



**Interoffice Memorandum**

**AGENDA ITEM**

February 21, 2018

**TO:** Mayor Teresa Jacobs  
-AND-  
Board of County Commissioners

**FROM:** Jon V. Weiss, P. E., Director  
Community, Environmental and Development Services  
Department

**CONTACT PERSON:** Renzo Nastasi, AICP, Manager  
Transportation Planning Division  
(407) 836-8072

**SUBJECT:** April 10, 2018 – Work Session  
Reams Road Roadway Conceptual Analysis Study

The Transportation Planning Division has completed the Roadway Conceptual Analysis Study for the widening of Reams Road, from two to four lanes. Reams Road is located in western Orange County within the Horizon West Special Planning Area and is part of the Lakeside Village Specific Area Plan. The project limits are from south of the intersection of Summerlake Park Boulevard and Ficquette Road to Taborfield Avenue, a distance of approximately 3.1 miles. This study and subsequent production phase that completes the widening of Reams Road will be funded under Mayor Jacob's INVEST in Our Homes for Life Program.

The purpose of the study was to develop the most appropriate road alignment including stormwater facilities and bicycle and pedestrian accommodations while minimizing environmental impacts. The need for this roadway is based on a variety of factors including future traffic operations, safety and social and economic demands.

The backup documentation for this item has been delivered under separate cover. It may also be accessed online as part of the eAgenda by clicking [here](#).

The study is also available under the Roadway Project section of the county's Traffic and Transportation webpage:

**<http://www.orangecountyfl.net/TrafficTransportation/ReamsRoadRCA.aspx>**

Page Two  
February 21, 2018  
Reams Road Roadway Conceptual Analysis Study

This item is for informational purposes only: no action is required by the Board.  
Following the work session, a Public Hearing will be scheduled.

RN/bh/am

c: Mark V. Massaro, P.E., Director, Public Works Department  
Diana Almodovar, P.E., Manager, Development Engineering  
Brian Sanders, Project Manager, CEDS-Transportation Planning Division  
Blanche Hardy, P.G., Principal Planner, CEDS-Transportation Planning Division



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# Reams Road

## Roadway Conceptual Analysis Report

From South of Summerlake Park Boulevard to Taborfield Avenue

**DRAFT**



March 2018

***Prepared for:***

Orange County Public Works



ORANGE COUNTY  
GOVERNMENT  
FLORIDA

REAMS ROAD

ROADWAY CONCEPTUAL ANALYSIS REPORT

FROM SOUTH OF SUMMERLAKE PARK BOULEVARD TO TABORFIELD AVENUE

DRAFT

PREPARED FOR

ORANGE COUNTY PUBLIC WORKS



PREPARED BY

INWOOD CONSULTING ENGINEERS, INC.

MARCH 2018

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# EXECUTIVE SUMMARY

## ES.1 Introduction

Orange County conducted a Roadway Conceptual Analysis (RCA) for the Reams Road corridor from south of Summerlake Park Boulevard to Taborfield Avenue in west Orange County. The project location is shown in Figure 1-1. The objective of the RCA is to identify a preferred improvement alternative to address the current and future transportation needs along the corridor. The preferred improvements identified in this report will serve as the basis for the subsequent design of the roadway improvements. This RCA report summarizes the essential components of the study, including public involvement, data collection, traffic analysis, roadway design, drainage design, and environmental impacts.

## ES.2 Purpose and Need for Improvement

The purpose and need for the project is based on several factors. These are to provide traffic capacity, to meet social/economic demands, to be consistent with transportation plans, and to enhance safety.

Portions of Reams Road within the project limits are currently operating at an unacceptable Level of Service (LOS) F. By the design year 2045, all of Reams Road, within the project limits, will operate at an unacceptable LOS F. Roadway improvement are needed to provide an acceptable level of service.

Reams Road is located in Horizon West, which includes five mixed use villages surrounded by greenbelts, as well as a Town Center. Reams Road serves the rapidly developing Lakeside Village, which was the first village approved in Horizon West. Existing land use adjacent to the Reams Road corridor consists of the Walt Disney Parks and Resorts cast member parking area located on the south side of the roadway, residential developments, commercial development, institutional development, undeveloped properties, and wetlands. Roadway improvements are needed to serve this rapidly growing area.

The widening of Reams Road, from Summerlake Park Boulevard to CR 535 (Winter Garden Vineland Road), is included in the MetroPlan Orlando 2040 Long Range Transportation Plan (Blueprint 2040) as an Orange County Unfunded Need. The project is consistent with the Orange County Comprehensive Plan, the MetroPlan Orlando 2040 LRTP Unfunded Needs Plan, and the MetroPlan Orlando FY 2017/18-2021-22 Orlando Urban Area Transportation Improvement Program.

Crash reports for the three-year time period between April 2, 2014 and April 2, 2017 were obtained and reviewed. Crashes were considered to be associated with the intersection if the crash occurred due to the operation of the intersection or was within the length of the turn lane bay. Ninety-seven crashes occurred at the study intersections over the three-year period. Thirty-one crashes occurred along the segments not associated with the operations of an intersection. Capacity and intersection improvements will enhance safety along the corridor.

## ES.3 Existing Conditions

Reams Road, within the project limits, is a two-lane undivided roadway. The Lakeside Village Specific Area Plan, adopted May 20, 1997 by Orange County, identifies Reams Road as a major urban collector from Summerlake Park Boulevard/Ficquette Road at the west end of the study limits to west of Jayme Drive, as a minor collector from west of Jayme Drive to Via Trieste Drive, and as a neighborhood circulator from Via Trieste Drive to Taborfield Avenue. Reams Road has a posted speed limit of 45 miles per hour (mph).

Sidewalk improvements have been made along Reams Road as developments have been constructed. However, extended distances along Reams Road do not have pedestrian features.

The existing right-of-way along Reams Road varies throughout the project corridor. When originally constructed, the existing right-of-way was typically 60 feet in width. As new development has occurred along the corridor, additional right-of-way has been acquired.

Floridian Place is the only signalized intersection within the study limits.

The existing transportation network within the study corridor is comprised mainly of the current roadway system. LYNX Transit routes 56 and 302 service the area south of Reams Road along Center Drive with stops at Disney University and the Magic Kingdom Bus Station. These routes access the stops from the south and do not utilize Reams Road. The LYNX Vision 2030 Plan does not include any future routes in the vicinity of Reams Road.

Street lighting is limited along Reams Road. Thirteen Utility Agency/Owners (UAO) have been identified within the project area through a Sunshine 811 Design Ticket and utility coordination efforts.

The Reams Road project area is located in the Reedy Creek drainage basin within the jurisdiction of the South Florida Water Management District (SFWMD). The entire project area is a tributary of the Reedy Creek Improvement District (RCID) L-407 and L-107 Canals. Stormwater runoff from the existing roadway is collected in roadside swales and then discharged into adjacent wetlands and drainage systems.

## ES.4 Traffic Analysis

Detailed project traffic analyses are provided in separate documents; the Design Traffic Technical Memorandum and the Design Traffic Engineering Report. These documents provide the existing traffic conditions of the area as well as analysis of the improvement alternatives. A four-lane improvement to Reams Road will result in an acceptable level of service along the corridor.

## ES.5 Alternatives

An evaluation matrix was developed to compare the pros and cons of the No-build alternative and three Build alternatives. The matrix, shown in Table ES-1, considers the social, natural, and physical impacts, and the costs of all of the alternatives.

The basic elements of the typical section include the full reconstruction of Reams Road and consist of two 11-foot travel lanes in each direction separated by a 19.5-foot raised median. Type E curb and gutter is used along the inside lanes, and Type F curb and gutter is used along the outside lanes. A five-foot sidewalk is located on the south side of the roadway, and a 14-foot multiuse trail is located along the north side of the roadway. The typical right-of-way width is 120 feet but varies from 100 feet to 140 feet depending on the alignment alternative and the width of the existing right-of-way. The alignment alternatives consisted of a centered/hybrid alignment, a south alignment, and a north alignment. Transportation Systems Management and Operations alternatives were also considered and incorporated into the build alternatives.

Table ES-1-1  
Alternatives Evaluation Matrix

## Reams Road RCA

From South of Summerlake Park Boulevard to Taborfield Avenue

### Alternatives Evaluation Matrix

	<b>No-Build Alternative</b>	<b>Centered/Hybrid Alignment</b>	<b>South Alignment</b>	<b>North Alignment</b>
<b>Evaluation Criteria</b>	<b>No Improvements</b>	<b>4-Lane Urban with 5-Foot Sidewalk and 14-foot Multi-use Trail</b>	<b>4-Lane Urban with 5-Foot Sidewalk and 14-foot Multiuse Trail</b>	<b>4-Lane Urban with 5-Foot Sidewalk and 14-foot Multiuse Trail</b>
<b>Relocations</b>				
<b>Number of Residential Acquisitions</b>	None	0	73	16
<b>Number of Business Business Acquisitions</b>	None	0	2	0
<b>Number of Parcels Impacted</b>	None	41	52	42
<b>Social, Natural, &amp; Physical Impacts</b>				
<b>Social &amp; Neighborhood</b>	None	Low	High	High
<b>Archaeological/Historical Sites</b>	None	0	0	0
<b>Threatened and Endangered Species</b>	None	No adverse impacts	No adverse impacts	No adverse impacts
<b>Archaeological/Historical Sites</b>	None	0	0	0
<b>Wetlands (acres)</b>	None	6.80	7.49	5.69
<b>Floodplains (acre-feet)</b>	None	13.22	13.22	14.37
<b>Potential High or Medium Ranked Contamination Cites</b>	None	3	3	3
<b>Estimated Costs (Present Day Costs)</b>				
<b>Design (15% of Construction)</b>	No cost	\$3,787,000	\$3,653,000	\$3,637,000
<b>Right-of-Way Acquisition</b>	No cost	\$7,175,000	\$18,660,000	\$10,980,000
<b>Wetland Mitigation</b>	No cost	\$690,000	\$760,000	\$578,000
<b>Roadway Construction</b>	No cost	\$25,244,000	\$24,354,000	\$24,248,000
<b>Reimbursable Utility Relocation</b>	No cost	\$4,200,000	\$4,250,000	\$0
<b>CEI (15% of Construction)</b>	No cost	\$3,787,000	\$3,653,000	\$3,637,000
<b>Total Cost</b>	No cost	\$44,883,000	\$55,330,000	\$43,080,000



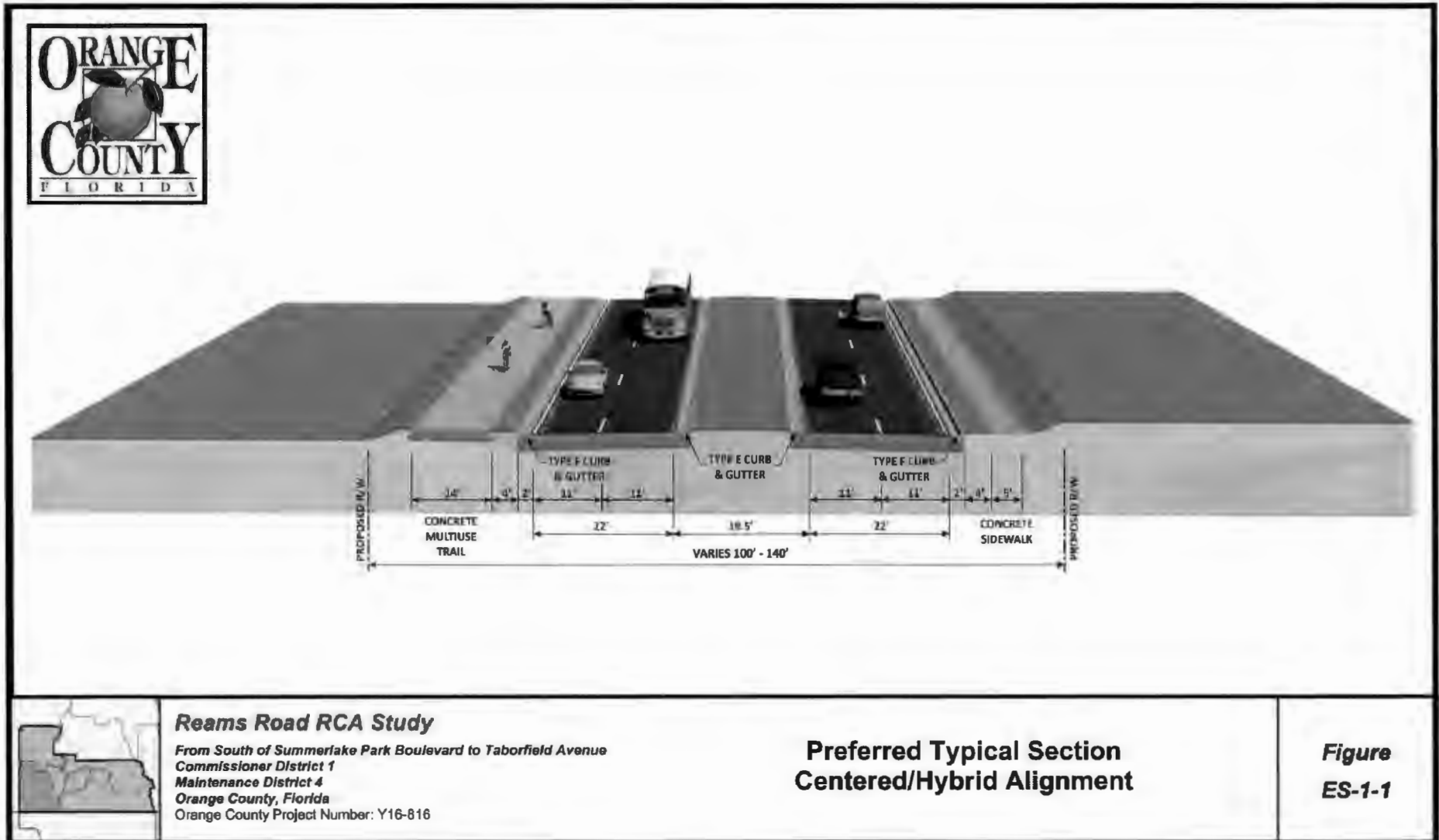
## ES.6 Preferred Alternative

The preferred typical section is shown in Figure ES-1-1 and contains the following roadway design elements:

- Four 11-foot travel lanes
- A five-foot sidewalk located on the south side of the roadway
- A 14-foot multiuse trail located on the north side of the roadway
- Type E curb and gutter along the inside lanes
- Type F curb and gutter along the outside lanes
- A 19.5-foot raised median
- Two 4-foot utility strips between the Type F curb and gutter and the sidewalk or multiuse trail
- A grass strip between the multiuse trail or sidewalk and the right-of-way line of varying width
- The proposed right-of-way varies in width between 100 feet and 140 feet but is typically 120 feet

Based on the matrix evaluation and public involvement activities, the preferred alternative is the Centered/Hybrid Build Alternative. The preferred alignment alternative minimizes right-of-way impacts, social impacts as measured by relocations, and project costs. The Preferred Alternative is shown on the concept plans contained in Appendix A as well as described in more detail in Section 7 Preferred Alternative. The right-of-way identification maps are contained in Appendix B.

Figure ES-1-1  
Preferred Typical Section



## ES.7 Public Involvement

Critical to the success of this project is the feedback received from the local community. There have been two community meetings held to present project related information to the public and to receive input regarding the project. Meeting summaries, along with the Public Involvement Documents, are contained in Appendix D. Small group meetings were held with representatives from Walt Disney World, and Noah's Notes. Minutes from these meetings are included in Appendix D.

## ES.8 Conclusions and Recommendations

The objective of the Reams Road RCA is to develop and evaluate alternatives for improvement of Reams Road from south of Summerlake Park Boulevard to Taborfield Avenue. The alternatives sought to provide for the cost-feasible improvements to the roadway in order to balance the safety and mobility needs of all mode users in the corridor. The process incorporated the insights from planning, engineering, and the public to refine the alternatives, and ultimately advance a preferred alternative into the design phase. It is recommended that the preferred alternative detailed in Section 7 of this report be advanced by Orange County into the design phase.

Retaining walls are recommended between Jayme Drive and Floridian Place, and between Floridian Place and Center Drive. The use of the retaining walls will reduce right-of-way acquisition impacts to adjacent properties. It is recommended that Orange County discuss with the adjacent property owners the possibility of utilizing a harmonizing agreement to allow regrading the adjacent property to eliminate the need for a retaining wall.

# 1 INTRODUCTION

## 1.1 Introduction and Study Area

Orange County Public Works conducted a Roadway Conceptual Analysis (RCA) for Reams Road from south of Summerlake Park Boulevard to Taborfield Avenue in west Orange County. The project corridor is approximately 2.88 miles in length. The limits of the project are from approximately 0.21 miles south of Summerlake Park Boulevard to Taborfield Avenue, as shown in Figure 1-1, Project Location Map.

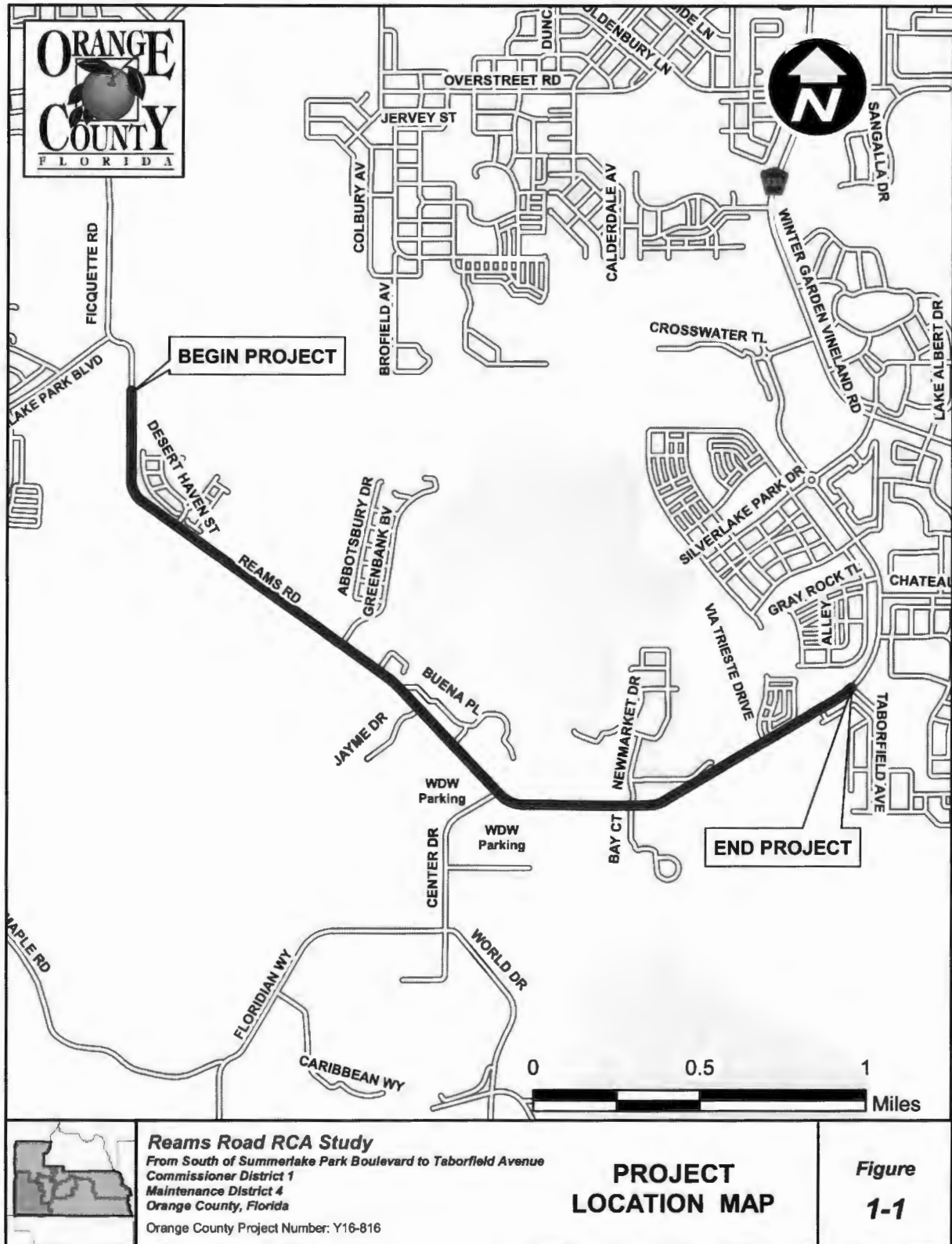
Orange County's RCA process has been implemented with the intent of applying a comprehensive interdisciplinary approach, combining the strengths of engineering and transportation planning disciplines in the initial development phases of Orange County's major roadway improvement projects. The interdisciplinary approach also seeks to assure early and systematic coordination with all effected County Departments and Divisions, the appropriate state and local entities, and the citizenry. The resulting effort is to accurately gather and convey information pertinent to the development of the project, thereby identifying viable opportunities to expedite or advance subsequent project phases.

Reams Road is located in unincorporated west-central Orange County in Commission District 1. Reams Road, within the project limits, is currently a two lane, undivided collector. Reams Road has a circuitous alignment, connecting to County Road (CR) 535 (via Silverlake Park Drive) at the east end of the study limits, and connecting at Summerlake Park Boulevard/Ficquette Road at the west end of the study limits. The proposed improvements will increase roadway capacity in order to accommodate future traffic demands in the project area. Reams Road serves the rapidly developing Lakeside Village and provides access to the Disney World cast member parking area. The proposed improvements will also enhance bicycle and pedestrian infrastructure along the Reams Road corridor, therefore improving safety for bicycle and pedestrian users.

## 1.2 Purpose of Report

The purpose of this RCA Report is to present an overview of existing conditions, document the findings of the engineering and environmental studies conducted for this project, describe the results of the alternatives evaluation, and provide the identification of and the justification for the recommended improvements.

**Figure 1-1  
Project Location Map**



This document describes the determinations made regarding typical roadway cross sections, a summary of existing and future traffic conditions and the comparative analysis of improvement alternatives that would satisfy existing and future transportation demands.

Potential typical section and alignment alternatives were developed based upon the engineering and environmental data collected, a review of Orange County Comprehensive Plan 2010-2030 Goals, Objectives & Policies (effective September 1, 2017), and the application of current roadway design standards. The alternatives were evaluated based on impacts resulting from the alignment locations and configurations. Each alternative was assessed using evaluation criteria developed for that purpose. From that comparative evaluation, the preferred typical section, roadway alignment, and stormwater management system were identified.

This RCA Study included analysis of existing and projected traffic conditions, development of alignment and typical section alternatives, an evaluation of impacts to the social, natural, and physical environment, and a public involvement program. This report has been prepared to assist Orange County in identifying a recommended design concept alternative and will serve as the document of record for support of subsequent engineering decisions for the final design, right-of-way acquisition, and construction phases that follow.

The recommended conceptual roadway alignment plans, included in Appendix A, and the right-of-way identification maps, included in Appendix B, are an integral part of this document and should be reviewed in concert with this document. The plans reflect specific details concerning each area of the project and will supplement information that is contained in this report.

## 2 PURPOSE AND NEED FOR PROJECT

The purpose and need for the project is based on several factors. These are traffic capacity, social/economic demands, consistency with transportation plans, and safety. Each of these is discussed below.

### 2.1 Traffic Capacity

Portions of Reams Road within the project limits are currently operating at an unacceptable Level of Service (LOS) F. Without improvements, all of Reams Road, within the project limits, will operate at an unacceptable LOS F by the design year 2045.

Table 2-1 provides a list of the roadway parameters utilized in this analysis, taken from the Orange County Traffic Concurrency Management System. Included in this table are: number of lanes, functional classification, adopted Level of Service (LOS) standard, roadway service volumes, AM and PM peak hour traffic volumes, and existing LOS. Based upon this analysis, four of the Reams Road study roadway segments currently operate over capacity. The remaining study roadway segments all operate at acceptable levels of service.

Although Summerlake Park Boulevard is not within the project limits, the intersection has been included in the traffic analysis for informational purposes. The study intersections were analyzed under existing conditions using the procedures of the 2010 Highway Capacity Manual for signalized and unsignalized intersections. This analysis used existing traffic volumes and existing geometric conditions. Table 2-2 includes the summary results for the AM and PM peak hour intersection delay and level of service. All of the existing study intersections within the project limits currently operate at satisfactory levels of service.

In the design year 2045 and without capacity improvements, only Newmarket Drive is projected to operate at an acceptable level of service (LOS E or better) during the PM peak hour. The Floridian Place/Buena Place intersection is projected to operate at LOS F. The full access unsignalized intersections are projected to operate at LOS F for the minor street movements. The two right-in/right-out intersections are projected to operate at LOS F or better for the minor street movements.

Under the AM peak hour analysis, the Floridian Place signalized intersection will operate at LOS F. The full access unsignalized intersections are projected to operate at LOS F for the minor street movements. The two right-in/right-out intersections are projected to operate at LOS F or better for the minor street movements.

Therefore, capacity improvements are needed to achieve an acceptable level of service along Reams Road.

**Table 2-1  
Existing Roadway Level of Service**

Roadway/Segment	Adopted Functional Class	LOS	# of Lanes	Roadway Service Volumes Peak Hour/ Peak Direction Capacity Table <sup>1</sup>					AADT <sup>2</sup>	Peak Hour Traffic Volumes <sup>2</sup>		Peak Time <sup>2</sup>	LOS
Mainline Characteristics													
Reams Road				A	B	C	D	E		EB	WB		
Southeast of Summerlake Park Blvd	Collector	E	2	0	0	830	880	880	15,500	914	481	8:00-9:00 AM	F
East of Oasis Cove	Collector	E	2	0	0	830	880	880	16,500	512	973	5:00-6:00 PM	F
West of Jayme Drive	Collector	E	2	0	0	830	880	880	16,800	522	990	5:00-6:00 PM	F
West of Center Drive	Collector	E	2	0	0	830	880	880	14,100	438	831	5:00-6:00 PM	D
West of Newmarket Drive	Collector	E	2	0	0	830	880	880	14,700	867	456	5:00-6:00 PM	D
East of Via Trieste Drive	Collector	E	2	0	0	830	880	880	15,100	469	890	5:00-6:00 PM	F
Side Street Characteristics													
Summerlake Park Blvd				A	B	C	D	E		EB	WB		
West of Reams Road	Local	E	2	0	0	330	680	720	11,700	391	688	5:00-6:00 AM	E
Floridian Place				A	B	C	D	E		NB	SB		
South of Reams Road	Local	E	4	0	0	660	1,470	1,530	14,500	189	1,194	7:30-8:30 AM	D
Center Drive				A	B	C	D	E		NB	SB		
South of Reams Road	Local	E	2	0	0	330	680	720	4600	357	342	4:15-5:15 AM	C
Taborfield Avenue				A	B	C	D	E		NB	SB		
South of Reams Road	Local	E	2	0	0	330	680	720	800	42	50	4:00-5:00 AM	C

<sup>1</sup>From Orange County Traffic Concurrency Management Program

<sup>2</sup>Daily and Peak Hour traffic volumes



**Table 2-2**  
**Existing Intersection Delay and LOS for Study Intersections**

Study Intersections	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS
<b>Reams Road</b>					
Summerlake Park Boulevard/Ficquette Road	Stop <sup>1</sup>	9.1/54.4	A/F	8.8/445.3	A/F
Oasis Cove Boulevard	Stop <sup>2</sup>	8.0/31.4	A/D	10.5/30.1	B/D
Greenbank Boulevard	Stop <sup>2</sup>	7.9/26.7	A/D	10.4/27.8	B/D
Jayme Drive	Stop <sup>3</sup>	10.9/26.7	B/D	8.3/17.0	A/C
Floridian Place/Buena Place	Signal	32.6	C	32.2	C
WDW Cast Parking	Stop <sup>4</sup>	12.2	B	13.0	B
Center Drive/Community Driveway	Stop <sup>5</sup>	8.7/11.8/12.3	A/B B	8.2/15.8 10.9	A/C B
Newmarket Drive/Bay Court	Stop <sup>6</sup>	8.6 8.4/19.9 26.1	A A/C B	8.2 9.3/22.7 24.6	A A/C C
Via Trieste Drive/Aldendale Street	Stop <sup>6</sup>	8.6 8.5/22.2 15.7	A A/C C	8.3 9.4/24.2 19.1	A A/C C
Royal Estates	Stop <sup>3</sup>	12.3/15.8	A/C	9.3/20.3	A/C
Taborfield Avenue	Stop <sup>3</sup>	12.5/14.5	A/B	9.6/19.4	A/C

<sup>1</sup>NB Left Turn Major Street Movement/EB Minor Street Movements <sup>2</sup>EB Left Turn Major Street Movement/SB Minor Street Movements  
<sup>3</sup>WB Left Turn Major Street Movement/NB Minor Street Movements <sup>4</sup>NB Minor Street Right Turn Movement <sup>5</sup>EB Left Turn Major Street Movement/  
NB Minor Street Right Turn Movement | SB Minor Street Right Turn Movement <sup>6</sup>EB | WB Left Turn Major Street Movements/NB | SB Minor Street Movements

## 2.2 Social/Economic Demands

Reams Road is located in Horizon West, which includes five mixed use villages surrounded by greenbelts, as well as a Town Center. Reams Road serves the rapidly developing Lakeside Village, which was the first village approved in Horizon West. Existing land use adjacent to the Reams Road corridor consists of the Walt Disney Parks and Resorts cast member parking area located on the south side of the roadway, residential developments, commercial development, institutional development, undeveloped properties, and wetlands. Existing zoning along the project corridor is predominantly classified as Planned Development. Other zoning classifications found along the project corridor include, Residential 3 (Multiple Family Dwelling District), Residential CE-2 (Country Estate Rural Residential District), Commercial-1 (Retail Commercial District), and Agricultural 1 and Agricultural-2.

