, indicating that the use of a D30 factor of 58.08 is reasonable for this study.

Peak directions of travel were determined from current peak hour traffic conditions. The current peak directions of travel are eastbound and southbound during the A.M. peak hour and westbound and northbound during the P.M. peak hour.

6.3.2.3 Truck Factor

Truck counts were not performed on CR 466A to identify the existing number and percentage of trucks using this road, as the future truck percentage could vary substantially from existing conditions depending on the specific design of this roadway improvement and the potential for developing additional east-west corridors as discussed in Section 7.4. Nonetheless, truck traffic on CR 466A is anticipated to be relatively low as the road lies within a triangle formed by other roads that provide for direct travel to, between, and through Leesburg, Ocala, and I-75, including SR 44 to the south, US 301 to the west, and US 27/441 to the east. In consideration of the above, a truck factor of 4 percent was identified for use in this study for CR 466A in consultation with the Lake County Department of Public Works.

6.4 EXISTING TRAFFIC VOLUMES

Existing (2003) traffic volumes were determined through manual turning movement counts performed in February 2003 and by machine traffic counts performed in February 2003, February and March 2002, and summer 2001. Annual average daily traffic (AADT) volumes were estimated by factoring the machine counts by FDOT seasonal adjustment factors and, in the case of State Roads, by FDOT axle factors. In addition, the counts performed prior to 2003 were adjusted to represent 2003 traffic volumes using historical growth trends. The intersection turning movement counts were adjusted to reflect peak season conditions by factoring these counts by FDOT peak season factors. The turning movement and machine counts are provided

in Appendix C of the CR 466A (Miller Street) Design Traffic Study, along with the factors used to estimate 2003 conditions. 2003 AADT volumes and A.M. and P.M. peak hour, peak season intersection volumes are illustrated in Figure 6-2 through Figure 6-4, respectively.

6.5 EXISTING INTERSECTION LEVELS OF SERVICE

Level of service/capacity analyses for existing 2003 peak hour, peak season conditions were performed for the following intersections:

- CR 466A at CR 468
- CR 466A at Dixie Avenue
- CR 466A at US 27/441
- Dixie Avenue at US 27/441
- CR 466A at Fruitland Park Elementary

These analyses were performed using methodologies documented in the Highway Capacity Manual (TRB, 2000) and current signal timings where applicable. Table 6-1 summarizes the intersection Level of Service analysis for the CR 466A corridor. Worksheets documenting the intersection Level of Service analysis are provided in Appendix D of the CR 466A (Miller Street) Design Traffic Study, along with existing signal timing data.

As shown in Table 6-1, all of the analyzed intersections within the CR 466A corridor are currently estimated to operate at acceptable levels of service, with the exception of the eastbound approach to the intersection of CR 466A with US 27/441. During the A.M. peak hour, this approach is estimated to operate at Level of Service F, with an average delay of 61.2 seconds per vehicle. This condition is caused by the lack of gaps in traffic flow on US 27/441 available to motorists turning left onto US 27/441. However, this condition does not cause congestion on CR 466A, as evidenced by the volume-to-capacity ratio of 86 percent, because relatively few vehicles turn left onto US 27/441 at this location. An alternate means of access to northbound US 27/441 is available via the traffic signal at the intersection of Dixie Avenue with US 27/441.

6.6 EXISTING ROADWAY SEGMENT LEVELS OF SERVICE

A Level of Service analysis was performed for CR 466A for existing (2003) conditions based on generalized daily capacities documented in the FDOT's 2002 Quality/Level of Service Handbook. The 2003 AADT volumes on CR 466A were compared to the daily capacity thresholds for a major city/county two-lane signalized roadway in a transitioning area without turn-lanes. The resultant operating condition of CR 466A, within the project limits, was Level of Service C. Worksheets documenting the roadway segment Level of Service analysis are provided in Appendix E of the CR 466A (Miller Street) Design Traffic Study.

Figure 6-2 Existing 2003 Annual Average Daily Traffic Volumes

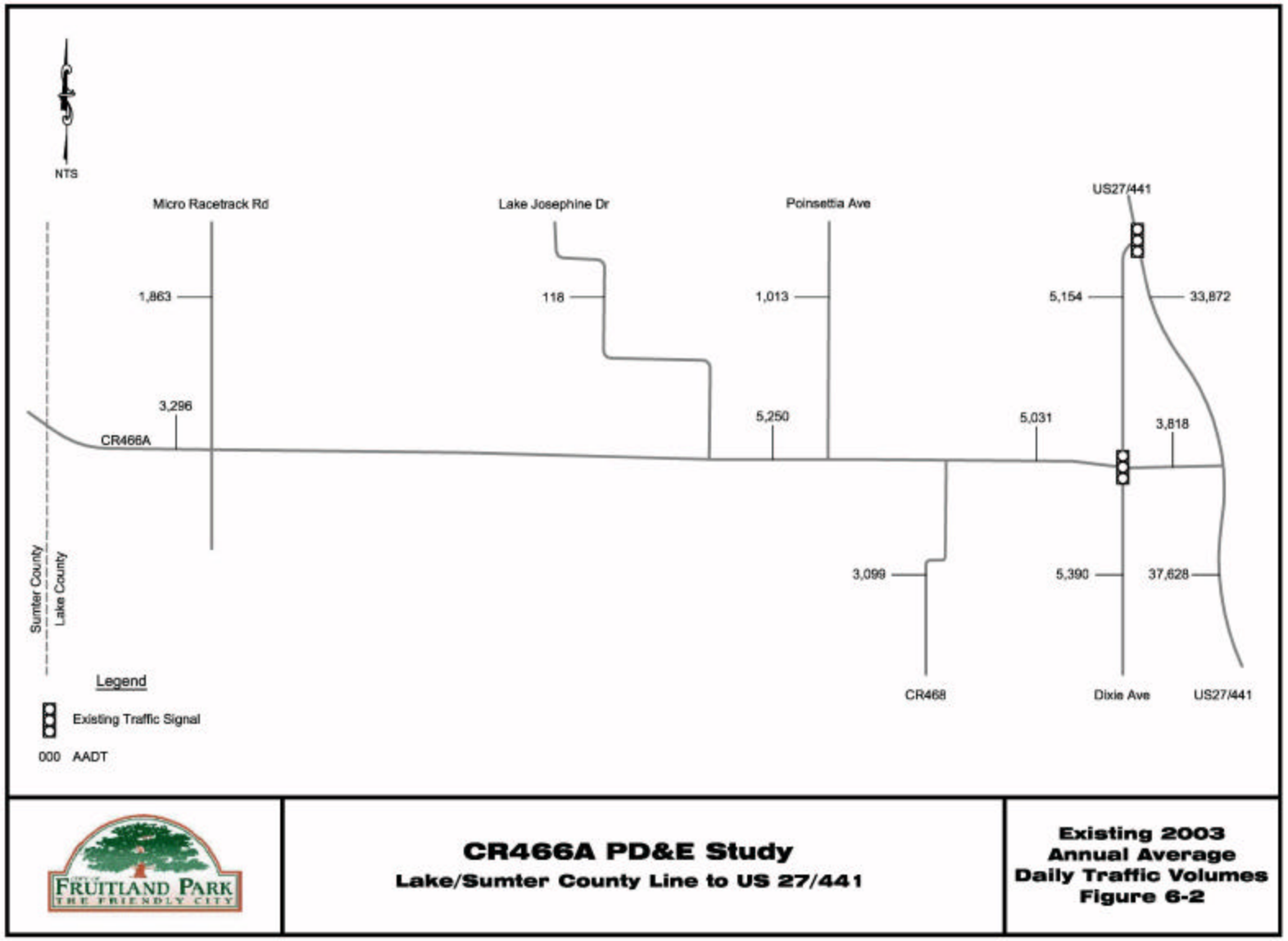


Figure 6-3 Existing 2003 A.M. Peak Hour, Peak Season Intersection Volumes

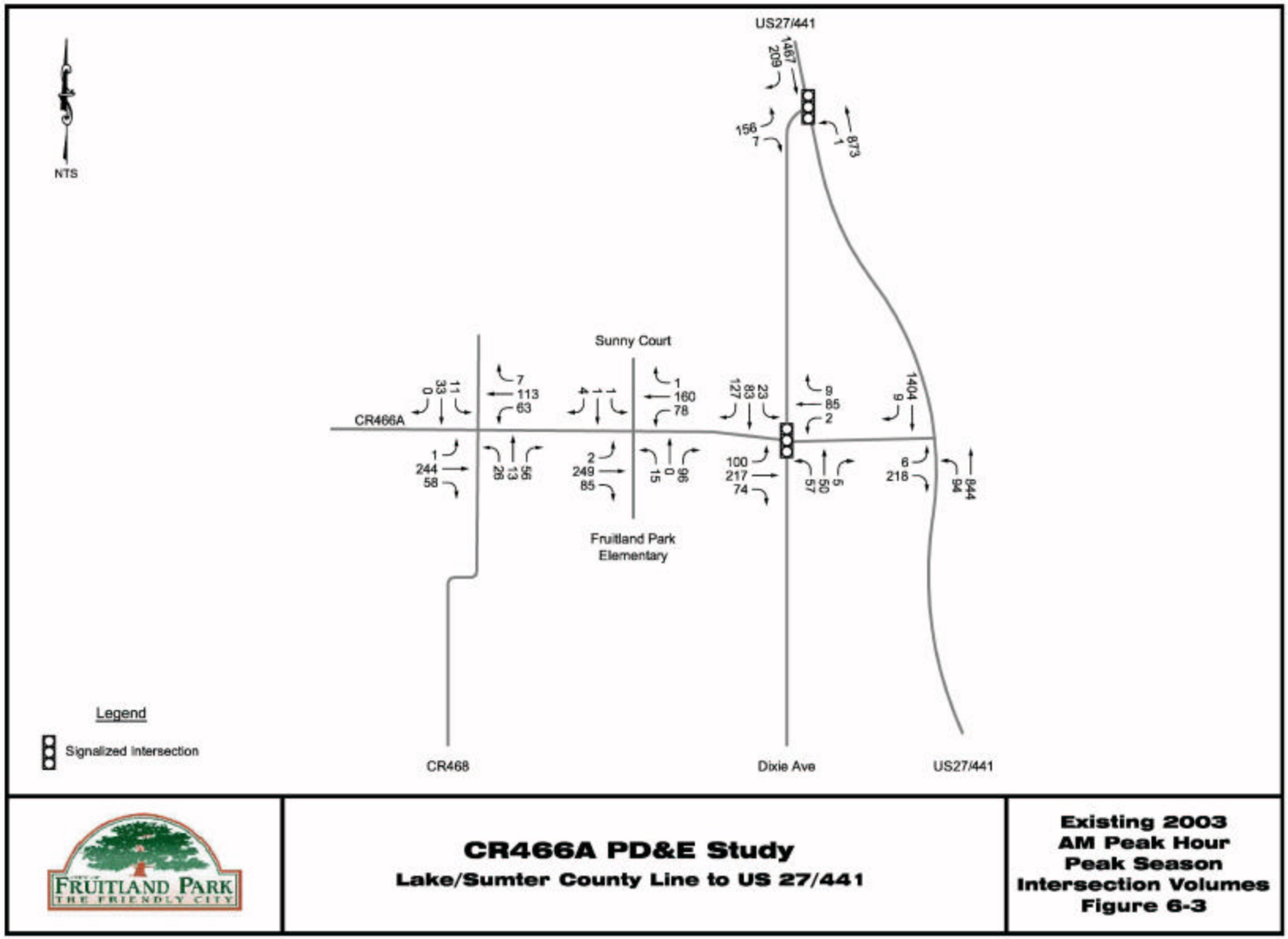


Figure 6-4 Existing 2003 P.M. Peak Hour, Peak Season Intersection Volumes

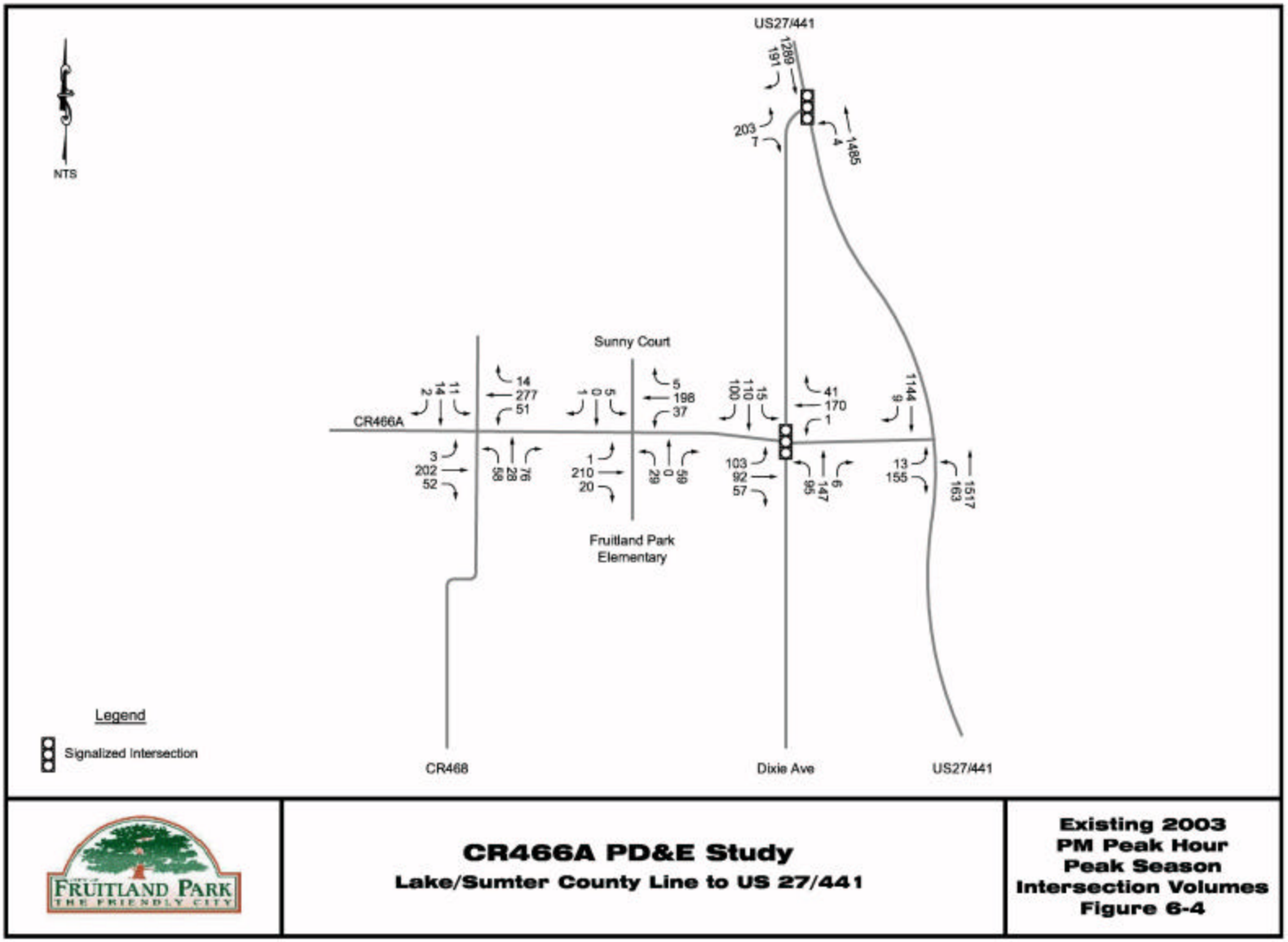


Table 6-1 Existing Peak Hour, Peak Season Intersection Level of Service Summary

Intersection	Measure	A.M. Peak Hour					P.M. Peak Hour				
		Signalized	Unsignalized				Signalized	Unsignalized			
			Minor Street		Major Street Left-Turn			Minor Street		Major Street Left-Turn	
			NB/EB	SB/WB	EB to NB / NB to WB	WB to SB / SB to EB		NB/EB	SB/WB	EB to NB / NB to WB	WB to SB / SB to EB
CR 466A at CR 468	V/C RATIO	n/a	0.19	0.13	0.001	0.06	n/a	0.34	0.08	0.002	0.04
	DELAY (sec/veh)	n/a	13.3	16.0	0.0	3.1	n/a	16.3	16.9	0.1	1.5
	LOS	n/a	B	C	A	A	n/a	C	C	A	A
CR 466A at Dixie Avenue	V/C RATIO	0.49	n/a	n/a	n/a	n/a	0.48	n/a	n/a	n/a	n/a
	DELAY (sec/veh)	8.5	n/a	n/a	n/a	n/a	7.9	n/a	n/a	n/a	n/a
	LOS	A	n/a	n/a	n/a	n/a	A	n/a	n/a	n/a	n/a
CR 466A at US 27/441	V/C RATIO	n/a	0.86	n/a	0.29	n/a	n/a	0.46	n/a	0.30	n/a
	DELAY (sec/veh)	n/a	61.2	n/a	18.2	n/a	n/a	22.9	n/a	14.1	n/a
	LOS	n/a	F	n/a	C	n/a	n/a	C	n/a	B	n/a
CR 466A at Fruitland Elementary*	V/C RATIO	n/a	0.24	0.02	0.001	0.08	n/a	0.22	0.03	0.001	0.04
	DELAY (sec/veh)	n/a	13.1	13.0	0.1	3.3	n/a	13.5	16.8	0.0	1.6
	LOS	n/a	B	B	A	A	n/a	B	C	A	A
Dixie Avenue at US 27/441	V/C RATIO	0.73	n/a	n/a	n/a	n/a	0.69	n/a	n/a	n/a	n/a
	DELAY (sec/veh)	9.6	n/a	n/a	n/a	n/a	9.7	n/a	n/a	n/a	n/a
	LOS	A	n/a	n/a	n/a	n/a	A	n/a	n/a	n/a	n/a

*Note: P.M. peak hour analysis for Fruitland Elementary performed for 2:30 P.M. to 3:30 P.M. period.
V/C Ratio: Volume to Capacity Ratio
LOS: Level of Service

6.7 FUTURE TRAFFIC PROJECTIONS

The Northwest District FSUTMS travel demand forecasting model, developed by the FDOT, was used as the basis for forecasting future year volumes for this study. The 1999 validation year model (99h) and the 2020 (20h) model were used to develop models for the 2012 opening year and the 2032 design year.

6.7.1 Model Highway Network

The Northwest District model was originally developed to forecast travel demands for the then-proposed Villages development, located in northwest Lake County, northeast Sumter County, and southern Marion County. Modifications to the traffic analysis zones representing The Villages were not necessary, as these traffic analysis zones were already adequately refined for the purposes of sub-area modeling. In addition, it was not deemed necessary to refine the traffic analysis zones in the vicinity of CR 466A between the Lake/Sumter County line and the City of Fruitland Park, inclusive, as this area is largely undeveloped or has relatively low development densities.

The 2012 opening year model network was developed by scaling-back the 2020 model network as follows:

- Differences between the 1999 validation year highway network and the 2020 highway network were identified within the geographic area approximately bounded by US 301on the west, US 27/441 on the east, CR 42 on the north, and SR 44 on the south.

- The existing (2003) road network number of lanes was confirmed through field review.

- Planned improvements to the road system within the geographic area described above were identified by reviewing Lake County's Transportation Construction Program (2003-2007), Sumter County's Capital Improvement Program (2002/03-2006/07), Marion County's Capital Improvement Program (2002/03-2006/07), and the FDOT's Five-Year Work Plan. Improvements with construction beginning through 2007 were assumed to be committed improvements.

- Roadways in both the 1999 and 2020 highway networks with the same number of lanes were not revised.

- Roadway improvements that were not included in the 1999 or 2020 highway networks, but were identified as committed improvements, were added to the highway network. This included the four-laning of CR 466 from US 301 to US 27/441.

- Roadway improvements that were not included in the 1999 highway network, but were included in the 2020 highway network, were dealt with as follows:

- If the roadway improvement was identified as a committed improvement with the same number of lanes as in the 2020 highway network, it was not revised. This included the four-laning of SR 44 from US 301 to CR 468, the four-laning of CR42 from US 301 to US 27/441, and the realignment of the Florida Turnpike/I-75 interchange.

- If the roadway improvement was identified as a committed improvement with a different number of lanes than in the 2020 highway network, it would have been revised to reflect the committed number of lanes. However, there were no such cases.

- If the roadway improvement was not identified as a committed improvement, and was not a proposed road internal to The Villages, it was removed from the highway network. This included the six-laning of US 27/441 from Dixie Avenue (south) to the Lake/Sumter County line, the six-laning of US 441 from US 27 to SR 44, the six-laning of US 27 from CR33 to CR25A(south), the four-laning of CR 33 from CR470 to US 27, and the six-laning of I-75 from SR50 to the Florida Turnpike.

In addition to the above modifications, the following existing roads were added to the 2012 opening year model:

- Lake Ella Road from Cherry Lake Road to US 27/441.
- Micro Racetrack Road from CR 466A to Lake Ella Road.
- Cherry Lake Road from Lake Ella Road to CR 466.

The 2032 design year model network was adapted directly from the 2020 model network with the following exceptions:

- Roadways that were not included in the 2020 highway network, but were identified as committed improvements, were added to the highway network. This included the four-laning of CR 466 from US 301 to US 27/441.

- The roads added to the 2012 highway network, as identified above, were also added to the 2032 highway network. These roads included Lake Ella Road, Micro Racetrack Road, and Cherry Lake Road.

CR 466A was modeled as a four-lane arterial roadway from Buena Vista Boulevard to US 27/441 in both the 2012 and 2032 highway networks, modified from its original 2020 coding as a four-lane collector roadway. The two-lane collector coding of CR 466A from US 301 to Buena Vista Boulevard was not modified in the model used to forecast design traffic volumes. However, a test run was conducted to evaluate how traffic volumes may change on CR 466A if it were to be improved to a four-lane arterial from US 301 to US 27/441. The results of this test run are discussed in Section 6.7.5 of this report.

Plots of the 1999, 2012, 2020, and 2032 model networks are provided in Appendix F of the CR 466A (Miller Street) Design Traffic Study.

6.7.2 Model Socioeconomic Data

Socioeconomic data for the 2012 and 2032 models were developed as follows:

- If a given traffic analysis zone was not in The Villages, the 2012 socioeconomic data for that traffic analysis zone were developed by interpolating between the 1999 and 2020 data, and the 2032 socioeconomic data for that traffic analysis zone were developed by extrapolating from the 1999/2020 data. The resultant socioeconomic data for traffic analysis zones within the CR 466A corridor were evaluated to ensure that estimated build-out levels were not exceeded.

- If a given traffic analysis zone was in The Villages, the 2012 and 2032 socioeconomic data for that traffic analysis zone were developed based on the amount and type of development expected to occur within that traffic analysis zone through Phase II of The Villages build-out and ultimate Villages build-out, respectively. Housing and employment data for The Villages was obtained through its Development of Regional Impact Substantial Deviation submittal, dated July 2001. Housing data were input into the model directly, while employment data were input to the model based on employee per square foot ratios derived from Trip Generation (Institute of Transportation Engineers, 6th edition, 1997). Employees were then classified as commercial, service, or industrial, based upon their associated land use.

The socioeconomic data developed for 2012 and 2032, and associated worksheets, are provided in Appendix G of the CR 466A (Miller Street) Design Traffic Study.

6.7.3 Travel Demand Forecasts

The 2012 and 2032 models, as described above, were used as a basis for forecasting AADT for this study. Output model volumes were adjusted from peak season weekday average daily traffic (PSWADT) to AADT using a model output conversion factor (MOCF) of 0.94, provided by the FDOT. Additional model volume refinements were made consistent with procedures identified in NCHRP Report 255, Highway Traffic Data for Urbanized Area Project Planning and Design (TRB, 1982). Specifically, volume smoothing techniques were applied to the output model volumes. The volume smoothing process considers both validation year model volumes and validation year traffic count volumes in adjusting forecasted model volumes.