The project limits fall within one U.S. Census Tract with two block groups. Data regarding each block group within the tract can be seen in Table 2-3.

**Table 2-3**  
**U.S. Census Data**

Census Tract	Block Group	Median Age	Median Income	Percent of population below poverty level	Total Population of Census Tract
017103	1	27	\$47,326	23.9%	5,614
017103	2	35	\$62,129	13.1%	11,266

Future land use data was obtained from Orange County Future Land Use Geographic Information Systems (GIS) data. Future land use along the project corridor is almost entirely classified as Village Horizon West. There is one area south of Reams Road and west of Jayme Drive that is classified as Medium Density Residential. Transportation improvements are needed to provide service to this growing community.

## 2.3 Consistency with Transportation Plans

The widening of Reams Road, from Summerlake Park Boulevard to CR 535 (Winter Garden Vineland Road), is included in the MetroPlan Orlando 2040 Long Range Transportation Plan (Blueprint 2040) as an Orange County Unfunded Need. The plan has the project listed in two segments, from Summerlake Park Boulevard to Center Drive, and from Center Drive to CR 535 (Winter Garden Vineland Road). Reams Road from Summerlake Park Boulevard to Taborfield Avenue is included in the FY 2017/18-2021-22 Orlando Urban Area Transportation Improvement Program as a locally funded highway project by Orange County.

The Orange County Comprehensive Plan, Capital Improvements Element, includes improvements to Reams Road, from Summerlake Park Boulevard to Taborfield as part of the 10-year schedule of capital improvements.

Reams Road is included as a four-lane roadway in Map 1C: Transportation Element Future Conditions Number of Lanes 2030. The project is consistent with the Orange County Comprehensive Plan, the MetroPlan Orlando 2040 L RTP Unfunded Needs Plan, and the MetroPlan Orlando FY 2017/18-2021-22 Orlando Urban Area Transportation Improvement Program.

## 2.4 Safety

Crash reports for the three-year time period between April 2, 2014 and April 2, 2017 were obtained and reviewed. Crashes were considered to be associated with the intersection if the crash occurred due to the operation of the intersection or was within the length of the turn lane bay. Ninety-seven crashes occurred at the study intersections over the three-year period. Thirty-one crashes occurred along the segments not associated with the operations of an intersection. Capacity and intersection improvements will enhance safety along the corridor.

## 3 EXISTING CONDITIONS

This section presents an overview of the existing physical characteristics and conditions of the Reams Road study corridor.

### 3.1 Roadway Characteristics

#### 3.1.1 Functional Classification

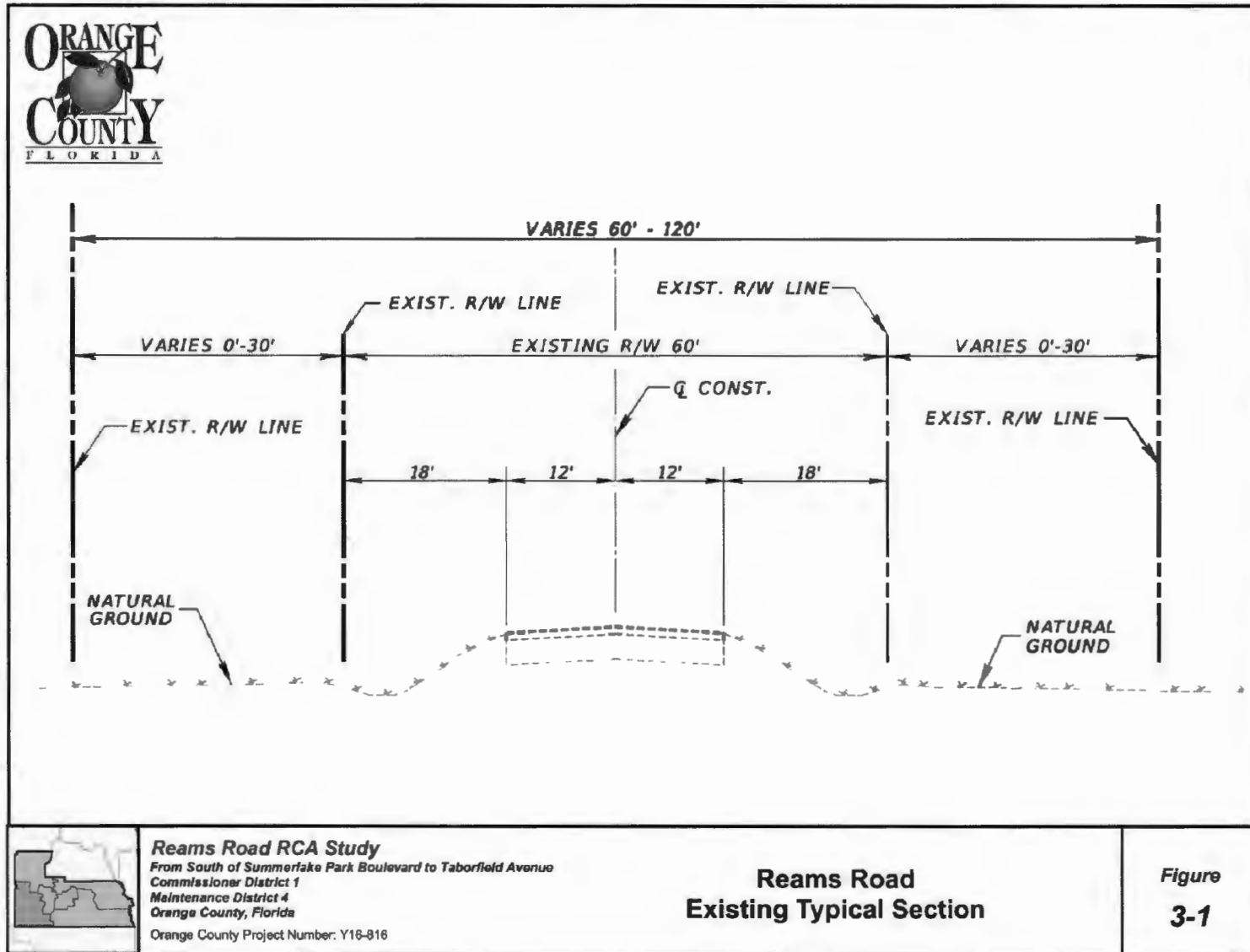
Reams Road, within the project limits, is a two-lane undivided roadway. The Lakeside Village Specific Area Plan, adopted May 20, 1997 by Orange County, identifies Reams Road as a major urban collector from Summerlake Park Boulevard/Ficquette Road at the west end of the study limits to west of Jayme Drive, as a minor collector from west of Jayme Drive to Via Trieste Drive, and as a neighborhood circulator from Via Trieste Drive to Taborfield Avenue. Reams Road has a posted speed limit of 45 miles per hour (mph).

#### 3.1.2 Typical Section

Reams Road is predominately a two-lane undivided rural roadway with roadside swales that collect stormwater. As development has occurred along the corridor, intersection improvements have been made consisting of left and/or right turn lanes. The improved intersections occur at the locations listed below. Figure 3-1 depicts the existing typical section.

- Oasis Cove Boulevard (eastbound left turn lane, and westbound left turn lane and right turn lane)
- Greenbank Boulevard (eastbound left turn lane and westbound right turn lanes)
- Peachtree Park Court (eastbound left turn lane)
- Jayme Drive (westbound left turn lane)
- Floridian Place/Buena Place (eastbound left turn lane and right turn lane, westbound dual left turn lanes and right turn lane)
- 7-Eleven driveway entrance (directional eastbound left turn lane)
- Newmarket Drive (eastbound left turn and right turn lane, and westbound left turn lane)
- Via Trieste Drive (eastbound left turn lane and westbound left turn lane)
- Royal Estates Boulevard (eastbound left turn lane and westbound left turn lane)
- Taborfield Avenue (westbound left turn lane).

**Figure 3-1**  
**Reams Road Existing Typical Section**



### 3.1.3 Pedestrian and Bicycle Facilities

Sidewalk improvements have been made along Reams Road as developments have been constructed. However, extended distances along Reams Road do not have pedestrian features. Table 3-1 provides the location of the intersections where pedestrian facilities have been constructed, the length of the sidewalk, and the location of the sidewalk relative to the north or south side of Reams Road and east or west of the intersection side street. Unless noted, the sidewalks are concrete and five feet wide.

**Table 3-1**  
**Existing Pedestrian Facilities**

<b>Intersection with Reams Road</b>	<b>Sidewalk Length and Location Relative to Reams Road (North Side or South Side)</b>
The Church of Latter-Day Saints	North: 440 feet
Greenbank Boulevard	North: 110 feet west and 175 feet east
Peachtree Park Court	North: 80 feet west and 235 feet east (14-foot concrete multiuse trail)
Floridian Place/Buena Place	North: 1,150 feet west and 175 feet east South: 720 feet west
Newmarket Drive	North: 1625 feet east (14-foot asphalt multiuse trail)
Via Trieste Drive	North: 190 feet west and 500 feet east South: 150 feet west and 1580 feet east

Reams Road has limited bicycle facilities. There are no on-road bicycle lanes and no paved shoulders. Short segments of 14-foot multiuse trails exist at Peachtree Park Court and Newmarket Drive as noted above in Table 3-1.

### 3.1.4 Existing Right-of-Way

The existing right-of-way along Reams Road varies throughout the project corridor. When originally constructed, the existing right-of-way was typically 60 feet in width. As new development has occurred along the corridor, additional right-of-way has been acquired. Table 3-2 summarizes the existing rights-of-way along the corridor.

**Table 3-2  
Existing Right of Way**

Station	Right-of-Way Width	Location
120+45 to 129+25	60 feet	From Begin Project at Ficquette Road realignment to Oasis Cove subdivision
129+25 to 131+05	90 feet	Oasis Cove subdivision
131+05 to 141+05	90-148-110 feet	Oasis Cove subdivision
141+05 to 169+85	100 feet	Oasis Cove subdivision to 645 feet west of Greenbank Boulevard
169+85 to 175+15	60 feet	645 feet west of Greenbank Boulevard to 125 feet west of Greenbank Boulevard
175+15 to 185+20	110 feet	125 feet west of Greenbank Boulevard
185+20 to 189+60	110-90 feet	125 feet west of Greenbank Boulevard to 700 feet east of Greenbank Boulevard
189+60 to 191+20	60 feet	700 feet east of Greenbank Boulevard to 110 feet west of Jayme Drive
191+20 to 197+10	90 feet	110 feet west of Jayme Drive to 300 feet west of Floridian Place
197+10 to 202+50	60 feet	300 feet west of Floridian Place to 230 feet east of Floridian Place
202+50 to 209+60	83 feet	230 feet east of Floridian Place to 7-11 east driveway
209+60 to 218+20	83-138-116 feet	7-11 east driveway to eastern most WDW parking lot entrance
218+20 to 231+55	116 feet	Eastern most WDW parking lot entrance to 75 feet west of Bay Court
231+55 to 231+90	70 feet	75 feet west of Bay Court 60 feet east of Bay Court
231+90 to 254+50	90 feet	60 feet east of Bay Court to 190 feet west of Via Trieste Drive
254+50 to 259+60	120 feet	190 feet west of 235 feet east Via Trieste Drive
259+60 to 261+20	120-113 feet	235 feet east Via Trieste Drive to 510 feet east of Via Trieste Drive
261+20 to 272+10	120 feet	510 feet east of Via Trieste Drive to west of Taborfield Avenue
272+10 to 273	100 feet	West of Taborfield Avenue to east of Taborfield Avenue (End Project)

### 3.1.5 Existing Horizontal and Vertical Alignment

Reams Road has a circuitous alignment traversing southerly from Summerlake Park Boulevard/Ficquette Road to Oasis Cove Boulevard, southeasterly to Center Drive, easterly to east of Newmarket Drive, and northeasterly to Taborfield Avenue.

At the project beginning, south of Summerlake Park Boulevard, Reams Road is at an elevation of approximately 100-feet. It then rises to an elevation of approximately 104-feet west of Oasis Cove Boulevard before falling to an elevation of approximately 97-feet near the Oasis Cove Boulevard intersection with Reams Road. It then gently rises and falls between elevations of approximately 100-feet and 104-feet before falling to a low point east of Greenbank Boulevard at a culvert crossing. It then again gently rises and falls between an elevation of approximately 100-feet and 103-feet before falling to an elevation of approximately 96-feet east of Center Drive. Reams Road then gently rises to an elevation of approximately 105-feet at Taborfield Avenue. It is noted that the information presented in the section is based on Orange County LiDAR information which utilizes the NAVD88 datum.

### 3.1.6 Signalized Intersections

Floridian Place is the only signalized intersection within the study limits.

## 3.2 Crash Data

Crash reports for the three-year time period between April 2, 2014 and April 2, 2017 were obtained and reviewed. Although Summerlake Park Boulevard is not within the project limits, the intersection has been included in the traffic analysis for informational purposes. Ninety-seven crashes occurred at the study intersections over the three-year period. Thirty-one crashes occurred along the segments not associated with the operations of an intersection.

Sixteen crashes occurred at the intersection of Reams Road and Summerlake Park Road over the three-year period with six occurring in 2014, six occurring in 2015, three occurring in 2016 and one occurring in 2017. There were six injuries in four crashes, no fatalities, and property damage estimated at \$127,950. None of the crashes involved a DUI, and six were failure to yield right-of-way.

Three crashes occurred at the intersection of Reams Road and Oasis Cove Boulevard over the three-year period with two occurring in 2014 and one occurring in 2016. There were three injuries in two crashes, no fatalities, and property damage estimated at \$14,500. None of the crashes involved a DUI, and none were failure to yield right-of-way.

No crashes occurred at the intersection of Reams Road and Greenbank Boulevard over the three-year period.

One crash occurred at the intersection of Reams Road and Jayme Drive over the three-year period with the crash occurring in 2016. There were no injuries, no fatalities, and property damage estimated at \$1,500. The crash did not involve a DUI and was listed as a failure to yield right-of-way.

Seventeen crashes occurred at the intersection of Reams Road and Floridian Place/Buena Place over the three-year period with five occurring in 2014, eight occurring in 2015, seven occurring in 2016 and four occurring in 2017. This intersection was rebuilt and signalized in August 2016. Ten crashes occurred before this improvement. There were two injuries in two crashes, no fatalities, and property damage estimated at \$70,150. None of the crashes involved a DUI, and seven were failure to yield right-of-way.

Fifty crashes occurred at the intersection of Reams Road and Center Drive over the three-year period with eleven occurring in 2014, fifteen occurring in 2015, twenty-four occurring in 2016 and none occurring in 2017. This intersection was reconfigured to prohibit eastbound left turns from Reams Road, and



northbound left turns from Center Drive in August 2016. Forty-three of the crashes occurred before this modification, with only seven occurring after. There were twenty-five injuries in eighteen crashes, no fatalities, and property damage estimated at \$293,970. None of the crashes involved a DUI, and nineteen were failure to yield right-of-way.

Seven crashes occurred at the intersection of Reams Road and Bay Court/Newmarket Drive over the three-year period with five occurring in 2014, one occurring in 2016 and one occurring in 2017. There were seven injuries in three crashes, no fatalities, and property damage estimated at \$110,120. None of the crashes involved a DUI, and one was failure to yield right-of-way.

One crash occurred at the intersection of Reams Road and Via Trieste Drive over the three-year period, occurring in 2014. There were no injuries, no fatalities, and property damage estimated at \$5,000. The crash did not involve a DUI or failure to yield right-of-way.

Two crashes occurred at the intersection of Reams Road and Taborfield Avenue over the three-year period with one occurring in 2014 and one occurring in 2017. There were no injuries, no fatalities, and property damage estimated at \$7,000. None of the crashes involved a DUI or failure to yield right-of-way.

Thirty-one crashes occurred along the study area but not associated with the operation of an intersection listed above. Eight crashes occurred in 2014, ten crashes in 2015, twelve in 2016 and one in 2017. There were eleven injuries in nine crashes, no fatalities, and property damage estimated at \$280,870. None of the crashes involved DUI, and two by failure to yield right-of-way. Four crashes involved an animal in the roadway.

Among the total one hundred twenty-eight crashes recorded along the study corridor, thirty-seven were rear end crashes, thirty-six were left turn crashes, seven were angle and five were sideswipe. Seventeen crashes involved vehicles running off road, two crashes involved vehicle backing into vehicles, twenty-nine were one vehicles crashes and twenty-one were "other" types. Three crashes involved pedestrians or bikes. Overall, fifty-five drivers were cited for careless driving and thirty-six for failure to yield right-of-way. One hundred occurred during daylight with the remaining twenty-eight occurring at night. One hundred eleven occurred in dry weather and the remaining seventeen occurring during wet conditions.

The intersection million entering vehicles safety ratio for the study intersections and the one million vehicle miles of travel (MVMT) were calculated for the roadway corridor. The FDOT District Five average five-year crash rate for 2-3 lane (two-way total) undivided urban roadways is 2.99 crashes/MVMT. The study segment crashes/MVMT is 1.830, less than the district-wide average.

The FDOT District Five average five-year crash rate for intersections along 2-3 lane (two-way total) undivided urban roadways is 0.166 and 0.2426 for three-leg and four-leg intersections, respectively.

Three intersections have a safety ratio over the appropriate average above. The safety ratio for Floridian Place is 0.720. However, this intersection was rebuilt and signalized after 10 of the 17 crashes occurred. The safety ratio for Center Drive/Community Drive is 3.332 crashes/MEV. Once again, this intersection was significantly modified prohibiting left turns after 43 of the 50 crashes occurred. The intersection of Newmarket Drive/Bay Court had a safety ratio of 0.405. All the remaining intersections have safety ratios of 0.162 or less. The entire study roadway segment has a safety ratio of 1.873 per 1 million vehicle-miles of travel (MVMT).

### 3.3 Existing Transportation Network

The existing transportation network within the study corridor is comprised mainly of the current roadway system. LYNX Transit routes 56 and 302 service the area south of Reams Road along Center Drive with stops at Disney University and the Magic Kingdom Bus Station. These routes access the stops from the south and do not utilize Reams Road. The LYNX Vision 2030 Plan does not include any future routes in the vicinity of Reams Road.

Reams Road connects to SR 429 to the west via Summerlake Park Boulevard, Hamlin Groves Trail and New Independence Parkway. Reams Road connects to CR 535 to the east via Silverlake Park Drive. Other planned roadway improvements in the vicinity of the project include:

- Ficquette Road from West of Overstreet Road to South of CR 535, widen to 4-lanes
- Ficquette Road from Summerlake Park Boulevard to Overstreet Road, widen to 4-lanes
- Reams Road from Taborfield Avenue to Gold Creek Trail, widen to 4-lanes

### 3.4 Long Range Transportation Improvements

The widening of Reams Road, from Summerlake Park Boulevard to CR 535 (Winter Garden Vineland Road), is included in the MetroPlan Orlando 2040 Long Range Transportation Plan (Blueprint 2040) as an Orange County Unfunded Need. The plan has the project listed in two segments, from Summerlake Park Boulevard to Center Drive, and from Center Drive to CR 535 (Winter Garden Vineland Road). Reams Road from Summerlake Park Boulevard to Taborfield Avenue is included in the FY 2017/18-2021-22 Orlando Urban Area Transportation Improvement Program as a locally funded highway project by Orange County.

The Orange County Comprehensive Plan, Capital Improvements Element, includes improvements to Reams Road, from Summerlake Park Boulevard to Taborfield as part of the 10-year schedule of capital improvements.

Reams Road is included as a four-lane roadway in Map 1C: Transportation Element Future Conditions Number of Lanes 2030. The project is consistent with the Orange County Comprehensive Plan and the MetroPlan Orlando 2040 LRTP Unfunded Needs Plan, and the MetroPlan Orlando FY 2017/18-2021-22 Orlando Urban Area Transportation Improvement Program.

### 3.5 Lighting

Street lighting is limited along Reams Road. A standard cobra head luminaire is located on a utility pole at Bay Court. Several utility poles along the Walt Disney Parks and Resorts cast member parking area near Center Drive also have standard cobra head luminaires attached. The signal strain poles at Floridian Place have standard cobra head luminaires attached. No other areas within the project limits have lighting.

### 3.6 Existing Utilities

Thirteen Utility Agency/Owners (UAO) have been identified within the project area through a Sunshine 811 Design Ticket and utility coordination efforts. There are numerous existing utilities within the project corridor including overhead and underground electric, water and wastewater mains, gas mains, and communication lines. All of the utility providers and operators were contacted on July 12, 2017 and were

provided aerial maps of the project for review. Based on the aerial maps, UAOs were asked to assist in locating and identifying their existing and any planned facilities within the area of study. Details of the UAOs contacted on the project and a description of the facilities identified within the corridor are summarized in Table 3-3. The locations of existing and proposed utilities have been plotted on the base aerial maps contained in Appendix C.

**Table 3-3  
Existing Utilities Summary**

Utility Company	Facility Type	Description
AT&T Corporation	Fiber	High capacity buried fiber line along the north side of Summerlake Park Boulevard, which then turns north along the west side of Ficquette Road.
AT&T Distribution	Phone/Fiber	No Facilities
Bright House	Cable/Phone	Aerial fiber and coax on the Duke Energy pole line from Summerlake Park Boulevard to Greenbank Boulevard. Buried fiber and coax from Greenbank Boulevard to east of Center Drive. Portions of facilities located within easements adjacent to Disney owned parcels. Aerial fiber and coax from east of Center Drive to Via Trieste Drive. Buried fiber and coax from Via Trieste Drive to the end of the project.
Century Link	Phone/Fiber	Buried fiber along both sides of Summerlake Park Boulevard. Buried telephone along the left side of Reams Road from Summerlake Park Boulevard to Center Drive. Buried telephone and fiber along the south side of the road from Center Drive to end of project. Buried telephone along the north side of the road from Newmarket Drive to east of Via Trieste Drive.
Florida Gas Transmission	Gas	4" natural gas pipeline along the south side of Reams Road from Center Drive to Bay Court.
Duke Energy-Distribution	Electric	12.4 kV overhead electric lines along the north and south side of the road from Summerlake Park Boulevard to north of Oasis Cove. 12.4 kV overhead electric lines along north side of the road from Oasis Cove to the south side of the community where the lines transition to the south side of the road and continue to the project limits. 12.4 kV underground electric lines to most of the subdivisions and businesses along Reams Road.
Duke Energy-Transmission	Transmission Electric	Transmission facilities enter the project from a 75' Duke Energy easement west of Greenbank Boulevard and continue along the south side of Reams Road in an easement to Buena Vista Place, where the transmission lines exit the project to the south in an easement.
Duke Energy-Fiber	Fiber	No Facilities

Utility Company	Facility Type	Description
Lake Apopka Natural Gas	Gas	4" poly gas main along the south side of the road from Summerlake Park Boulevard to west of Oasis Cove.
Orange County Utilities	Water/Sewer	8" water main along the south side of Reams Road from Oasis Cove Boulevard to Buena Vista Place. 12" DIP water main along the south side of Reams Road from Buena Vista Place to Newmarket Drive. 24" DIP water main along the north side of Reams Road from Newmarket Drive to Taborfield Avenue. 16" DIP reclaimed main along the south side of Reams Road from Summerlake Park Boulevard to Greenbank Boulevard. 16" DIP reclaimed main along the north side of Reams Road from Greenbank Boulevard to the Buena Vista Place Entrance. 16" DIP reclaimed main along the south side of Reams Road from Buena Vista Place to Newmarket Drive. 16" reclaimed main along the north side of Reams Road from Newmarket Drive to Taborfield Avenue. 16" PVC force main along the north side of Reams Road for the limits of the project.
Summit Broadband	Phone/Fiber	Buried fiber optic cable along the south side of the road from Summerlake Park Boulevard to an easement along the south side of Windermere Cay Apartments.
Reedy Creek Energy Services	Wtr/Swr/Gas /Elec/Comm	8" water main, sewer, electric, and communications located in an easement on Disney University parcel. 12" water main located within the right-of-way on the west side of Bay Court.
Smart City Telecom	Cable/Fiber	Buried fiber, 50 pr copper, and 8-way duct bank located in an easement along the south side of Reams Road on Disney owned parcels.

### 3.7 Geotechnical Exploration

This section presents a summary of the preliminary geotechnical evaluation for the Reams Road RCA study.

#### 3.7.1 Local Geology and Hydrology

Orange County is in the central Florida peninsular zone of the Atlantic Coastal Plain physiographic province, a geographic region typified by sedimentary materials of recent geologic age. Topography in the county is generally characterized as broad plains, low ridges and knolls, localized wetlands and marshes, and lakes.

Local geology can be defined using three, general, subsurface layers or "units." The uppermost unit is a zone of predominantly fine to medium sand containing silt and clay, with thin, localized zones of silt, clay, and shell near the bottom. Reported thicknesses range from less than ten feet to more than 50 feet. This sandy, surficial unit is called the "Undifferentiated Sediments".

The Undifferentiated Sediments are underlain by a layer of clays, silts, clayey sands, and silty sands known collectively as the "Hawthorn Group." This geologic unit ranges in thickness from zero to more than 100 feet. Hawthorn Group materials vary widely in composition and are often interbedded with each other, making geotechnical identification and classification difficult. Because of the typically high clay and silt content, Hawthorn Group materials have low permeability and act as a hydrogeologic confining-layer between the sandy Undifferentiated Sediments above and the porous carbonate bedrock beneath. Hawthorn Group materials can be thin, or even absent, in some areas.

The third unit in the geologic sequence is soft to moderately hard limestone known as the Ocala Limestone. Like most soft, carbonate rocks, Ocala Limestone is susceptible to the formation of solution features in mildly acidic environments. The upper portion of the formation is riddled with highly-localized, solution features such as potholes, chimneys, and sinks. The underlying rock mass contains interconnected chambers and caverns filled with fresh water that percolated from the surface. Because of the abundant volumes of water, the Ocala Limestone is also known as the Upper Floridan aquifer.

Higher rates of groundwater flow ("recharge") from the surficial sands into the aquifer can occur in areas where Hawthorn Group materials are thin or absent. Higher flow rates can transport the sands immediately above the bedrock into voids beneath, loosening the sands from below ("raveling") which can cause sinkholes to form. Sinkhole occurrence cannot be predicted reliably; customary geotechnical practice in central Florida is to assign sinkhole risk qualitatively, based on reported aquifer recharge rates. Review of the USGS map "Recharge and Discharge Areas of the Floridan Aquifer in the St Johns River Water Management District and Vicinity" revealed that the project vicinity is within an area of low to moderate recharge. As a result, the risk of sinkhole activity in the vicinity is likely to be low to moderate, compared to the overall risk in central Florida.

### 3.7.2 Soil Exploration

The United States Geological Survey quadrangle topographic map for the general area showed the terrain in the project vicinity as a series of low knolls separated by areas of wetlands and marsh. The ground surface in the vicinity was mapped between the Elevation 105 feet NGVD (El. 105) contour near the tops of the knolls to below the El. 100 contour around the edges. Some wetlands and depressions were mapped below the El. 95 contour.

The United States Department of Agriculture Natural Resources Conservation Service (NRCS) Soil Survey of Orange County, Florida reported the predominant soil units in the area as Immokalee fine sand and Smyrna fine sand. Pomello fine sand, Zolfo fine sand, and Tavares-Millhopper fine sand were mapped in areas that corresponded to higher elevations on the USGS topographic map. Basinger fine sand, Samsula-Hontoon-Basinger association, and Sanibel muck were shown in the areas mapped as wetlands and marsh, and Urban land was mapped in an apparently developed area north of Walt Disney World.

Immokalee fine sand and Smyrna fine sand are found on broad, low-lying plains in Orange County. These soils are reported to be nearly level to level and poorly drained, with seasonal high groundwater levels within a foot of the ground surface in natural, undisturbed, typically rural areas.

Pomello fine sand, Zolfo fine sand, and Tavares-Millhopper fine sand are found on low knolls and ridges on the plains. These soils are reported as nearly level to gently sloping, and moderately well drained to

well drained, with seasonal high groundwater levels between two feet and more than six feet below the natural ground surface.

Basinger fine sand, Samsula-Hontoon-Basinger association, and Sanibel muck are found in wetlands, marshes, and other natural, localized, low-lying areas on the terrain. These soils are nearly level to level, and poorly drained. They are often submerged for most of the year, sometimes by as much as two feet of water during the rainy season. These soils often have a surficial layer of organic material that may be more than six feet deep in places.

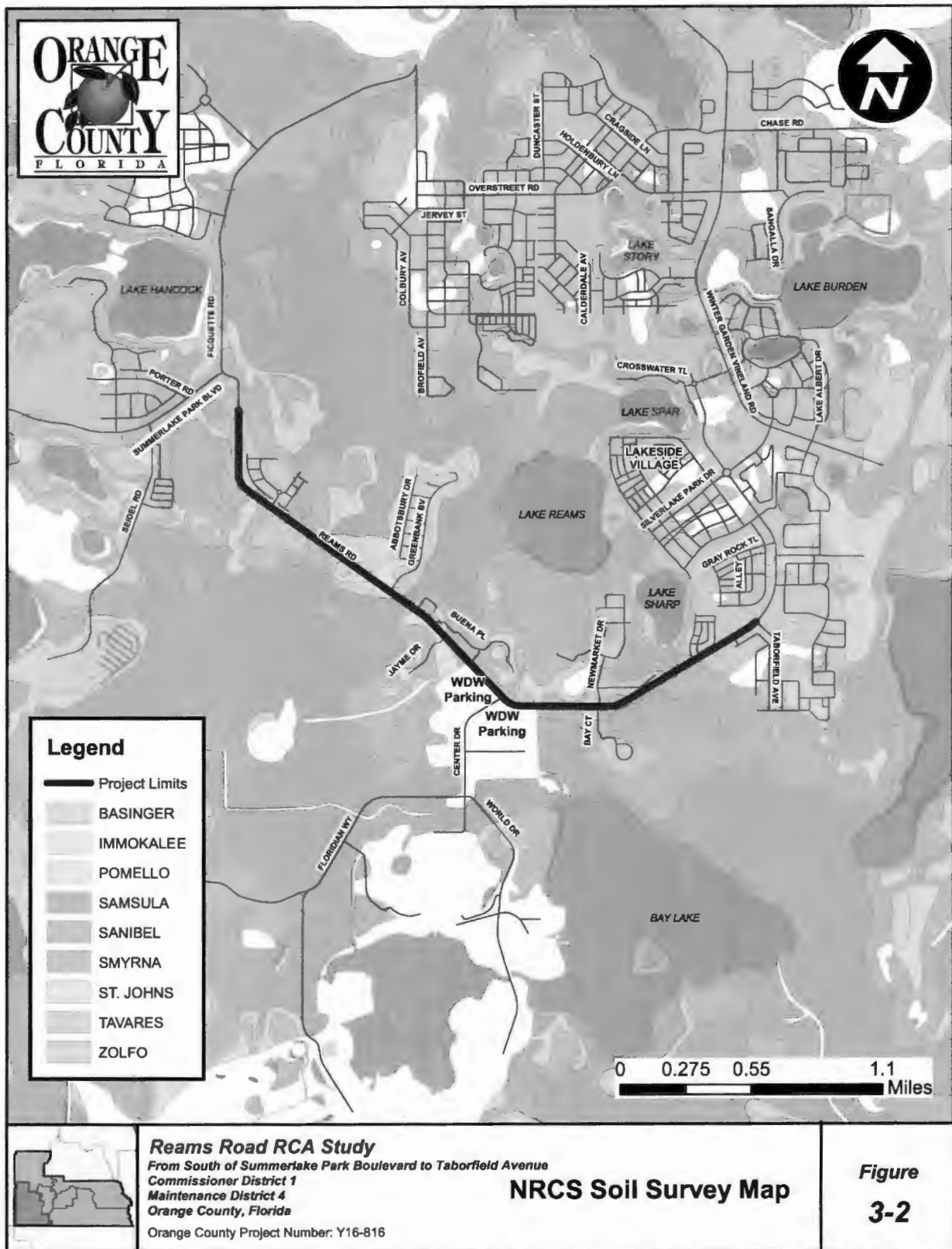
Urban land is covered by streets, buildings, or other surfaces, or has been modified by human activity so that the natural soils and their characteristics are barely discernible.

Characteristics of the reported soil units discussed above are summarized below in Table 3-4. A depiction of the soil types and their location along the project corridor is shown in Figure 3-2.

**Table 3-4**  
**USDA NRCS Soil Survey Map Units in Project Area**

Soil Unit No. and Name		Description	AASHTO Group	ESHWL Depth (ft)	Hydrologic Soil Group
3	Basinger fine sand, depressional	Sand	A-3, A-2-4	+2 to 1	D
20	Immokalee fine sand	Sand	A-3, A-2-4	0 – 1	B/D
34	Pomello fine sand	Sand	A-3, A-2-4	2 – 3.5	C
37	St Johns fine sand	Sand	A-3	0 – 1	B/D
41	Samsula-Hontoon-Basinger assn.	Muck, sand	A-8	+2 to 1	B/D
42	Sanibel muck	Muck	A-8	+1 to 1	B/D
44	Smryna fine sand	Sand	A-3, A-2-4	0 to 1	B/D
47	Tavares-Millhopper fine sand	Sand	A-3, A-4	3.5 to 6	A
50	Urban land				
54	Zolfo fine sand	Sand	A-3, A-2-4	2 to 3.5	C

Figure 3-2  
Soils Map



### 3.8 Potential Contamination

A contamination screening evaluation was conducted for the project. The evaluation identified 15 sites within the study area that could have some risk of contamination impacts to this project. Of these 15 sites, two were rated as No contamination potential, 10 were rated as Low contamination potential, two were rated as Medium contamination potential, and one was rated as High contamination potential. Table 3-5 provides information related to the Medium and High rated sites. Figure 3-3 shows the locations of the Medium and High rated sites.

**Table 3-5  
Medium and High Rated Contamination Sites within the Project Area**

Site No.	Site Name	Description
10	Walt Disney World North Service Area Fueling Tanks 1360 Facilities Way, Bay Lake, LUST ID: U001364370, FDEP ID:8622592.	This site is located on Walt Disney World property adjacent to Facilities Way, approximately 0.2 miles south of Reams Road. This facility was listed as a LUST/SPILLS site in the EDR Report. According to FDEP records, petroleum contamination was discovered on July 20, 1990. Subsequently, source removal and site assessment activities have been implemented. Currently, Walt Disney World is working with the FDEP to achieve no further action designation with conditions for this site due to contaminants being left in place remaining within the property boundary. The rating for this site is Medium.
11	Walt Disney World Laundry 1201 Facilities Way, Lake Buena Vista, FDEP ID: 9502358	This site is located on Walt Disney World property adjacent to Facilities Way, approximately 0.2 miles south of Reams Road. The site currently operates as a dry-cleaning facility for Walt Disney World staff. According to documents available on FDEP Oculus database, this site has historic and current groundwater contamination from a spill that occurred in 1989. Tetrachloroethene (TCE), 1,2-DCE, and vinyl chloride have been detected above respective limits in groundwater as of June 2017. Currently, an on-site groundwater treatment system and soil vapor extraction system are active. Though there has been a decrease in contaminant levels, they currently remain above limits. The rating for this site is High.
12	RCID Central Energy Plant, 5300 N Center Drive, Bay Lake, FDEP ID: 8521938	This site is located on Walt Disney World property adjacent to Facilities Way, approximately 0.3 miles south of Reams Road. This facility was listed as a LUST site in the EDR Report. According to a discharge notification form dated August 30, 1989, an estimated 30,000 gallons of diesel fuel leaked from a damaged pipe. Subsequently, remediation activities were conducted including source removal and natural attenuation monitoring. Currently Walt Disney World is working with the FDEP to achieve no further action designation with institutional controls, including groundwater use restrictions for this site due to the contaminants being left in place. The rating for this site is Medium.



**Figure 3-3**  
**Contamination Sites Map**



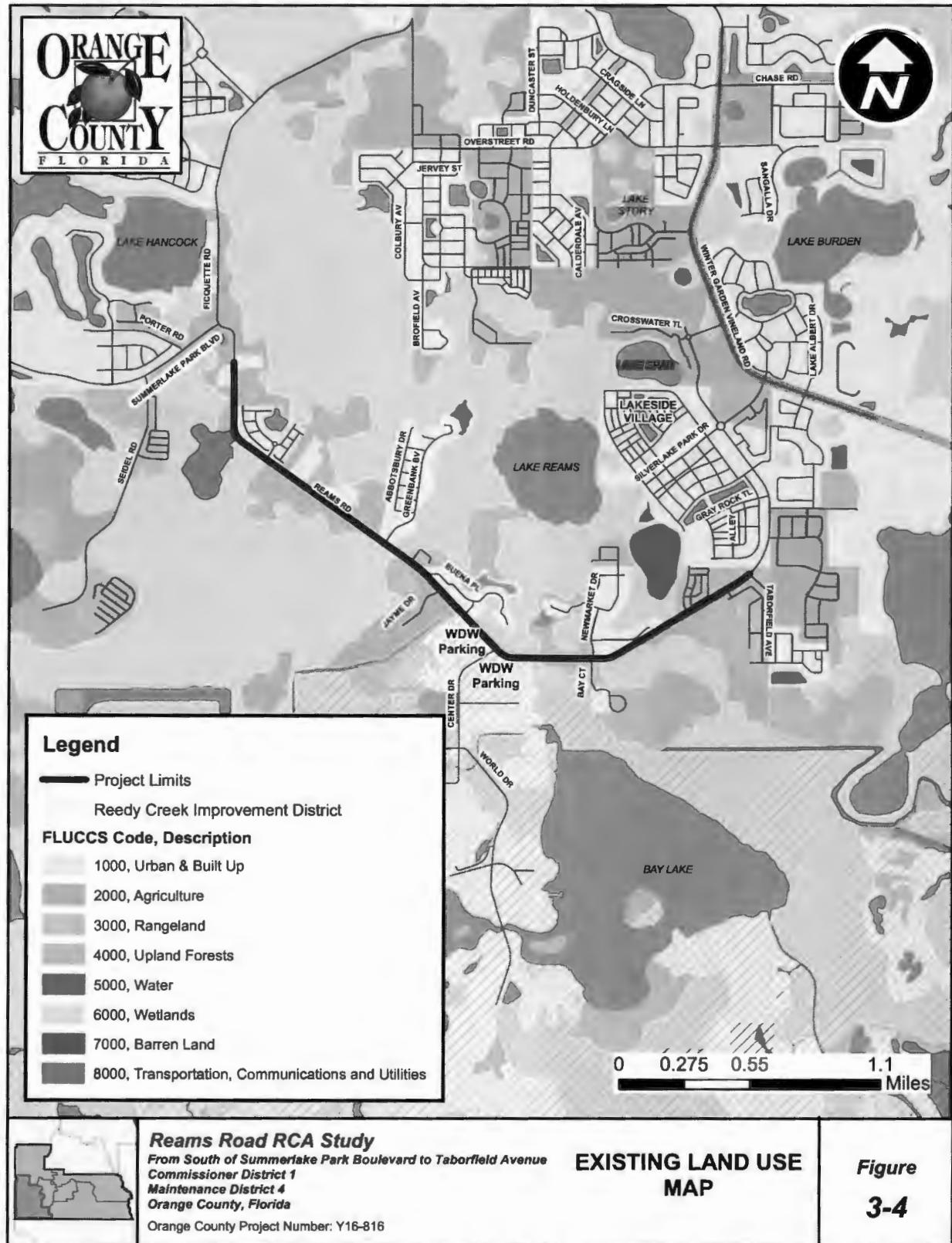
### 3.9 Land Use and Current Development Plans

Reams Road is located in Horizon West, which includes five mixed use villages surrounded by greenbelts, as well as a Town Center. Reams Road serves the rapidly developing Lakeside Village, which was the first village approved in Horizon West. Existing land use adjacent to the Reams Road corridor is predominantly residential development and the Walt Disney Parks and Resorts cast member parking area and access, located on the south side of the roadway. The remainder of land use adjacent to Reams Road is made up of undeveloped upland properties, commercial development, institutional development, and wetlands. Existing zoning along the project corridor is predominantly classified as Planned Development. Other zoning classifications found along the project corridor include, Residential 3 (Multiple Family Dwelling District), Residential CE-2 (Country Estate Rural Residential District), Commercial-1 (Retail Commercial District), and Agricultural 1 and Agricultural-2.

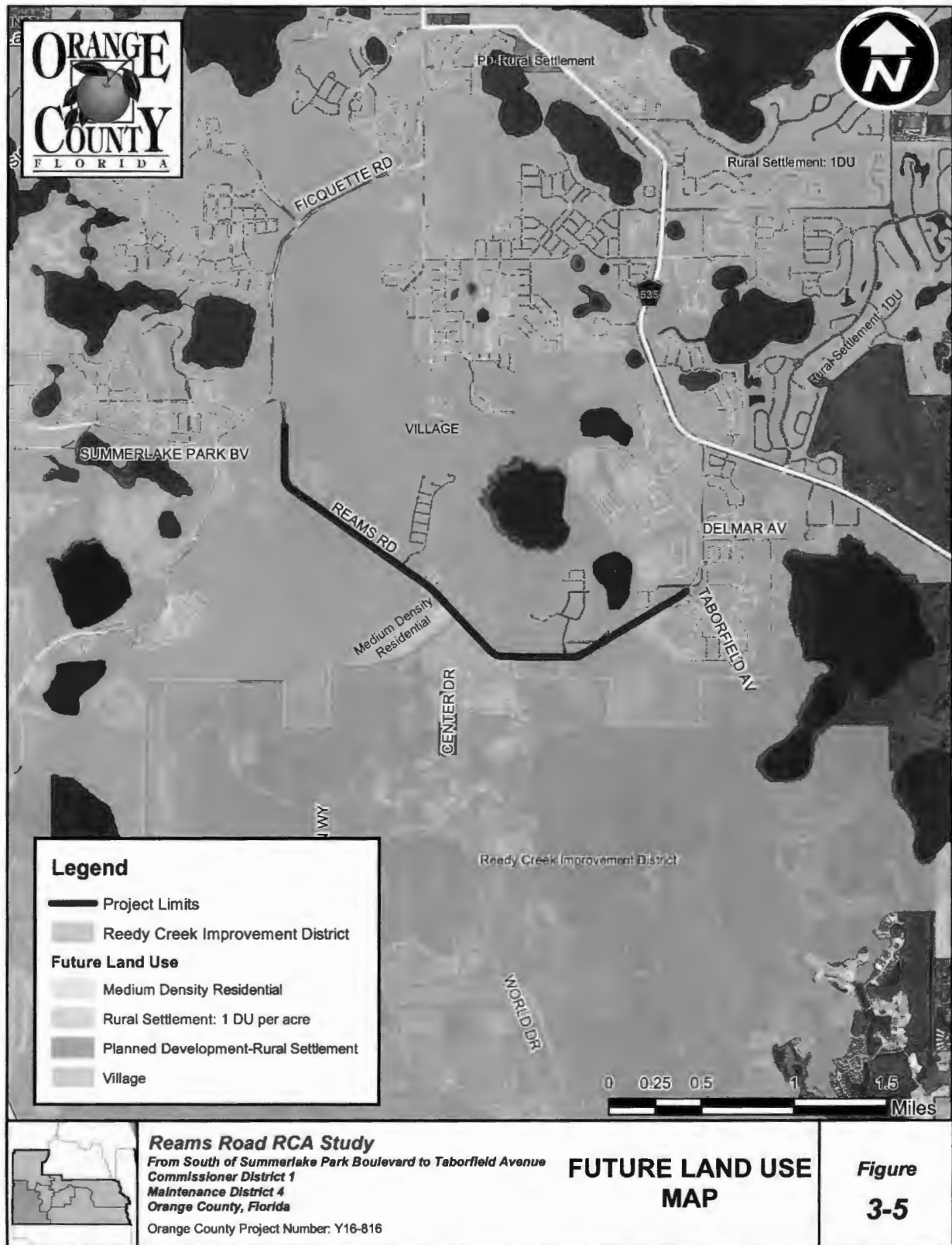
Future land use data was obtained from Orange County Future Land Use GIS data. Future land use along the project corridor is almost entirely classified as Village Horizon West. There is one area south of Reams Road and west of Jayme Drive that is classified as Medium Density Residential. Figure 3-4 and Figure 3-5 identify existing and future land uses, respectively, within the study area.

The Reams Road corridor is rapidly developing, and new development projects have begun throughout the study time period. Figure 3-6 shows the existing and proposed developments along the corridor.

**Figure 3-4**  
**Existing Land Use Map**



**Figure 3-5  
Future Land Use Map**



**Figure 3-6**  
**Existing and Proposed Developments**



### 3.10 Cultural Features

Cultural features within the Reams Road Corridor are shown in Figure 3-7. Details regarding specific features are discussed below.

#### Schools

There are no existing schools along the project corridor. However, there are two Orange County Public Elementary Schools in the vicinity of the project corridor, Sunset Park Elementary School and Bay Lake Elementary School. Sunset Park Elementary School is located approximately 2.1 miles north of the eastern project limits at the intersection of CR 535 and Overstreet Road. Bay Lake Elementary School is located approximately 1-mile north of the project limits at 12005 Silverlake Park Drive.

Additionally, there are two planned Orange County Public Schools in the vicinity of the Reams Road corridor. These schools are currently known as 'Site 25-E-SW-4' and 'Site 37-M-SW-4 (Bridgewater Area)' and will be officially named when the projects approach completion in 2019. Site 25-E-SW-4 is located on Taborfield Avenue, east of the project limits and will eventually contain an Elementary School with an expected capacity of 830 students. The proposed opening date for this facility is August 2019. Site 37-M-SW-4 (Bridgewater Area) is located north of the project limits in Lakeside Village, north of Lake Reams. This site is planned to hold a middle school with an expected capacity of 1,215 students. The proposed opening date for this facility is August 2019. Table 3-6 shows the public schools zoning for residents living on the Reams Road corridor.

#### Religious Institutions

There is one religious institution located adjacent to Reams Road, The Church of Jesus Christ of Latter-Day Saints Windermere, located at 13749 Reams Road.

#### Police/Fire Protection

There are no police or fire protection sites located adjacent to Reams Road within the project limits.

#### Community Centers

There are no community service facilities located adjacent to Reams Road within the project limits.

#### Hospitals

There are no hospitals located adjacent to Reams Road within the project limits.

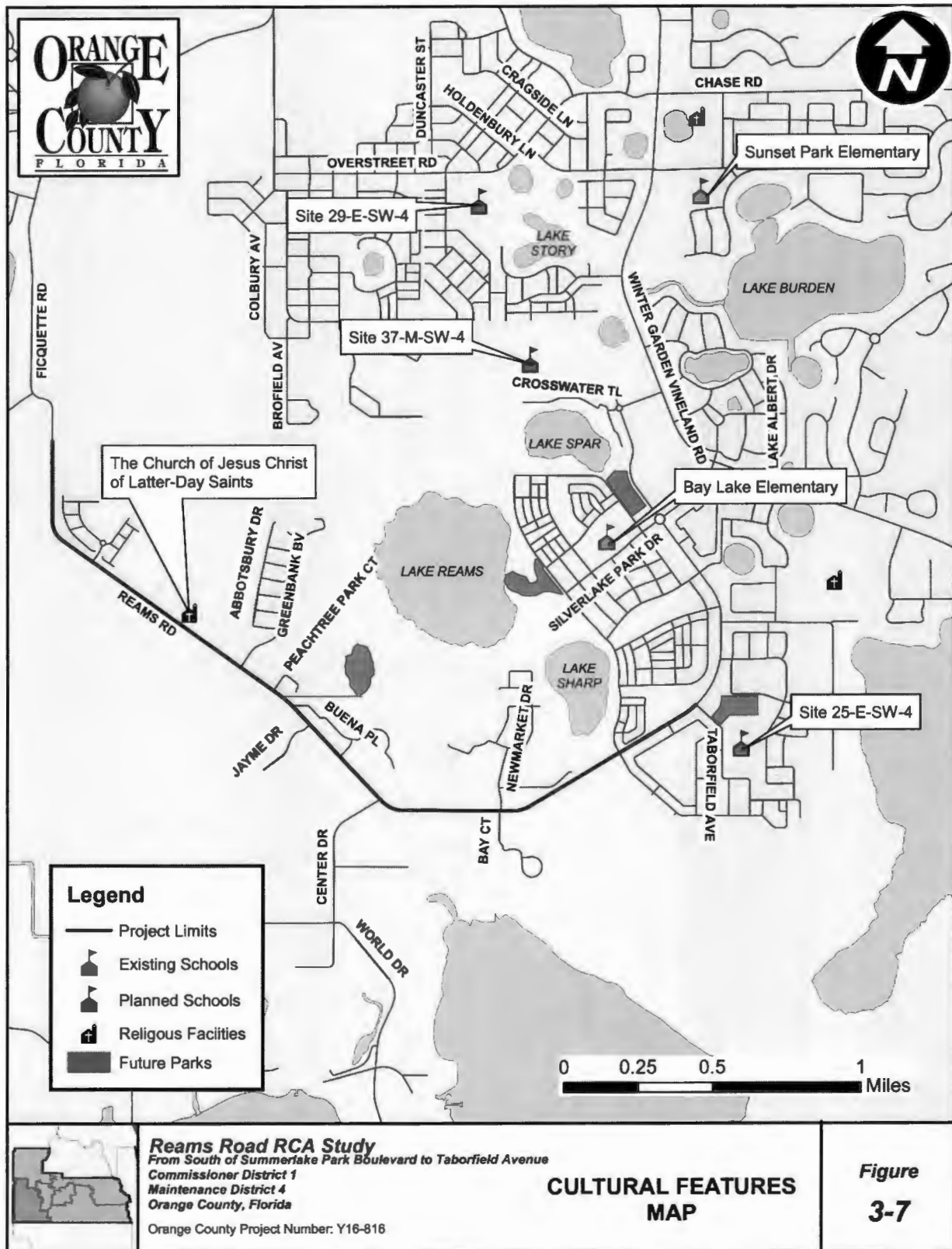
#### Cemeteries

There are no cemeteries located adjacent to Reams Road within the project limits.

#### Parks and Trails

There are no public parks located adjacent to Reams Road within the project limits.

**Figure 3-7**  
**Cultural Features Map**



**Table 3-6**  
**Public School Zoning within the Study Area**

<b>School Type</b>	<b>Boundary Along Reams Road</b>	<b>School</b>
Elementary	Ficquette Road to Silverlake Park Drive	Bay Lake
Middle	Ficquette Road to Silverlake Park Drive	Bridgewater
High School	Ficquette Road to Silverlake Park Drive	Windermere

There are three existing trail segments along the Reams Road Corridor and one trail segment which intersects Reams Road west of Via Trieste Drive. Table 3-7 provides the location of the intersections where the existing trail facilities have been constructed, the length of the trail, and the location of the trail relative to the north or south side of Reams Road and east or west of the intersection side street. The existing multiuse trail adjacent to Reams Road at Peachtree Park Court is proposed to lead to an Orange County Neighborhood Park planned for the parcel behind Peachtree Park Court. There is currently no timeline for the park's construction.