In addition, manual adjustments were made to the PRODS.yya and ATTRS.yya intermediate output model files to explicitly account for the trip generation characteristics of retirees within The Villages. This was accomplished by replacing the productions and attractions calculated by the Northwest District model's GEN module for traffic analysis zones within The Villages that were entirely residential (each traffic analysis zone within The Villages was populated with either residential units or employment). The productions and attractions within these zones were replaced with values calculated using equations from the Tampa Bay Regional Planning Model

(TBRPM). The TBRPM trip generation model is a lifestyles model that explicitly accounts for the trip generation characteristics of retirees, as well as working families with children and working families without children. Worksheets documenting these calculations and the adjustments to the PRODS.yya and ATTRS.yya model files are provided in Appendix H of the CR 466A (Miller Street) Design Traffic Study. Figure 6-5 and Figure 6-6 illustrate the 2012 and 2032 AADT forecasts, respectively.

6.7.4 Comparison of Historical Trend to Forecasted Model Volumes

The 2012 and 2032 AADT forecasts from the Northwest District models were compared to a historically-based traffic volume growth trend for CR 466A. The model-forecasted traffic volume was broken down into the component attributable to local growth and the component attributable to The Villages. Figure 6-7 illustrates this comparison.

As shown in Figure 6-7, the historical average annual growth trend of approximately 5.9 percent per year closely parallels the model-forecasted CR 466A local traffic volumes. The 2012 and 2032 model-forecasted local volumes are only 21 percent greater and 1 percent less than the historical trend predicted volumes, respectively.

6.7.5 Alternative Laneage Evaluation

An evaluation was performed to estimate the effect on the portion of CR 466A within the project limits if the road were improved to a four-lane arterial from US 301 to US 27/441. This evaluation was conducted using the 2032 design year model and consisted of comparing the unadjusted output volumes between (1) a model network that had CR 466A coded as a two-lane collector from US 301 to Buena Vista Boulevard and as a four-lane arterial from Buena Vista Boulevard to US 27/441, and (2) a model network that had CR 466A coded as a four-lane arterial from US 301 to US 27/441. The results of this evaluation indicated that improving CR 466A to a four-lane arterial between US 301 and Buena Vista Boulevard would not significantly impact the traffic volumes on CR 466A within the project limits, as the model predicted traffic volumes to increase on this segment of CR 466A by no more than 1 percent. Plots of the model networks used for this evaluation are provided in Appendix F of the CR 466A (Miller Street) Design Traffic Study.

Figure 6-5 Opening Year 2012 AADT Forecast

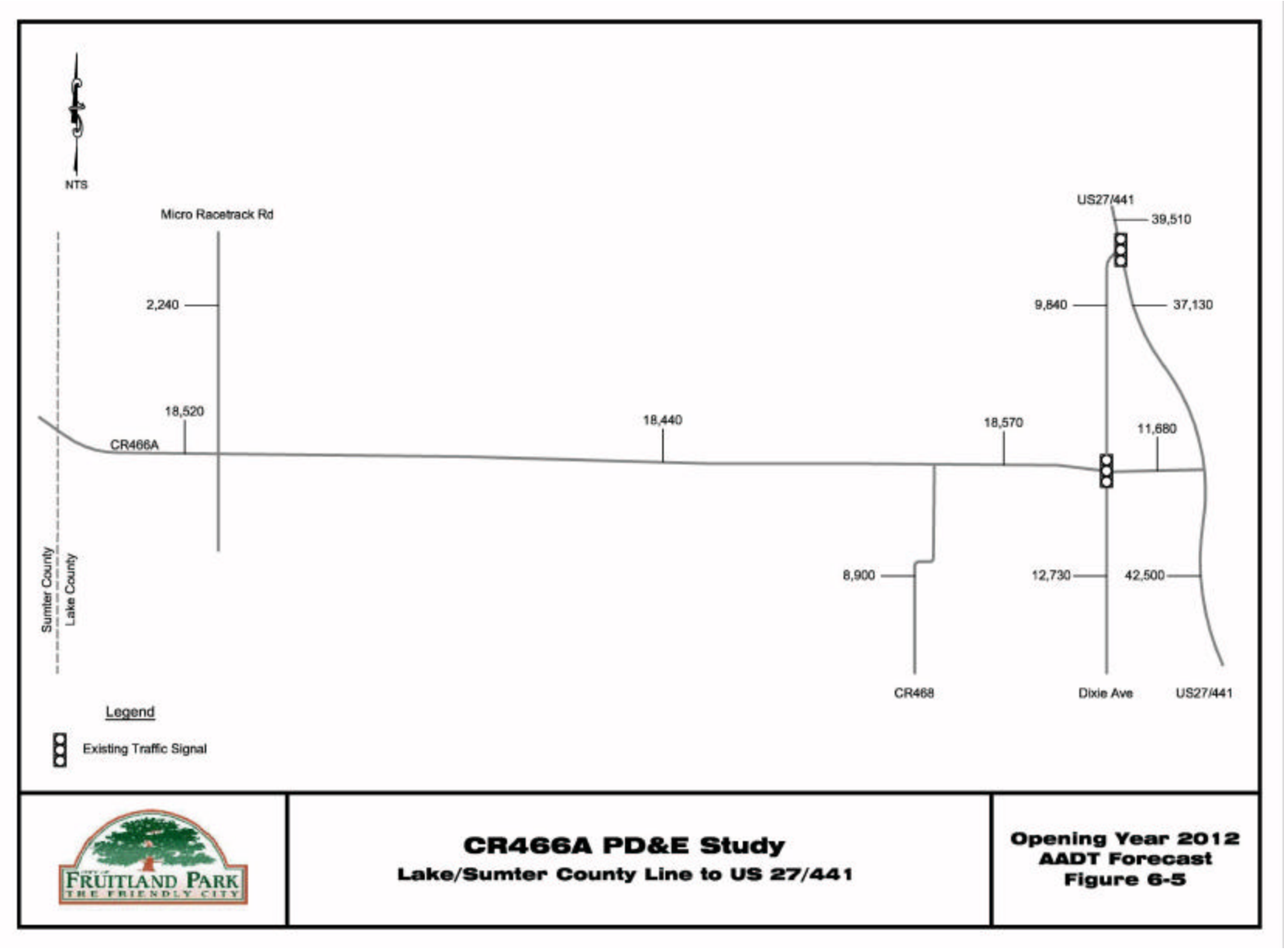


Figure 6-6 Design Year 2032 AADT Forecast

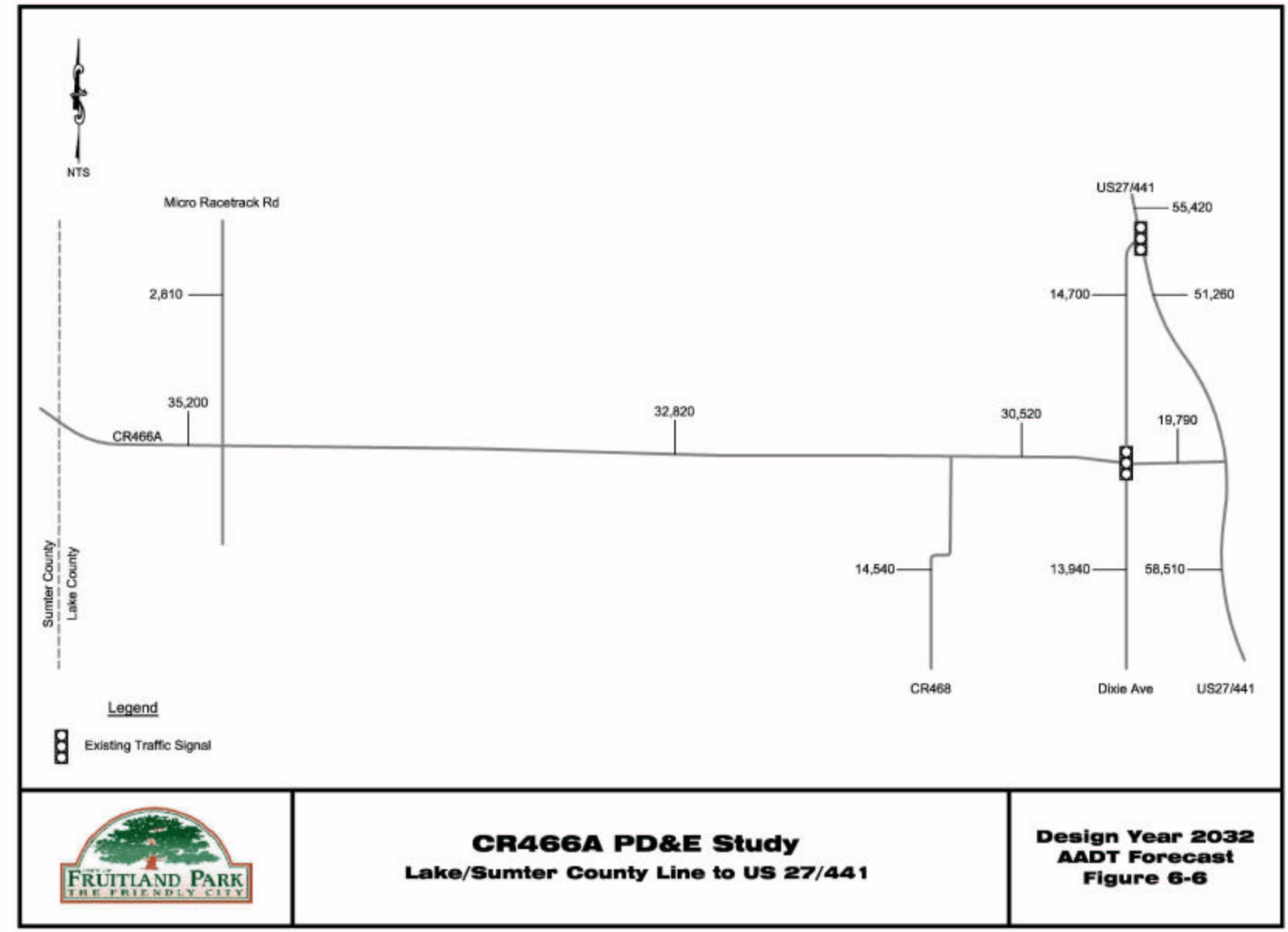
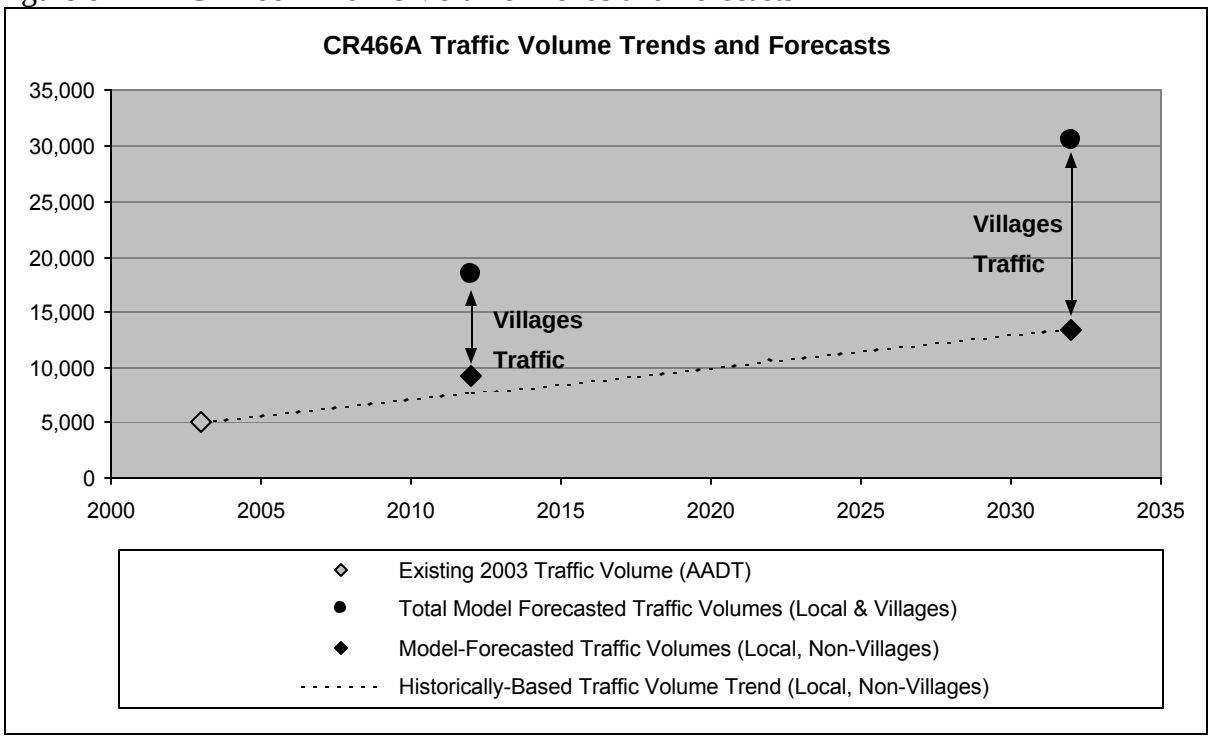


Figure 6-7 CR 466A Traffic Volume Trends and Forecasts



6.7.6 No-Build Traffic Volume Forecast

CR 466A traffic volumes were forecast for the No-Build condition using the 2012 and 2032 models with CR 466A coded as a two-lane collector from Buena Vista Boulevard to US 27/441 (i.e., not improved from its existing condition). The output model volumes for the No-Build condition were adjusted to AADT using a model output conversion factor (MOCF) of 0.94. However, these volumes were not further adjusted using the volume smoothing procedure as this procedure is not applicable to roadway segments with forecasted volumes that exceed the segment's capacity. Further discussion of No-Build operating conditions is contained in Sections 6.8.1 and 6.9.1 of this report. Figure 6-8 and Figure 6-9 illustrate the 2012 and 2032 No-Build AADT forecasts, respectively. Plots of the No-Build model networks used for this evaluation are provided in Appendix F of the CR 466A (Miller Street) Design Traffic Study.

6.7.7 Design Hour Volumes

The K30 and D30 factors discussed in Section 6.3 were applied to the 2012 and 2032 AADT volume forecasts illustrated in Figure 6-5 and Figure 6-6 to estimate directional A.M. and P.M. peak hour design volumes for the Build alternatives for the following intersections:

- CR 466A at CR 468.
- CR 466A at Dixie Avenue.
- CR 466A at US 27/441.
- Dixie Avenue at US 27/441.
- CR 466A at Morse Boulevard.

Figure 6-8 No-Build 2012 AADT Forecast

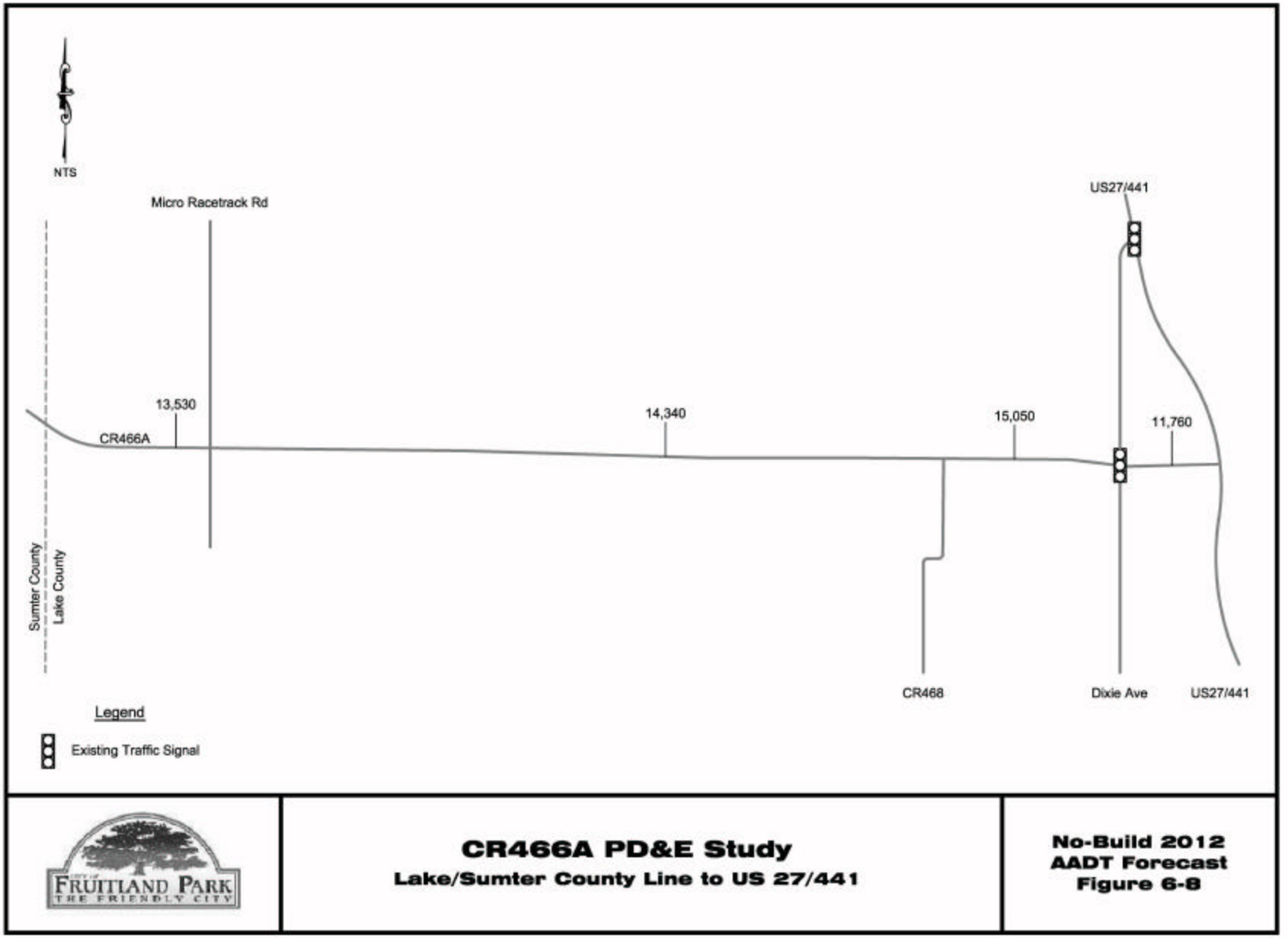
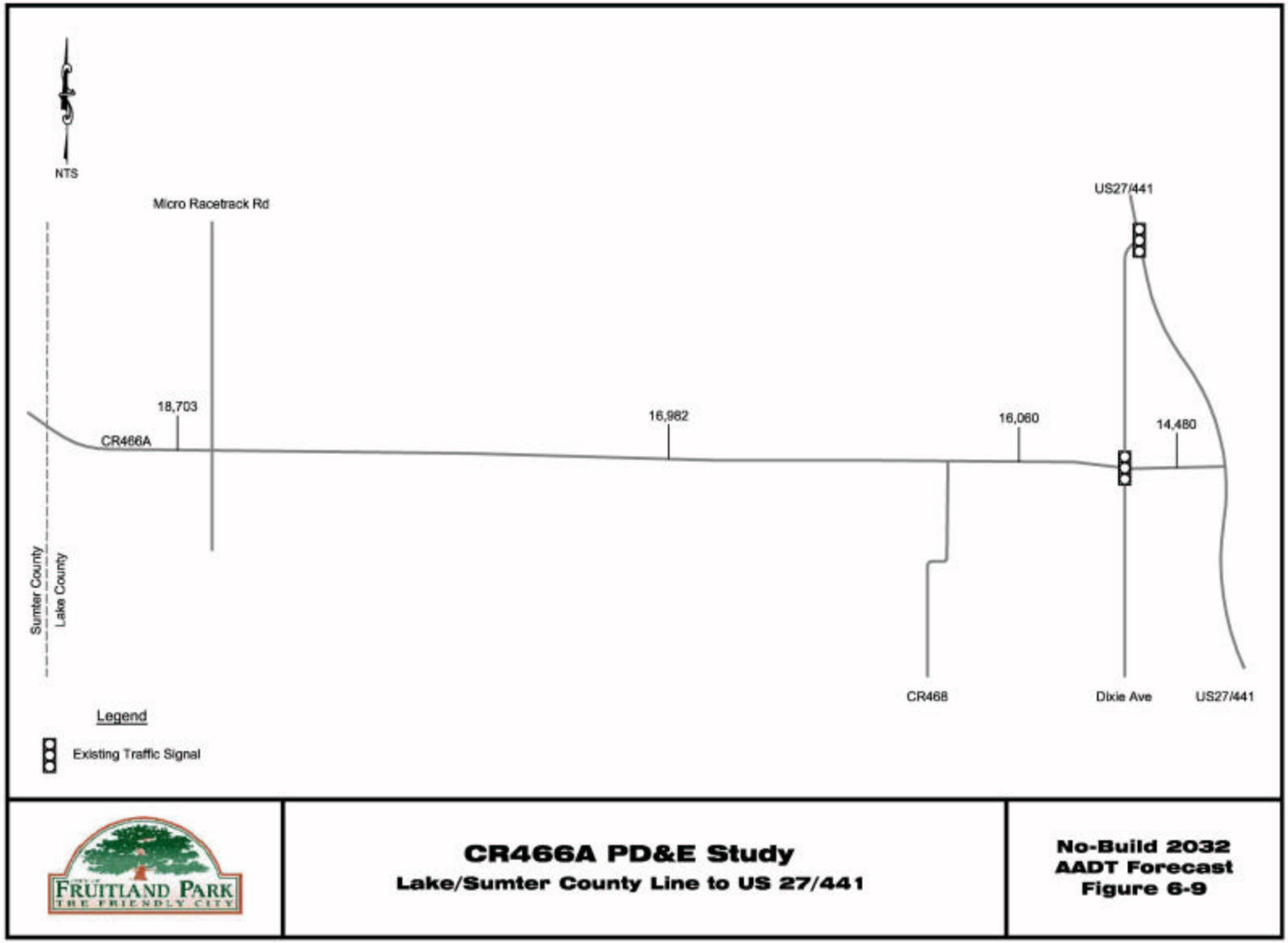


Figure 6-9 No-Build 2032 AADT Forecast



The forecasted peak hour design year volumes were converted to intersection turning movement volumes using procedures identified in NCHRP Report 255, Highway Traffic Data for Urbanized Area Project Planning and Design (TRB, 1982), that involve an iterative procedure which balances inbound and outbound intersection flows. The iterative procedure was not applied to the CR 466A at Morse Boulevard intersection, as this intersection does not currently exist. Engineering judgment was applied to estimate the turning movement volumes for this intersection. Further adjustments were made to the volumes at the three eastern terminus intersections (CR 466A at Dixie Avenue, CR 466A at US 27/441, and Dixie Avenue/US 27/441) to reflect the current traffic circulation pattern in which most motorists traveling to/from the north use the Dixie Avenue at US 27/441 intersection and most motorists traveling to/from the south use the CR 466A at US 27/441 intersection. The turning movement volumes assigned to these intersections represent a worst-case condition in which no motorists traveling to/from the north use the CR 466A at US 27/441 intersection and no motorists traveling to/from the south use the Dixie Avenue at US 27/441 intersection.

Figure 6-10 and Figure 6-11 illustrate the 2012 opening year A.M. and P.M. peak hour design intersection turning movement volumes, respectively. Figure 6-12 and Figure 6-13 illustrate the 2032 design year A.M. and P.M. peak hour design intersection turning movement volumes, respectively. Worksheets documenting the development of design hour intersection volumes are provided in Appendix I of the CR 466A (Miller Street) Design Traffic Study.

In addition to the current eastern terminus traffic circulation pattern, two eastern terminus alternative concepts were analyzed. One concept would involve routing all traffic to US 27/441 via only CR 466A (Concept Three), and the other concept would involve routing all traffic to US 27/441 via only Dixie Avenue (Concept Two). Figure 6-14 and Figure 6-15 illustrate the 2012 opening year A.M. and P.M. peak hour design intersection turning movement volumes, respectively, for the eastern terminus alternative concepts. Figure 6-16 and Figure 6-17 illustrate the 2032 design year A.M. and P.M. peak hour design intersection turning movement volumes, respectively, for the eastern terminus alternative concepts.