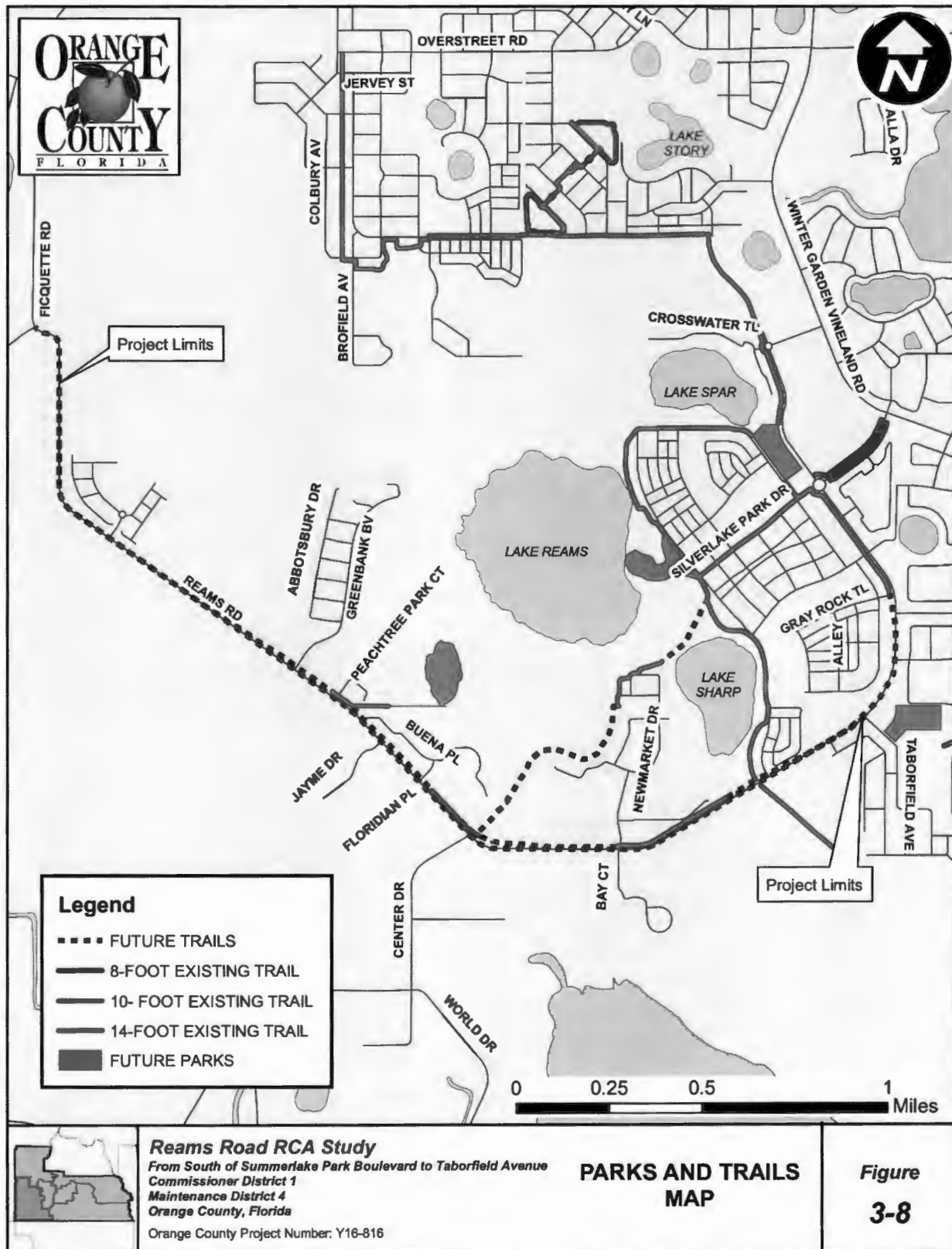
**Table 3-7**  
**Existing Trail Facilities**

<b>Intersection with Reams Road</b>	<b>Existing Trail Length and Location Relative to Reams Road (North Side or South Side)</b>
Peachtree Park Court	North: 80 feet west and 235 feet east (14-foot concrete)
Buena Place	North: 911 feet east (10-foot concrete)
Newmarket Drive	North: 1625 feet east (14-foot asphalt)

There are two proposed multiuse trails in the vicinity of the Reams Road corridor, as identified in the Orange County Horizon West Trails Study. The study identified one proposed arterial trail along Reams Road throughout the project limits. Another trail is proposed in the area behind Lake Sharp. This trail will intersect with Reams Road west of Newmarket Drive, circumvent Lake Sharp and connect to existing pedestrian facilities located at Reams Road and Via Trieste Drive, and Aldendale Street. Figure 3-8 illustrates the existing and planned parks and trail facilities in the study area.



**Figure 3-8  
Parks and Trails Map**



### 3.11 Archaeological and Historic Features

A cultural resource assessment desktop analysis was performed for the Reams Road study area to locate any cultural and historic resources that may be impacted by the project. This analysis was completed in July 2017. Based on this analysis, there are no cultural resources listed, determined eligible, or appear to be potentially eligible for listing in the National Register of Historic Places (NRHP). Historic resources will not be a critical issue for this project. The study area does have the potential to contain one or more undiscovered prehistoric sites. Sites in this area are typically small lithic and or artifact scatters which are not considered eligible for listing in the NRHP. Additionally, the project corridor contains one historic structure. This structure is identified as historic resource 8OR10251 and is a ruinous concrete block structure that was recorded in 2015 (ACI 2015). The State Historic Preservation Office (SHPO) determined that it was ineligible for listing in the NRHP. A review of property appraiser data and historic aerial photographs indicate that there is the potential for one additional historic structure at 13406 Reams Road. It is unlikely that this structure is eligible for listing in the NRHP. If fieldwork is required, it should comply with requirements set forth in Chapters 267, 373 and 872.05, Florida Statutes (FS), as well as any federal regulations for the purpose of determining possible effects on historic properties listed, or eligible for listing in the NRHP, or otherwise of historical, architectural or archaeological value.

### 3.12 Hydrologic and Natural Features

A Hydraulic and Natural Features Report was prepared as part of the Reams Road RCA Study and is contained in the project files. The following is a summary of some of the information contained in the report related to the corridor analysis discussion.

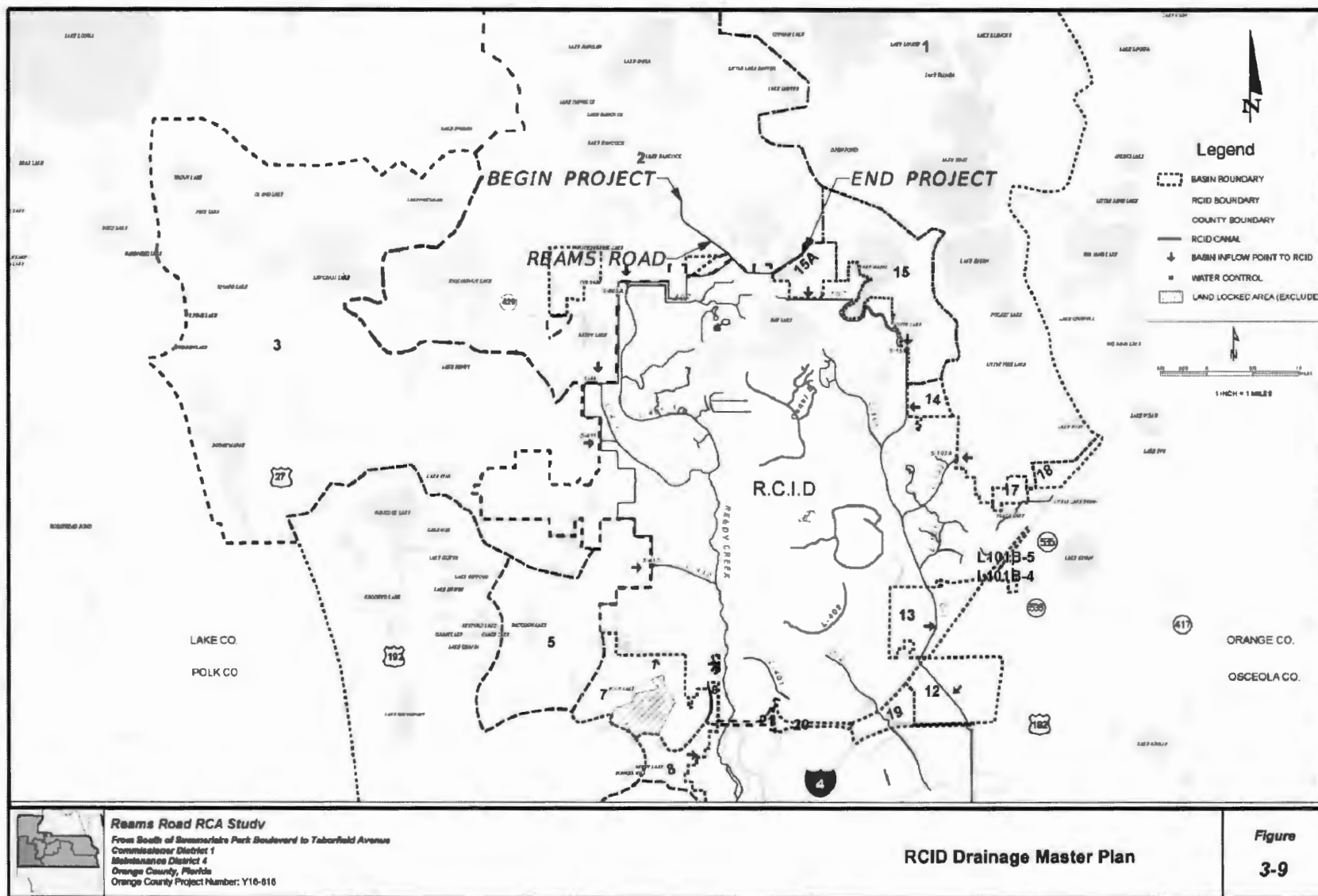
#### 3.12.1 Existing Drainage Features

The Reams Road project area is located in the Reedy Creek drainage basin within the jurisdiction of the South Florida Water Management District (SFWMD). The entire project area is a tributary of the Reedy Creek Improvement District (RCID) L-407 and L-107 Canals. The RCID Drainage Master Plan is shown in Figure 3-9.

Reams Road, through the project limits, consists of a two-lane rural minor arterial roadway with turn lanes for the adjacent residential subdivisions. Generally, stormwater sheet flows off the roadway into roadside ditches, which convey the stormwater to adjacent wetlands. The wetlands primarily drain to the south towards the canal system operated by RCID or north into Lake Reams. For a depiction of the existing drainage features, please refer to the Hydrologic & Natural Features Map shown on Figure 3-10.

There have been no recorded drainage maintenance problems within the project corridor. However, some erosion causing pot holes adjacent to the edge of pavement as well as minor flooding of Reams Road have been recorded near the intersection of Silverlake Park Drive, north of the project corridor. During the Hurricane Irma storm event in September 2017, Reams Road was overtopped at the culvert crossing east of Greenbank Boulevard, and between Center Drive and Newmarket Drive.

**Figure 3-9  
RCID Drainage Master Plan**



**Figure 3-10**  
**Hydrologic and Natural Features Map**



### 3.12.2 Water Quality

The water quality of the receiving water for this drainage basin, Lake Reams, was reviewed by the Florida Department of Environmental Protection (FDEP) in June of 2016. The water sampling location, Station ID 26011414, is located in the southwest corner of the lake. Please refer to Table 3-8 for a partial summary of the routine samples taken at approximately 0.3 meters of depth within the lake. According to the sample results, Lake Reams is not classified as an impaired water body by FDEP

**Table 3-8  
Water Quality**

Station ID	WBID	Category	Characteristic	Result Value	Result Units	Analysis Date	MDL	MDL Units
26011414	3170G6	Routine Sample	Nitrogen, Nitrite (NO <sub>2</sub> ) + Nitrate (NO <sub>3</sub> ) as N	0.007	mg/l	6/13/2016	0.004	mg/l
26011414	3170G6	Routine Sample	Phosphorus as P	0.023	mg/l	6/16/2016	0.002	mg/l
26011414	3170G6	Routine Sample	Salinity	0.07	Ppth	6/9/2016		
26011414	3170G6	Routine Sample	Sulfur, sulfate (SO <sub>4</sub> ) as SO <sub>4</sub>	11	mg/l	6/16/2016	0.02	mg/l
26011414	3170G6	Routine Sample	Total Organic Carbon (TOC)	20	mg/l	6/16/2016	0.50	mg/l
26011414	3170G6	Routine Sample	Total Suspended Solids (TSS)	3	mg/l	6/14/2016	2	mg/l
26011414	3170G6	Routine Sample	Turbidity	1.7	NTU	6/10/2016	0.1	NTU
26011414	3170G6	Routine Sample	pH	6.2		6/9/2016		

### 3.12.3 Existing Permits

Over 16 permits were researched to obtain stormwater and environmental design information for existing systems within the project corridor. Please refer to Table 3-9 for a summary of permits that will be directly referenced during the development of the proposed stormwater management systems for the Reams Road RCA.

**Table 3-9  
Existing Permits**

Project Name	Agency/Permit Type	Permit No.	Date Issued	Description
Buena Vista Place Phase I	SFWMD/ERP Standard General	48-00991-P	8/10/1998	A surface water management system serving 21.78 acres of residential development known as Buena Vista Apartments
Buena Vista Place Phase II	SFWMD/ERP Modification	48-00991-P	5/6/1999	Modification of a surface water management system serving 3.7 acres of commercial development known as Buena Vista Place - Phase II
Lakes of Windermere - Jackson Townhomes Phases 1B, 2	SFWMD/ERP Modification	48-01039-P	4/17/2003	Modification of an existing surface water management system to serve 17.8 acres of the 80.93 acres residential development within the Lake Reams Neighborhood known as Lakes of Windermere - Jackson Townhomes Phases 1B, 2
Lakes of Windermere Peachtree	SFWMD/ERP Standard General	48-01286-P	10/8/2002	Construction and operation of a surface water management system to serve an 84.01 acres residential phase within the master permit
Oasis Cove	SFWMD/ERP	48-01585-P	11/14/2005	Construction and operation of a surface water management system to serve a residential development
Lake Buena Vista LDS	SFWMD/ERP	48-01891-P	8/1/2017	Construction and operation of a surface water management system to serve a church facility
Royal Estates PD Phase 1 Parcel 2	SFWMD/ERP	48-02241-P	4/1/2013	Construction and operation of a surface water management system to serve a residential development
Royal Estates PSP Parcel 1	Orange County/PSP	PSP 16-09-337	2/28/2017	Preliminary Subdivision Plan
Legado	SFWMD/ERP	48-02583-P	3/1/2017	Construction and operation of a surface water management system to serve a residential development
The Preserve at Lakeside Village	SFWMD/ERP	48-02535	8/1/2016	Construction and operation of a surface water management system to serve a residential development
Reams Road Development Offsite Wetlands Impact Plan	SFWMD/ERP	48-02444-P	6/26/2015	Construction and operation of a 0.25 acres project known as Reams Road Development Offsite Wetlands Impact Plan for the removal of vegetation from the Reams Road public right-of-way along the curve of the road

### 3.12.4 Floodplains and Floodways

Based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM's), the majority of the study area is located within Zone X (500 Year) floodplain. The remaining area is located within Zone A (100 Year) floodplain with portions classified as Zone AE floodplains. The Zone A floodplains occur on the south side of Reams Road, from the beginning of the study area to west of Floridian Place. The Zone AE floodplains occur on the north side of Reams Road, throughout the entire project corridor. The base flood (100 Year) elevation for Zone AE floodplain is 98.8 feet, NAVD. Please refer to Figure 3-11 for a depiction of the floodplains in the study area. There are no floodways within the project limits.

There will be floodplain impacts within the project corridor that will be mitigated by providing additional volume in the proposed stormwater treatment ponds and/or proposed floodplain compensation ponds.

### 3.12.5 Existing Cross Drains

Four existing cross drains are located within the study area as indicated in Table 3-10 below. The hydrology and hydraulic analyses for the cross drains were performed using AdICPR 4.0 (Advanced Interconnected Channel and Pond Routing) software as a part of the Reams Road Watershed Model Update dated August 2017 and prepared by Singhofen & Associates. A detailed analysis for each cross drain is recommended during final design to verify the proposed lengths and sizes.

**Table 3-10**  
**Existing Cross Drains**

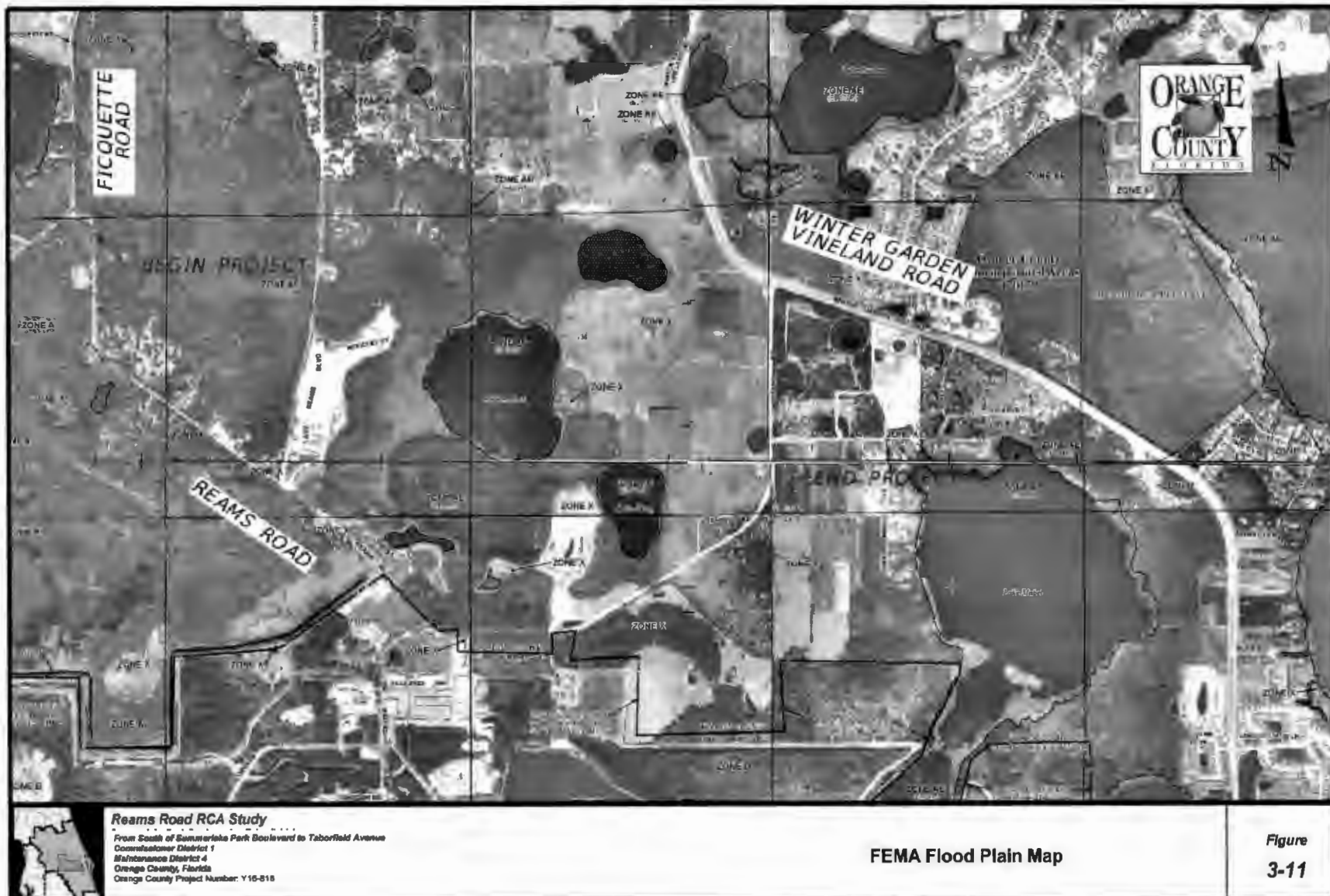
Culvert	Station	Existing Conditions			Link Name <sup>1</sup>	Existing HW (NAVD) <sup>2</sup>
		#	Size / Type	Length (ft)		
CD #1 <sup>3</sup>	116+06	1	15" / RCP	39	RW16090_P1	98.51
CD #2	128+68	1	15" / RCP	39	RW16090_P2	
CD #3	140+17	1	18" / RCP	75	RW16090_P3	
CD #4	180+09	4	(2) 18"/RCP (2) 21"/PVC	63	RG04001_P1 RG04001_P2 RG04001_P3 RG04001_P4	98.17

<sup>1</sup>Link Names from Reams Road Watershed Model Update prepared by Singhofen & Associates, dated 2017.

<sup>2</sup>Existing HW (100Year-24Hour) from Reams Road Watershed Model Update prepared by Singhofen & Associates, dated 2017.

<sup>3</sup>CD #1 is outside the project limits but is included for informational purposes.

**Figure 3-11  
FEMA Flood Plain Map**





### 3.12.6 Drainage Basin Descriptions

Five existing roadway basins are delineated along the corridor as shown in Figure 3-12. These basins generally outfall into roadside ditches, which convey the stormwater to adjacent wetlands. These existing drainage systems provide positive outfalls for the basins. There is no existing stormwater treatment or attenuation of flows.

#### 3.12.6.1 Basin 1

Basin 1 consists of the grassed right-of-way and existing pavement areas of Reams Road beginning at station 120+50 and southward to station 135+60, containing 4.30 acres of right-of-way area. The majority of the soils are classified as HSG B/D, with a SHWT depth of 1 foot or less based on this soil type. The remainder is classified as HSG C with a SHWT table depth ranging from 2 to 3.5 feet. One-foot contours indicate that Basin 1 ranges in elevation from 99 feet at the north end to 104 feet at the southern end of the basin, with a low point in the middle of the basin. Stormwater runoff sheet flows into adjacent roadside ditches that flow towards an existing cross drain (CD-2) located at station 128+68. The existing cross drain flows toward the wetland system located on the west side of Reams Road.

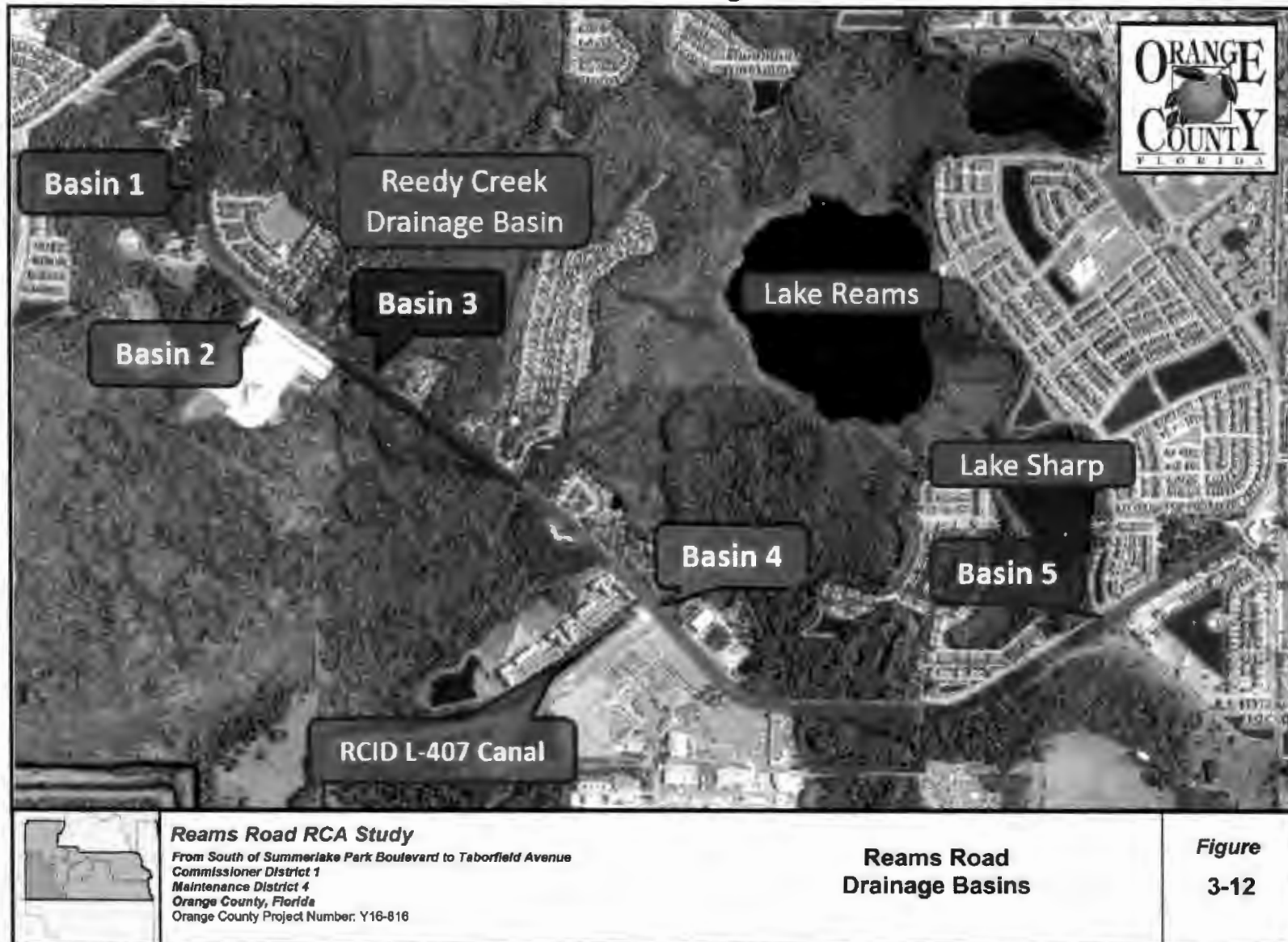
#### 3.12.6.2 Basin 2

Basin 2 consists of the grassed right-of-way and existing pavement areas of Reams Road beginning at station 135+60 and southeastward to station 153+00, containing 4.52 acres of right-of-way area. The majority of the soils are classified as HSG B/D, with a seasonal high-water table depth of 1 foot or less based on this soil type. The remainder is classified as HSG C with a seasonal high-water table depth ranging from 2 to 3.5 feet. One-foot contours indicate that Basin 2 ranges in elevation from 104 feet at the north end to 103 feet at the southern end of the basin, with the roadway grade sloping towards the northwest.

#### 3.12.6.3 Basin 3

Basin 3 consists of the grassed right-of-way and existing pavement areas of Reams Road beginning at station 153+00 and southeastward to station 180+09, containing 7.68 acres of right-of-way area. The majority of the soils are classified as HSG B/D, with a seasonal high-water table depth of 1 foot or less based on this soil type. The remainder is classified as HSG C with a seasonal high-water table depth ranging from 2 to 3.5 feet. One-foot contours indicate that Basin 3 ranges in elevation from 103 feet at the northwest end to 98 feet at the southeast end of the basin, with the roadway grade sloping towards the southeast. The majority of stormwater runoff sheet flows into adjacent roadside ditches that flow towards an existing cross drain (CD-4) located at station 180+09. The existing cross drain conveys stormwater from the wetland system on the north side of Reams Road to the wetland system on the south side. Lake Reams is hydraulically connected to the wetland system on the north side of the roadway.

**Figure 3-12**  
**Reams Road Drainage Basins**



#### **3.12.6.4 Basin 4**

Basin 4 consists of the grassed right-of-way and existing pavement areas of Reams Road beginning at station 180+09 and southeastward and then east to station 232+20, containing 13.83 acres of right-of-way area. The majority of the soils are classified as HSG B/D, with a SHWT depth of 1 foot or less based on this soil type. The remainder is classified as HSG C with a SHWT depth ranging from 2 to 3.5 feet and urban land consisting of a parking lot on the south side of the roadway and commercial businesses on the north side. One-foot contours indicate that Basin 4 ranges in elevation from 98 feet at the northwest end to 100 feet at the east end of the basin, with the roadway grade sloping towards the southeast. The majority of stormwater runoff sheet flows into adjacent roadside ditches that flow towards wetland systems located on both the north and south side of Reams Road. Stormwater runoff from a portion of this basin (eastbound from station 193+00 to station 210+00) sheet flows into adjacent roadside ditches, on the south side of the road, before being conveyed into the L-407 Canal system operated by RCID.

#### **3.12.6.5 Basin 5**

Basin 5 consists of the grassed right-of-way and existing pavement areas of Reams Road beginning at station 232+20 and northeast to station 272+40, containing 11.15 acres of right-of-way area. The majority of the soils are classified as HSG B/D, with a seasonal high-water table depth of 1 foot or less based on this soil type. The remainder is classified as HSG C with a seasonal high-water table depth ranging from 2 to 3.5 feet. One-foot contours indicate that Basin 5 ranges in elevation from 100 feet at the west end to 105 feet at the northeast end of the basin, with the roadway grade sloping towards the southwest. The majority of stormwater runoff sheet flows into adjacent roadside ditches that flow towards wetland systems located on both the north and south side of Reams Road.