6.8 FUTURE INTERSECTIONS LEVELS OF SERVICE

6.8.1 No-Build Levels of Service

Intersection Level of Service/Capacity analyses were not performed for the No-Build condition because volume-to-capacity ratios for CR 466A were estimated to be well above 1.0 as documented in Section 6.9.1 of this report.

Figure 6-10 Opening Year 2012 A.M. Peak Hour Intersection Volumes

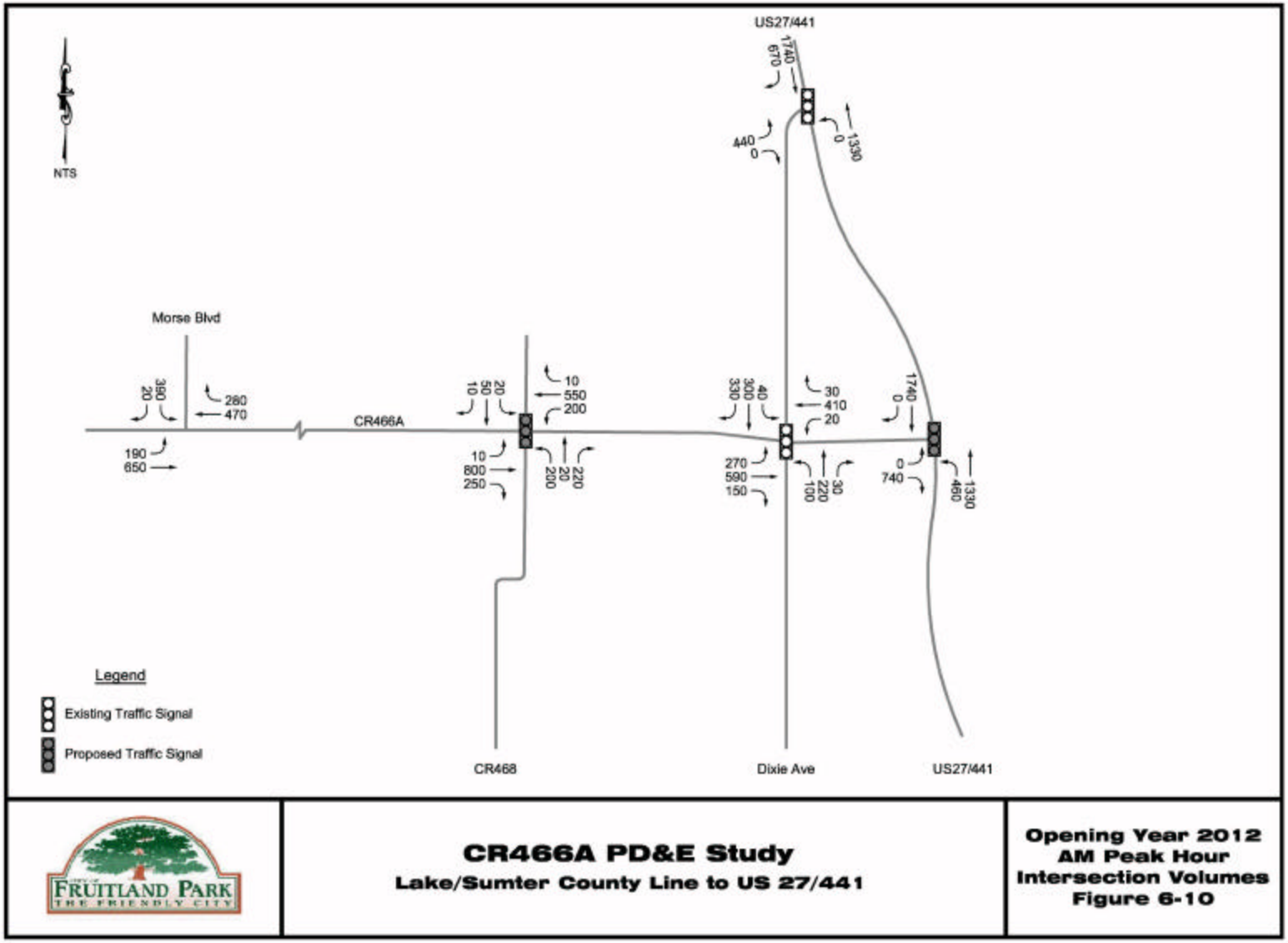


Figure 6-11 Opening Year 2012 P.M. Peak Hour Intersection Volumes

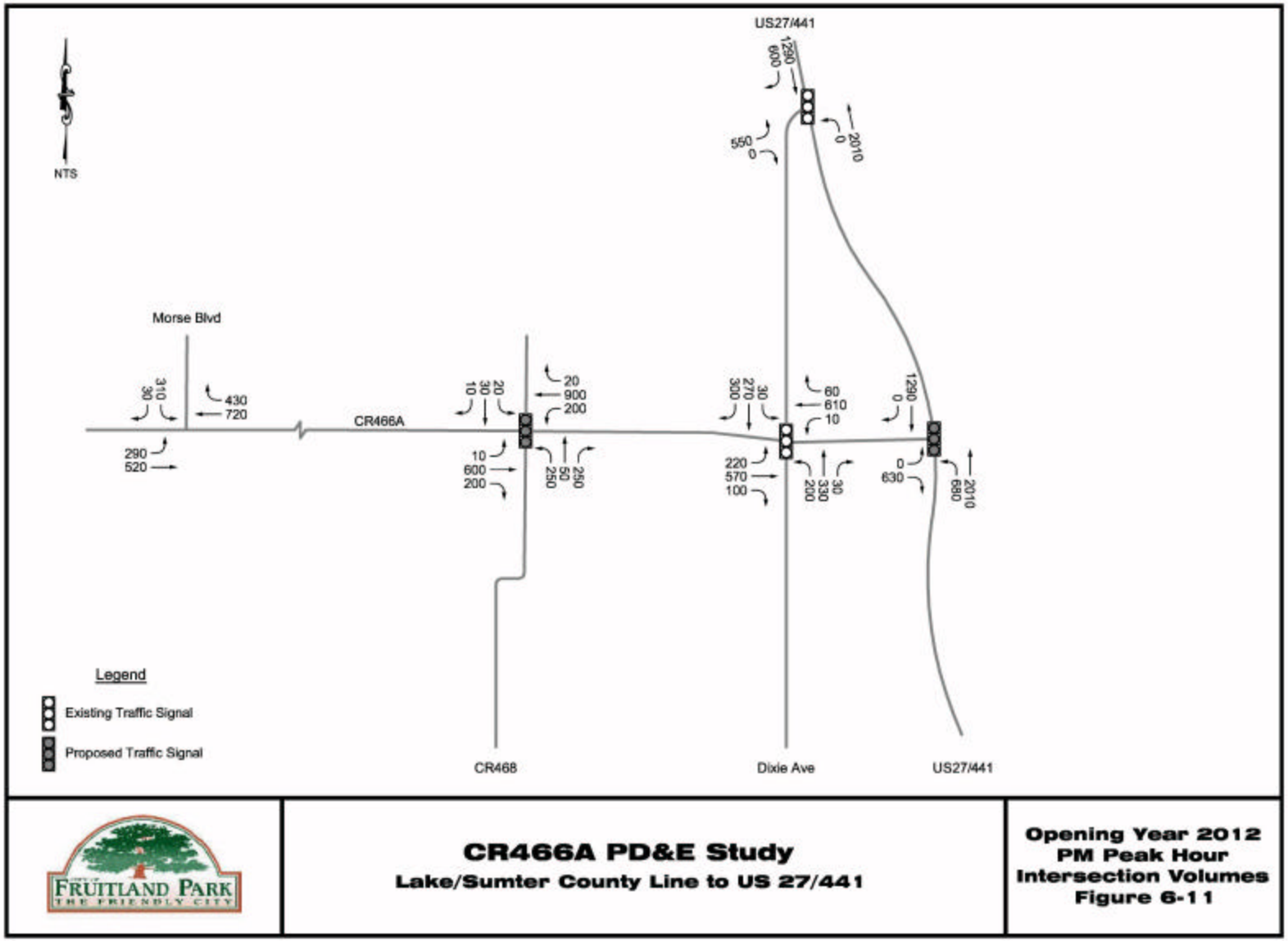


Figure 6-12 Opening Year 2032 A.M. Peak Hour Intersection Volumes

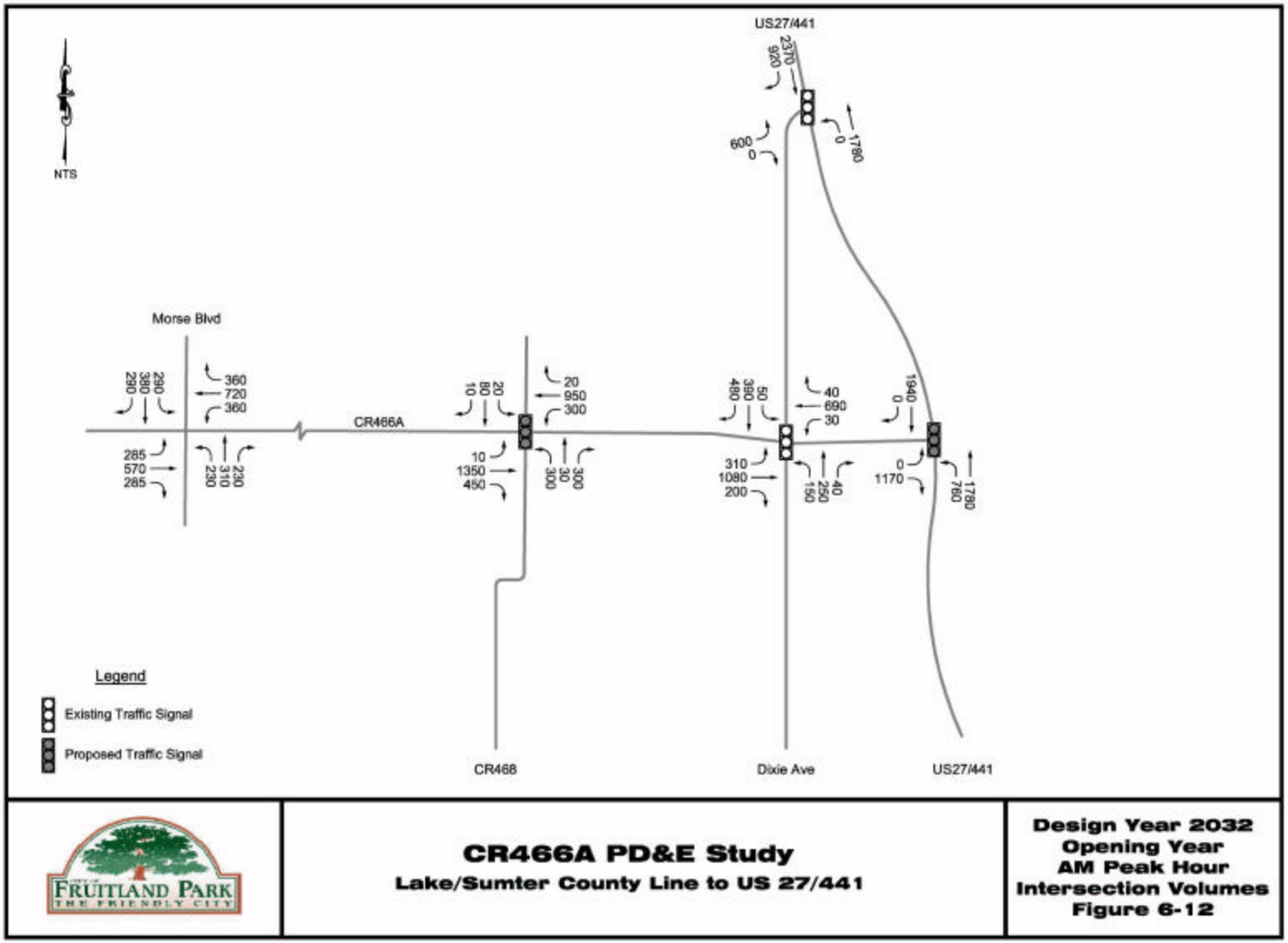


Figure 6-13 Opening Year 2032 P.M. Peak Hour Intersection Volumes

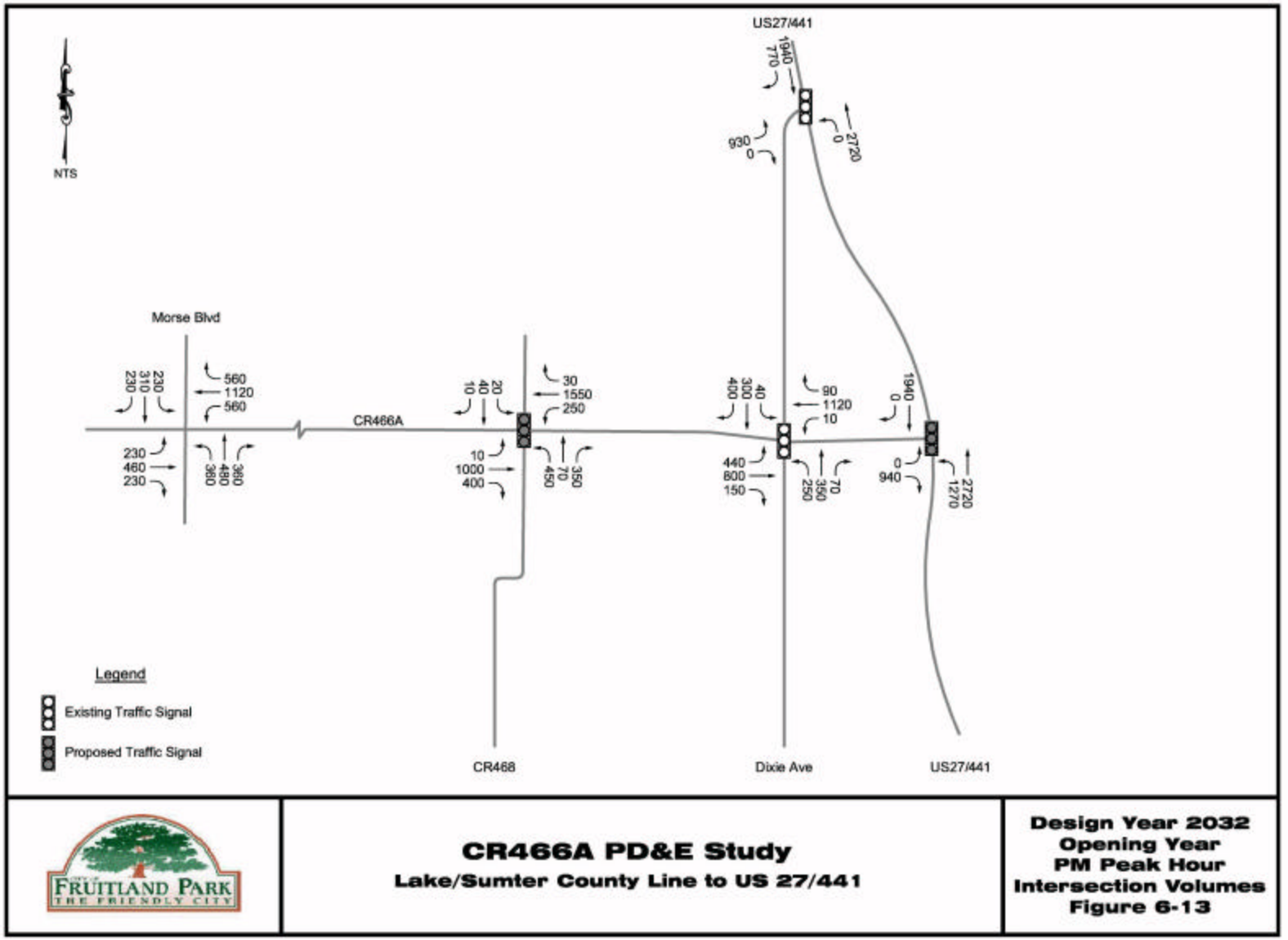


Figure 6-14 Opening Year 2012 A.M. Peak Hour Intersection Volumes – Alternative Concepts

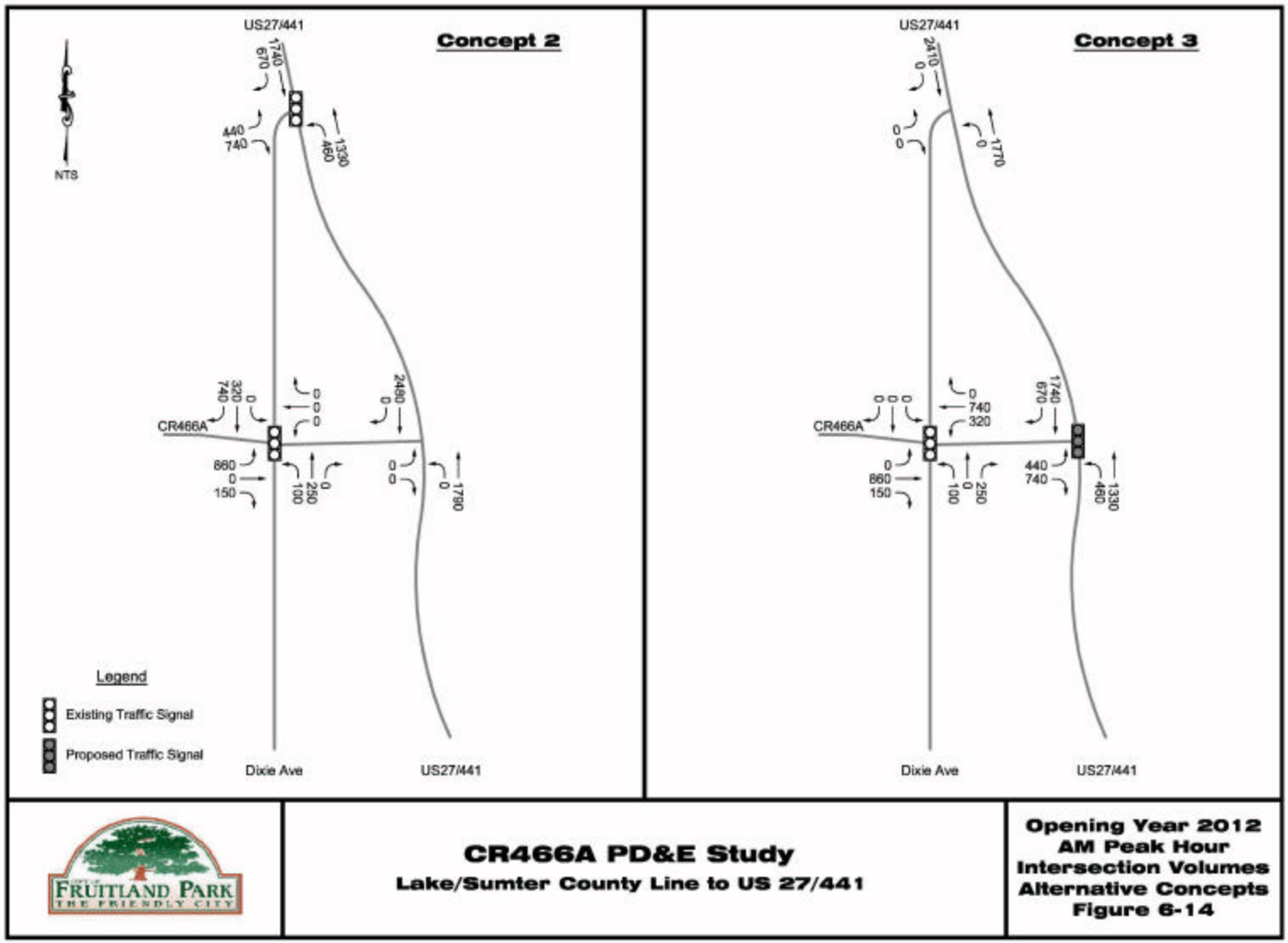


Figure 6-15 Opening Year 2012 P.M. Peak Hour Intersection Volumes – Alternative Concepts

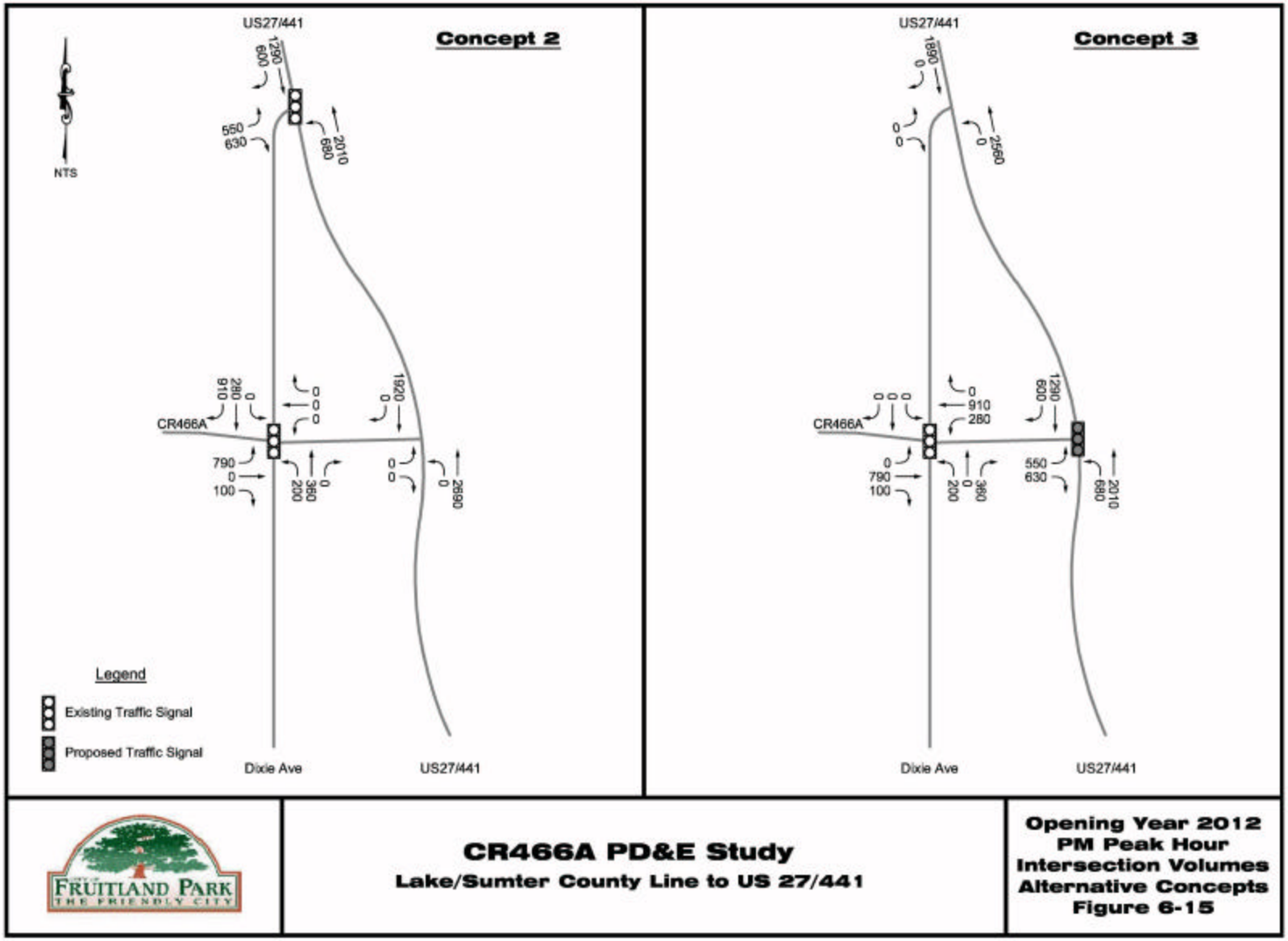


Figure 6-16 Opening Year 2032 A.M. Peak Hour Intersection Volumes – Alternative Concepts