### **3.13 Wetlands and Species**

An Ecological Summary Report was prepared as part of the Reams Road RCA Study and is contained in the project files. The following is a summary of the results evaluation.

#### **3.13.1 Wetlands**

The SFWMD land use database was reviewed for vegetative community types within the study area. The character, condition, and quality of wetland systems within the study area have experienced vegetative and hydrologic alterations as a result of adjacent residential and commercial development and bisected by Reams Road. Major wetland systems are hydrologically connected to Lake Reams, and Lake Sharp, located north of Reams Road. Each wetland was field verified and dominant vegetative species recorded. Wetlands and/or other surface waters are shown in Figure 3-13, Figure 3-14, and Figure 3-15, and are discussed in detail below.

**Figure 3-13**  
**Wetlands and Other Surface Waters Map #1**



**Figure 3-14**  
**Wetlands and Other Surface Waters Map #2**



**Figure 3-15**  
**Wetlands and Other Surface Waters Map #3**





#### Wetland 1

Wetland 1 is located west of Reams Road and south of Summerlake Park Boulevard. This system is classified as FLUCFCS 6170 – Mixed Wetland Hardwood. Wetland 1 is a large forested wetland system vegetatively comprised of a mixed canopy of cypress (*Taxodium* sp.), water oak (*Quercus nigra*), black gum (*Nyssa sylvatica*), red bay (*Persea borbonia*), dahoon holly (*Illex cassine*), cinnamon fern (*Osmunda cinnamomea*), and standing water. This system continues offsite.

#### Wetland 2

Wetland 2 is located east of Reams Road, and north of a multi-family residential dwelling. Wetland 2 is classified as FLUCFCS 6170 – Mixed Wetland Hardwood and is vegetatively comprised of water oak, slash pine (*Pinus elliottii*), red bay, dahoon holly, cinnamon fern, and grapevine (*Vitis* spp.)

#### Wetland 3

Wetland 3, located west of Reams Road and within the south border of Pond 2A, is classified as FLUCFCS 6430 – Wet Prairie. Wetland 3 is an herbaceous system vegetatively comprised of red root (*Lachnanthes caroliniana*), rushes (*Juncus* spp.), chalky bluestem (*Andropogon* spp.), bahiagrass (*Paspalum notatum*), and standing water.

#### Wetland 4

Wetland 4 is located southwest of Reams Road, and east of the easement to proposed Pond 2B. This system is classified as FLUCFCS 6210 – Cypress. Wetland 4 is vegetatively comprised of a dominant canopy of cypress, with scattered red bay, and dahoon holly, with an understory of ferns, red root, and standing water.

#### Wetland 5

Wetland 5 is located north of Reams Road, adjacent to The Church of Jesus Christ of Latter-Day Saints of Windermere. This wetland system is classified as FLUCFCS 6170 – Mixed Wetland Hardwood and is vegetatively comprised of a mixed canopy of slash pine, red maple (*Acer rubrum*), red bay, dahoon holly, with scattered cypress, and standing water. Wetland 5 is part of a larger system that continues offsite.

#### Wetland 6

Wetland 6 is located southwest of Reams Road and is hydrologically connected via a box culvert to Wetland 7. Wetland 6 is classified as FLUCFCS 6210 – Cypress. This system has a dominant canopy of cypress, with an understory of primrose willow (*Ludwigia* sp.), maidencane (*Panicum hemitomon*), pickerelweed (*Pontederia cordata*), cattail (*Typha* sp.), and standing water.

#### Wetland 7

Wetland 7 is located northeast of Reams Road and is hydrologically connected via a culvert to Wetland 6. Wetland 7 is classified as FLUCFCS 6210 – Cypress, and is vegetatively comprised of cypress, primrose willow, Brazilian pepper (*Schinus terebinthifolius*), maidencane, pickerelweed, and standing water.

#### Wetland 8

Wetland 8 is located north of Reams Road and east of Center Drive. Wetland 8 is classified as FLUCFCS 6210 – Cypress, and is vegetatively comprised of cypress, red bay, dahoon holly, primrose willow, pickerel weed, swamp fern, cattails, ceasarweed (*Urena lobate*), and standing water.

#### Wetland 9

Wetland 9 is located north of Reams Road and west of Newmarket Drive. Wetland 9 is classified as FLUCFCS 6210 – Cypress and is vegetatively comprised of a dominant canopy of cypress, with scattered red bay, and dahoon holly. The groundcover consists of swamp fern, cinnamon fern, duckweed (*Lemna* sp.), and standing water.

#### Wetland 9A

Wetland 9A is located north of Reams Road and west of Newmarket Drive. Wetland 9 is classified as FLUCFCS 6210-Cypress and is vegetatively comprised of a dominant canopy of cypress, with scattered red bay and dahoon holly. The groundcover includes swamp fern and cinnamon fern, with standing water present.

#### Wetland 10

Wetland 10 is located south of Reams Road and west of Bay Court. Wetland 10 is classified as FLUCFCS 6210 – Cypress and is vegetatively comprised of cypress, red bay, dahoon holly, and primrose willow.

#### Wetland 11

Wetland 11 located south of Reams Road and west of Aldendale Street. Wetland 11 is defined as FLUCFCS 6170 - Mixed Wetland Hardwood system with slash pines, red bay, dahoon holly, cabbage palms (*Sabal palmetto*), wax myrtle, primrose willow, water oak, and elephant ear (*Colocasia esculenta*).

#### Wetland 12

Wetland 12 is located southeast of Reams Road, within an improved pasture, and is classified as 6430 – Wet Prairie. Wetland 12 is vegetatively comprised of red root, rushes, chalky bluestem, and bahiagrass.

#### Wetland 13

Wetland 13 is located north of Reams Road and west of Via Trieste Drive. Wetland 13 is classified as FLUCFCS 6170 – Mixed Forested Hardwood and is comprised of red bay, red maple, slash pine, saw palmetto, winged sumac (*Rhus copallinum*), and muscadine grapevine.

#### Wetland 14

Wetland 14 is located south of Reams Road within an improved pasture. Wetland 14 is classified as FLUCFCS 6445 – Emergent Aquatic Vegetation – Water Lily. Wetland 14 is an open water pond dominated with water lilies (*Nymphaea* spp.).



### 3.13.2 Other Surface Waters

#### Surface Water 1 & 2

Surface waters 1 and 2 are located southeast of Reams Road within the easement for Pond 5D. These areas are characterized as FLUCFCS 5300 – Reservoirs. These are small cattle ponds within pasture area. These systems consist of open water and maintained bahiagrass. Table 3-11 lists the wetlands and surface waters within the project limits and provides specific FLUCFCS codes for each location.

**Table 3-11**  
**Approximate Wetland Impacts**

Wetland/Other Surface Water ID	FLUCFCS Code	Roadway Impact (ac)*	Proposed Pond ID	Proposed Pond Impact (ac)*
Wetland 1	6170	1.30	1B	2.23
Wetland 2	6170	--	1A	0.28
Wetland 3	6430	--	2A	0.12
Wetland 4	6210	0.08	2B	0.44
Wetland 5	6170	--	3A	1.34
Wetland 6	6210	0.46	--	--
Wetland 7	6210	0.33	--	--
Wetland 8	6210	0.53	--	--
Wetland 9	6210	--	4A-1	0.5
Wetland 10	6210	--	4A-2	0.26
Wetland 11	6210	0.03	4B-1	0.49
Wetland 12	6170	0.38	5A	0.32
Wetland 13	6430	--	5A	0.49
Surface Water 1	6170	0.23	--	--
Surface Water 2	5300	--	5D	.03

\* Impact acreages are based on approximate limits and should be field delineated and surveyed prior to permitting activities.

### 3.13.3 Federal and State Listed Species

#### *3.13.3.1 Federal and State Listed Flora*

Florida Natural Areas Inventory (FNAI) is a non-profit conservation organization and maintains a database of recorded occurrences of imperiled plant and wildlife species, and rare habitat types. The FNAI classifies imperiled species not as threatened or endangered, but by a 5-tiered ranking system on a global and state-wide basis. Although FNAI is not a regulatory or law enforcement agency, the FNAI database was consulted for this study due to their comprehensive wildlife species occurrence records.

The FNAI tracking list for Orange County was reviewed for federal and/or state listed flora known to occur in Orange County, and the potential for such species to occur within the study area. Listed flora species are those categorized by FWS and/or FWC as T, E, or SSC, thereby receiving a level of protection because of their listed status. The potential occurrence of listed flora species identified within the proposed project is based on the type of vegetative communities present. The probability of each species occurring within the study area was ranked using the following requirements:

1. No – indicates no suitable habitat present. Suitable habitat is defined as intact natural land that is typically used by the species under consideration.

2. Low – indicates that marginally suitable habitat may exist within the property, but the species was not observed during field observations. Marginal describes natural land that has been altered from its native state due to human activity, ecological succession, or conversion; however, a species under consideration could still inhabit.

3. Moderate – indicates that suitable habitat exists within the property, but the species was not observed during field observations.

4. High – indicates that suitable habitat exists within the property and the species of interest was observed during field observations.

Table 3-12 provides a summary of federally and/or state-listed flora species known to occur in Orange County and their potential for occurrence within the limits of the study area.

**Table 3-12**  
**Federal and State Listed Plant Species**

Scientific Name	Common Name	Habitat	FWS Status	FWC Status	Occurrence Potential
<i>Bonamia grandiflora</i>	Florida bonamia	Sand pine scrub with evergreen scrub oaks, bare sunny sand areas, road rights-of-way, fire lanes	T	E	Low
<i>Calopogon multiflorus</i>	many-flowered grass-pink	Fire maintained damp pinelands and meadows	--	T	Low
<i>Centrosema arenicola</i>	sand butterfly pea	sandhill, scrubby flatwoods, dry upland woods	--	E	Low
<i>Chionanthus pygmaeus</i>	pygmy fringe tree	scrub, sandhill, xeric hammock	--	E	Low
<i>Deeringothamnus pulchellus</i>	beautiful pawpaw	open slash or longleaf pine flatwoods with wiregrass and dwarf live oak understory	E	E	Low
<i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>	scrub buckwheat	Sandhill, oak-hickory scrub on yellow sands, high pineland between scrub and sandhill, turkey oak barrens	T	E	Low
<i>Illicium parviflorum</i>	star anise	Banks of spring-run or seepage streams, bottomland forest, hydric hammock, baygall dominated by red maple and sweet bay	--	E	Low
<i>Lechea cernua</i>	scrub pinweed	Fire-maintained scrub	--	T	Low
<i>Lupinus westianus</i> var. <i>aridorum</i>	scrub lupine	Sand pine scrub	E	E	Low
<i>Matelea floridana</i>	Florida spiny-pod	Mesic hammock	--	E	Low
<i>Monotropa hypopithys</i>	pinemap	Moist, shaded, temperate forests	--	E	Low

Scientific Name	Common Name	Habitat	FWS Status	FWC Status	Occurrence Potential
<i>Najas filifolia</i>	narrowleaf naiad	Freshwater ponds	--	T	Low
<i>Nemastylis floridana</i>	celestial lily	wet flatwoods, prairies, marshes, cabbage palm hammocks edge	--	E	Moderate
<i>Nolina atopocarpa</i>	Florida beargrass	Flatwoods, savannas, shell middens	--	T	No
<i>Nolina brittoniana</i>	Britton's beargrass	Scrub, sandhill, scrubby flatwoods, xeric hammock	E	E	Low
<i>Ophioglossum palmatum</i>	hand fern	Old leaf bases of cabbage palms in maritime hammocks and wet hammocks	--	E	Low
<i>Panicum abscissum</i>	cutthroat grass	Seepage slopes	--	E	No
<i>Paronychia chartacea</i>	Papery whitlow-wort	Sandy openings around sandhill upland lakes and karst ponds; Lake Whales Ridge scrub	T	E	Low
<i>Pecluma plumula</i>	plume polypody	Tree branches, limestone in hammocks, wet woods, and limesinks	--	E	Low
<i>Polygonella myriophylla</i>	sandlace	Open, sandy areas within scrub, mostly white sand	E	E	Low
<i>Prunus geniculata</i>	scrub plum	Sandhill and oak scrub	--	E	Low
<i>Pteroglossaspis ecristata</i>	giant orchid	Sandhill, scrub, pine flatwoods, pine rocklands	--	T	Low
<i>Stylisma abdita</i>	scrub stylisma	Scrub, high pine	--	E	Low
<i>Warea amplexifolia</i>	Wide-leaf warea	Sandhill with longleaf pine and wiregrass; Lake Wales Ridge	--	E	Low
<i>Zephyranthes simpsonii</i>	redmargin zephyrlily	Wet pinelands, pastures and roadsides	--	T	Low

Occurrence Potential = No, Low, Moderate, High.

Code Key: E = Endangered, T = Threatened, SSC= Species of Special Concern, T S/A = Threatened Similar in Appearance

Data Source: Florida Natural Areas Inventory (FNAI) Tracking List Orange County Updated July 2017; Atlas of Florida Plants Institute for Systematic Botany; Florida Department of Agriculture and Consumer Services Endangered, Threatened and Commercially Exploited Plants of Florida; U.S. Fish & Wildlife Services North Florida Ecological Services Office Species Account/Biologue.

### 3.13.3.2 Federal and State Agencies Listed Wildlife Species

Federal and state agencies are charged with protecting endangered, threatened, and species of special concern wildlife, and their critical habitat. A discussion of each agency charged with protection of these species within the study area follows.

#### *U.S. Fish and Wildlife Service*

U.S. Fish and Wildlife Service (FWS) regulate impacts to protected species pursuant to Section 9 of the Endangered Species Act. The FWS is typically involved in the wetland permitting process through consultation with the U.S. Army Corps of Engineers (USACE). In accordance with the Fish and Wildlife Coordination Act [16 USC 662], the USACE must consult with the FWS on any project receiving a Section 404

permit to ensure that impacts to wildlife are avoided or minimized. The FWS classifies imperiled plant and wildlife species as "Endangered" or "Threatened" (with those in the greatest peril of extinction listed as endangered). The FWS has issued specific guidelines for the management of some protected species. The project study area falls within FWS's jurisdiction and consultation area for the eastern indigo snake, sand skink, and wood stork. Details regarding the eastern indigo snake, sand skink, and wood stork are provided below.

#### *Florida Fish and Wildlife Conservation Commission*

Florida Fish and Wildlife Conservation Commission (FWC) regulate impacts to state-protected wildlife species pursuant to the Florida State Constitution as implemented via Sec. 39 F.A.C. The FWC classifies imperiled wildlife species as "Endangered," "Threatened," or "Species of Special Concern" (in order of peril). Florida Fish and Wildlife Conservation Commission maintains a database of recorded occurrences of listed animal species and has developed guidelines for the management of some protected wildlife species in Florida. These management guidelines vary with the species according to rarity, habitat requirements, and compatibility with development. Detailed permitting for the state-protected gopher tortoise is provided below.

Literature reviews and database queries were conducted to identify federally and/or state-listed wildlife species known to occur in Orange County as well as the potential occurrence of such species utilizing the study area. Federal and/or state-listed wildlife species are those categorized by FWS and/or FWC as T, E, or SSC, thereby receiving a level of protection because of their listed status. The potential occurrence of listed species identified within the study area is based on the type and quality of present vegetative communities, and surrounding land uses. The probability of each wildlife species occurring within the study area was ranked using the following requirements:

1. No – indicates no suitable habitat present. Suitable habitat is defined as intact natural land that is typically used by a species under consideration.
2. Low – indicates that marginally suitable habitat may exist within the property, but the species was not observed during field observations. Marginal describes natural land that has been altered from its native state due to human activity, ecological succession, or conversion; however, a species under consideration could still inhabit.
3. Moderate – indicates that suitable habitat exists within the property, but the species was not observed during field observations.
4. High – indicates that suitable habitat exists within the property and the species of interest was observed during field observations.

Table 3-13 provides a summary of those federally and/or state-listed species known to occur in Orange County, and their potential for occurrence within the study area. A discussion of federal and/or state listed wildlife with the occurrence potential of "moderate" or "high" are discussed in detail below. During field observations the American alligator, gopher tortoise, Florida sandhill crane, roseate spoonbill, and wood stork were observed.

**Table 3-13**  
**Federal and State Listed Wildlife Species**

Scientific Name	Common Name	FWS Status	FWC Status	Occurrence Potential
<b>Fish</b>				
<i>Pteronotropis welaka</i>	bluenose shiner	--	T	No
<b>Reptiles</b>				
<i>Drymarchon corais couperi</i>	eastern indigo snake	T	T	Moderate
<i>Neoseps reynoldsi</i>	sand skink	T	T	Moderate
<i>Gopherus polyphemus</i>	gopher tortoise	--	T	High
<i>Pituophis melanoleucus</i>	pine snake	--	T	Moderate
<i>Stilosoma extenuatum</i>	short-tailed snake	--	T	Low
<i>Alligator mississippiensis</i>	American alligator	T S/A	T S/A	High
<b>Birds</b>				
<i>Haliaeetus leucocephalus</i>	bald eagle	--	--	Low
<i>Aphelocoma coerulescens</i>	Florida scrub-jay	T	T	Low
<i>Speotyto cunicularia floridana</i>	Florida burrowing owl	--	T	Low
<i>Egretta caerulea</i>	little blue heron	--	T	Moderate
<i>Egretta tricolor</i>	tricolored heron	--	T	Moderate
<i>Falco sparverius paulus</i>	southeastern American kestrel	--	T	Low
<i>Grus canadensis pratensis</i>	Florida sandhill crane	--	T	High
<i>Mycteria americana</i>	wood stork	T	T	High
<i>Polyborus plancus audubinii</i>	Audubon's crested caracara	T	T	Low
<i>Pandion haliaetus</i>	osprey	--	SSC*	Moderate
<i>Picoides borealis</i>	red-cockaded woodpecker	E	--	Low
<i>Platalea ajaja</i>	roseate spoonbill	--	T	High
<i>Sternula antillarum</i>	least tern	--	T	Low
<b>Mammals</b>				
<i>Sciurus niger shermani</i>	Sherman's fox squirrel	--	SSC	Low

Occurrence Potential = No, Low, Moderate, High.

Code Key: E = Endangered, T = Threatened, SSC= Species of Special Concern, T S/A = Threatened Similar in Appearance

Data Source: URL: Florida's endangered species, and threatened species dated May 2017:

[http://myfwc.com/media/1515251/threatened\\_endangered\\_species.pdf](http://myfwc.com/media/1515251/threatened_endangered_species.pdf) and Florida Natural Areas Inventory (FNAI) Tracking List  
Orange County Updated July 2017.

\*Monroe County, Florida ONLY

### *Bald Eagle*

Although the bald eagle (*Haliaeetus leucocephalus*) has been delisted, the species remains protected through the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Florida has one of the densest concentrations of nesting bald eagles in the lower 48 states. Bald eagles typically nest and roost in forested habitats consisting of mature canopy trees located along habitat edges allowing an unobstructed view of

surrounding areas. Daytime roosts are in the highest trees and adjacent to shorelines. High quality foraging habitat for bald eagles has a diversity and abundance of prey, access to shallow water, and tall trees or structures. Their diet consists of fish, birds, and small mammals (FWC). A FWS permit is needed for activities with the potential to disturb nesting bald eagles, or to remove or “take” a bald eagle nest.

The FWC Bald Eagle Nest locator was queried for known bald eagle nest sites within a one-mile radius of the project study area. No documented bald eagle nest sites were identified within the one-mile radius search.

It is anticipated that the proposed project will not adversely affect the bald eagle.

### *3.13.3.3 Federally Listed Species*

#### *American Alligator*

The American alligator (*Alligator mississippiensis*) is listed as threatened due to similarity in appearance to the American crocodile (*Crocodylus acutus*) by FWS. The American alligator inhabits fresh and brackish marshes, ponds, lakes, rivers, swamps, bayous and large spring runs and are known to inhabit salt marsh and estuarine habitats in some parts of the state (Scott 2004). Alligators play a vital role in creating and maintaining microhabitats (gator holes), which can benefit a host of species for refuge to water source habitats. Nests consist of a mound of compacted earth and vegetation usually four to seven feet in diameter (Scott 2004). Nesting season occurs in the spring. The alligator has a wide variety of food sources which include fish, ducks, wading birds, raccoons, and turtles.

The American alligator has been known to inhibit existing stormwater management ponds and was observed within the limits of the study area, specifically within Wetland 7, as well as having been observed using the culvert to cross between the two wetland systems. The proposed project includes widening the travel lanes through this section of the study area and maintaining the hydrologic connection to the wetland systems to the north and south of Reams Road. The proposed project may affect, but is not likely to adversely affect the American alligator.

#### *Sand Skink*

The sand skink (*Neoseps reynoldsi*) is a unique lizard adapted to an underground existence and is listed as threatened by FWS. This species occurs only on Florida’s central ridges requiring high elevations and appropriate soil types. The sand skink inhabits loose sands of sand pine-rosemary scrub, less often longleaf pine-turkey oak (sandhill) or turkey oak “barrens” adjacent to scrub, especially high pine-scrub ecotones (FWS, 1999). However, the sand skink is known to occur in areas with dense undergrowth and extensive canopy closure. It is fossorial (usually within 8 cm of surface) but can be found under logs, leaf litter, and other surface debris. Well-drained sands in open glades free of rooted plants are optimal, whereas dry, porous sands are unfavorable; moisture under leaf litter is important in regulation of body temperature and for successful egg incubation. The sand skink eats mainly beetle larvae and termites as well as adult beetles, spiders, caterpillars, and larval antlions (FWS, 1999).

The study area is located within the FWS Sand and Blue-tailed Mole Skinks Consultation Area (Roadway Conceptual Analysis Ecological Summary Appendix A-FWS Sand and Blue-tailed Mole Skinks Consultation Area Map as a part of the project documents). Appropriate soil type and elevations (82 feet above sea level or higher) for the sand skink are located within the study area. When the location, elevation, and onsite soil

types are appropriate, then either: (1) a skink survey is necessary to determine if the site is occupied or (2) conservation measures should be implemented.

The FWS designed the Sand and Bluetail Mole Skink Conservation Guidelines (April 4, 2012) to assess the relative risk of taking sand skinks. The FWS assumes presence of the sand skink if the three criteria (location, soils, and elevation) are met. In order to determine absence, a visual pedestrian survey should be conducted. The pedestrian survey may be conducted at any time of the year; however, tracks are more detectable in the spring (March through May), and in the fall (October to November) (Sand Skink Protocol, 2011). If the sand skink is found to be present, FWS will assume a presence within an 80-foot radius of skink evidence, provided there are no physical barriers (canals, roads, etc.).

If the pedestrian survey is negative, a coverboard survey is necessary to verify the absence of the species. Coverboard surveys should be conducted from March 1 through May 15 and follow the FWS survey protocol. Negative pedestrian and coverboard surveys indicate a low risk of take to the sand skink.

Should the pedestrian and/or coverboard survey indicate a presence of the sand skink, then mitigation credits may be purchased from a FWS approved mitigation bank to offset the habitat loss. The proposed project “may affect, but is not likely to adversely affect” the sand skink.

#### *Eastern Indigo Snake*

The eastern indigo snake (*Drymarchon corais couperi*) is listed as threatened by the FWS. The species occurs in a variety of terrestrial habitats. The eastern indigo snake prefers uplands but will also utilize wetlands and agricultural areas (FWS 2013). Eastern indigo snakes have large home ranges, generally requiring 124 to 248+ acres of undisturbed habitat during the warmer months and 25 acres in winter months (Hallam et al. 1998). This species is known to use gopher tortoise burrows as a refuge from the elements, including cold temperatures and fire, but are also known to take refuge in stumps, roots and debris piles. In northern Florida, it winters mostly in gopher tortoise burrows (Hipes et al. 2000). The eastern indigo snake consumes rats, rabbits, snakes, amphibians, eggs, birds, turtles and baby alligators. Breeding ranges from November to April, with egg laying occurring from April to June (FWS 2013).

Using the FWS Eastern Indigo Snake Programmatic Effect Determination Key, revised July 2017, the project receives a “not likely to adversely affect” (NLAA) the eastern indigo snake. The proposed project is 1) not located within open water or a salt marsh, 2) will impact less than 25 acres of xeric habitat and 3) has known holes, cavities, active or inactive gopher tortoise burrows or other underground refugia where a snake could be buried, trapped and/or injured during project activities.

The FWS Field office requires notification if the Standard Protection Measures for the Eastern Indigo Snake, August 2013, will be implemented (Appendix B- Standard Protection Measures for the Eastern Indigo Snake, of the Roadway Conceptual Analysis Ecological Summary, located in the project documents) at least 30 days prior to clearing/land alteration activities. Additionally, permit conditions may require that all gopher tortoise burrows, active or inactive be excavated prior to site manipulation near the burrows to allow any potential indigo snakes to vacate the vicinity.

#### *Wood Stork*

The wood stork (*Mycteria americana*) is listed as threatened by FWS. This species is typically found in freshwater marshes, swamps, lagoons, ponds, flooded fields, depressions in marshes, and brackish wetlands.

The critical foraging areas for this species include areas of very shallow water, generally six to ten inches in depth, where there is an abundance of small fishes and other aquatic life. These small fish may include mosquitofish, sailfin mollies, flagfish, and several species of sunfish. Wood storks may also prey on frogs, salamanders, snakes, crayfish, insects, and baby alligators (Scott 2004).

The study area is located within the 15-mile core foraging habitat for two wood stork colonies (FWS 2015). Foraging areas include drainage features, small water bodies, and a stormwater pond. Using the Corps of Engineers and U.S. Fish and Wildlife Service Effect Determination Key for the Wood Stork in Central and North Peninsular Florida, the study area is not within 2,500 feet of an active colony site and will likely impact no greater than 0.5 acre of Suitable Foraging Habitat (SFH). Therefore, the proposed project is not likely to adversely affect the wood stork.

### *3.13.3.4 Listed State species*

#### *Gopher Tortoise*

The gopher tortoise (*Gopherus polyphemus*) is listed by the State of Florida as threatened. The gopher tortoise inhabits subterranean burrows in dry upland habitats. Vegetative communities most often inhabited by gopher tortoises include longleaf pine sandhills, xeric oak hammocks, scrub, pine flatwoods, dry prairies and coastal dunes. Gopher tortoises can also be found in pastures, ruderal fields, and grassy roadsides. To be suitable for gopher tortoises, the habitat must have well-drained sandy soils for digging burrows, herbaceous plants, and open sunny areas for nesting, and basking. Periodic natural fires play an important role in maintaining tortoise habitat by opening up the canopy and promoting growth of herbaceous plants used for forage. If natural fires are suppressed, the habitat becomes unsuitable for gopher tortoises (Cox 1987). Gopher tortoise burrows are an important habitat to many native species. It is estimated that 39 invertebrates and 42 vertebrate species use the gopher tortoise burrow to some degree (Cox 1987). Of those species, protected species that are frequent inhabitants of the gopher tortoise burrow include the Florida pine snake, eastern indigo snake, and burrowing owl. This commensal relationship warranted field investigation for such species within the study area.

The project study area contains suitable habitat for the gopher tortoise. Gopher tortoise burrows were observed within proposed Pond 4B. Prior to development, a survey of all suitable habitat for gopher tortoises, in accordance with FWC guidelines, should be conducted. Gopher tortoises must be relocated before any land clearing or development occurs. FWC provides four options for the land owner to address the presence of gopher tortoises:

1. Avoid development
2. Avoid destruction of tortoise burrows
3. Relocate tortoises on-site (permit required)
4. Relocate tortoises off-site (permit required)

It is anticipated that the relocation of gopher tortoises to a long-term off-site recipient site may be required for the construction of proposed project with gopher tortoise burrows.



### *Florida Pine Snake*

The Florida pine snake (*Pituophis melanoleucus*) is listed as threatened by FWC. The Florida pine snake is found in sandhills, including old fields and pastures, with a moderate to open canopy and dry sandy soils, in which it burrows. The pine snake is also found in sand pine scrub and scrubby flatwoods; and often coexists with pocket gophers and gopher tortoises (FNAI 2001). The diet of the Florida pine snake primarily consists of moles, rabbits, mice, rats, squirrels, lizards, and other snakes and their eggs (Ernst and Ernst 2003).

The Florida pine snake was not observed within the limits of the study area, however suitable habitat is available, specifically where gopher tortoise burrows were identified (proposed Pond 4B). Excavation of gopher tortoise burrows provides reasonable assurance that the Florida pine snake will not be impacted.

### *Florida Sandhill Crane*

The Florida sandhill crane (*Grus canadensis pratensis*) is listed as threatened by FWC. The Florida sandhill crane is a non-migratory bird found in freshwater marshes, prairies, and pastures (FNAI 2001). These birds nest in freshwater ponds and marshes, with an average water depth of 5 to 13 inches, and sites vary from year to year due to the fluctuation of water levels. Their diet consists of berries, seeds, insects, mice, small birds, snakes, lizards, and frogs.

Florida Fish and Wildlife Conservation Commission recommend conducting surveys to determine if active nest sites are present between December and August. If the FWC survey protocol is followed (Appendix D-Florida Sandhill Crane Survey Protocol, of the Roadway Conceptual Analysis Ecological Summary, located in the project documents) and no active nests are detected, then no further review or coordination with FWC is required. The Florida sandhill crane was observed foraging within residential areas and the grassy roadside within the study area, and no active nest sites were detected. Marginally suitable nesting habitat is found within the study area; however, no nest sites were observed, and water levels were not adequate at the time of site review.

It is anticipated that the proposed project will not impact the Florida sandhill crane.

### *Wading Birds*

The little blue heron (*Egretta caerulea*) is listed as threatened by FWC. The little blue heron is typically found in marshes, ponds, lakes, meadows, mudflats, lagoons, streams, mangrove lagoons, and other bodies of shallow water. The little blue heron's diet consists of various types of fishes, amphibians and invertebrates. Nesting generally occurs in both coastal and freshwater environments in swamps and/or mangrove forests. They are also known to share nesting sites with other wading birds to form rookery colonies (Rodgers 1996).

The tri-colored heron (*Egretta tricolor*) is listed as threatened by FWC. This species is typically found in habitats similar to the little blue heron and snowy egret, which include marshes, ponds, sloughs and freshwater areas. Tri-colored herons typically feed on small fishes, amphibians, crustaceans, snails, worms and aquatic insects. Nesting can occur in a variety of wetland trees including willow, wax myrtle, marsh elder, pond apple, and buttonbush. Breeding in freshwater rookeries occurs during periods of high water in freshwater wetlands.

The roseate spoonbill (*Platalea ajaja*) is listed as threatened by FWC. This species typically nests on coastal mangrove islands or in Brazilian pepper on man-made dredge spoil islands near suitable foraging habitat and occasionally in willow heads at freshwater sites (FNAI 2011). Roseate spoonbills forage in shallow waters, including marine tidal flats and ponds, coastal marshes, mangrove-dominated inlets and pools, and freshwater sloughs and marshes. The diet of the roseate spoonbill primarily consists of crayfish, shrimp, crabs, and small fish (FWC).

The little blue heron and the tri-colored heron were not observed during field reviews. The roseate spoonbill was observed foraging within the existing stormwater management system (Pond 1). Measures to mitigate wetland impacts can be designed to provide additional benefits to wetland dependent protected wildlife species potentially impacted by the project.

### *3.13.3.5 Non-listed Wildlife Species*

In addition to federal and/or state-listed wildlife species, the study area supports additional wildlife species. Wildlife species noted within the study area during field reviews include: red-shoulder hawk (*Buteo lineatus*), great egret (*Ardea alba*), great blue heron (*Ardea herodias*), common grackle (*Quiscalus quiscula*), mockingbird (*Mimus polyglottos*), raccoon (*Procyon lotor*), wild boar (*Sus scrofa*), white tailed deer (*Odocoileus virginianus*), and brown anole (*Anolis sagrei*). In addition, wetland systems within the study area provide resting, nesting, and foraging opportunities for wetland dependent species and migratory birds.

### **3.13.4 Wetland and/or Surface Water Regulatory Overview and Permitting Requirements**

Wetland systems are regulated at federal, state and local levels making the presence of such systems important in planning for transportation projects. A discussion of each agency with potential jurisdiction over wetlands within the study area follows.

#### *U.S. Army Corps of Engineers*

The USACE regulates the discharge of dredge or fill material in water of the U.S. under Section 404 of the Clean Water Act, and in navigable waters of the U.S. under Sections 9 and 10 of the Rivers and Harbors Act of 1899. The term “navigable waters of the U.S.” is defined to include all waters that are subject to the ebb and flow of the tide, and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce (USACE Guidebook). In 1985, the U.S. Environmental Protection Agency (EPA) signed a Migratory Bird Memo which suggested that the movement of birds across state lines could be used as a link to interstate commerce. The USACE adopted the regulation in 1986 as the “Migratory Bird Rule” (MBR) which allowed the USACE to assert jurisdiction over nearly all, natural water bodies, including wetlands that could be or were used as habitat by migratory birds.

The USACE (Federal Register 1982) and the EPA (Federal Register 1980) jointly define wetlands as: “areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” and “wetlands generally include swamps, marshes, bogs, and similar areas” (Corps of Engineers Wetlands Delineation Manual 1987).

Impacts to wetland systems deemed jurisdictional by the USACE require a Standard, General, or Nationwide Permit.

General Permits are issued on a nationwide or regional basis for a category of activities that are similar in nature and cause only minimal individual and cumulative impacts. General Permits are reviewed every five years and have been developed as a way to reduce the burden of the regulatory program on the public and ensure timely issuance of permits.

Nationwide Permits are activity specific and are issued when there are generally less than 0.5-acres of impact and may not require full compensation mitigation. Nationwide Permit 14 Linear Transportation Projects regulates activities associated with roads, highways, railways, trails, airport runways, and taxiway. For a NWP 14 in non-tidal waters, there must be less than 0.5-acre of impacts of water of the U.S.

Standard Permits are required when the proposed project does not meet the criteria of a General Permit or Nationwide Permit.

#### *South Florida Water Management District*

South Florida Water Management District regulates impacts to wetlands and/or other surface waters pursuant to Part IV, Chapter 373 of the F.S., and in accordance with Chapters 40E-4, 40E-40; 40E-41 and 40E-400 of the Florida Administration Code. South Florida Water Management District generally requires an Environmental Resource Permit (ERP) to impact wetlands, which are typically defined as stated above by the USACE. Permit thresholds have been developed to determine which type of permit may be required, and generally require mitigation for impacts to wetland systems that are over 0.5 acre in size. In addition, SFWMD considers secondary impacts to wetland systems, which average 25-feet into the wetland system. In order to reduce secondary wetland impacts, SFWMD generally requires a 15-foot minimum and 25-foot average upland buffer to be preserved around a wetland system.

#### **3.13.5 Wildlife Corridors**

As part of the Reams Road RCA process, the project team evaluated the opportunity of implementing wildlife crossings within the study area. Wildlife crossings are most often associated with roadways where natural habitat is located on either side of a crossing and those natural areas can be protected from site conversion through preservation or conservation. Wildlife crossings allow for wildlife to move uninterrupted and safely through a roadway corridor from one side to the other, from natural habitat to natural habitat. This study found little evidence of use by listed wildlife species within the study area however common wildlife species like raccoons, rabbits, opossums, snakes and turtles are known to occur in the study area.

#### *Current Corridor Condition*

The current study area is a mix of residential and commercial development, and natural vegetated communities. The current configuration of Reams Road is predominantly a two-lane roadway with little to no shoulders. Natural vegetation consists of forested wetlands, marshes, upland forests and pasture areas. These natural communities are being developed at an accelerated rate; during this study, two new development projects have begun.

#### *Future Corridor Condition*

A review of existing and pending Orange County development permits along the study area shows that a tremendous amount of growth and development is planned in the area. Of the 50± distinct properties/parcels throughout the study area, only 14 do not currently have permitted or pending permit development plans.

Of those 14, several will be utilized for stormwater management ponds to support roadway improvements and resolve some drainage issues within the study area.

### *Evaluation Criteria*

Detailed analysis of the study area for wildlife crossing implementation included review of biodiversity database, identification and location of conservation lands and/or public lands, current and future development plans, as well as input from citizens. While there is no significant listed wildlife species presence within the study area, there have been records of common wildlife species (i.e. raccoons, opossums, etc.) identified.

Two critical evaluation criteria, when determining the implementation and placement of wildlife crossings, are the presence of natural habitat on both sides of the roadway that is protected from site alteration, and the ability to construct a fence along the roadway to guide wildlife to the crossing. Therefore, if a potential wildlife crossing location currently has natural habitat on both sides of the roadway that is under private ownership, and the property owner prohibits the construction of a fence or reserves the right to move or remove the wildlife fence in the future, the long-term viability of the location is greatly diminished. Using these criteria, the viability of wildlife crossings within the Reams Road study area is limited.

### *Selection of Potential Wildlife Crossing Locations*

Using the evaluation criteria above, along with biodiversity data available for the study area, existing natural communities, and input from citizens, two potential wildlife locations were identified: 1) east of Disney property, west of Newmarket Drive/Bay Court, and 2) at the existing large box culvert crossing located east of Greenbank Boulevard.

### *Application of Evaluation Criteria to Potential Wildlife Crossing Locations*

#### **Wildlife Crossing Location 1 - East of the Disney parking lot, West of Newmarket Drive/Bay Court**

Wildlife Crossing Location 1 has natural habitat consisting of wetlands and uplands on both sides of the roadway. The property on both sides of the roadway in this location is owned by a development subsidiary of Walt Disney Parks and Resorts. Conversations with Disney representatives indicate that a wildlife crossing and fencing on both sides of the roadway could be constructed at this time. However, Disney is reserving the right to relocate the fence on the south side of the property away from the roadway in the future to allow the frontage property to be developed. This would reduce the effectiveness of a wildlife crossing in this location.

#### **Wildlife Crossing Location 2 – East of Greenbank Boulevard**

The County currently identifies this area as a wildlife crossing and has installed flashing signs identifying the area as such. Wildlife Crossing Location 2 has natural wetland habitat on both sides of the road. Although the properties on both sides of the roadway are privately owned, the proposed crossing location serves as a hydrologic connection between the wetlands. Therefore, it is unlikely that the wetlands will be developed in the future. This would allow a guiding fence to be constructed adjacent to the wetlands.

### *Conclusion*

#### **Wildlife Crossing Location 1 – East of the Disney parking lot, West of Newmarket Drive/Bay Court**

Based on the information and analysis presented above, it is concluded that a wildlife crossing east of the Disney parking lot and west of New Market Boulevard is not justified due to the lack of sustainable natural communities (i.e. preservation or conservation lands) on both sides of the roadway in the future. A wildlife crossing in this location may be reconsidered in the future should plans to develop the frontage on the south side of the roadway be altered.

#### Wildlife Crossing Location 2 – East of Greenbank Boulevard

A wildlife crossing could be supported east of Greenbank Boulevard. Final configuration of the component of the crossing will be determined during roadway design. The wildlife crossing would be at an existing box culvert and would include an appropriately sized reinforced concrete pipe (RCP) with an inlet grate in the median to allow for light penetration. The pipe would be placed above the seasonal high-water level, providing a dry crossing for wildlife species to utilize. Additionally, a herpetological fence would be installed along both the north and south right-of-way, extending from upland limit to upland limit on either side of the flow way. The herpetological fence would be buried one foot in the ground with three feet above to discourage digging under the fencing and minimize access over the fence. A crossing in this location is viable as this is a major drainage feature in the area and must be maintained in the future to provide hydrologic flow and flood control.

## 4 DESIGN CONTROLS AND STANDARDS

### 4.1 Roadway Design Criteria

Sources used to determine the design criteria for the Reams Road RCA include the FDOT Plans Preparation Manual, the FDOT Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System, the FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Florida Greenbook), and the Manual of Uniform Traffic Control Devices (MUTCD). Specific design criteria used for the development of the proposed design are identified below:

- Design Speed: 45 mph (Posted: 45 mph)
- Functional Classification: Urban Arterial Collector
- Level of Service: LOS of "E" or better
- Lane Widths: Travel lane - 11 feet
- Sidewalk Width (south side): 5 feet
- Multiuse trail (north side): 14 feet
- Median Width: 19.5 feet, raised
- Curb Type: Type E (median) Type F (outside)
- Border Width: 14 feet from outside edge of pavement
- Lateral Offset: 4 feet from Face of Curb
- Pavement Design: (to be determined)
- Landscape Budget: (to be determined later in the process)

### 4.2 Drainage Design Criteria

The project area is located within the South Florida Water Management District (SFWMD). In addition, the entire corridor lies within the tributary drainage basin subject to the requirements of the Reedy Creek Improvement District (RCID). The stormwater management systems throughout the study are designed to meet or exceed the drainage criteria established by the SFWMD, RCID, and Orange County. These design criteria include requirements for providing treatment for water quality protection and attenuation of discharge rates. The following is a summary of the design criteria required by each of the governing agencies.

#### 4.2.1 Orange County

Orange County requires the peak discharge from the developed site to not exceed the peak rate of discharge from the site in the existing conditions for the 25-year/24-hour storm event. Where no positive outfall is available, the stormwater management system is required to retain the 100-year/24-hour storm event.

The Orange County criteria requires that pollution abatement detention volume for wet detention areas be provided for the greater of the first one (1) inch of runoff from the total developed project or the runoff from two and one-half (2.5) inches over the net new impervious area. Orange County criteria for pollution abatement volume for a dry retention system is one-half (1/2) inch of runoff from the developed site or the runoff generated from the first one (1) inch of rainfall on the developed site, whichever is greater.

Compensation will be required for all flood water displaced by development below the 100-year flood elevation. Compensating storage is to be accomplished between the normal seasonal high-water elevation and the 100-year flood elevation.

#### 4.2.2 South Florida Water Management District (SFWMD)

SFWMD requires that the discharge rate is limited to rates that do not causing adverse impacts to existing off-site properties and either historic discharge rates, rates determined in previous District permit actions, or rates specified in District criteria. The criteria states that the design storm event to be used is the 25-year/72-hour storm; however, local (Orange County- 25 year/24-hour storm) discharge criteria are deferred to for this project. For the purposes of this corridor analysis, SFWMD has verified that the roadway ponds will defer to the local criteria and meet the standard 25 year/24-hour discharge criteria.

SFWMD also requires that pollution abatement volume for wet detention areas be provided for the greater of the first one (1) inch of runoff from the total developed project or the runoff from two and one-half (2.5) inches over the net new impervious area. The required pollution abatement detention volume for dry retention areas shall be equal to 50% of the required pollution abatement volume for wet detention.

#### 4.2.3 Reedy Creek Improvement District (RCID)

The RCID will exercise jurisdiction over this project. The RCID drainage fee is established based on any discharge from the proposed project which exceeds 13 cubic feet per second per square mile (CSM) for the 50-year/72-hour (12.91 inches rainfall) event using the SFWMD distribution. Once the construction plans and design calculations are complete, the information should be submitted to the RCID office of Planning and Engineering.

## 5 TRAFFIC CONDITIONS

The chapter presents a summary of the existing traffic conditions as well as the future traffic projections for the major intersections and roadway segments along Reams Road as documented within the Draft Design Traffic Technical Memorandum (DDTTM) developed as part of this study and completed in October 2017.

Although Summerlake Park Boulevard is not within the project limits, the intersection has been included in the traffic analysis for informational purposes. In analyzing the existing operating conditions, traffic counts were first conducted at pertinent roadway segments and intersections. The following intersections along Reams Road were evaluated as part of this study:

- Reams Road @ Summerlake Park Boulevard (Unsignalized)
- Reams Road @ Oasis Cove Boulevard (Unsignalized)
- Reams Road @ Greenbank Boulevard (Unsignalized)
- Reams Road @ Jayme Drive (Unsignalized)
- Reams Road @ Floridian Place/Buena Place (Unsignalized)
- Reams Road @ WDW Cast Parking/Commercial Driveway (Signalized)
- Reams Road @ Center Drive/Commercial Driveway (Unsignalized)
- Reams Road @ Bay Court/Newmarket Drive (Unsignalized)
- Reams Road @ Aldendale Street/Via Trieste Drive (Unsignalized)
- Reams Road @ Royal Estates Boulevard (Unsignalized)
- Reams Road @ Taborfield Avenue (Unsignalized)

Level of Service (LOS) analyses were then conducted for both intersections and roadway segments using the existing traffic counts, signal timing data and roadway and intersection geometry. The intersection LOS analysis was performed based on the Highway Capacity Manual methodologies as commuted using the Synchro software. The roadway segment LOS analysis was conducted based on the generalized Annual Average Daily Traffic (AADT) volumes for urbanized areas from the latest FDOT 2013 Quality/Level of Service Handbook. The following sub-sections describe in more detail the overall process and results.

### 5.1 Existing Conditions

#### 5.1.1 Traffic Counts

All existing traffic count data was collected during the month of April 2017. The data collected included:

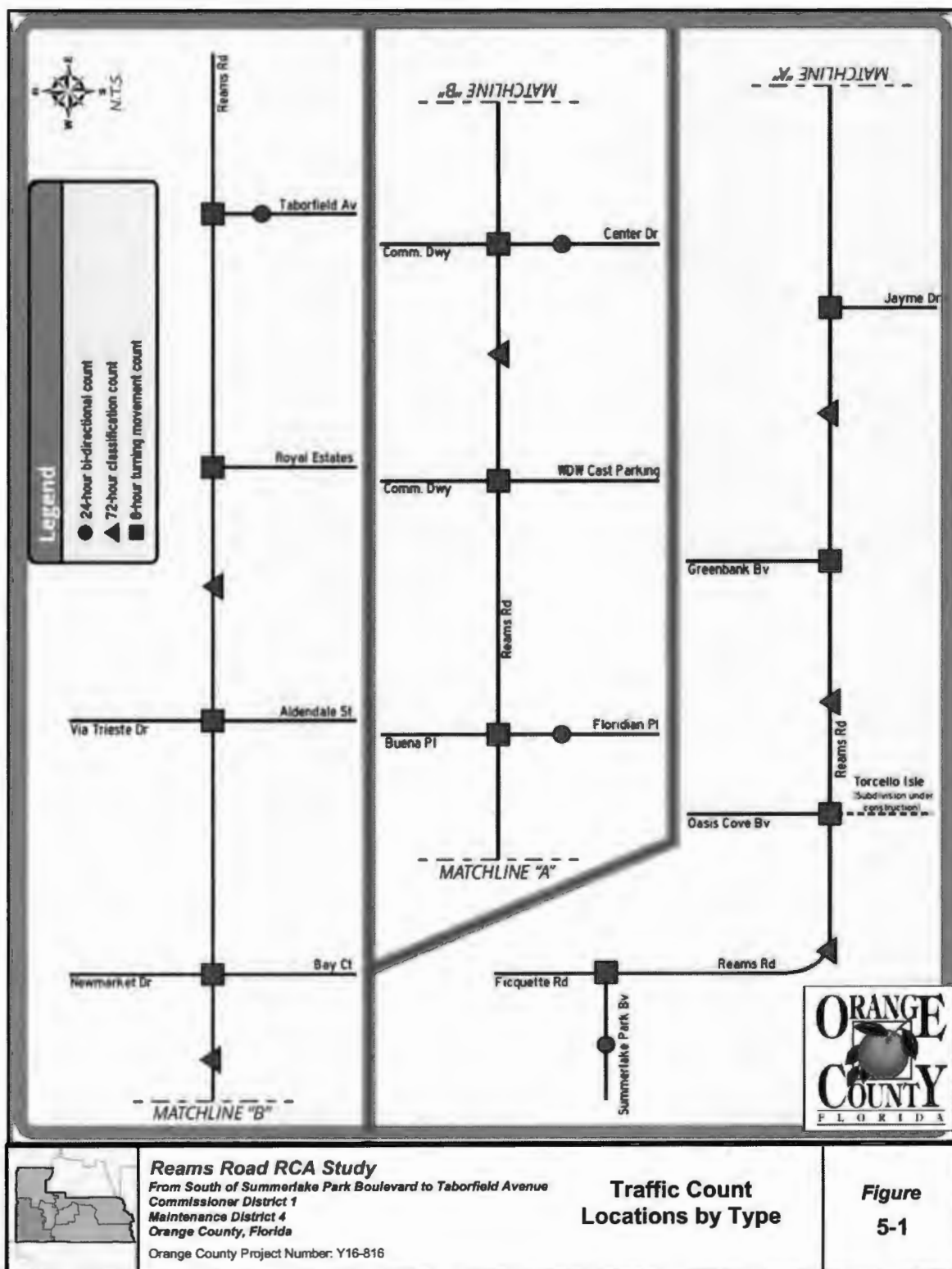
- 24-Hour Bi-directional Counts (4 locations)
- 72-Hour Classification Counts (6 locations)
- 8-Hour intersection turning movement counts for a.m. and p.m. peak hours (11 intersections)

The weekday turning movement counts were collected for the intersections along Reams Road between the peak hours of 7:00-10:00 a.m. and 2:00-7:00 p.m.

All traffic count data collected were seasonally adjusted utilizing the latest (2016) FDOT axle and seasonal adjustment factors for Orange County to provide 2017 annual average conditions. Daily classification counts were adjusted to AADT using FDOT peak season adjustment factors only, as no axle adjustment was necessary. The traffic data collection locations are summarized in Figure 5-1.



**Figure 5-1**  
**Traffic Count Locations by Type**



### 5.1.2 Traffic Characteristics

The following design traffic characteristics were established using traffic flow characteristics obtained from the traffic count data:

- K30 - represents the relationship between the travel demand occurring during the 30th highest hour of the year and the average annual daily traffic.
- D30 - represents the directional factor occurring in the traffic flow during the 30th highest hour.
- T-factor - represents the percentage composition of medium sized and heavy trucks occurring in the traffic stream.

The existing traffic characteristics were established using the traffic counts collected. Specific traffic characteristics are listed below:

- K – the proportion of AADT occurring during the peak study hour for the study roadway
- D – the proportion of traffic in the design hour of the design year traveling in the peak direction
- T-daily – the percentage of buses and trucks occurring during a day (24-hours)
- T-peak – the percentage of buses and trucks occurring during the design hour

These measured K, D, and T-daily factors are annotated in Table 5-1. This table also includes FDOT and Orange County K and D factors for comparisons purposes.

**Table 5-1  
Traffic Characteristics Comparison**

Roadway/Segment	Measured Characteristics			“K” Estimated <sup>1</sup>	FDOT 2016 FTI <sup>2</sup>			Orange County Counts <sup>3</sup>		
	“K”	“D”	“TDaily”		“K”	“D”	“TDaily”	“K”	“D”	“TDaily”
Mainline Characteristics										
Reams Road										
Southeast of Summerlake Park Boulevard	8.96%	69.07%	2.52%	9.23%	9.00%	52.50%	5.70%	--	--	--
East of Oasis Cove	8.10%	73.45%	2.75%	8.35%	--	--	--	8.55%	67.21%	--
West of Jayme Drive	8.08%	74.21%	2.71%	8.33%	--	--	--	--	--	--
West of Center Drive	7.93%	51.93%	2.95%	8.17%	--	--	--	--	--	--
West of Newmarket Drive	7.96%	64.21%	3.30%	8.20%	--	--	--	7.98%	63.36%	--
East of Via Trieste Drive	7.62%	60.44%	3.20%	7.85%	--	--	--	--	--	--
Average	8.11%	65.55%	2.91%	8.36%	--	--	--	--	--	--
Side Street Characteristics										
Summerlake Park Boulevard										
West of Reams Road	8.86%	63.76%	--	9.13%	--	--	--	--	--	--
Floridian Place										
South of Reams Road	9.16%	86.21%	--	9.44%	--	--	--	--	--	--
Center Drive										
South of Reams Road	14.72%	51.07%	--	15.17%	--	--	--	--	--	--
Taborfield Avenue										
South of Reams Road	10.67%	54.35%	--	11.00%	--	--	--	--	--	--

<sup>1</sup>Estimated K Standard= Measured K \* (median of the thirteen highest consecutive peak season factors/median of thirteen lowest consecutive peak season factors).

(1.01/0.98) = 1.030612

<sup>2</sup>FDOT 2016 Florida Transportation Information Data DVD

<sup>3</sup>Orange County Public Works 2016 Traffic Counts

The following design traffic characteristics were established using traffic flow characteristics obtained from the traffic count data and the FDOT Project Traffic Forecasting Handbook (PTFH):

- Standard K – the design peak hour factor utilized for the design traffic volumes within a Large Urbanized Area.
- D - represents the directional factor occurring in the traffic flow during the peak hour.
- T-daily - the percentage of buses and trucks occurring in the traffic stream during a day (24-hours).
- T-peak – the percentage of trucks and buses occurring during the design hour

Table 5-2 presents the recommended design traffic characteristics for Reams Road and the intersecting side streets. The design traffic characteristics are used to develop design hour volumes (DHV) and directional design hour volumes (DDHV). The recommended T-daily factor is used to determine the Equivalent Single Axle Loadings (ESALs) for the project corridor for pavement design and the recommended T-peak factor is used in the intersection operational analysis.

**Table 5-2  
Recommended Design Traffic Characteristics**

Roadway/Segment	Recommended Design Characteristics*			
	"K" Factor	"D" Factor	"TDaily" Factor	"Tpeak" Factor
<b>Mainline Characteristics</b>				
Reams Road				
Summerlake Park Boulevard to Taborfield Avenue	9.00%	65.55%	2.91%	1.46%
<b>Side Street Characteristics</b>				
Summerlake Park Boulevard	9.00%	63.76%	2.91%	1.46%
Floridian Place	9.00%	67.10%	2.91%	1.46%
Center Drive	9.00%	51.07%	2.91%	1.46%
Taborfield Avenue	9.00%	54.35%	2.91%	1.46%

Notes:

\*K Factor for Reams Road and side streets are based on FDOT Standard K values recommended for an urban arterial from the 2014 Project Traffic Forecasting Handbook.

\*D Factor for Reams Road is based on the average of the field data collected for Reams Road.

\*D Factor for the side street is based on the measured values for the side street except for Floridian Place where D Factor restricted to FDOT High value 67.10%.

\*The Tdaily Factor for Reams Road and side streets are based on the average of the field data collected for Reams Road.

\*The Tpeak Factor is the Tdaily factor divided by 2.

The K factor was based on the FDOT PTFH Large Urbanized Area Arterials & Highways Standard K factor. Existing D factors were compared to historical FDOT D factors for Reams Road for the last six years and also compared to the range of acceptable factors found in the FDOT PTFH. Side street D factors were based on existing D percentages, except for Floridian Place where the FDOT High D (67.1) was used. The Reams Road

T-daily and T-peak factors were based on the average of the existing traffic count percentages. Minor street T-daily and T-peak factors were also based on the Reams Road factors.

#### 5.1.3 Existing Geometry

Figure 5-2 provides the year 2017 intersection geometry for all the intersections to be evaluated in the study. The existing geometry is important, as this information will be used in evaluating the need for potential geometric improvements to accommodate future travel demand.