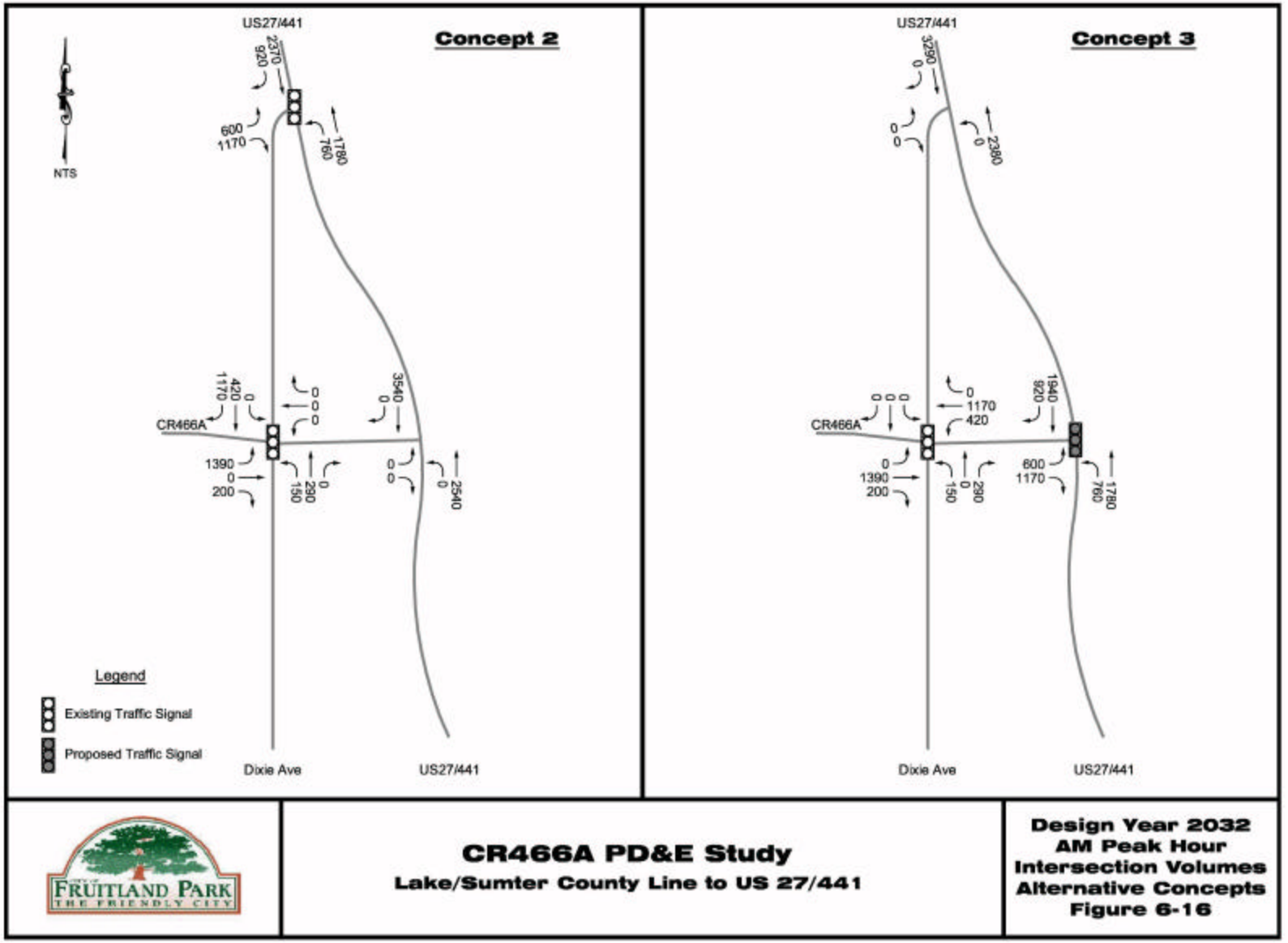
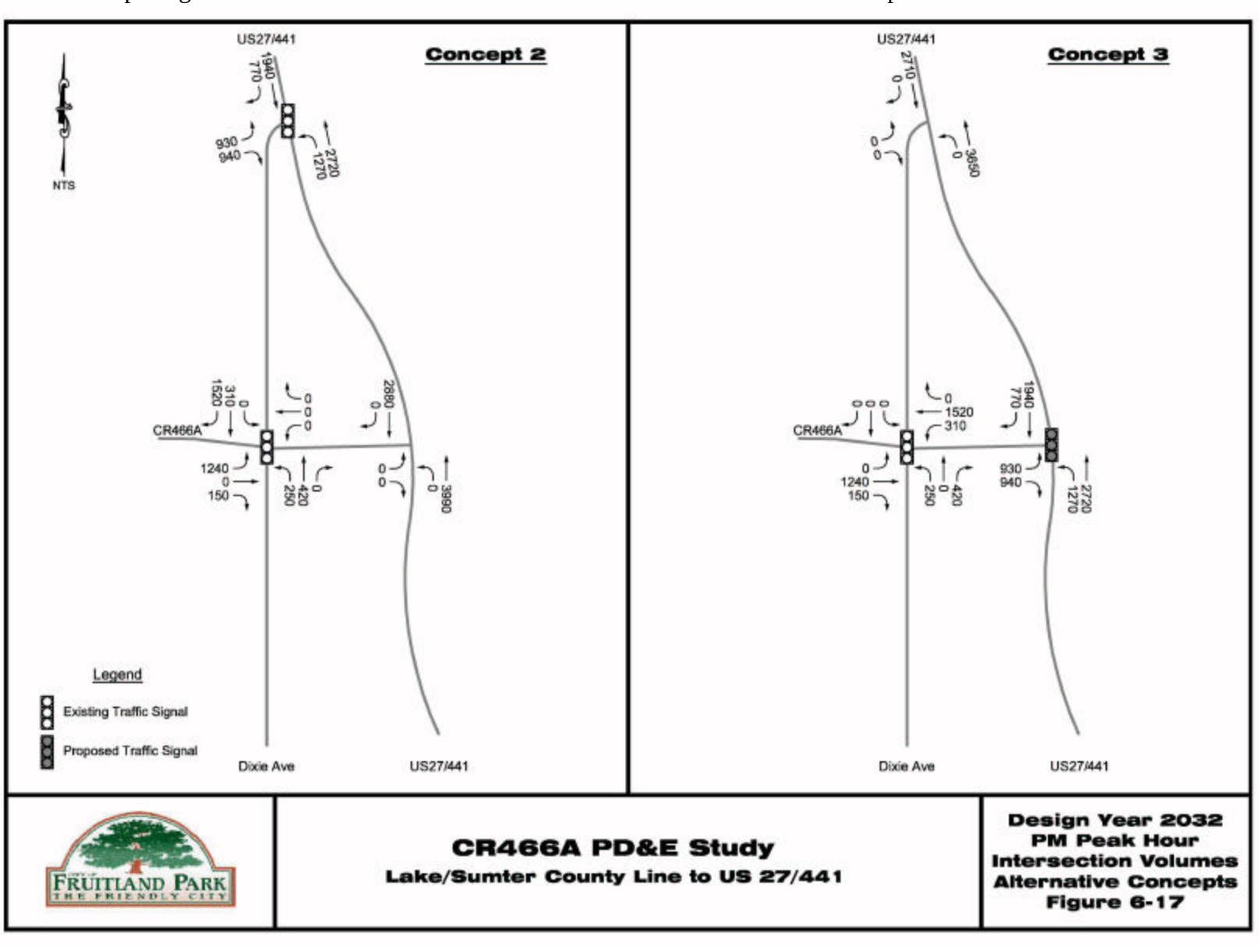


Figure 6-17 Opening Year 2032 P.M. Peak Hour Intersection Volumes – Alternative Concepts



6.8.2 Levels of Service with Roadway Improvements

Level of service/capacity analyses were performed for 2012 opening year and 2032 design year A.M. and P.M. peak hour conditions using the traffic volumes illustrated in Figure 6-10 through Figure 6-17, for the following intersections:

- CR 466A at CR 468.
- CR 466A at Dixie Avenue.
- CR 466A at US 27/441.
- Dixie Avenue at US 27/441.
- CR 466A at Morse Boulevard.

These analyses were performed using the minimum intersection lane configuration and traffic control needed to provide operating conditions at or below approximately 90 percent to 95 percent saturation. Since the six-laning improvement to US 27/441 in the vicinity of CR 466A is not yet a committed improvement, the 2012 Level of Service analyses for intersections affected by US 27/441 were performed for two scenarios: one with US 27/441 in its existing four-lane condition and one with US 27/441 improved to six lanes. These analyses were performed using methodologies documented in the Highway Capacity Manual (TRB, 2000). Table 6-2 and Table 6-3 summarize the intersection Level of Service analyses for the 2012 opening year and 2032 design year conditions, respectively. Worksheets documenting the opening year and design year intersection Level of Service analysis are provided in Appendix J of the CR 466A (Miller Street) Design Traffic Study.

As shown in Table 6-2, acceptable levels of service can be expected at each intersection for the 2012 opening year, with the illustrated intersection laneage and traffic control. Furthermore, similar operating conditions can be achieved for each of the eastern terminus concepts. Concept one is estimated to provide marginally better operations at the intersections of US 27/441 with CR 466A and Dixie Avenue, approximately 50 percent to 70 percent of the delays associated with concepts two and three, and marginally worse operations at the intersection of CR 466A with Dixie Avenue, approximately 10 percent to 40 percent more delay than associated with concepts two and three. In addition, concept one can be implemented with fewer improvements to Dixie Avenue and US 27/441. Concepts two and three are estimated to provide for operations that are within about 10 percent of each another, in terms of delay.

As shown in Table 6-3, acceptable levels of service can be expected at each intersection for the 2032 design year, with the illustrated intersection laneage and traffic control. Concept one is estimated to provide better operating conditions at the intersections of US 27/441 with CR 466A and Dixie Avenue than concepts two and three, better operating conditions at the intersection of CR 466A with Dixie Avenue than concept three, and only marginally worse operating conditions at the intersection of CR 466A with Dixie Avenue than concept two. In addition, concept one can be constructed with fewer auxiliary turn lanes than concepts two and three, avoiding the need to implement triple left-turns.

Table 6-2 2012 Opening Year Level of Service Summary

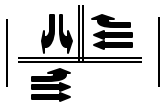
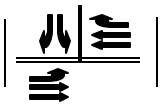
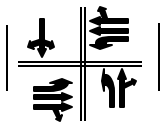
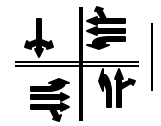
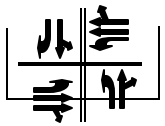
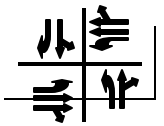
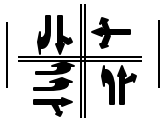
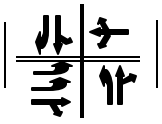
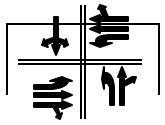
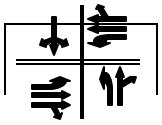
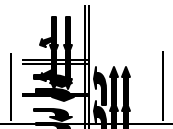
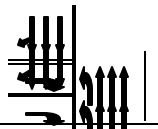
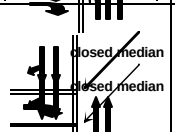
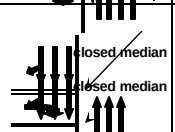
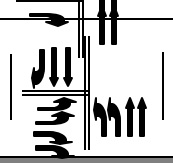
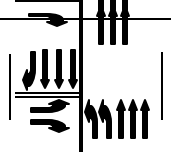
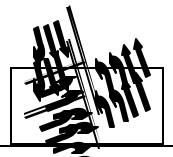
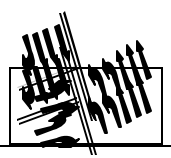
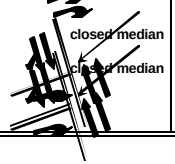
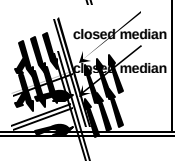
Intersection	Concept	Traffic Control	Measure	US 27/441 with 4-Lanes			US 27/441 with 6-Lanes		
				Minimum Intersection Laneage	Operating Conditions		Minimum Intersection Laneage	Operating Conditions	
					A.M. Peak Hour	P.M. Peak Hour		A.M. Peak Hour	P.M. Peak Hour
CR 466A at Morse Boulevard	n/a		V/C RATIO		0.63	0.78		0.63	0.78
		Signal	DELAY (sec/veh)		14.3	16.8		14.3	16.8
			LOS		B	B		B	B
CR 466A at CR 468	n/a		V/C RATIO		0.70	0.66		0.70	0.66
		Signal	DELAY (sec/veh)		19.0	16.6		19.0	16.6
			LOS		B	B		B	B
CR 466A at Dixie Avenue	One		V/C RATIO		0.62	0.70		0.60	0.69
		Signal	DELAY (sec/veh)		28.5	30.0		29.7	29.7
			LOS		C	C		C	C
	Two	Signal	V/C RATIO		0.60	0.69		0.60	0.69
			DELAY (sec/veh)		20.7	23.2		20.7	23.2
			LOS		C	C		C	C
	Three	Signal	V/C RATIO		0.76	0.75		0.75	0.75
			DELAY (sec/veh)		23.1	26.5		23.9	26.6
			LOS		C	C		C	C

Table 6-2 2012 Opening Year Level of Service Summary

Intersection	Concept	Traffic Control	Measure	US 27/441 with 4-Lanes			US 27/441 with 6-Lanes		
				Minimum Intersection Laneage	Operating Conditions		Minimum Intersection Laneage	Operating Conditions	
					A.M. Peak Hour	P.M. Peak Hour		A.M. Peak Hour	P.M. Peak Hour
CR 466A at US 27/441	One	Signal	V/C RATIO		0.92	0.91		0.96	0.77
			DELAY (sec/veh)		19.6	21.3		19.0	17.2
			LOS		B	C		B	B
	Two	STOP Sign	V/C RATIO		UNSIGNALIZED			UNSIGNALIZED	
			DELAY (sec/veh)						
			LOS						
	Three	Signal	V/C RATIO		0.92	0.88		0.97	0.95
			DELAY (sec/veh)		29.1	28.7		35.5	34.5
			LOS		C	C		D	C
Dixie Avenue at US 27/441	One	Signal	V/C RATIO		0.75	0.88		0.71	0.85
			DELAY (sec/veh)		13.7	15.9		17.5	23.9
			LOS		B	B		B	C
	Two	Signal	V/C RATIO		0.92	0.89		0.97	0.95
			DELAY (sec/veh)		32.2	30.5		39.2	36.4
			LOS		C	C		D	D
	Three	STOP Sign	V/C RATIO		UNSIGNALIZED			UNSIGNALIZED	
			DELAY (sec/veh)						
			LOS						

V/C Ratio: Volume to Capacity Ratio
LOS: Level of Service

Table 6-3 2032 Design Year Level of Service Summary

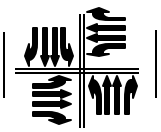
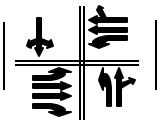
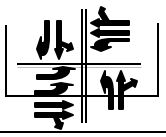
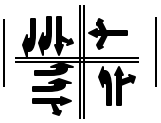
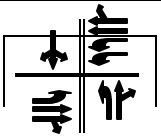
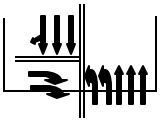
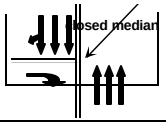
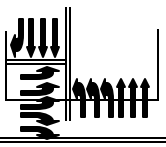
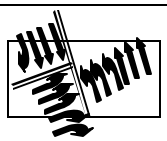
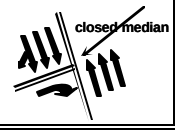
Intersection	Concept	Traffic Control	Measure	Minimum Intersection Laneage	Operating Conditions	
					A.M. Peak Hour	P.M. Peak Hour
CR 466A at Morse Boulevard	n/a	Signal	V/C RATIO		0.82	0.95
			DELAY (sec/veh)		25.2	37.9
			LOS		C	D
CR 466A at CR 468	n/a	Signal	V/C RATIO		0.92	0.93
			DELAY (sec/veh)		39.9	40.6
			LOS		D	D
CR 466A at Dixie Avenue	One	Signal	V/C RATIO		0.82	0.96
			DELAY (sec/veh)		32.8	40.6
			LOS		C	D
	Two	Signal	V/C RATIO		0.83	0.77
			DELAY (sec/veh)		31.0	28.9
			LOS		C	C
	Three	Signal	V/C RATIO		0.94	0.91
			DELAY (sec/veh)		54.3	49.6
			LOS		D	D
CR 466A at US 27/441	One	Signal	V/C RATIO		0.96	0.91
			DELAY (sec/veh)		15.9	15.1
			LOS		B	B
	Two	Stop Sign	V/C RATIO		UNSIGNALIZED	
			DELAY (sec/veh)			
			LOS			
	Three	Signal	V/C RATIO		0.96	1.00
			DELAY (sec/veh)		31.5	42.8
			LOS		C	D

Table 6-3 2032 Design Year Level of Service Summary

Intersection	Concept	Traffic Control	Measure	Minimum Intersection Laneage	Operating Conditions	
					A.M. Peak Hour	P.M. Peak Hour
Dixie Avenue at US 27/441	One	Signal	V/C RATIO		0.77	0.96
			DELAY (sec/veh)		16.8	28.3
			LOS		B	C
	Two	Signal	V/C RATIO		1.03	1.00
			DELAY (sec/veh)		52.0	46.1
			LOS		D	D
	Three	STOP Sign	V/C RATIO		UNSIGNALIZED	
			DELAY (sec/veh)			
			LOS			

V/C Ratio: Volume to Capacity Ratio
LOS: Level of Service

6.9 FUTURE ROADWAY LEVELS OF SERVICE

6.9.1 No-Build Levels of Service

A Level of Service analysis was performed for CR 466A for 2012 and 2032 No-Build conditions based on generalized daily capacities documented in the FDOT 2002 Quality/Level of Service Handbook. The No-Build AADT volumes on CR 466A were compared to the daily capacity thresholds for a major city/county two-lane roadway in a transitioning area without turn-lanes. The resultant operating condition of CR 466A, within the project limits, was Level of Service F for both 2012 and 2032 conditions with 2012 volume-to-service capacity ratios of 1.08 to 1.38 (v/c ratios of 1.01 to 1.29), and 2032 volume-to-service capacity ratios of 1.33 to 1.72 (v/c ratios of 1.24 to 1.60). Worksheets documenting the opening year and design year roadway segment Level of Service analysis are provided in Appendix K of the CR 466A (Miller Street) Design Traffic Study.

6.9.2 Levels of Service with Roadway Improvements

A Level of Service analysis was performed for CR 466A for 2012 and 2032 Build conditions based on generalized daily capacities documented in the FDOT 2002 Quality/Level of Service Handbook. The Build AADT volumes on CR 466A were compared to the daily capacity thresholds for a four-lane Class I arterial roadway in a transitioning area. The resultant 2012 operating condition of CR 466A (concept one), within the project limits, was Level of Service B with volume-to-capacity ratios of 0.34 to 0.57 (v/s ratios equal to v/c ratios). The resultant 2032 operating condition of CR 466A (concept one), within the project limits, ranged from Level of Service B to F; with volume-to-capacity ratios of 0.58 to 1.11 (v/s ratios equal to v/c ratios).

However, the segments of CR 466A that indicated poor operating conditions in 2032 were those located west of CR 468. Traffic signals are currently not anticipated to be needed between CR 468 and the western project limit; therefore, this section of CR 466A would operate as uninterrupted and thus have a higher capacity than if it were to have traffic signals. As an uninterrupted facility, this section of CR 466A is estimated to operate at Level of Service C in the 2032 design year, with volume-to-service capacity ratios of 0.54 to 0.67 (v/c ratios of 0.48 to 0.59). Roadway levels of service were not analyzed for eastern terminus alternative concepts two and three, because the results of the intersection Level of Service analyses for these concepts were sufficient to evaluate the viability of these concepts, further discussed in Section 6.10. Worksheets documenting the opening year and design year roadway segment Level of Service analysis are provided in Appendix K of the CR 466A (Miller Street) Design Traffic Study.

6.10 RECOMMENDED INTERSECTION IMPROVEMENTS

6.10.1 Intersection Traffic Control

Currently signalized intersections are recommended to remain signalized in the future as traffic volumes are estimated to increase at these locations. These intersections are CR 466A at Dixie Avenue and Dixie Avenue at US 27/441.

The currently unsignalized intersections of CR 466A at CR 468 and CR 466A at US 27/441 are anticipated to need signalization by the 2012 opening year. Therefore, signalization at these locations is recommended concurrent with the construction of the CR 466A improvements.

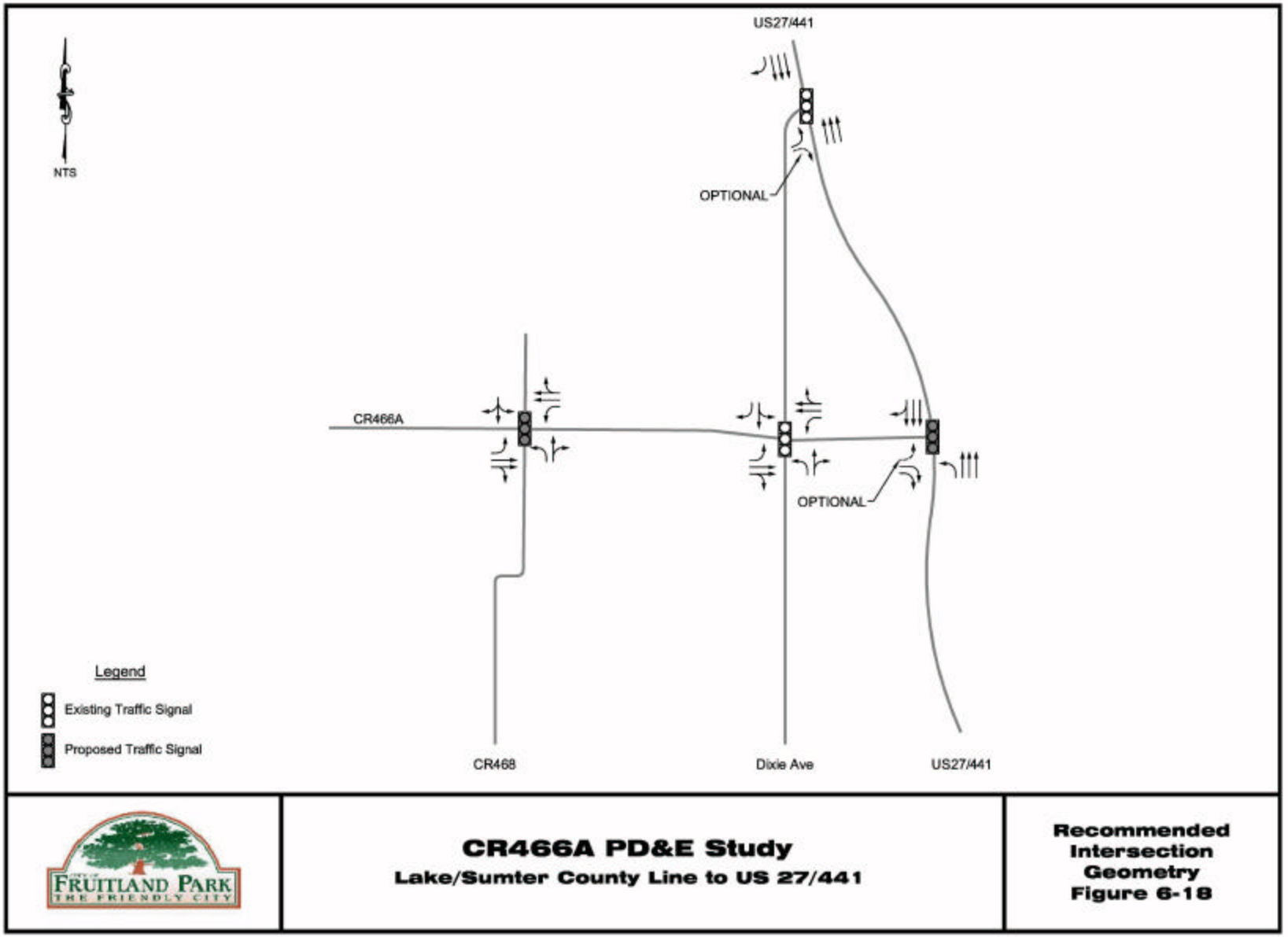
The intersection of CR 466A at Morse Boulevard is anticipated to need signalization when it is constructed. This intersection will be located within The Villages of Sumter in Sumter County. Therefore, the timeframe for its construction will depend on when Sumter County improves the section of CR 466A within its jurisdiction and the development schedule of The Villages of Sumter. Furthermore, recommended geometry for this intersection should be developed as part of a PD&E study performed by Sumter County.

The currently unsignalized intersection of CR 466A at Micro Racetrack Road indicates a potential need for signalization prior to the 2032 design year. However, signalization at this location is not recommended until warrants are actually met.

6.10.2 Intersection Laneage

Based on the intersection capacity analyses documented in Section 6.9.2, it is recommended that the eastern terminus alternative that reflects current traffic circulation patterns (concept one) be constructed. Based on the need for additional east-west corridors parallel to CR 466A, as discussed in Section 7.4, it is further recommended that the intersection laneage needed to accommodate 2012 opening year volumes be constructed. Figure 6-18 illustrates the recommended intersection geometry at signalized intersections, as used in the 2012 Level of Service analyses, with the exception of the eastbound-to-southbound right-turn movement at the

Figure 6-18 Recommended Geometry at Signalized Intersections



intersection of CR 466A with US 27/441. It is recommended that dual eastbound-to-southbound right-turn lanes be constructed at this location, rather than the single right-turn lane needed to accommodate 2012 traffic volumes, as (1) it is necessary to provide two eastbound through lanes at the intersection of CR 466A with Dixie Avenue, and (2) a second right-turn lane is estimated to be needed at this location by 2016.

An analysis was performed to estimate the year within which peak hour traffic demands at the signalized intersections will exceed each intersection's capacity with the recommended intersection geometry. This analysis was performed (1) to identify the period by which either additional parallel corridors should be constructed or additional intersection improvements should be made, and (2) to use as the analysis year for estimating vehicular queue lengths for auxiliary turn lane design. The results of this analysis are summarized in Table 6-4, and worksheets documenting this analysis are provided in Appendix L of the CR 466A (Miller Street) Design Traffic Study.

Table 6-4 Signalized Intersection Failure Year (with Recommended Intersection Geometry, without Additional Parallel Corridors)

Intersection	Year At Which Volume-To-Capacity Ratio Is Estimated To Equal 1.0	Estimated Level Of Service At Designated Year
CR 466A at CR 468	2030	D
CR 466A at Dixie Avenue	2023	D
CR 466A at US 27/441	2019	C
Dixie Avenue at US 27/441	2021	D

As shown in Table 6-4, the signalized intersections within the CR 466A corridor are estimated to operate at or below capacity until the years ranging from 2019 to 2030. Therefore, the construction of additional parallel corridors, or additional laneage improvements to the CR 466A corridor, should be planned to be implemented by 2019. Consequently, the needed lengths of intersection auxiliary turn-lanes were estimated for 2019 conditions, as discussed in the following.

6.10.3 Auxiliary Turn Lanes

Intersection volumes were estimated for 2019 through linear interpolation of the 2012 opening year volumes and the 2032 design year volumes and used to develop recommended lengths for auxiliary turn lanes at signalized intersections. For this study, the 90th percentile queue length was estimated for each movement per the Median Handbook (FDOT, 1997), as none of the study roads are FIHS facilities. Queue lengths for each intersection movement were estimated using the Poisson Distribution to predict the 90th percentile number of vehicles that would arrive on

any given RED traffic signal phase. Appendix M of the CR 466A (Miller Street) Design Traffic Study contains worksheets documenting the application of the Poisson Distribution/Red Arrivals methodology.

The 2019 A.M. and P.M. peak hour 90th percentile queue lengths for each intersection movement were estimated by multiplying the 90th percentile vehicular queue by the average assumed space occupied by a queued vehicle. The average space assumed to be occupied by a queued vehicle was based on the estimated percentage of trucks on each movement per the Median Handbook (FDOT, 1997). Table 6-5 through Table 6-8 summarize the estimated 90th percentile queue lengths, deceleration distances, taper lengths, and total recommended auxiliary turn lane lengths for each of the analyzed intersections. The deceleration distances and taper lengths included in Table 6-5 through Table 6-8 are based on FDOT Roadway and Traffic Design Standards, Index 301 (2002), assuming a design speed of 40 mph for CR 466A, as discussed in Section 5.1, and design speeds for other roads consistent with the posted speed limit on these roads plus 5 mph.

The recommended turn-lane lengths summarized in Table 6-5 through Table 6-8 may not be financially feasible for construction depending on factors such as right-of-way impacts and physical constraints. The actual length that can be provided for each turn-lane will be determined during the design phase.

At unsignalized intersections, turning volumes from CR 466A onto side streets are estimated to be minor, with the possible exception of the CR 466A at Micro Racetrack Road intersection. Therefore, right-turn lanes are not recommended for construction at unsignalized locations, and left-turn lanes constructed at median openings are recommended to provide for 50 feet of queue storage (two vehicles) plus a deceleration and taper distance of 155 feet (consistent with a 40-mph design speed) east of Lake Josephine Drive, and a deceleration and taper distance of 240 feet (consistent with a 50-mph design speed) west of Lake Josephine Drive. The location of median openings will be determined as the access management plan is developed during the next stage of the PD&E study.

Table 6-5 Auxiliary Turn Lane and Queue Length Summary – CR 466A at CR 468 (2019)

Period	Queue Data	Eastbound		Westbound		Northbound	
		Left	Thru-Right	Left	Thru-Right	Left	Thru-Right
A.M. Peak Hour	90th Percentile Per Lane Vehicular Queue	1	16	11	6	10	10
	90th Percentile Queue Length	27 ft	432 ft	297 ft	162 ft	270 ft	270 ft
P.M. Peak Hour	90th Percentile Per Lane Vehicular Queue	1	14	10	11	12	11
	90th Percentile Queue Length	27 ft	378 ft	270 ft	297 ft	324 ft	297 ft
Maximum 90th Percentile Peak Hour Queue (Rounded Value)		30 ft	*Note 1*	300 ft	*Note 1*	325 ft	*Note 1*
Recommended Thru Lane Queue Clearance Distance		0 ft	*Note 1*	0 ft	*Note 1*	0 ft	*Note 1*
Minimum Queue Storage Adjustment		25 ft	*Note 1*	0 ft	*Note 1*	0 ft	*Note 1*
Design Speed		40 mph	40 mph	40 mph	40 mph	40 mph	40 mph
Deceleration Distance *(Excluding Taper)*		105 ft	*Note 1*	105 ft	*Note 1*	105 ft	*Note 1*
Taper		50 ft	*Note 1*	50 ft	*Note 1*	50 ft	*Note 1*
Total Auxiliary Lane Length *(Including Taper)*		210 ft	*Note 1*	455 ft	*Note 1*	480 ft	*Note 1*

Note 1: Approach Lane

Table 6-6 Auxiliary Turn Lane and Queue Length Summary – CR 466A at Dixie Avenue (2019)

Period	Queue Data	Eastbound		Westbound		Northbound		Southbound	
		Left	Thru-Right	Left	Thru-Right	Left	Thru-Right	Thru-Left	Right
A.M. Peak Hour	90th Percentile Per Lane Vehicular Queue	9	10	2	9	6	9	12	13
	90th Percentile Queue Length	243 ft	270 ft	54 ft	243 ft	162 ft	243 ft	324 ft	351 ft
P.M. Peak Hour	90th Percentile Per Lane Vehicular Queue	11	9	1	13	9	12	11	13
	90th Percentile Queue Length	297 ft	243 ft	27 ft	351 ft	243 ft	324 ft	297 ft	351 ft
Maximum 90th Percentile Peak Hour Queue (Rounded Value)		300 ft	*Note 1*	55 ft	*Note 1*	245 ft	*Note 1*	*Note 1*	355 ft
Recommended Thru Lane Queue Clearance Distance		0 ft	*Note 1*	0 ft	*Note 1*	0 ft	*Note 1*	*Note 1*	0 ft
Minimum Queue Storage Adjustment		0 ft	*Note 1*	0 ft	*Note 1*	0 ft	*Note 1*	*Note 1*	0 ft
Design Speed		40 mph	40 mph	40 mph	40 mph	35 mph	35 mph	*Note 1*	35 mph
Deceleration Distance *Excluding Taper)*		105 ft	*Note 1*	105 ft	*Note 1*	95 ft	*Note 1*	*Note 1*	95 ft
Taper		50 ft	*Note 1*	50 ft	*Note 1*	50 ft	*Note 1*	*Note 1*	50 ft
Total Auxiliary Lane Length *(Including Taper)*		455 ft	*Note 1*	210 ft	*Note 1*	390 ft	*Note 1*	*Note 1*	500 ft

Note 1: Approach lane.

Table 6-7 Auxiliary Turn Lane and Queue Length Summary – CR 466A at US 27/441 (2019)

Period	Queue Data	Eastbound	Northbound
		Right	Left
A.M. Peak Hour	90th Percentile Per Lane Vehicular Queue	13	15
	90th Percentile Queue Length	351 ft	405 ft
P.M. Peak Hour	90th Percentile Per Lane Vehicular Queue	8	
	90th Percentile Queue Length	216 ft	459 ft
Maximum 90th Percentile Peak Hour Queue (Rounded Value)		355 ft	460 ft
Recommended Thru Lane Queue Clearance Distance		0 ft	0 ft
Minimum Queue Storage Adjustment		0 ft	0 ft
Design Speed		40 mph	50 mph
Deceleration Distance *(Excluding Taper)*		*Note 1*	190 ft
Taper		*Note 1*	50 ft
Total Auxiliary Lane Length *(Including Taper)*		*Note 1*	700 ft

Note 1: Approach lanes terminate as turn-lanes.

Table 6-8 Auxiliary Turn Lane and Queue Length Summary – Dixie Avenue at US 27/441 (2019)

Period	Queue Data	Northeast		Southeast	
		Left	Right[1]	Through	Right
A.M. Peak Hour	90th Percentile Per Lane Vehicular Queue	14	0	14	4
	90th Percentile Queue Length	378 ft	0 ft	406 ft	108 ft
P.M. Peak Hour	90th Percentile Per Lane Vehicular Queue	18	0	12	3
	90th Percentile Queue Length	486 ft	0 ft	348 ft	81 ft
Maximum 90th Percentile Peak Hour Queue (Rounded Value)		490 ft	0 ft	*Note 2*	110 ft
Recommended Thru Lane Queue Clearance Distance		0 ft	0 ft	*Note 2*	0 ft
Minimum Queue Storage Adjustment		0 ft	55 ft	*Note 2*	0 ft
Design Speed		35 mph	35 mph	*Note 2*	50 mph
Deceleration Distance *(Excluding Taper)*		*Note 3*	95 ft	*Note 2*	190 ft
Taper		*Note 3*	50 ft	*Note 2*	50 ft
Total Auxiliary Lane Length *(Including Taper)*		*Note 3*	200 ft	*Note 2*	350 ft

Note 1: Optional lane.
Note 2: Approach lane.
Note 3: Approach lane terminates as turn-lane.

7.0 CORRIDOR ANALYSIS

7.1 CORRIDOR ANALYSIS OVERVIEW

The CR 466A PD&E Study included an analysis of alternative corridors to identify the most feasible corridor for providing needed transportation improvements that could accommodate the future east-west travel demand projected for the study area. The following sections present the analysis of alternative corridors and the basis for recommending a specific corridor for the development of conceptual design alternatives.

7.2 ALTERNATIVE CORRIDORS

The Consultant design team, in conjunction with Lake County and the City of Fruitland Park, developed several alternative corridors. The process used to develop these corridors involved aerial images of northwest Lake County and northeast Sumter County, overlaid with environmental data, projected development, and existing/future roadways. The alternative corridors are listed below, referenced to their respective figures illustrating the number of lanes and 2032 design year AADT volume for each. The AADT volumes used for the alternative corridor evaluation were calculated by multiplying the output model volumes by a 0.94 MOCF factor. Additional model volume refinements were made consistent with the volume smoothing procedure discussed in Section 6.7.3. Plots of the 2032 model networks used to develop the 2032 design year AADT volumes for each alternative are provided in Appendix N of the CR 466A (Miller Street) Design Traffic Study, and worksheets documenting the AADT forecasts are provided in Appendix O of the CR 466A (Miller Street) Design Traffic Study

- Alternative One – CR 466A Corridor (Figure 7-1).
- Alternative Two – Lake Ella Road Corridor (Figure 7-2).
- Alternative Three – CR 460 Corridor (Figure 7-3).
- Alternative Four – Griffin Road Corridor (Figure 7-4).
- Alternative Five – Timbertop Lane Corridor (Figure 7-5).
- Alternative Six – Multiple Corridors (Figure 7-6).

7.3 DEVELOPMENT DENSITY

The traffic analysis documented in Section 6.0 of this report and the traffic volumes illustrated in Figure 7-1 through Figure 7-6 were based, in part, on the population growth forecasts of the Lake County Long-Range Transportation Plan. This population forecast, extrapolated to 2032, indicates a gross population density within the CR 466A corridor of 1.2 persons per acre. This is only 20 percent of the population density for the adjacent Villages of Sumter development, which is expected to have a gross population density of 6.6 persons per acre at build-out. Therefore, it may be reasonable to expect that as The Villages is constructed, the land between The Villages and the City of Fruitland Park will begin to attract more intense development than