#### 5.1.4 Existing Year Traffic Volumes

The adjusted 2017 AADT's for the individual roadway segments within the project study limits are provided in Table 5-3. Figure 5-3 and Figure 5-4 provides the existing AM and PM turning movement counts for each of the intersections counted.

#### 5.1.5 Existing Condition Level of Service Analysis

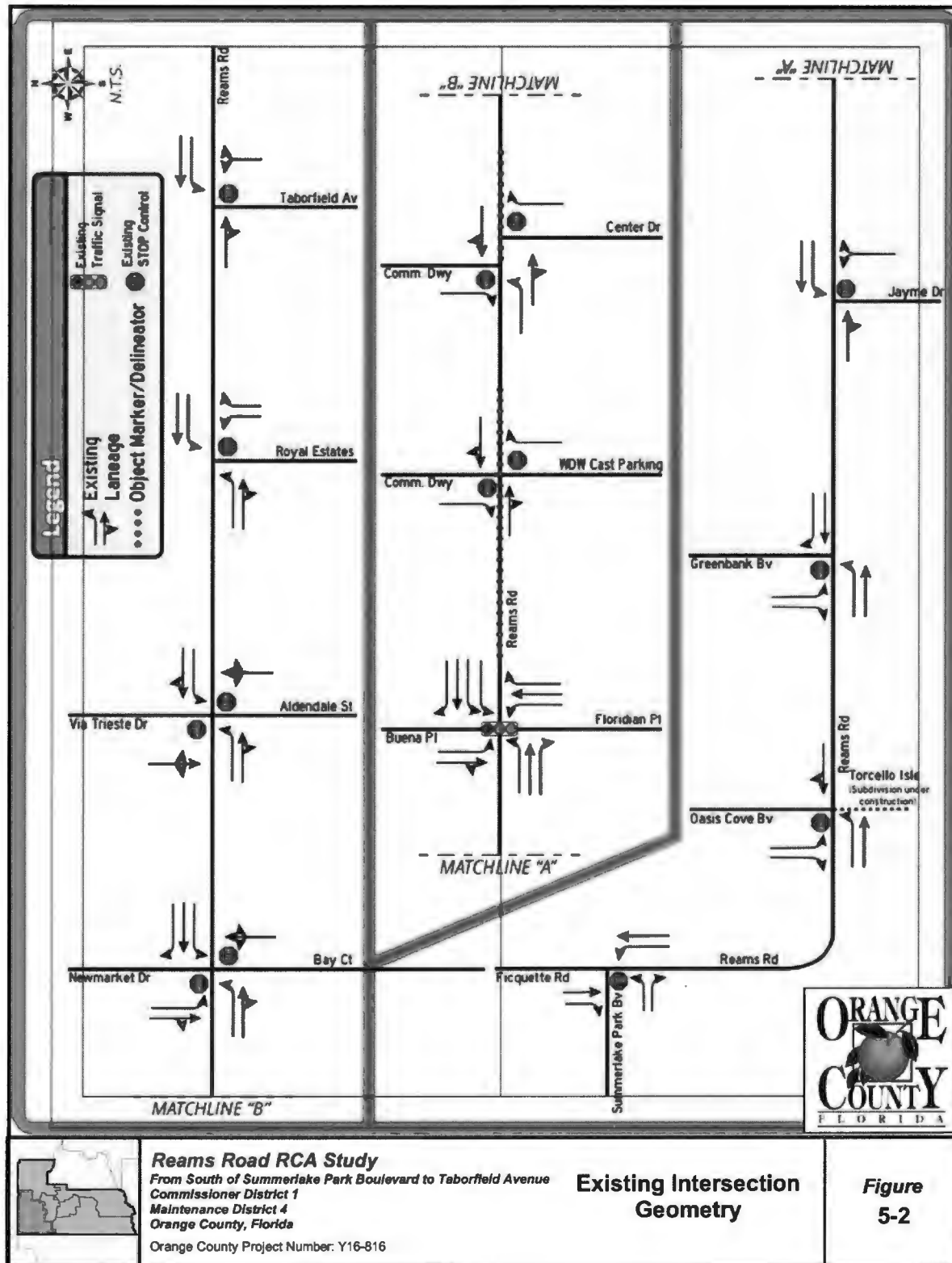
Reams Road and intersecting roadways were evaluated to determine existing operating conditions during AM and PM peak hour periods.

Level of Service (LOS) is a qualitative measure that seeks to describe the operating conditions of a roadway segment or intersection. Various factors such as speed, travel time, traffic delay due to signalization, freedom to maneuver, safety, driving comfort, and convenience play into the determination of LOS. Levels of Service are designated as "A" through "F" as a way to describe the full range of traffic operation conditions. LOS "A" represents virtually free flow conditions and LOS "F" represents constrained or failed conditions.

#### Roadway Segments

Table 5-3 also provides a list of the roadway parameters utilized in this analysis, taken from the Orange County Concurrency Management System. Included in this table are: number of lanes, functional classification, adopted Level of Service (LOS) standard, roadway service volumes, a.m. and p.m. peak hour traffic volumes and existing LOS. Based upon this analysis, four of the Reams Road study roadway segments currently operate over capacity. The remaining study roadway segments all operate at acceptable levels of service.

**Figure 5-2**  
**Existing Intersection Geometry**



**Table 5-3  
Existing Roadway Level of Service**

Roadway/Segment	Adopted Functional Class	LOS	# of Lanes	Roadway Service Volumes Peak Hour/ Peak Direction Capacity Table <sup>1</sup>					AADT <sup>2</sup>	Peak Hour Traffic Volumes <sup>2</sup>	Peak Time <sup>2</sup>	LOS	
Mainline Characteristics													
Reams Road				A	B	C	D	E		EB	WB		
Southeast of Summerlake Park Boulevard	Collector	E	2	0	0	830	880	880	15,500	914	481	8:00- 9:00 AM	F
East of Oasis Cove	Collector	E	2	0	0	830	880	880	16,500	512	973	5:00- 6:00 PM	F
West of Jayme Drive	Collector	E	2	0	0	830	880	880	16,800	522	990	5:00- 6:00 PM	F
West of Center Drive	Collector	E	2	0	0	830	880	880	14,100	438	831	5:00- 6:00 PM	D
West of Newmarket Drive	Collector	E	2	0	0	830	880	880	14,700	867	456	5:00- 6:00 PM	D
East of Via Trieste Drive	Collector	E	2	0	0	830	880	880	15,100	469	890	5:00- 6:00 PM	F
Side Street Characteristics													
Summerlake Park Boulevard				A	B	C	D	E		EB	WB		
West of Reams Road	Local	E	2	0	0	330	680	720	11,700	363	690	5:00- 6:00 AM	E
Floridian Place				A	B	C	D	E		NB	SB		
South of Reams Road	Local	E	4	0	0	660	1,470	1,530	14,500	450	855	7:30- 8:30 AM	D
Center Drive				A	B	C	D	E		NB	SB		
South of Reams Road	Local	E	2	0	0	330	680	720	4600	271	143	4:15- 5:15 AM	C
Taborfield Avenue				A	B	C	D	E		NB	SB		
South of Reams Road	Local	E	2	0	0	330	680	720	800	25	47	4:00- 5:00 AM	C

<sup>1</sup>From Orange County Traffic Concurrency Management Program

<sup>2</sup>Daily and Peak Hour traffic volumes from Table 5-1

### Intersections

The study intersections were analyzed under existing conditions using the procedures of the 2010 Highway Capacity Manual for signalized and unsignalized intersections. This analysis used existing traffic volumes and existing geometric conditions. Table 5-4 includes the summary results for the a.m. and p.m. peak hour intersection delay and level of service. As can be seen, all of the existing study intersection currently operate at satisfactory levels of service. The unsignalized intersection of Summerlake Park Boulevard, to the north of the project limits, currently operates with an LOS F condition for the minor street movement during the a.m. and p.m. peak hours.

Figure 5-3 and Figure 5-4 illustrate the results of the existing condition A.M. peak hour and P.M. peak hour LOS analysis.

## 5.2 Future Analysis Scenarios

### 5.2.1 Design Period

Orange County estimates that the opening year target for the widening of Reams Road is 2025. Given this anticipated schedule, the following periods were used to provide design traffic forecasts for the Reams Road Roadway Conceptual Analysis study:

- Opening Year 2025
- Mid Design Year 2035
- Design Year 2045

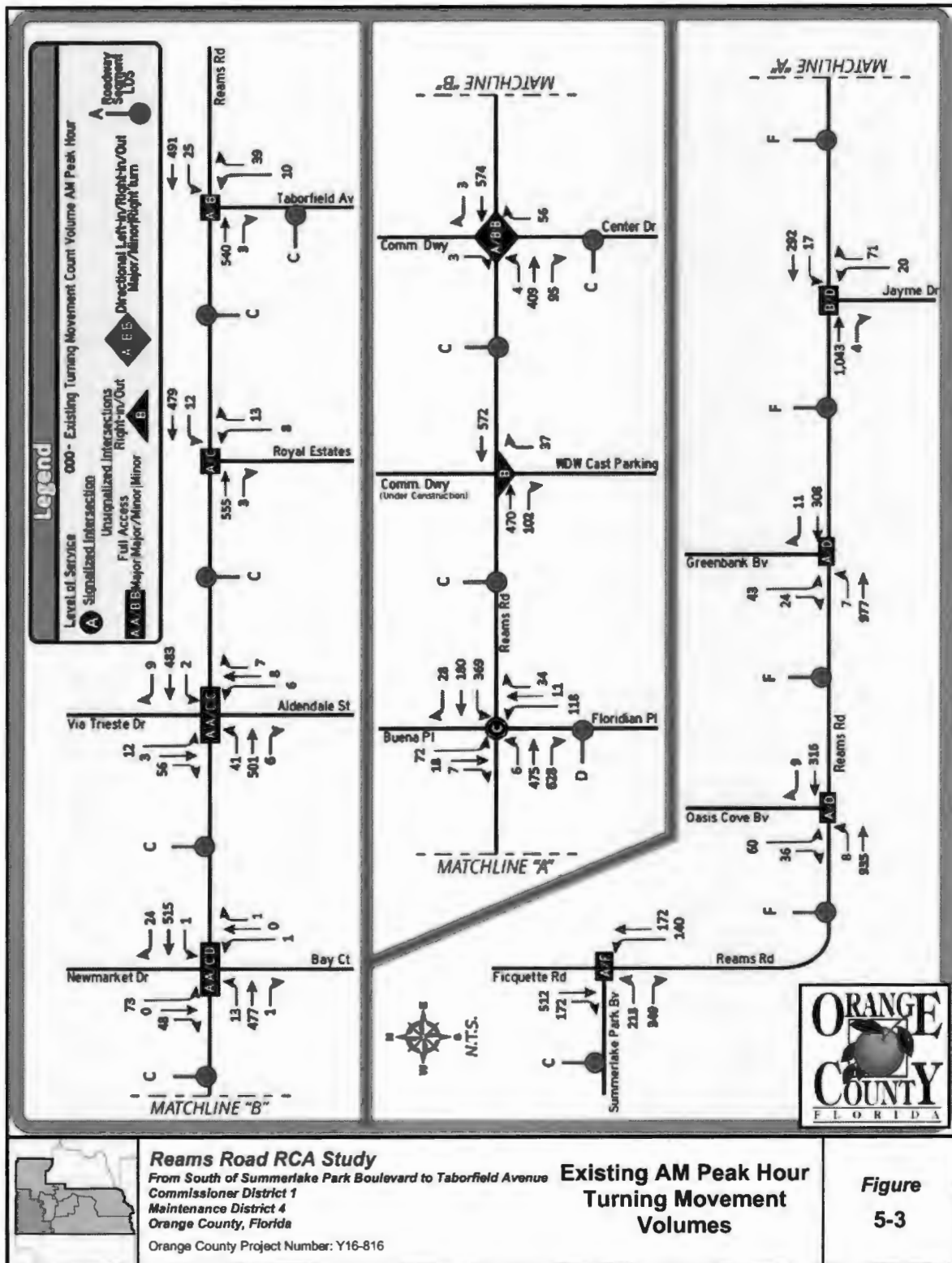
### 5.2.2 Analysis Scenarios

Design traffic volumes were developed for two traffic conditions, No-Build and Build. The No-Build condition for Reams Road, between Summerlake Park Road and Taborfield Avenue, assumes that the subject facilities will maintain existing lane geometry and intersection configurations. The Build condition includes Reams Road from Summerlake Park Road and Taborfield Avenue being widened to a four-lane roadway.

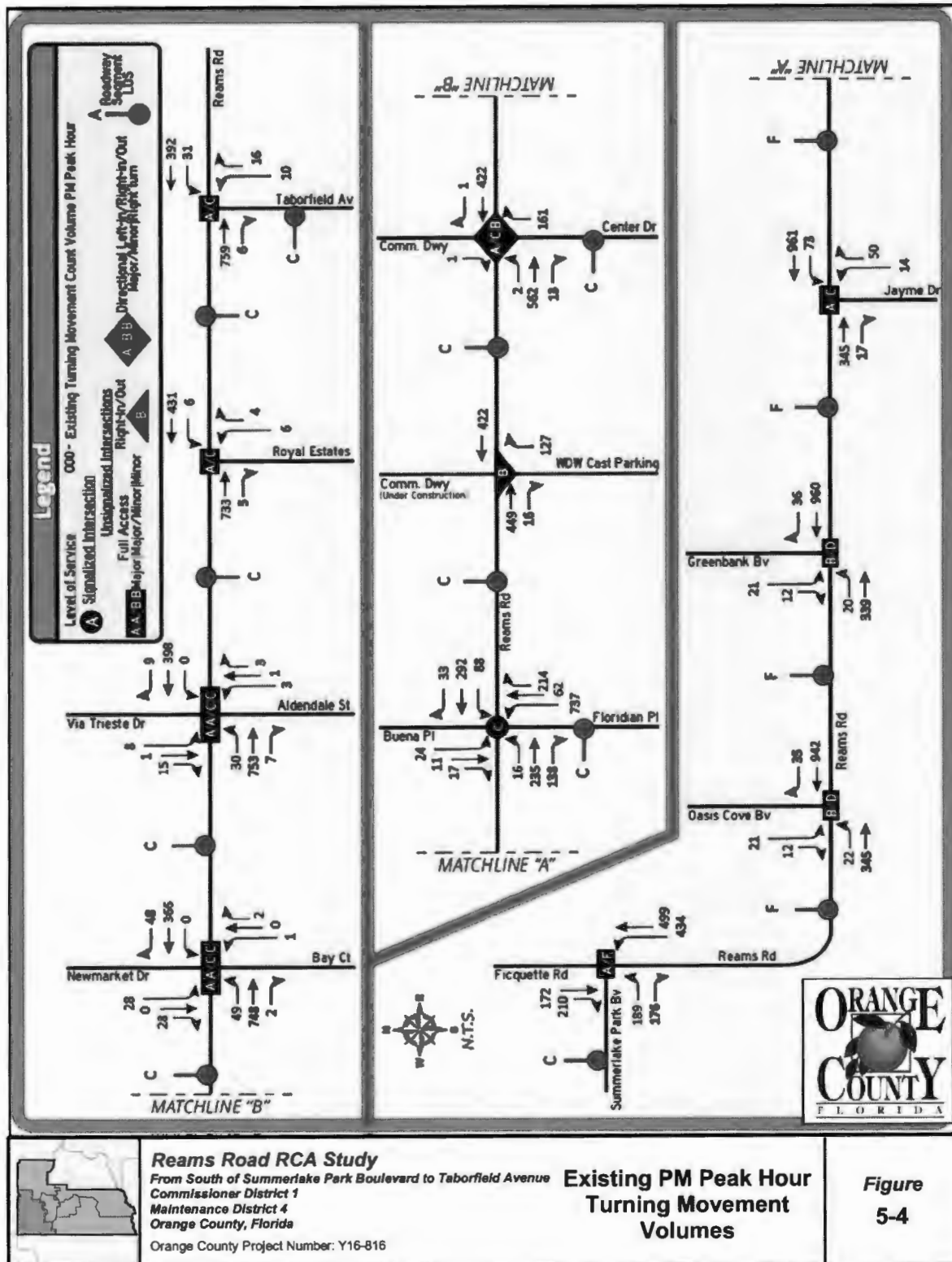
The build scenario of four-laning Reams Road between Summerlake Park Road and Taborfield Avenue (Design Phase, ROW Phase), in addition to the segment from Taborfield Avenue to Delmar Avenue (Construction Phase), and Ficquette Road from Summerlake Park Boulevard to Overstreet Road (Construction Phase) are consistent with the programmed improvements identified in the FY 2016/2017 – 2020/2021 Orlando Urban Area Transportation Improvement Program (TIP) adopted by the Orlando Urban Area Metropolitan Planning Organization (MetroPlan Orlando) in July 2016 and Orange County CIP dated June 2017. The Orlando Urban Area Year 2040 Long Range Cost Feasible Plan does not include the widening of Reams between Summerlake Park Road and Taborfield Avenue. No additional changes were made to the roadway network for the model.



**Figure 5-3**  
**Existing AM Peak Hour Turning Movement Volumes**



**Figure 5-4**  
**Existing PM Peak Hour Turning Movement Volumes**



**Table 5-4**  
**Existing Intersection Delay and LOS for the Study Intersections**

Study Intersections	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS
<b>Reams Road</b>					
Summerlake Park Boulevard/Ficquette Road	Stop <sup>1</sup>	9.1/54.4	A/F	8.8/445.3	A/F
Oasis Cove Boulevard	Stop <sup>2</sup>	8.0/31.4	A/D	10.5/30.1	B/D
Greenbank Boulevard	Stop <sup>2</sup>	7.9/26.7	A/D	10.4/27.8	B/D
Jayme Drive	Stop <sup>3</sup>	10.9/26.7	B/D	8.3/17.0	A/C
Floridian Place/Buena Place	Signal	32.6	C	32.2	C
WDW Cast Parking	Stop <sup>4</sup>	12.2	B	13.0	B
Center Drive/Community Driveway	Stop <sup>5</sup>	8.7/11.8/12.3	A/B B	8.2/15.8 10.9	A/C B
Newmarket Drive/Bay Court	Stop <sup>6</sup>	8.6 8.4/19.9 26.1	A A/C B	8.2 9.3/22.7 24.6	A A/C C
Via Trieste Drive/Aldendale Street	Stop <sup>6</sup>	8.6 8.5/22.2 15.7	A A/C C	8.3 9.4/24.2 19.1	A A/C C
Royal Estates	Stop <sup>3</sup>	12.3/15.8	A/C	9.3/20.3	A/C
Taborfield Avenue	Stop <sup>3</sup>	12.5/14.5	A/B	9.6/19.4	A/C

<sup>1</sup>NB Left Turn Major Street Movement/EB Minor Street Movements <sup>2</sup>EB Left Turn Major Street Movement/SB Minor Street Movements

<sup>3</sup>WB Left Turn Major Street Movement/NB Minor Street Movements <sup>4</sup>NB Minor Street Right Turn Movement <sup>5</sup>EB Left Turn Major Street Movement/NB Minor Street Right Turn Movement | SB Minor Street Right Turn Movement <sup>6</sup>EB | WB Left Turn Major Street Movements/NB | SB Minor Street Movements

## 5.3 Future Year Traffic Projections

### 5.3.1 Future Corridor Travel Demand

The development of traffic projections for Reams Road requires the examination of historical traffic growth, proposed development within the corridor vicinity, and a basic understanding of the traffic circulation patterns and characteristics of the corridor. In arriving at the volume forecasts for the Reams Road Corridor, various growth rates were examined. The following sections discuss the resulting growth rates from various methodologies and the recommended growth factor used in this analysis.

### 5.3.2 Trends Analysis

Traffic projections using historical growth patterns derived from annual traffic count reports form the basis of the Trends Analysis methodology. Trends analysis uses linear regression techniques relating traffic volumes with time. Statistical validity of trends-based analysis increases with increasing number of sample years and increasing R<sup>2</sup> value. R<sup>2</sup> values of 70% or greater are recommended. It should be noted that future travel demand estimated from trends analysis is based solely on historical traffic, economic and development growth patterns. Similarly, the trend analysis method relies on historical traffic counts and does not consider traffic diversion to other roadways due to road capacity improvements within the surrounding roadway system.

The trends growth rate analysis was based on a calculation of historic growth rates from a traffic count station on Reams Road west of Walt Disney World (WDW). The historic traffic count showed a 7.5% annual growth rate from year 2010 to year 2016. It was deemed that this growth rate would not be sustainable due to the following:

- Limited employee/cast member expansion area to the north near Reams Road, with existing three access points and a large portion of the land already supporting parking lots
- WDW may be moving employee generators to locations away from routes accessed by Reams Road, such as to a centralized laundry facility at another location.
- Additional WDW access points will be built or existing access points will be improved- EPCOT Center Drive and Osceola Parkway are currently being extensively widened to allow more flow through though locations

The trend analysis worksheets are included in Appendix E of the Draft Design Traffic Technical Memorandum, located in the project documents.

### 5.3.3 FSUTMS Model

The most current Orlando Urban Area Transportation Study (OUATS) FSUTMS model was used in forecasting future traffic for the Reams Road corridor. This model has a base year 2009 validation and a long-range forecasting application for the year 2040. This model was used to forecast volumes for two scenarios, Build and No-Build conditions. The Build condition reflects the widening of Reams Road from Summerlake Park Road to Taborfield Avenue. It also includes the adjacent widening to the east on Reams Road (to Delmar Avenue) and on Ficquette Road. The No-Build condition represents maintaining existing roadway geometry (two lanes) along Reams Road from Summerlake Park Road to Taborfield Avenue.

In order to simulate the Reams Road as a two-lane (no-build scenario) and four-lane (build scenario) roadway between Summerlake Park Road and Taborfield Avenue, the following network changes were made to the OUATS highway networks and socio-economic data. These changes were based on the programmed improvements listed in the most current Transportation Improvement Program (TIP) prepared by Orlando MetroPlan, field visits, aerial photos, and the planned improvements listed in the Year 2040 Long Range Plan. The following network and socio-economic ("SE") data changes that were made include:

- Widening of Summerlake Park Boulevard west of Reams Road / Ficquette Road to four lanes.
- Widening of Reams Road from SR 535 to Taborfield Avenue to four lanes.
- Interpolation and Extrapolation of base OUATS ("SE") data to the analysis years
- Adjusted SE data to Bureau of Economic and Business Research (BEBR) medium population projections by County by analysis year

Based on the revised network, under the no-build scenario (2 lanes), year 2035 traffic volumes along Reams Road between Summerlake Park Boulevard and Taborfield Avenue range from 12,100 to 15,800 vehicles per day. Similarly, based on the revised network, under the build scenario (4 lanes), year 2045 traffic volumes along Reams Road between Summerlake Park Boulevard and Taborfield Avenue range from 16,700 to 26,400 vehicles per day. Using the model and comparing to the 2009 base year validation, an average annual growth rate to year 2035 of 2.89% was observed, while 2045 showed an annual growth rate of 2.76%. The FSUTMS plots showing the number of lanes (by color) and daily volume for the No-Build and Build scenarios are included in Appendix F of the Draft Design Traffic Technical Memorandum, located in the project documents.

#### Bureau of Economic and Business Research (BEBR)

County-wide population growth rates from BEBR were also reviewed to develop potential growth rates. This forecasted data is developed by the University of Florida, and - Bureau of Economic and Business Research (University of Florida). The BEBR Population growth was determined to be approximately 2% growth per year, County-wide. This growth rate may be slightly low, since the western area of Orange County surrounding the Reams Road study area is growing significantly.

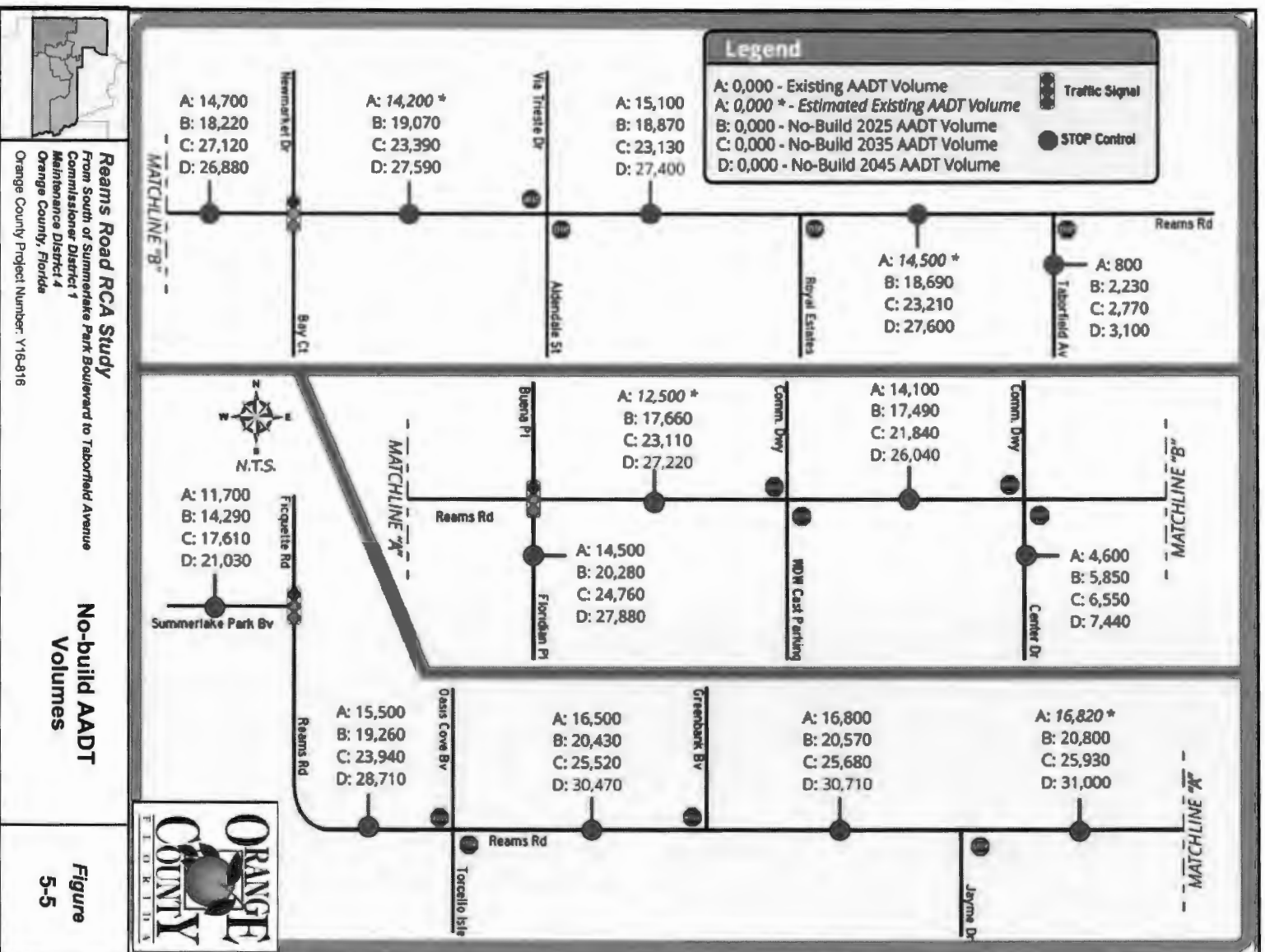
#### 5.3.4 Mainline Traffic Volume Projections

Figure 5-5 and Figure 5-6 show the future year Annual Average Daily Traffic (AADT) traffic projections for the opening year 2025, interim year 2035, and design year 2045 along Reams Road and the side streets for the No-Build and Build Scenarios, respectively. Information regarding the methodology used to develop future traffic projections are contained within the DDTM.