Figure 7-1 Alternative One - CR 466A Corridor

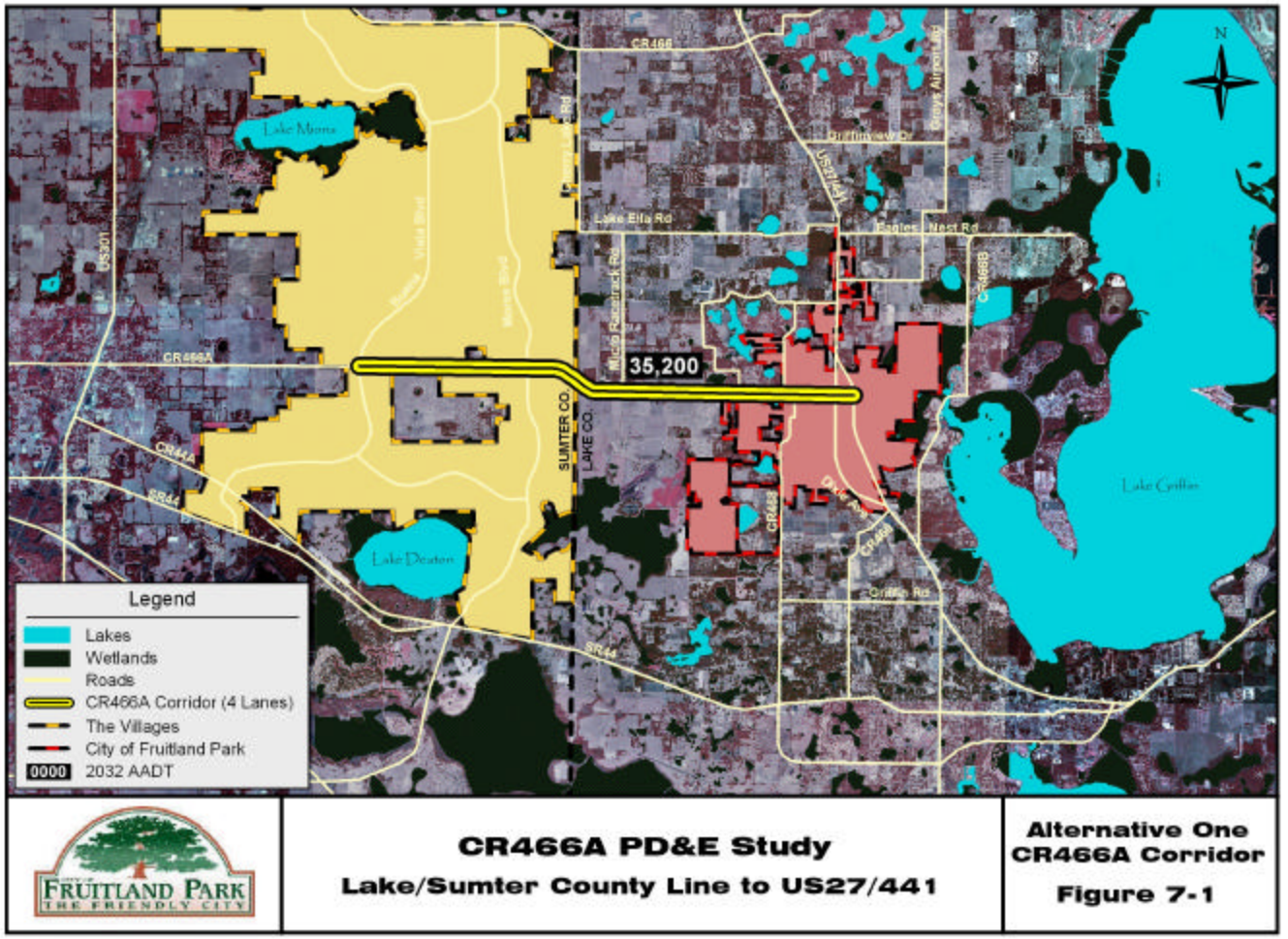


Figure 7-2 Alternative Two - Lake Ella Road Corridor

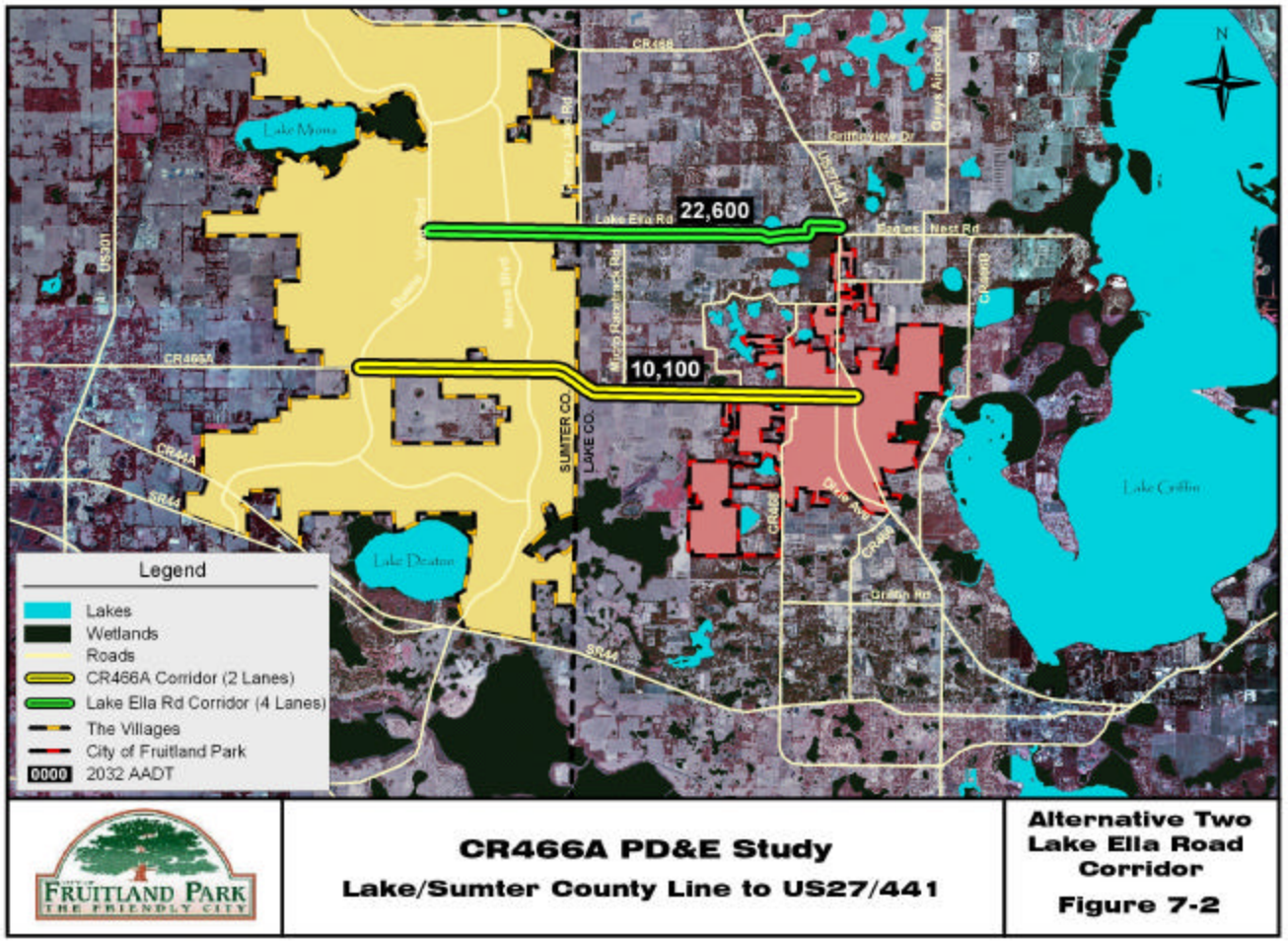


Figure 7-3 Alternative Three – CR 460 Corridor

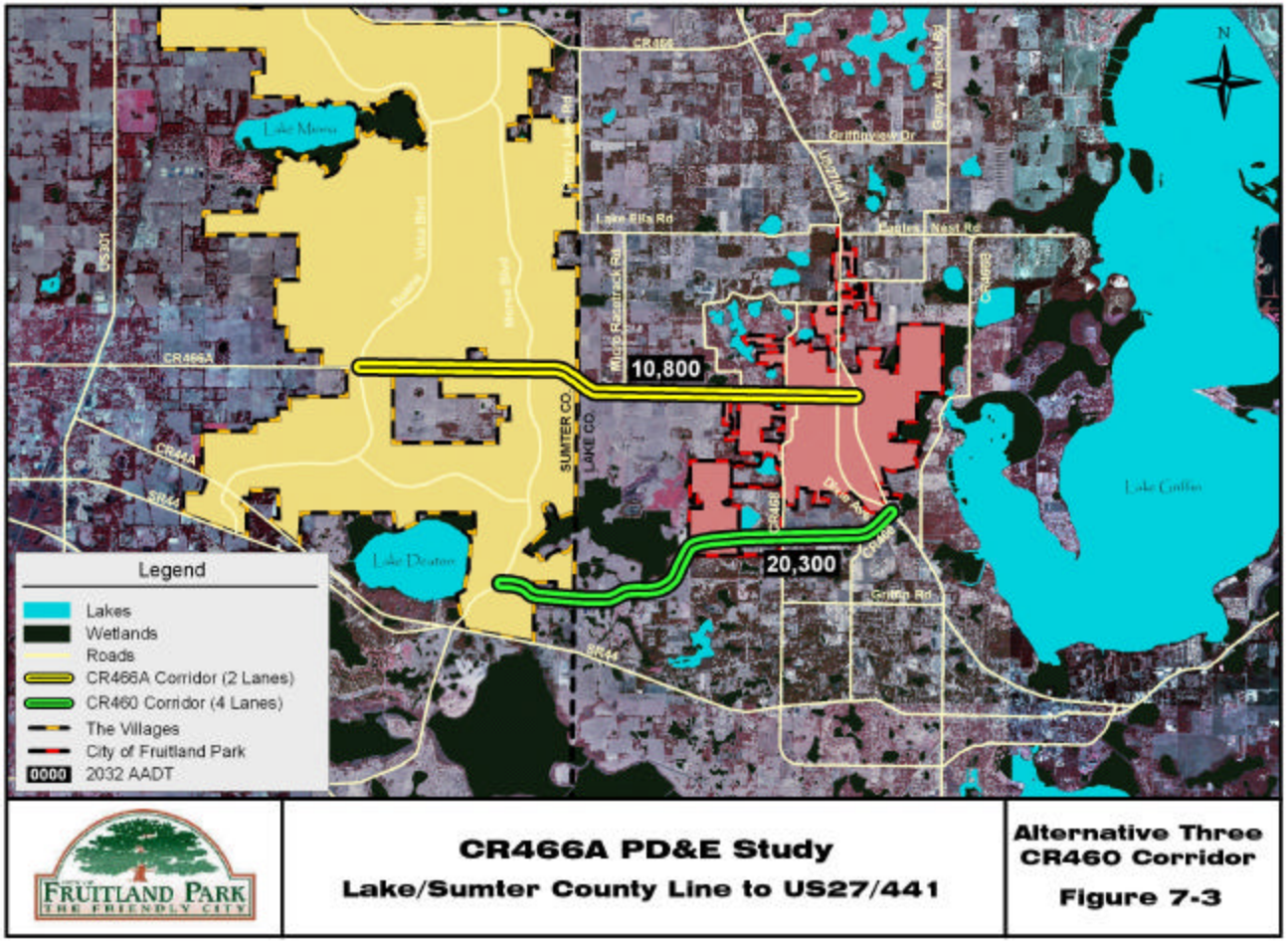


Figure 7-4 Alternative Four - Griffin Road Corridor

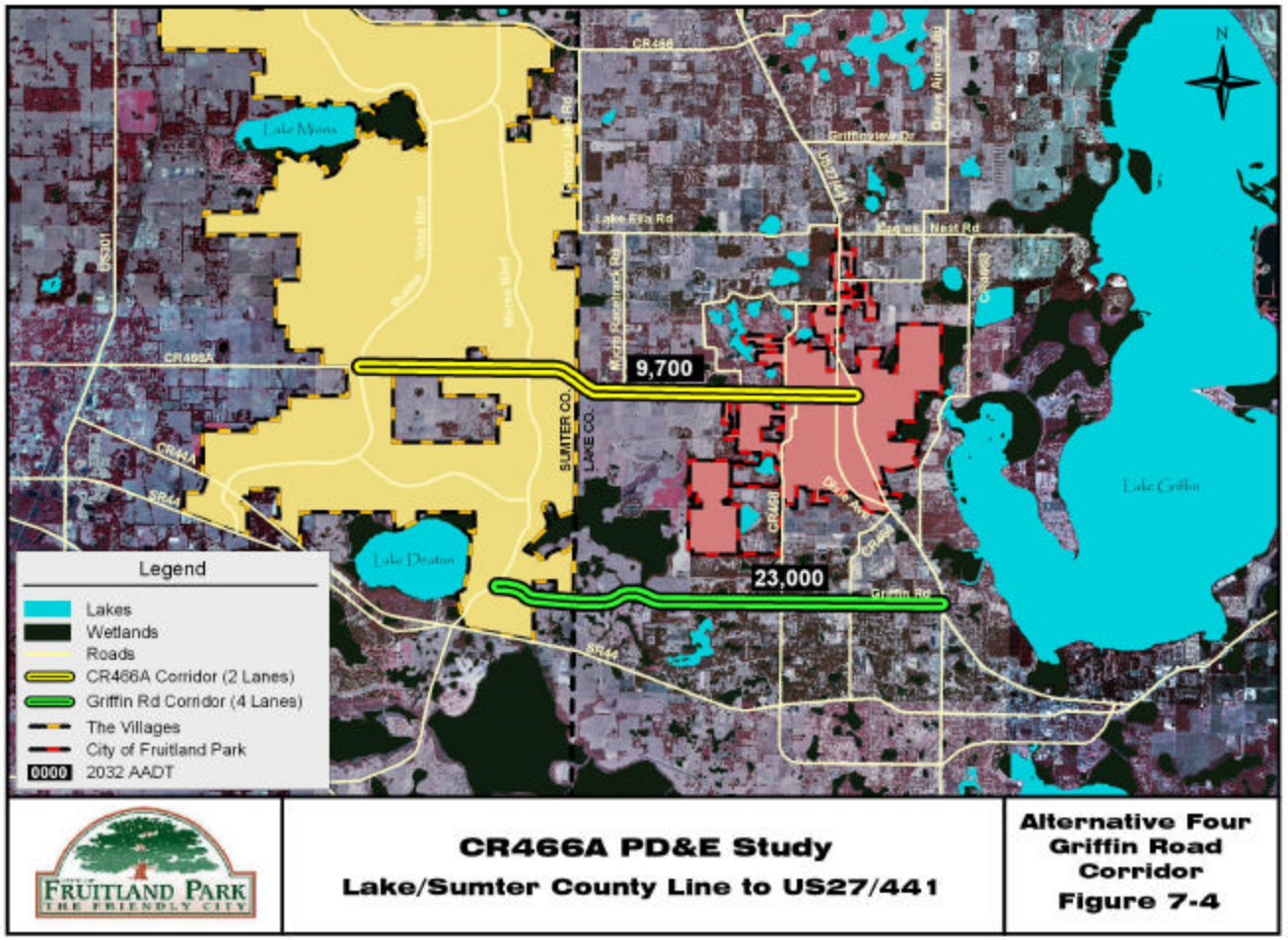


Figure 7-5 Alternative Five - Timbertop Lane Corridor

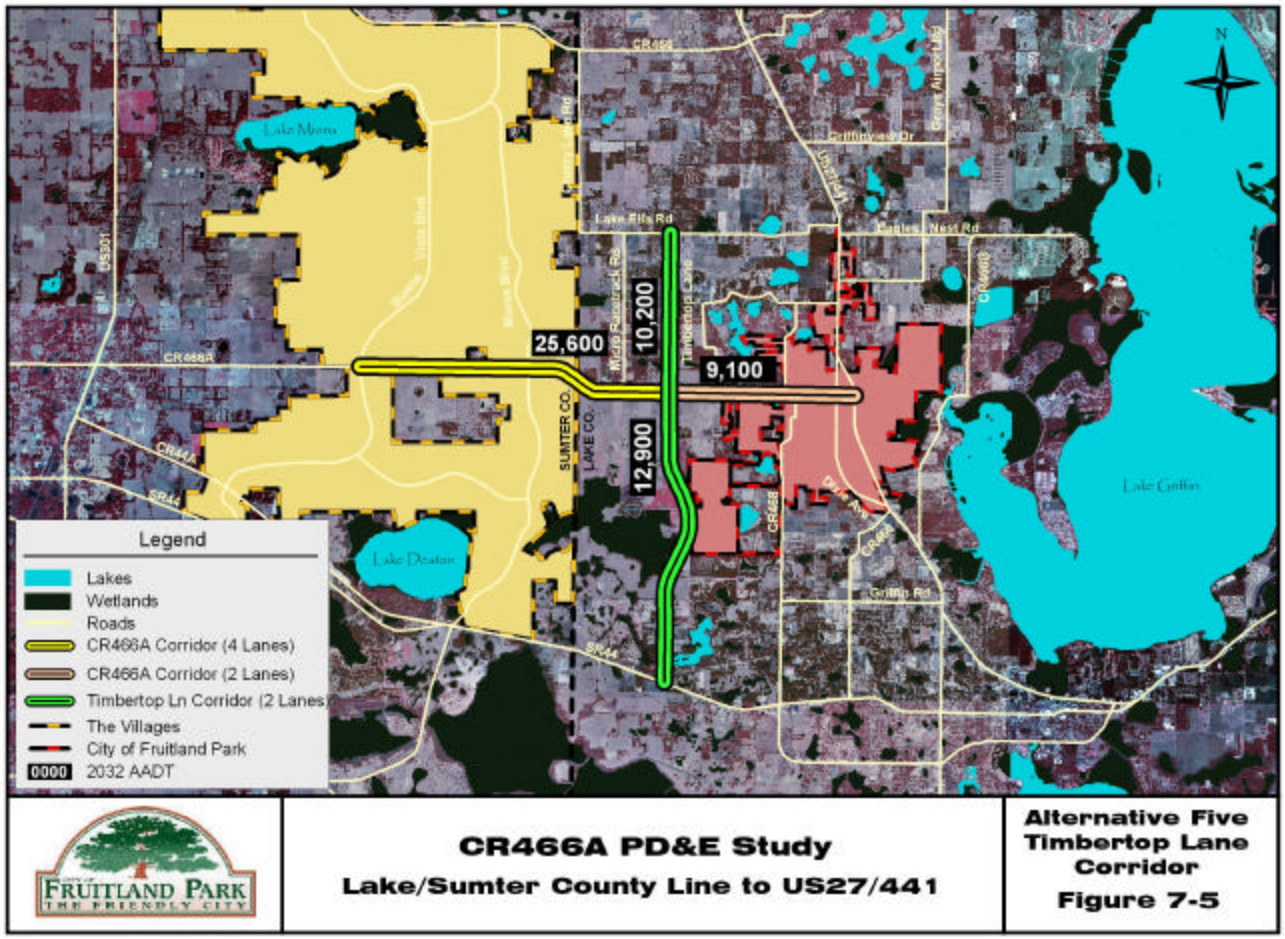


Figure 7-6 Alternative Six - Multiple Corridors

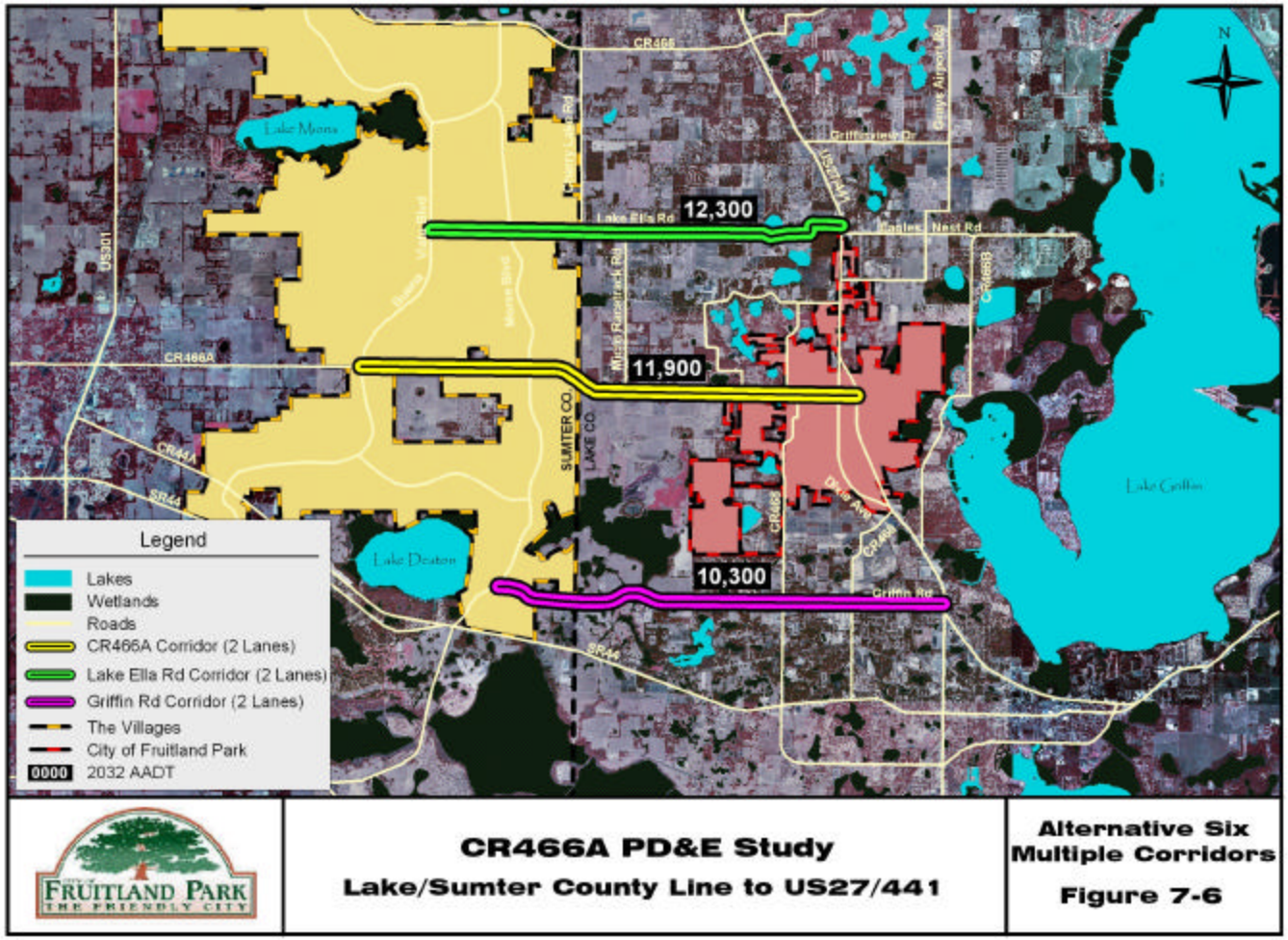
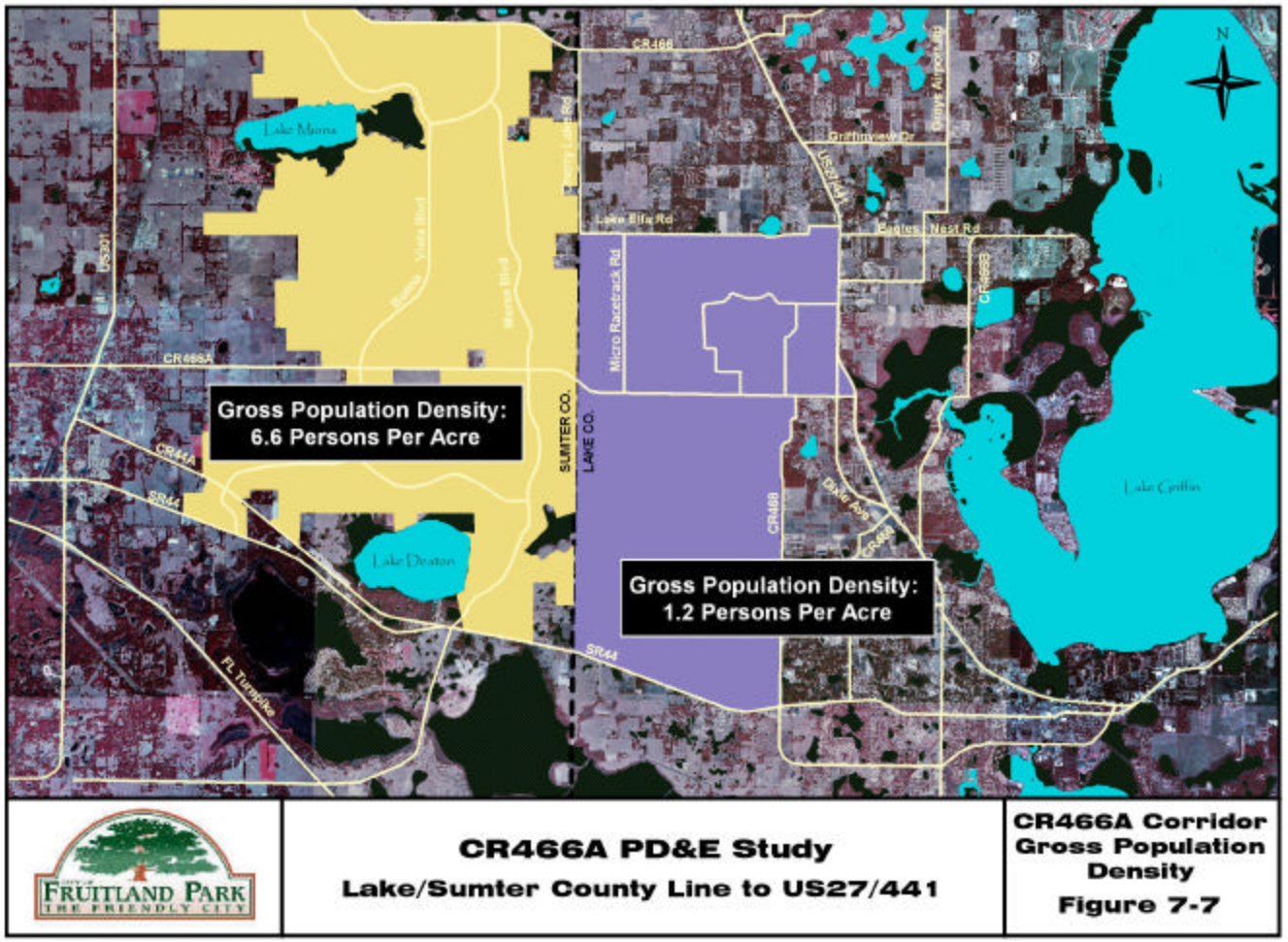


Figure 7-7 CR 466A Corridor Gross Population Density



is currently forecasted. Figure 7-7 illustrates the location of the relatively undeveloped CR 466A corridor in relation to The Villages of Sumter. Worksheets documenting population densities are provided in Appendix P of the CR 466A (Miller Street) Design Traffic Study.

7.4 RECOMMENDED CORRIDOR

The 2032 design year traffic volume forecasts illustrated in Figure 7-2 through Figure 7-6 indicate that potential exists to leave CR 466A as a two-lane facility if an alternative corridor is constructed. However, as discussed in Section 7.3, traffic volumes within the CR 466A corridor could increase substantially over the volumes documented in this report if development within the CR 466A corridor intensifies similar to the adjacent Villages development. Therefore, it is recommended that CR 466A be improved to four lanes within the next ten years and that Lake County and Sumter County further explore the possibility of implementing additional corridors.

8.0 ALTERNATIVE ALIGNMENT ANALYSIS

8.1 NO-BUILD ALTERNATIVE

The No-Build alternative consists of retaining the existing two lanes on CR 466A through the design year. Other planned roadway improvements, including those identified in the Lake County Long-Range Transportation Plan, were assumed to be constructed for the No-Build alternative. In the vicinity of CR 466A, these improvements include improving CR 466 to four lanes from Morse Boulevard to US 27/441, improving US 27/441 to six lanes from US 27/441 southward, and improving CR 468 to four lanes from SR 44 to Griffin Road.

8.1.1 Advantages

Some advantages to the No-Build alternative are typical when considering a roadway construction project. These include the following:

- No roadway design plans preparation costs.
- No right-of-way acquisition costs.
- No roadway construction or utility relocation costs.
- No inconvenience to the traveling public and property owners due to roadway construction.

8.1.2 Disadvantages

The disadvantages of the No-Build alternative include the following:

- Increases in traffic congestion and higher delays to motorists.
- Higher crash potential.
- Minimization of the potential for increased economic viability.
- Loss of opportunity to provide beautification, landscaping, and other aesthetic enhancements.

In addition, the No-Build alternative is not consistent with the goals and objectives of the City of Fruitland Park's adopted Comprehensive Plan or Lake County's adopted Comprehensive Plan.

8.2 TRANSPORTATION SYSTEM MANAGEMENT

Transportation System Management (TSM) strategies are alternatives to roadway widening that maximize the efficiency of the existing roadway system. These alternatives are generally recommended in urbanized areas and historically provide for only short-term relief to existing congestion.

TSM strategies could include intersection widening, improvements to traffic signal timings, the promotion of transit and car-pooling, and provisions for bicycles and pedestrians. The implementation of TSM strategies alone will not appreciably increase the capacity of CR 466A, particularly not to the level needed to accommodate future travel demands. Therefore, the addition of travel lanes to CR 466A is the only viable option for significantly improving its capacity. However, some of the TSM strategies mentioned above will be incorporated into CR 466A improvements to provide mobility for multiple transportation modes.

8.3 SCREENING OF BUILD ALTERNATIVES

8.3.1 Overview

Alternatives for alignment were considered in addition to the No-Build alternative. These alignments were evaluated for cost, right-of-way impacts, impacts to community features, and public support.

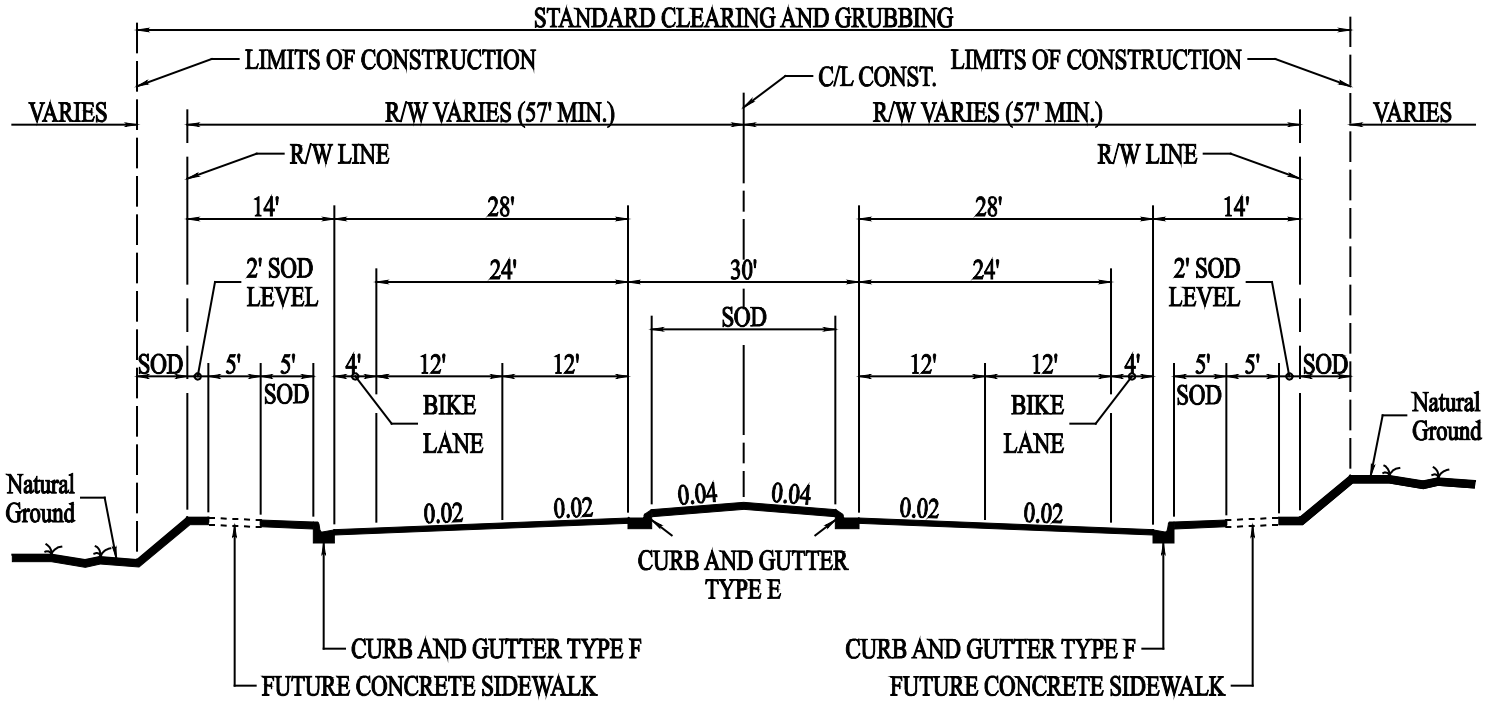
8.3.2 Typical Sections

Due to the existing difference in character between the west end of the project, which is very rural and has a higher posted speed, and the east end of the project, which is more urbanized and has a lower posted speed, it was agreed by the City, County, and citizens that two typical sections would be appropriate. One, called the *suburban section*, will run from the county line to Lake Josephine Drive. This section has wider lanes, a wider median, and a larger buffer zone between the curb and the sidewalk (to be installed in the future). The other, called the *urban section*, is proposed from Lake Josephine Drive to US 27/441. This section has narrower lanes, a narrower median, and less space between the curb and sidewalk. Both sections include a four-foot wide bicycle lane on each side of the road. Proposed typical sections are shown in Figure 8-1 and Figure 8-2.

8.3.3 Alignments

The residential nature of the corridor and the need to acquire significant right-of-way made choosing an alignment a process of consensus-building with the local government and citizens. The first alignment was developed to minimize the number of relocations required due to the roadway alignment. This alignment was then presented to a citizen's task force, which provided input that developed the other alignment. The citizen's task force alignment is labeled Alternative 1 and the least-relocation alignment is labeled Alternative 2.

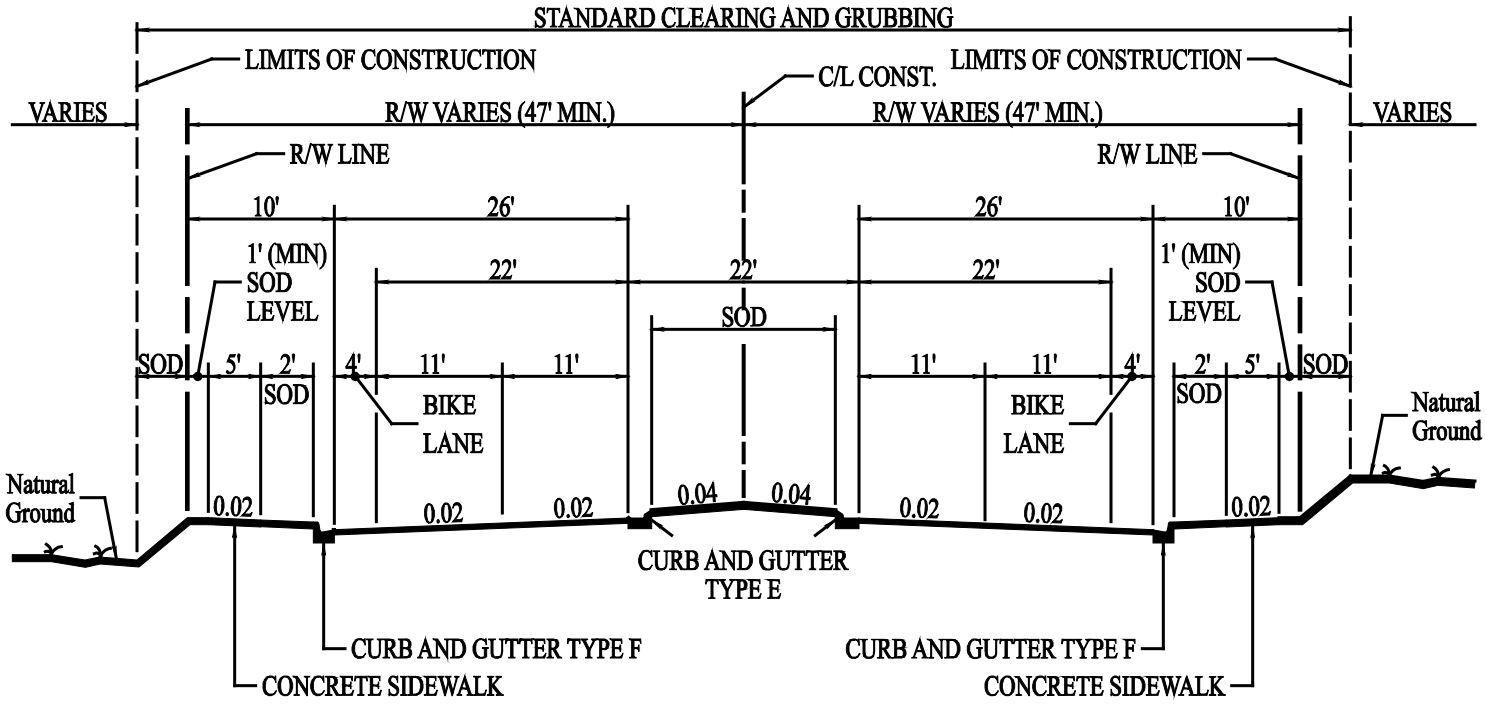
Both alignments are the same from the county line to Spring Lake Drive, holding the existing north right-of-way line and pushing the widening to the south. See Appendix B for alignment alternatives.



LAKE-SUMTER COUNTY LINE TO LAKE JOSEPHINE DR

Figure 8-1 Suburban Typical Section

Jones Edmunds & Associates, Inc. JEA



LAKE JOSEPHINE DR TO US 27/441

Figure 8-2 Urban Typical Section

Jones Edmunds & Associates, Inc. JEA

8.3.4 Evaluation Matrix of Alternatives

To evaluate the Build alternative alignments, the evaluation matrix shown in Table 8-1 was developed using criteria from a variety of categories, including socioeconomic, environmental, cultural, hazardous material contamination, public support, and cost. A brief description of these criteria follows:

- *Parcels Impacted* – The number of parcels, listed by type, which will potentially have right-of-way acquired from them in order to construct the roadway and retention sites.

- *Potential Business Relocations* – The number of businesses that will have the potential to be relocated by the proposed improvements for the Build alternative, including acquisitions required for retention sites. In addition, other business effects expected to be sustained by the proposed improvements that will not require relocation (such as parking loss) were also considered as part of the right-of-way cost estimate.

- *Potential Residential Relocations* – The number of residences that will have the potential to be relocated by the proposed improvements, including retention sites.

- *Potential Cultural Resources Impacts* – The number of historic, archaeological, or 4(f) sites impacted by each Build alternative, and the square feet of right-of-way required from church and school properties to construct the Build alternatives.

- *Wetlands Impact* – The number of acres of wetlands potentially impacted by construction of the Build alternatives.

- *Noise Sensitive Sites* – Noise-sensitive sites are defined as any property (owner-occupied, rented, or leased) where frequent human use occurs and where a lowered noise level would be of benefit. Typical noise-sensitive sites include residences, schools, churches, and recreational areas. The number shown in the evaluation matrix represents the number of noise-sensitive sites that are predicted to experience noise levels that reach or exceed 66 dBA (decibels) or experience an increase of 15 dBA greater than existing noise levels.

- *Potentially Contaminated Sites* – This is the number of potentially contaminated sites within or adjacent to the proposed right-of-way for each Build alternative option.

- *Right-of-Way Costs* – Cost of right-of-way acquisition is related to both the number of parcel affected and the acreage acquired. Administrative costs are incurred with each land parcel affected, regardless of the acreage of the acquisition on that parcel. Right-of-way costs were determined by FDOT right-of-way estimate specialists and include the cost of potential relocations, property purchase, and miscellaneous damages.

Table 8-1 Evaluation Matrix

	Alternative 1	Alternative 2
Evaluation Factors		
Number of Parcels Impacted (including retention sites)	**71**	**62**
Business	8	11
Residential	43	35
Unimproved	20	16
Potential Relocations (including retention sites)	**21**	**17**
Business	3	2
Residential	16	11
Right-of-Way Acquisition (acres)	**36.13**	**36.12**
Roadway	14.21	14.20
Retention Sites	21.92	21.92
Potential Community and Cultural Resource Impacts		
Potential Historic Structures	0	0
Archaeological Sites	0	0
Parks [Section 4(f)]	0	0
Church property impact (sq. ft.)	280	14,682
School property impact (sq. ft.)	31,495	43,993
Natural/Physical Environmental Factors		
Wetlands Impact (acres)	0	0
Potential T&E Species Involvement (N/L/M/H)	H	H
Noise Sensitive Sites (67 dBA or greater)	6	8
Potential Contamination Sites	1	1
Community Support		
Public Support (Y/N)	Y	N
Local Government Support (Y/N)	Y	N
Project Costs ($M)	$ 31,533,000	$ 31,488,000
Construction Cost	$ 18,122,000	$ 18,122,000
Roadway	$ 16,098,000	$ 16,098,000
Retention Sites	$ 2,024,000	$ 2,024,000
Right-of Way Cost	$ 8,601,000	$ 8,562,000
Roadway	$ 7,025,000	$ 6,986,000
Retention Sites	$ 1,576,000	$ 1,576,000
Engineering Design Cost	$ 2,405,000	$ 2,402,000
Construction, Engineering, and Inspection (CEI) Cost	$ 2,405,000	$ 2,402,000

8.3.5 Recommended Alternative

As demonstrated by the analysis matrix, the two Build alternative alignments have very similar right-of-way impacts (in terms of both acreage and number of relocations), cultural resources impacts, environmental impacts, and costs. Based upon strong support of citizens and the City of Fruitland Park, Alternative 1 is the recommended alignment alternative.

9.0 PRELIMINARY DESIGN ANALYSIS

9.1 DESIGN TRAFFIC VOLUMES

The procedures used to forecast AADT and design traffic volumes are documented in Section 6.0 of this report. AADT volumes on CR 466A are forecasted to range from 11,700 vehicles per day (vpd) to 18,600 vpd for the 2012 opening year and from 19,800 vpd to 35,200 vpd for the 2032 design year. However, these volume forecasts reflect a condition in which no alternative corridors are constructed and population densities within the CR 466A corridor remain relatively low, compared with projected development patterns for adjacent areas. Therefore, as discussed in Section 6.10.2, the design of the improvements to CR 466A is recommended to be based on the design traffic forecasts for the 2012 opening year, as illustrated in Figure 6-10 and Figure 6-11.

9.2 TYPICAL SECTIONS

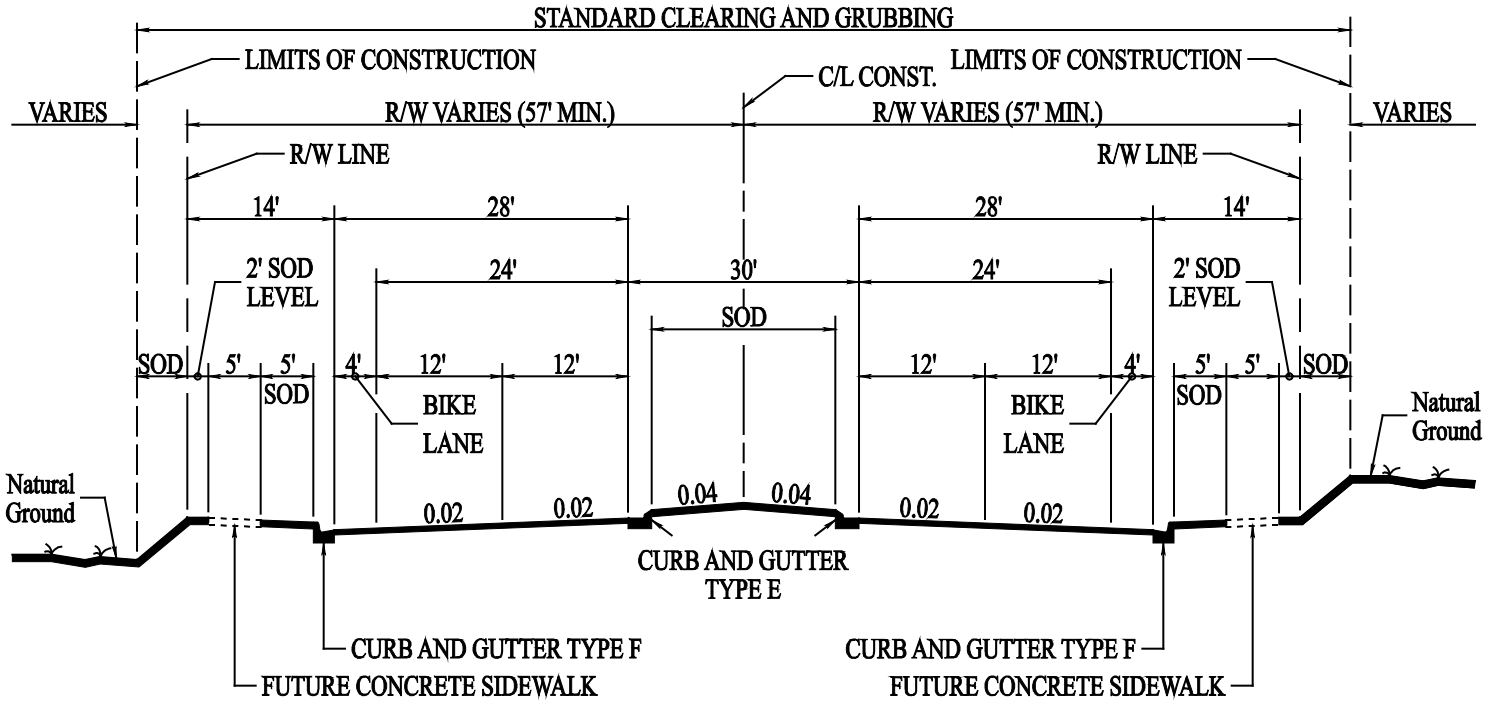
The suburban typical section, shown in Figure 9-1, is recommended from the county line to Lake Josephine Drive. This typical section includes the following:

- Four travel lanes, each 12 feet wide.
- Four-foot wide, on-road bicycle lanes in each direction, adjacent to the outside lanes.
- Curb and gutter on outside lanes and median.
- A 30-foot wide raised median.
- Five-foot wide buffer strip between the curb and sidewalk.
- Allowance for a five-foot wide sidewalk to be constructed in the future.
- Minimum 114-foot right-of-way width.

The urban typical section, shown in Figure 9-2, is proposed from Lake Josephine Drive to US 27/441. This typical section includes the following:

- Four travel lanes, each 11 feet wide.
- Four-foot wide, on-road bicycle lanes in each direction, adjacent to the outside lanes.
- Curb and gutter on outside lanes and median.
- A 22-foot wide raised median.
- Two-foot wide buffer strip between the curb and sidewalk.
- Five-foot wide sidewalk on each side of the road.
- Minimum 94-foot right-of-way width.

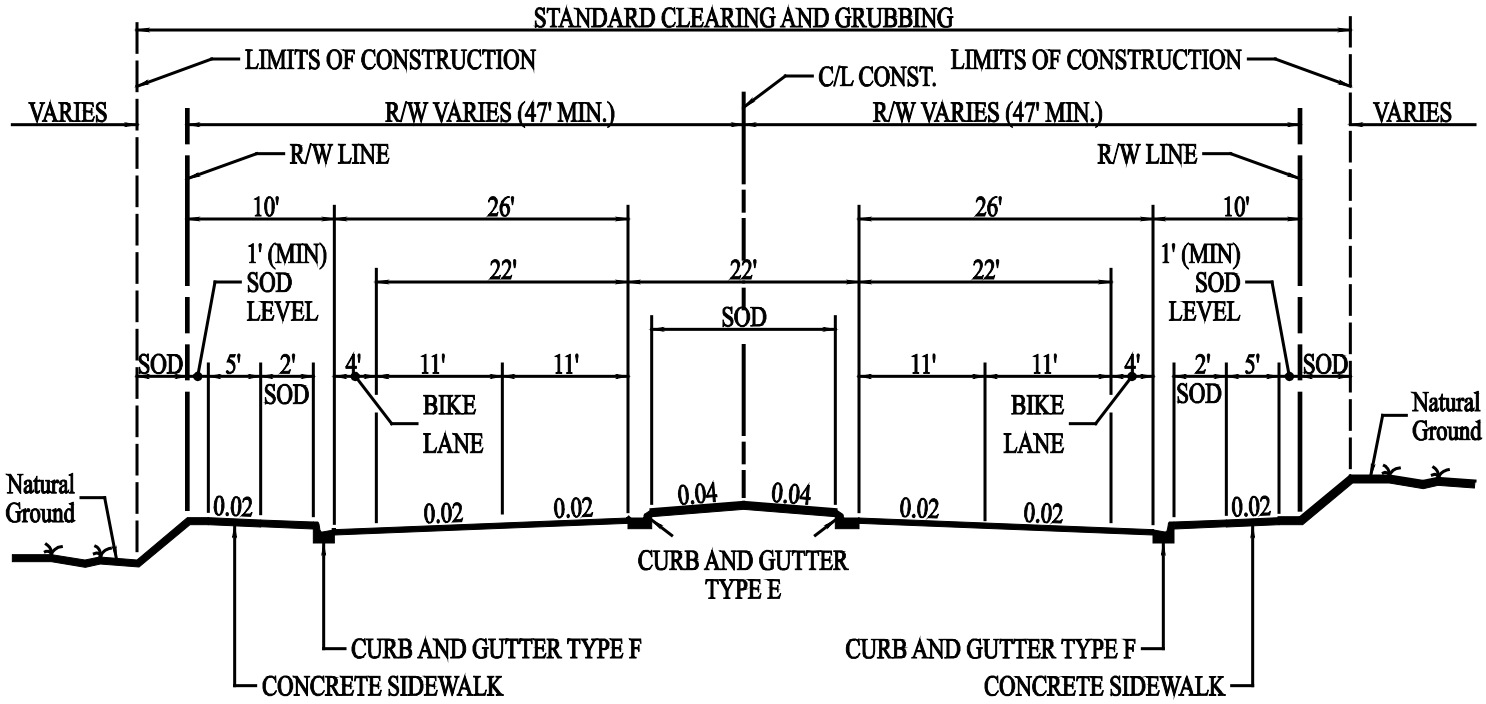
The median widths recommended in the preferred alternative are wider than the minimum widths required for the design speed and facility type. These widths were based on public input received during the study phase and were selected to accommodate a U-turning vehicle in the suburban section and to store a crossing vehicle in the urban section. The selection of median width can be discussed and modified during the early stages of the final design phase.



LAKE-SUMTER COUNTY LINE TO LAKE JOSEPHINE DR

Figure 9-1 Suburban Typical Section

Jones Edmunds & Associates, Inc. JEA



LAKE JOSEPHINE DR TO US 27/441

Figure 9-2 Urban Typical Section

Jones Edmunds & Associates, Inc. JEA

9.3 INTERSECTION IMPROVEMENTS AND SIGNAL ANALYSIS

The recommended geometry for signalized intersections is illustrated in Figure 6-18. The laneage recommended for each signalized intersection is estimated to provide for operating conditions at or below approximately 90 percent to 95 percent saturation in the 2012 opening year; resulting in estimated Level of Service C or better conditions. With the recommended geometry, the signalized intersections within the CR 466A corridor are estimated to operate at or below capacity until the years ranging from 2019 to 2030. Therefore, the construction of additional parallel corridors, or additional laneage improvements to the CR 466A corridor, is recommended to be implemented by 2019.

During the course of the study, comments were received regarding the need for new signalization at intersections within the study corridor. Signalization can be addressed separately from this preliminary engineering report. Traffic counts and assessment of signal warrants should be performed as potential needs are identified and be conducted in accordance with Lake County's procedures.

9.4 ALIGNMENTS AND RIGHT-OF-WAY NEEDS

Appendix B includes raster-based plan sheets illustrating the recommended improvements for the project and anticipated right-of-way needs. As discussed in Section 8.3.5, the recommended alignment for this project is Alternative 1.

At the time of this document's production, Sumter County was producing final design plans for CR 466A within Sumter County, with plans to begin construction in 2005.The recommended alignment includes realignment of the curves near the Lake/Sumter County line. These recommended modifications extend into Sumter County. Coordination early in the final design phase will be required regarding the proposed realignment.

Based upon input from the City, there may be a desire to use the alignment as shown in Alternative 2, from Dixie Avenue to US 27/441. This possibility should be investigated during final design.

9.5 RELOCATION

The recommended widening of CR 466A will require approximately 114 feet of right-of-way width in the suburban section and 94 feet of right-of-way width in the urban section. In most areas, the existing right-of-way width is not sufficient to accommodate the proposed typical section. The acquisition of required right-of-way will necessitate residential and business relocations in some areas of the project. The proposed alignment may require relocation of three businesses and 16 residences. These estimates are based upon information available at the time of this study, and actual project right of way impacts will become more clearly known as design progresses.

9.6 COST ESTIMATES

9.6.1 Right-of-Way Costs

As shown previously on Table 8-1, the estimated right-of-way acquisition cost for the recommended improvements is $8.60 million. These costs include acquisition for roadway and retention areas and were calculated by FDOT using 2003 dollars.

9.6.2 Construction Costs

As shown on Table 8-1, the estimated construction cost, including construction of retention areas, is $18.12 million. These costs were developed using 2003 dollars.

9.6.3 Engineering Design Costs

The costs for final design engineering and Construction, Engineering, and Inspection (CEI) are shown in Table 8-1 and were estimated as a percentage of construction costs.

9.6.4 Total Project Costs

Total project costs for the recommended alternative are estimated to be $31.53 million.

9.7 RECYCLING OF SALVAGEABLE MATERIALS

During construction of the project, recycling of reusable materials will occur to the greatest extent possible. Where feasible, removal and recycling of the existing pavement for use in the new pavement will be considered. This will reduce the volume of materials that need to be hauled and disposed of away from the project and will reduce the cost of purchasing materials suitable for pavement construction. Other materials such as signs will also be salvaged and reused for maintenance operations if they are deemed to be in good condition.

9.8 USER BENEFITS

The public will realize benefits after the facilities are constructed. Savings in travel time, reduced vehicle operating costs, and reduced emergency response times are the primary benefits as compared to the No-Build alternative, which will operate at an unacceptable Level of Service. In addition, new and safer pedestrian and bicycle facilities will be constructed.

9.9 PEDESTRIAN AND BICYCLE FACILITIES

The design of CR 466A will incorporate sidewalks and bicycle lanes to the extent possible within the existing and proposed right-of-way. The recommended typical section has on-road bicycle lanes and provision of space for 5' sidewalks on both sides of the road. One comment received during the public hearing suggested elimination of the on-road bicycle lanes in favor of

a wider off-road path. Public involvement during the preliminary engineering phase will address the specific pedestrian and bicycle accommodations to be constructed.

9.10 SAFETY

The increased roadway capacity is expected to result in less congestion and should, therefore, reduce the probability of crashes. The design and alignment of the recommended improvements will meet applicable safety standards. Other safety-enhancing design features will include improved pavement conditions, drainage, sight distance, intersection geometry, signalization, access management, and pedestrian and bicycle facilities, where possible.

9.11 ECONOMIC AND COMMUNITY DEVELOPMENT

A variety of land uses are located within the study area. However, single-family homes are predominant in the eastern portion, while undeveloped land is predominant in the central to western portion. The improvements to CR 466A will enhance the development potential in the central to western portion, as this land is likely to become more attractive to developers.

9.12 ENVIRONMENTAL IMPACTS

9.12.1 Section 4(f) Lands

For the proposed widening of CR 466A from the Sumter/Lake County line to US 27/441 in Lake County, Florida, it was determined that there are four potential Section 4(f) resources that may be affected by this project. These four resources are Lake Griffin State Recreation Area, Fruitland Park Elementary School, Speedway Park, and Windy Acres Farms Penning. Details of these potential resources can be found in the Request for Determination of Section 4(f) Applicability report. Only the State Recreation Area appears to meet criteria established in Chapter 13 of the PD&E Manual. The main function of each resource will not be changed or limited by the widening of CR 466A; therefore. there will be no impacts as a result of either proposed Alternative 1 or Alternative 2 plans.

Public meetings have been held with various agencies and the public to discuss alternatives for the widening of CR 466A. No comments have been received from the owners of the potential Section 4(f) resources.

9.12.2 Cultural Resources

The architectural survey resulted in the discovery of eight historic buildings. All of these are residential structures and are of styles commonly found in Florida dating from the first half of the 20th century. None of these buildings is eligible for listing on the NRHP individually or as contributing resources to a potential district.

During the field survey, 115 shovel tests were excavated and a surface survey was conducted throughout the project area. One lithic flake was encountered during the survey with ST44. Testing around this positive test failed to produce additional cultural material. Due to the unexceptional nature of this artifact, it is not eligible for listing on the NRHP. Details of the architectural and field survey can be found in the Phase I Cultural Resource Survey Report. No cultural impacts will occur for either Alternative 1 or Alternative 2, and no further cultural resource study is recommended.

9.12.3 Wetlands

Seven wetlands are located within the project corridor. Sufficient field data were collected to respond to the appropriate section of the USACOE WRAP. A brief description of each wetland and an assessment of its value are included in the WER.

Besides the No-Build alternative (no wetland impacts), two different Build alternatives have been proposed for the CR 466A roadway project. At present, two wetland impacts could be expected. The first impact would be to Wetland 2 if pond location 6A were chosen. The second impact would be to Wetland 6 if pond location 1C were chosen. In both alternatives, less than one acre of wetland impact is anticipated to either of these wetlands. Additionally, neither of these pond locations is the preferred location for its basin.

9.12.4 Aquatic Preserves

No Aquatic Preserves are located within the CR 466A project; therefore, no Aquatic Preserve impacts will be associated with Alternative 1 or Alternative 2**.**

9.12.5 Water Quality

This project will increase imperviousness, which will result in an increased runoff volume and pollutant loading. Seven retention areas will be used to treat and attenuate runoff from the project area by meeting or exceeding the most stringent applicable criteria from SJRWMD and Lake County, which, in this case, is retention of post-development minus pre-development runoff volume for the 25-year, 96-hour storm event. Some of the retention areas will rely on existing natural retention areas (via right-of-way purchase), and others will be constructed ponds. Additionally, the appropriate BMPs will be used during construction to address erosion and sedimentation concerns.

9.12.6 Outstanding Florida Waters

No Outstanding Florida Waters are located within the CR 466A project; therefore, no OFW impacts will be associated with Alternative 1 or Alternative 2.

9.12.7 Floodplains/Floodways

This project should not have any adverse impacts to most of the existing floodplains, regardless of whether they are mapped on the FIRMs or are more localized. Any floodplains where minor impacts are proposed will be purchased or expanded to, at a minimum, maintain the existing 100-year flood level. In all other areas, the increased runoff volumes will be retained in constructed ponds. No floodways are within the project area.

9.12.8 Wildlife and Habitat

Results of the wildlife survey concluded that only two animal species, and no plant species, have the potential for impacts if this project is to be constructed for either Alternative 1 or Alternative 2. Gopher tortoise burrows were observed within two of the habitat areas. This Species of Special Concern will require a further survey prior to any construction. No adverse effect to this species is anticipated, provided the appropriate mitigation will be required for gopher tortoises. The FFWCC has documented a bald eagle nest within the project limits. This nest has been observed to be active, and the protective zones for the nest involve a portion of the proposed project limits. Following the USFWS approved guidelines will minimize potential impacts.

9.12.9 Farmlands

There were no farmlands identified in the CR 466A project and defined by the *Farmland Protection Policy Act* (FPPA) of 1984; therefore, no farmlands impacts are associated with Alternative 1 or Alternative 2.

9.12.10 Noise

A noise study was conducted along the project corridor. A total of 87 noise receivers were identified adjacent to the CR 466A right-of-way.

A Noise Sensitive Receiver is defined as "Any property (owner occupied, rented, or leased) where frequent exterior human use occurs and where a lowered noise level would be of benefit. In those situations where there are no exterior activities to be affected by the traffic noise, the interior of the building shall be used to identify a noise sensitive receiver."

The FHWA's Traffic Noise Model (TNM) version 2.0 was used to predict existing and future noise levels. The model included 87 noise sensitive receivers. In accordance with 23 CFR, Part 722, noise abatement measures were evaluated for the impacted noise sensitive sites.

Noise modeling analysis results for the 2032 Build scenario indicate that noise levels at five residential dwellings and one church will equal or exceed 66 decibels on the A-weighted (dBA) scale for Alternative 1. Noise modeling analysis results for the 2032 Build scenario indicate that noise levels at seven residential dwellings and one church will exceed the 66 dBA for

Alternative 2. Because of the numerous and closely spaced residential driveways and side streets, noise barriers would not be effective in the abatement of traffic noise. Therefore, noise barrier construction would not be considered reasonable or feasible for this project. A complete evaluation of the noise issues related to Alternative 1 and Alternative 2 can be found in the Noise Study Report (February 2004).

9.12.11 Air

An air quality study was conducted in accordance with Part 2, Chapter 16 of the PD&E Manual. Results of the modeling indicated that the critical distance was determined to be within ten feet of the nearest travel lane. The only air quality receptors within this distance for Alternate 1 or Alternate 2 are the proposed sidewalks. Based on the traffic volumes in Section 6, it is likely that the project will pass the screening test and there will be no impacts.

9.12.12 Contamination

Based on the findings and other research reported in the CSER, only one site within the project corridor had a contamination rating of either medium or high. This site, located at 100 Miller Street (CR 466A), is currently an operating service station known as a Handy Way food store. More information for this site can be found in the CSER. Soil and groundwater sampling analysis is recommended within the right-of-way adjacent to the Handy Way food store. This site was listed in the CSER as having a "high" probability of potential contamination impacts to the right-of-way.

9.13 UTILITIES

Existing utility locations are shown in Table 4-3. Utilities were not located or surveyed as part of this study, so utilities impacts of the recommended alternative cannot be thoroughly assessed. From the information provided by utility owners, it is anticipated that, at a minimum, the overhead electric distribution within the project limits will require relocation. There may be additional impacts to underground utilities due to profile adjustments; these conflicts will be identified and resolved during final design. Additionally, because CR 466A will be widened and, in some areas, significantly realigned, utility companies may want to take the opportunity to relocate and/or upgrade their facilities at the beginning of construction.

9.14 TRAFFIC CONTROL

CR 466A is an important thoroughfare as well as the only access for many properties located within the study area. Due to its importance, CR 466A will remain open to traffic (one lane in each direction during construction. Conceptually, the construction sequence will be as follows:

- Relocate utilities within the right-of-way.
- Construct stormwater retention ponds.
- Use existing pavement for traffic while constructing new adjacent lanes.

- Operate two-way traffic on newly constructed pavement (and crossovers) while constructing remaining new pavement.

Construction of the first phase of new roadway will need to be done in segments, since existing pavement is not consistently in the location of the eastbound or westbound proposed lanes. Median crossovers will need to be utilized to maintain traffic. Detailed traffic control and maintenance of traffic plans will be developed during final design.

9.15 RESULTS OF PUBLIC INVOLVEMENT PLAN

Public involvement, as an important part of the PD&E Study process, included public information meetings, workshops, and a formal public hearing. All these activities were key to the PD&E Study schedule, involved citizens with the project development, and gave them the opportunity for input into the decision-making process.

9.15.1 Public Involvement Plan

The Public Involvement Plan was developed at the beginning of the project and was an important guideline for the CR 466A PD&E Study. Citizen input continued throughout the Study and was incorporated into the final decisions of the Study.

The Plan documented the following:

- The Project Team's plan for public participation throughout the Study.
- The method to inform and involve stakeholders, including those with an interest in the project or who may be directly impacted by potential alternative improvements.
- The method to inform and involve appropriate county, state, regional, and local agencies and public officials in planning, review, and consent of the project.

A copy of the approved Public Involvement Plan is found in Appendix C.

9.15.2 Advance Notification

The local, regional, state and federal agencies having a concern with this project due to jurisdictional review or expressed interest were identified and contacted directly by the City of Fruitland Park through the Advance Notification (AN) coordination process. The AN was transmitted to all agencies at the end of September 2003. A copy of the AN and responses received are shown in Appendix D.

9.15.3 Newsletters

The Project Team utilized several means of communicating with the public about the Study activities and soliciting input for the development and selection of alignment and pond

alternatives. Public participation was solicited through the media, direct mailings, and the Internet. More detail about each forum follows:

- *Invitations/Newsletters* – Informational project invitations/newsletters were distributed three times to the community during the course of the PD&E Study. The intent of each mailing was to provide updates, announce any upcoming meetings, and encourage the citizens to share input.

  A comprehensive mailing list was created at the project's initiation for newsletter distribution and maintained throughout the CR 466A Study. In addition to the media and as outlined in the Public Involvement Plan, the following groups were mailed the information in order to share project information (including notification of upcoming meetings) as well as to solicit input and ideas:

  - Property owners, whose property lies, in whole or part, within 300 feet of the centerline of each project alternative (Section 339.155 F.S.).
  - Elected and appointed public officials.
  - Government agency personnel.
  - Technical/citizens advisory team members.
  - Any individuals or group requesting to be placed on the mailing list.

  A copy of the final Project Mailing List and Public Involvement Meeting invitations/newsletters can be found in Appendix C.

- *Project Website* – An official information and discussion bulletin board website was developed and updated as the project evolved. The project site address is http://www.countyroad466a.com. The site is hosted by the Consultant as part of the PD&E Study and is linked to an information page regarding the project. Information is provided on the site as follows:

  - Purpose of the Study.
  - Public Involvement.
  - Project Schedule.
  - Project Progress.
  - Frequently Asked Questions.

- *Citizen Website* – A citizen of Fruitland Park created a personal discussion website regarding the PD&E Study of CR 466A. The site address is www.CR 466a.com. The site does not necessarily reflect the opinions of officials or employees of the City of Fruitland Park. The site is owned, operated, and maintained by the citizen, who was responsible for its content. However the Project Team has monitored this site as well, including citizen comments in the overall Project Summary.

- *Newspaper Articles* – Various articles on the Study appeared in local newspapers.

- *Newspaper Advertisements* – Display advertisements were posted in *The Daily Commercial* nine days and 16 days before the public meetings. The advertisements were a black and white display and approved by the City prior to publication.

9.15.4 Public Information Workshops

9.15.4.1 Public Meeting #1

The Introductory/Kick-off meeting workshop was held on Tuesday evening, February 11, 2003, in Fruitland Park at the Casino, 604 West Berckman Street. The meeting acquainted the citizens with the purpose and process of the PD&E Study in identifying the most appropriate transportation improvements to accommodate current and projected traffic along the CR 466A corridor.

More than 60 people attended the meeting. Four written comments were received at the meeting. Citizens were notified of the meeting through press releases, newsletters/invitations, websites, and flyers. Copies of the press releases, newsletters/invitations, and PowerPoint presentation are included in Appendix C.

9.15.4.2 Public Meeting #2

The second public involvement meeting was held on Thursday evening, May 1, 2003, in Fruitland Park at the Casino, 604 West Berckman Street. The objective of the meeting was to share findings from the project traffic analysis and to receive public input. The meeting consisted of an open-house and an informal time to review maps and talk with the project team, followed by a formal presentation and question-and-answer period.

The meeting was attended by approximately 40 Fruitland Park residents, and 11 written comments were received. Citizens were notified of the meeting through press releases, newsletters/invitations, websites, and flyers. Copies of the press releases, newsletters/invitations, and PowerPoint presentation are included in Appendix C.

9.15.4.3 Special Mailing

Some residents indicated that there was not sufficient time between the receipt of the notice for the second Public Meeting and the actual meeting. To address this concern, a special mailing was then done on May 12th to share the most current information and solicit additional input. The information in the Special Mailing was very similar to the detail that was provided to attendees at the May 1, 2003, Public Involvement meeting.

Two hundred twenty-four letters were sent out on May 12, 2003, requesting that any comments be returned by the end of May 2003. Twelve (12) comments were received back from residents. A copy of the Special Mailing is included in Appendix C.

9.15.4.4 Fruitland Park City Commission Workshop #1

On July 29, 2003, the Project Team provided information to the Fruitland Park City Commission during a specially scheduled workshop. The content of the presentation was very similar to information previously provided to citizens during the Public Involvement meetings.

The workshop setting allowed the Commission to interact with the Project Team, ask questions, and gain more understanding about the Study process and options. An additional result of the workshop was the preparation and transmittal by the City of a position letter, stating the City's direction/preference that Lake County study the regional impacts of traffic and pursue additional corridors north and south of CR 466A in addition to improving CR 466A. Documentation in regard to this workshop is included in Appendix C.

9.15.4.5 Citizen Task Force (Citizens Group Meeting)

The meeting was held the evening of September 8, 2003, at 101A East Berckman in Fruitland Park. Eight citizens and five staff were in attendance. The Citizen Task Force was made up of interested citizens with diverse viewpoints.

The group objective developed at the meeting was to bring information to everyone to try to please the majority of the citizens and to proactively develop criteria/plan for widening or improvement prior to arrival of traffic.

Citizens were asked to prioritize design criteria to direct the design team. In the order prioritized by the Citizen Task Force, the decision-making criteria were as follows:

- Safety
- Aesthetics
- Minimal impact to properties
- Efficient traffic flow
- Access
- Short construction duration
- Preserving the environment
- Cost

A questionnaire was filled out by the citizens to assist the project team in the documentation of who was part of the process. Additionally, the questionnaire gave the project team some very important, independent feedback about citizen preferences regarding the project. The agenda is included in Appendix C.

9.15.4.6 Public Meeting #3

The meeting was held the evening of October 28, 2003, in Fruitland Park at the Casino, 604 West Berckman Street. Two CR 466A improvement alternative design options were presented for review by the citizens attending the meeting. Pond location alternatives were also presented. The following information was available:

- Plan views of the two alternative alignments.
- Plan views of pond location alternatives for all eight drainage basins.
- Recommended typical sections, showing dimensions of roads, one for the urban section and one for the suburban section.
- "Before" and "after" renderings for both urban and suburban sections.
- Right-of-way impacts for each alternative.
- Right-of-way acquisition process information.

Eighty-six people attended the meeting, and 20 written comments were received.

Citizens were notified of the meeting through press releases, newsletters/ invitations, websites, and flyers. Copies of the press releases, newsletters/invitations, and PowerPoint presentation are included in Appendix C.

9.15.4.7 Fruitland Park City Commission Update

An update on the CR 466A PD&E Study was presented at the regular Fruitland Park City Commission Meeting, December 11, 2003, 7:00 p.m., in the temporary Commission Chambers, The Casino-604 W. Berckman Street, Fruitland Park, Florida. The presentation was an update on everything that had transpired thus far. Visual aids were presented as part of the update. These included handouts of a PowerPoint presentation, color renderings of the two corridor alignments, and a project status report.

At the conclusion of the presentation the Commission discussed the desire to hold a workshop for the purpose of discussing future zoning and commercial opportunities along the corridor, and providing input on pond and alignment alternatives. Information related to this presentation is included in Appendix C.

9.15.4.8 Fruitland Park City Commission Special Workshop

At the request of the Fruitland Park City Commission, a special workshop was convened to discuss zoning and commercial opportunities along the corridor and provide input on the roadway alignment and pond alternatives. This meeting was held on Saturday, January 31, 2004, 8:00 A.M., in the Fruitland Park City Hall, 506 West Berckman Street, Fruitland Park, Florida.

Generally, the commissioners expressed a desire to relocate ponds so that areas directly adjacent to the improved road right-of-way would be available for commercial development. It was noted by the project team that such preferences would be taken into account during the final design process. The commission also provided input on preferences for roadway alignment and pond location alternatives. Meeting minutes for this special commission workshop are included in Appendix C.

9.15.4.9 Public Hearing

The public hearing was held the evening of May 27, 2004, in Fruitland Park at the City Hall, 506 West Berckman Street. The hearing was held in accordance with applicable state and federal regulations and conducted in accordance with the FDOT's PD&E Manual in order to qualify the project for federal funding.

An informal interaction period preceded the formal presentation, which took place as an agenda item during the regular City Commission meeting. During the informal meeting portion, displays of each alignment alternative were made and four consultant staff and various agency representatives were available to provide information and answer questions. Citizens were given speaker's cards, to be filled out if they wished to comment during the hearing, and comment cards, for submission of written comments either during the hearing or during the 10-day public comment period following the hearing.

The formal presentation detailed the required regulatory information, the process for determining the project need and developing alternatives, and the recommended alternative's attributes and impacts. Information was also given to citizens about how they could submit written comments as part of the public record for the public hearing.

Following the presentation, citizens were given an opportunity to make comments which are part of the verbatim transcript for the hearing, included in Appendix C.

Fifty-two people attended the hearing, six citizens provided oral comments during the hearing, and two written comments were received.

The hearing was advertised through ads in the Florida Administrative Weekly (FAW) and the Daily Commercial. A mailing was made to property owners, and notices were provided on the official project website and the citizen website. Copies of the ad in the FAW, the display ad placed in the Daily Commercial, the letter sent to property owners, the hearing transcript and the written comments received included in Appendix C.

9.15.4.10 Fruitland Park City Commission Update

A Fruitland Park City Commission update was given on the evening of July 8, 2004. The purpose of the update was to provide review of the project progress and process and discuss how the project documents addressed input from the citizens and the commission. Direction was given by the Commission to finalize the project documents on the basis of information presented at the presentation and to submit these documents to the City for review and approval.

9.15.4.11 Fruitland Park City Commission Meeting

This meeting was held the evening of August 12, 1004 for the purpose of holding a Commission vote on the study. A few additional comments were received which were incorporated into the final document. These included the following:

- Removal of Pond 1A as an alternative.
- Addition of information about Sumter County's construction schedule for this roadway in Sumter County.
- Modification of report language regarding provision of lighting.

The Commission unanimously approved the study, contingent upon inclusion of these modifications. In addition, the Commission expressed a strong desire to accelerate the design and construction schedule.

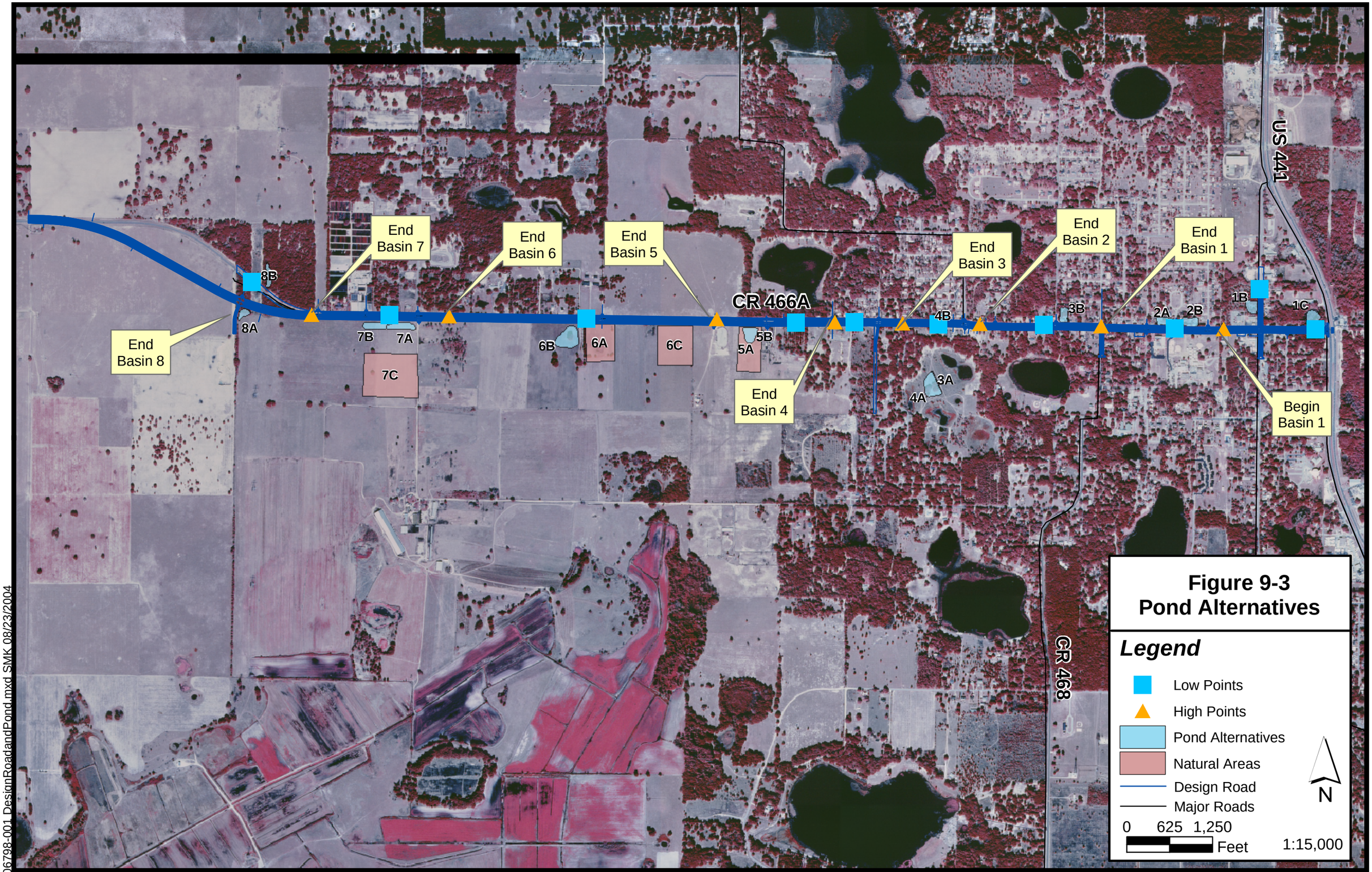
9.16 DRAINAGE

In order to provide the necessary attenuation and treatment for the increased imperviousness resulting from this project, seven retention areas have been proposed. The proposed areas are shown in Figure 9-3. Each retention area will consist of a constructed pond, the purchase and use of an existing low area, or the expansion of an existing low area. Most of the areas will serve the area that discharges directly to them; however, one of the proposed locations will provide compensating attenuation and treatment of a currently untreated area from within the same drainage basin in lieu of serving roadway runoff. The proposed constructed retention ponds will retain the difference in the pre-development versus post-development runoff volume for the 25-year, 96-hour storm event. The sizes of the existing low areas to be purchased are based on estimates of the post-development 100-year floodplain. Stormwater runoff from the roadway will be collected by a system of inlets and pipes and conveyed to the ponds and low areas.

9.17 SPECIAL FEATURES

9.17.1 Pedestrian and Bicycle Improvements

This project will add bicycle lanes on each side of the road through the project limits. In addition, a 5-foot sidewalk will be added to each side of the road in the urban segment (from



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For Information Purposes Only

Lake Josephine Drive to US 27/441). Space will be allowed and graded for a sidewalk in the suburban section, which can be constructed as pedestrian needs warrant.

9.17.2 Cross Street Improvements

The existing intersection at Cutoff/Marguerite is offset significantly. When the roadway is widened, realignment of Cutoff Road should be undertaken to create a safer and less confusing intersection. This realignment is shown in the concept plans.

9.17.3 Alignment Improvements

As discussed in Section 9.4, the proposed alternative recommends horizontal and vertical realignment of the curves near the county line. The existing combination of horizontal and vertical curvature is undesirable, and with the use of Morse Boulevard as an important access to the Villages sight distance in this area will become even more critical.

Because the realignment solution will extend across the county line, coordination with Sumter County will need to be undertaken. Depending upon the schedule for widening of CR 466A within Sumter County, right-of-way acquisition and construction in this area in Lake County may need to be advanced ahead of Lake County's current schedule.

9.18 ACCESS MANAGEMENT

Lake County does not maintain access spacing requirements for County Roads. The recommended access management plan generally conforms to FDOT Access Class 7. In order to provide access to existing road connections, some median openings are proposed at locations that are slightly less than the Class 7 criteria. Lake County staff has agreed with the proposed locations of the median openings, shown in the Concept Plans included in Appendix B.

There was some discussion of median opening placement during the course of this study. Median opening locations can be modified during final design, with the concurrence of Lake County and the City of Fruitland Park. Opportunities for public comment will be provided with public workshops during the final design phase. However, the general criteria for access management should remain the same, in order to provide the appropriate degree of efficient and safe traffic movement.

9.19 AESTHETICS AND LANDSCAPING

The City of Fruitland Park has requested that aesthetically pleasing lighting and landscaping be part of this project. The City of Fruitland Park and Lake County will provide guidance on aesthetic considerations such as landscaping and lighting during final design. Landscaping plans have not been developed at this time. However, the recommended typical sections provide median and border areas which are suitable for landscaping. The landscaping improvements should be developed in conformance with the design criteria for maintaining a clear zone and unobstructed sight distance.

APPENDIX A

FLOOD INSURANCE RATE MAPS

APPENDIX B

ALIGNMENT ALTERNATIVES

APPENDIX C

PUBLIC INVOLVEMENT DOCUMENTATION

APPENDIX D

ADVANCE NOTIFICATION (AN) AND RESPONSES RECEIVED