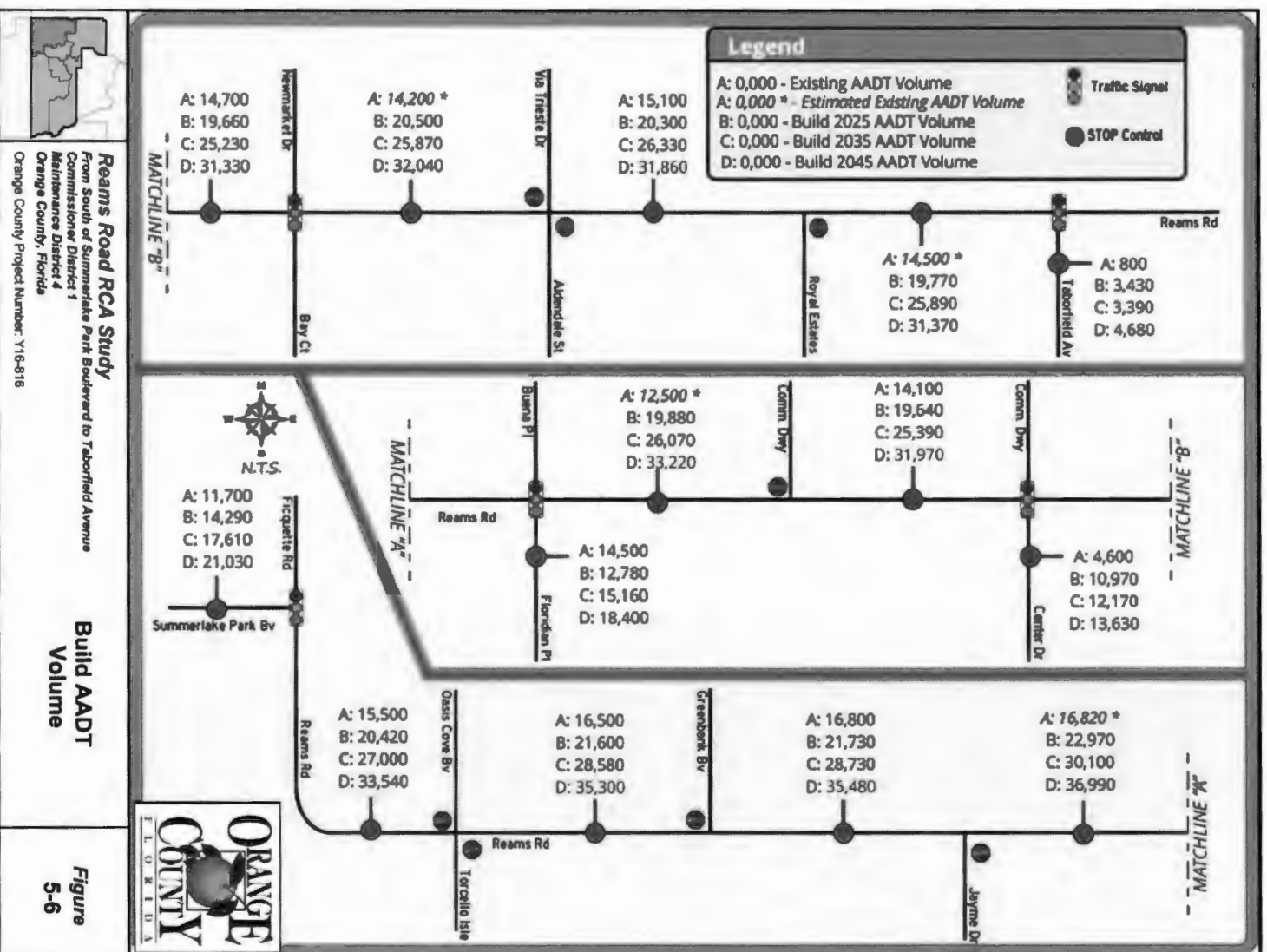
#### 5.3.5 Intersection Turning Movement Volume Projections

Figure 5-7 to Figure 5-9 show the intersection turning movement volumes projections for the opening year 2025, interim year 2035, and design year 2045 for the No-Build scenario along the Reams Road study corridor. Figure 5-10 to Figure 5-12 show the intersection turning movement volumes projected for the opening year 2025, interim year 2035, and design year 2045 for the Build scenario along the Reams Road study corridor. Information regarding the methodology used to develop future traffic projections is contained within the DDTM.

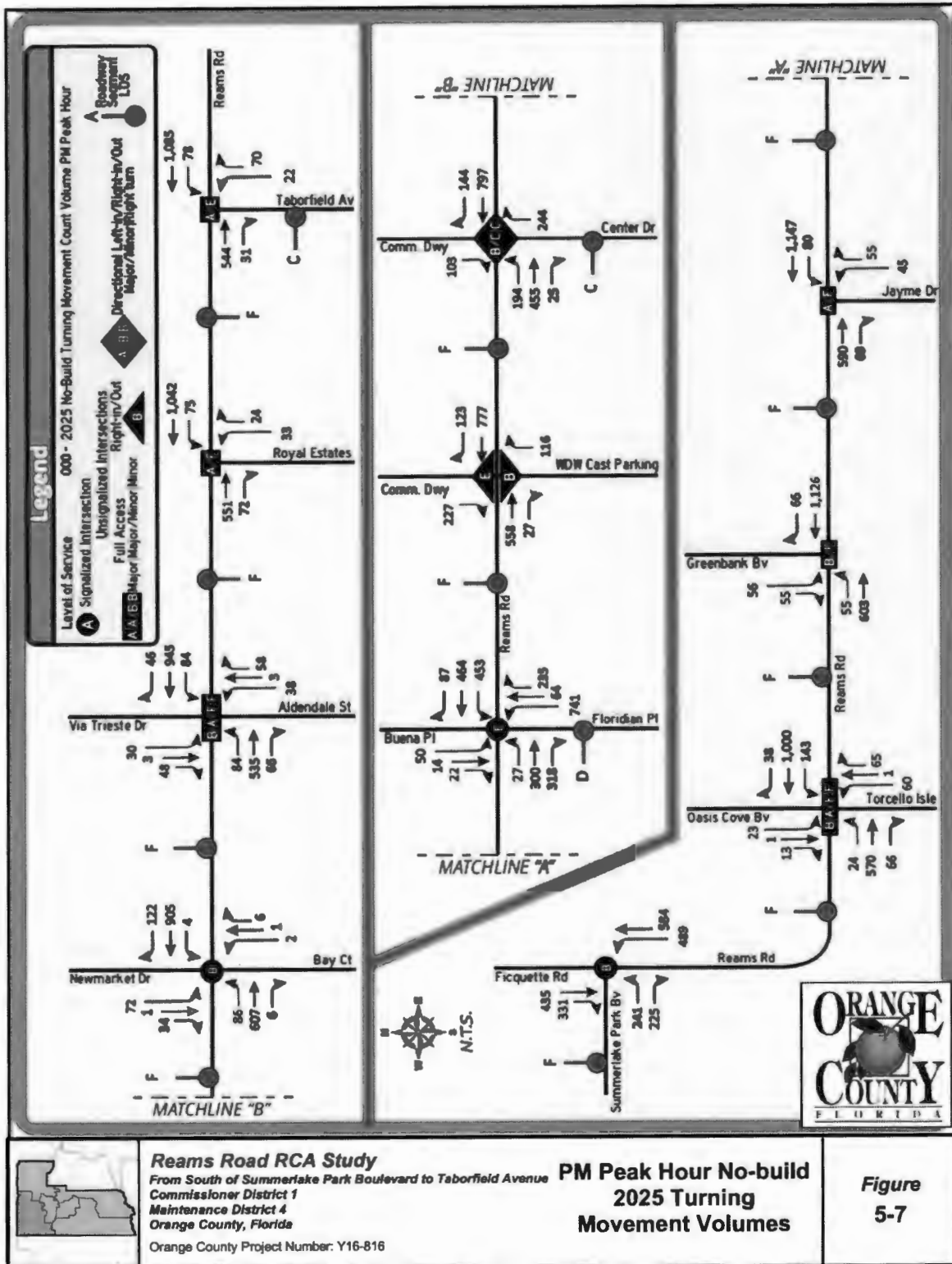
**Figure 5-5**  
PM Peak Hour No-build AADT Volumes



**Figure 5-6**  
PM Peak Hour Build AADT Volume

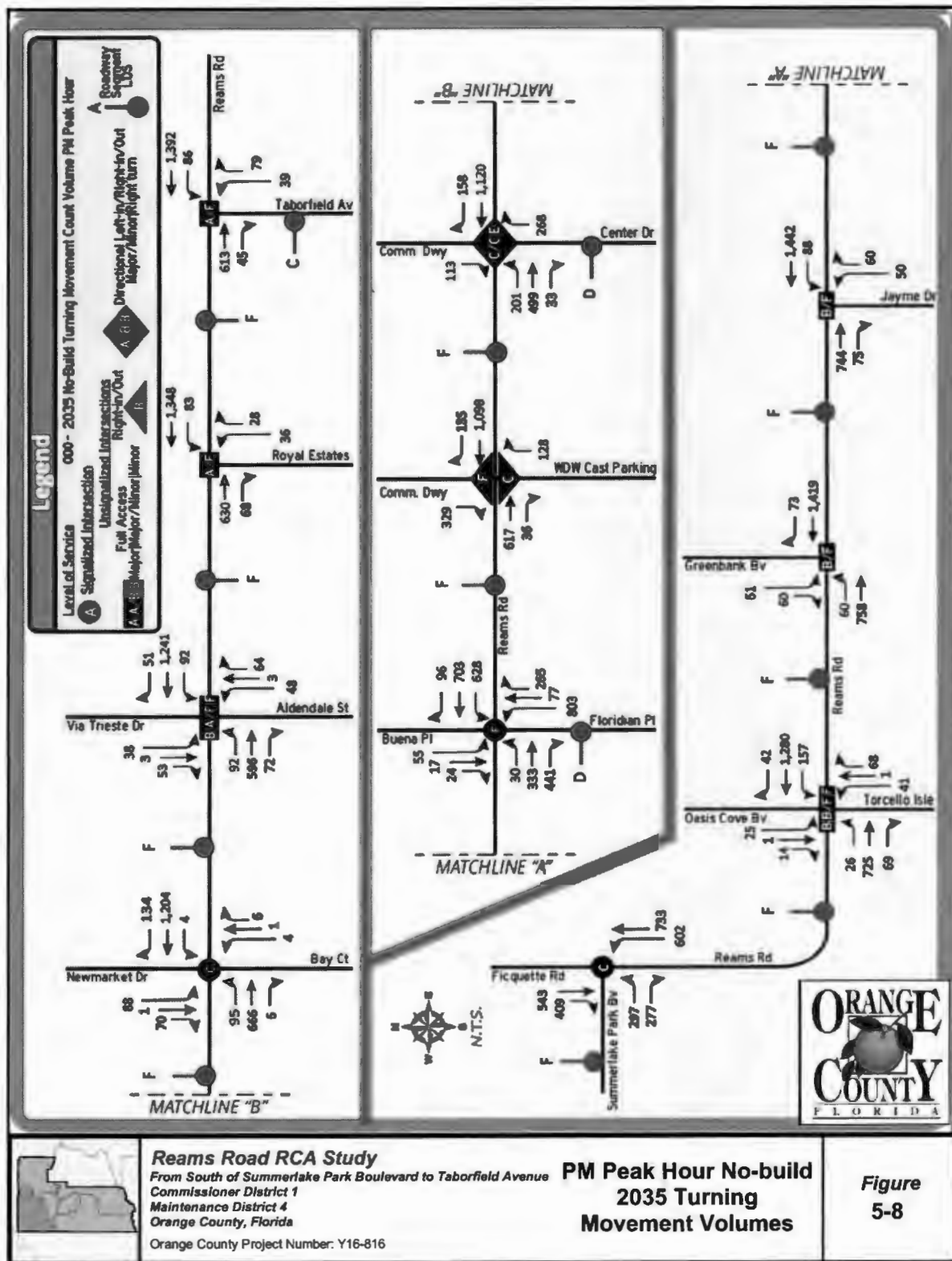


### PM Peak Hour No-build 2025 Turning Movement Volumes

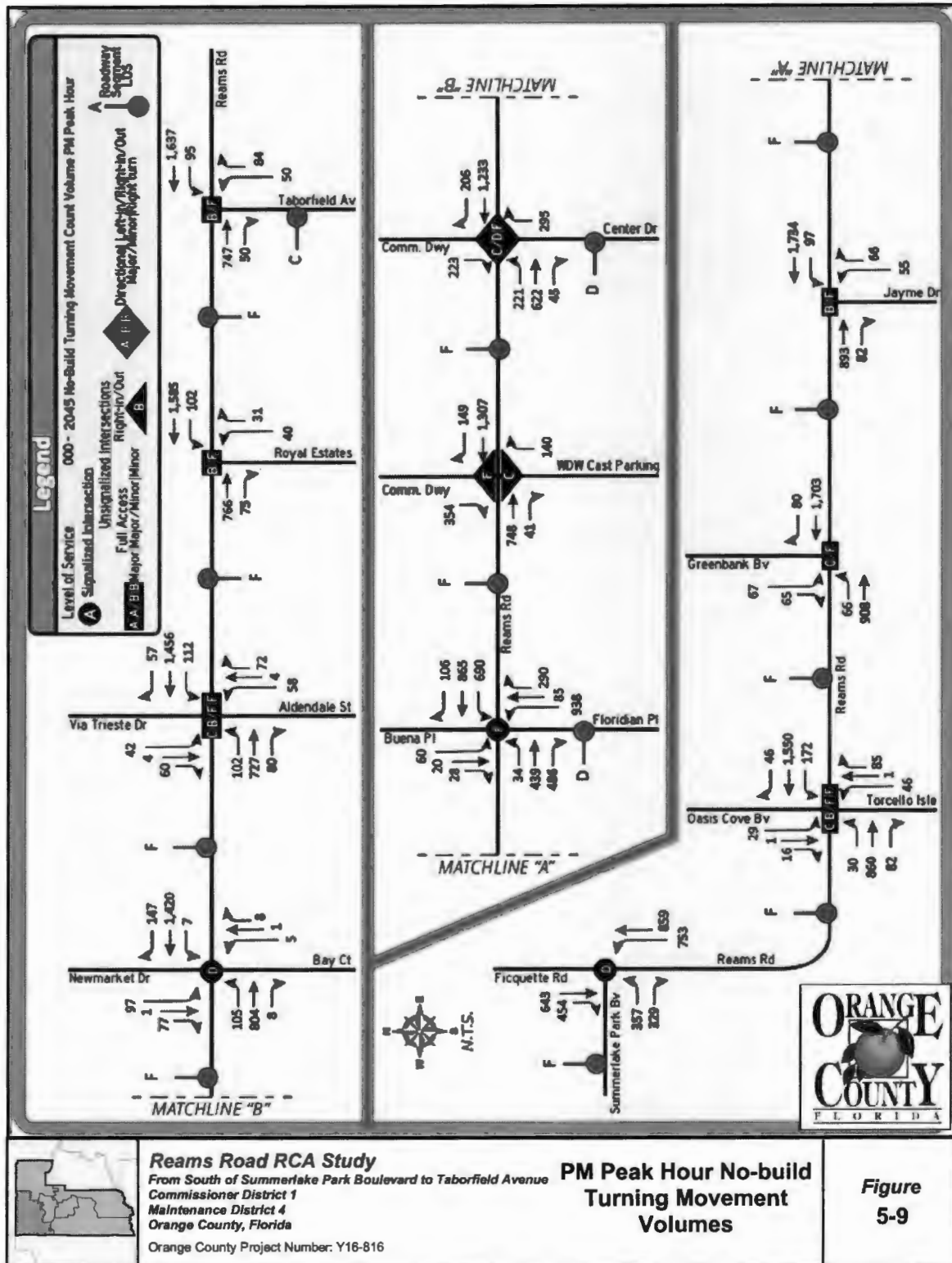




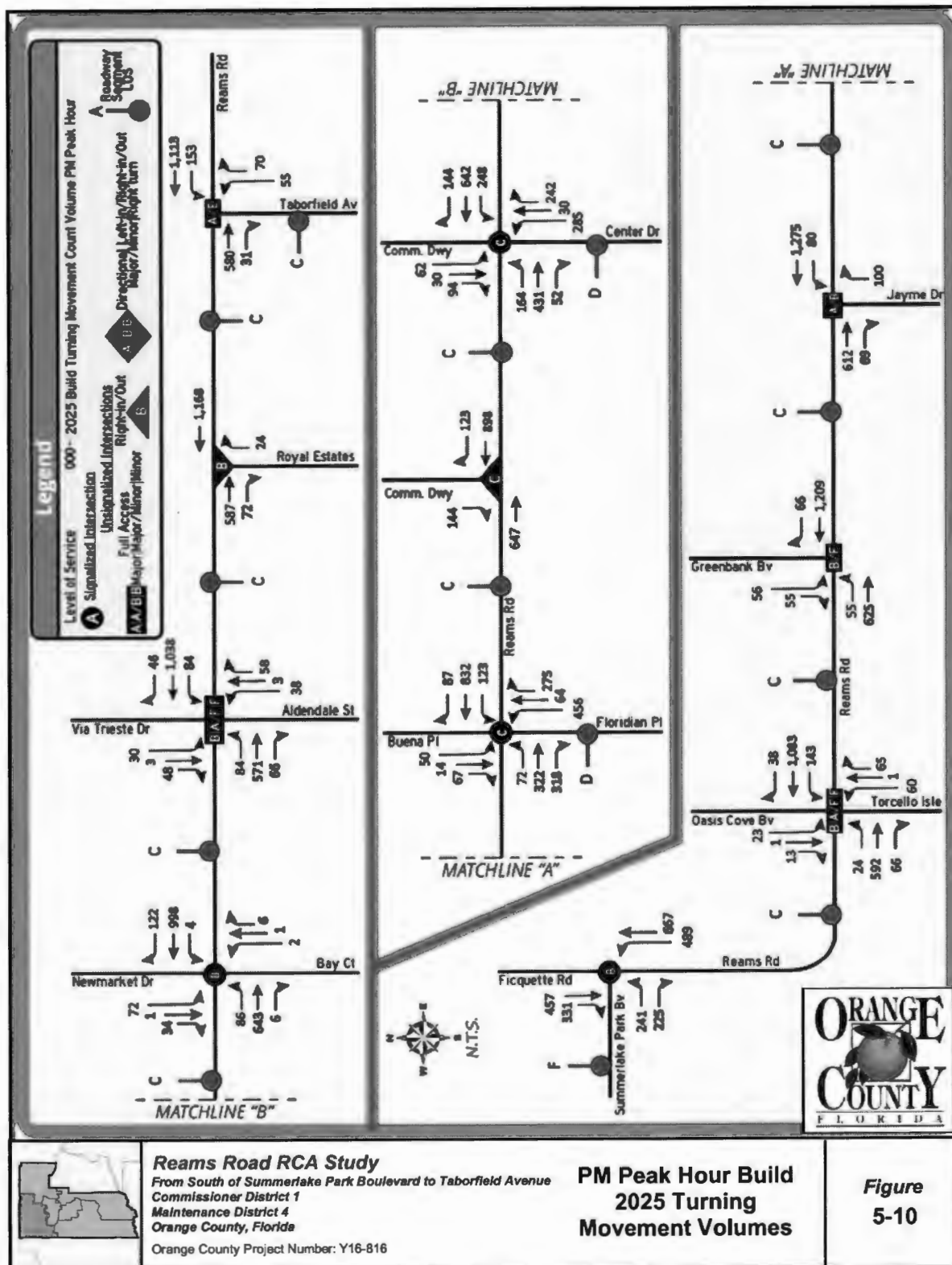
**Figure 5-8**  
**PM Peak Hour No-build 2035 Turning Movement Volumes**



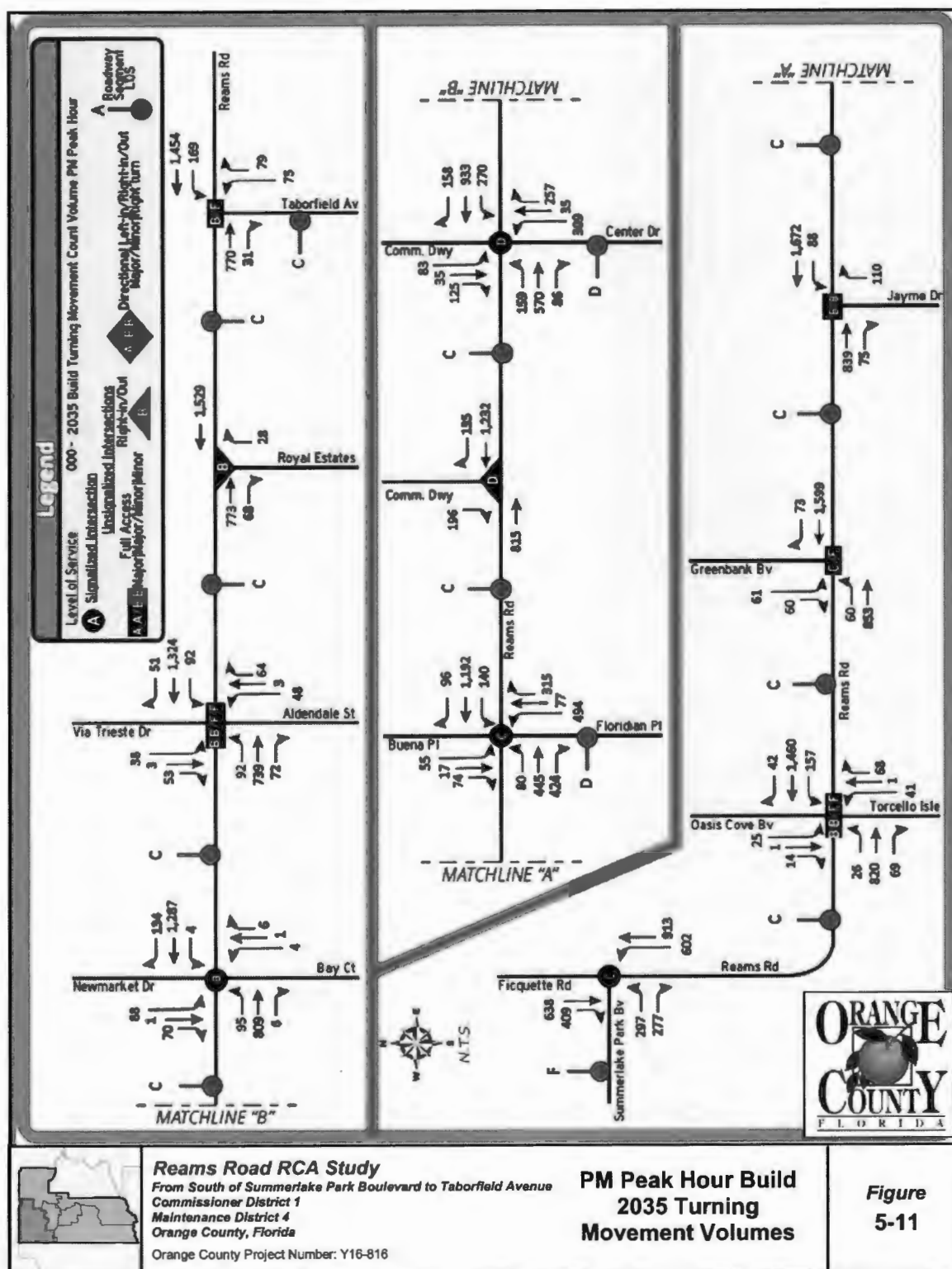
**Figure 5-9**  
**PM Peak Hour No-build 2045 Turning Movement Volumes**



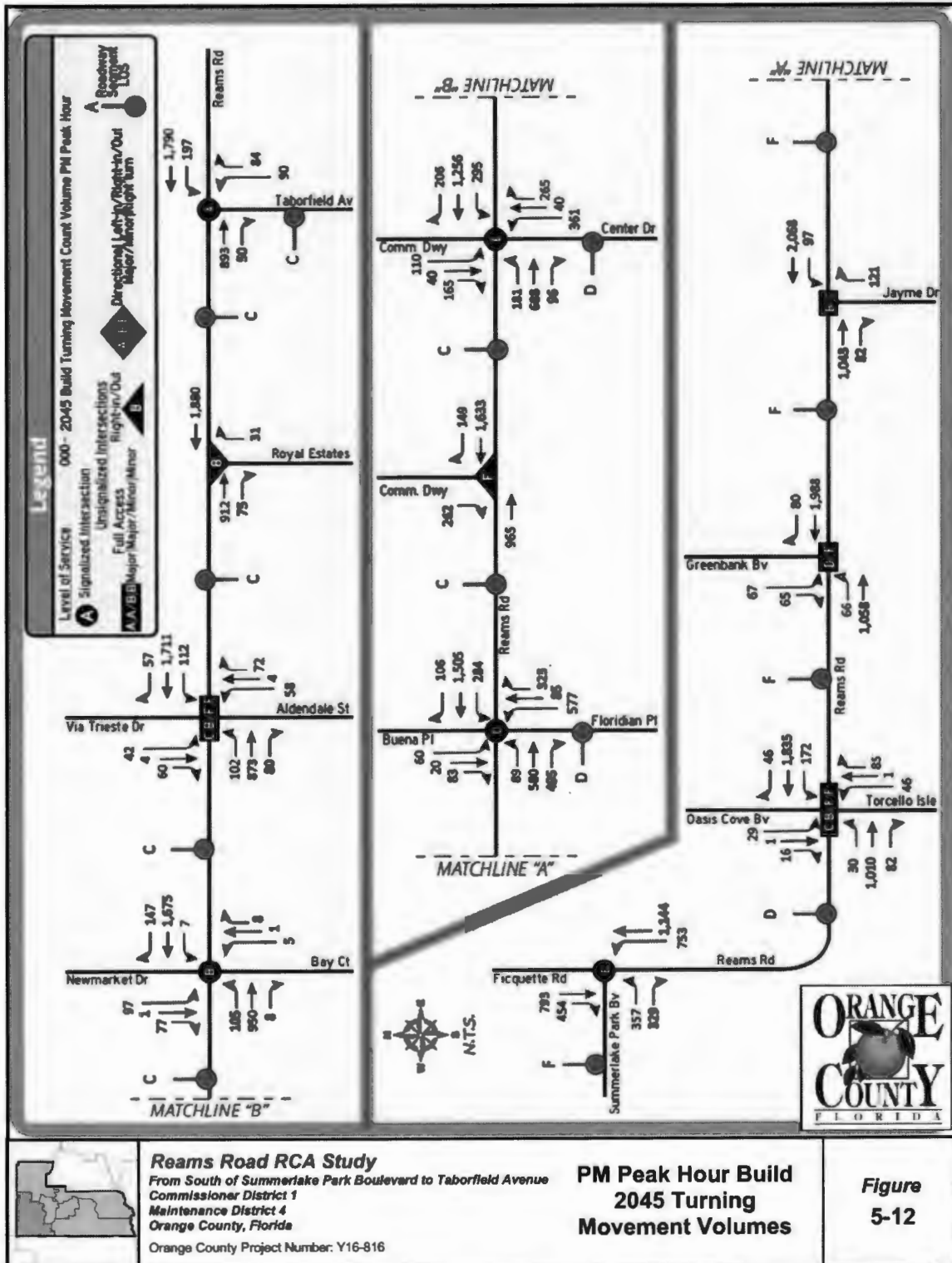
### PM Peak Hour Build 2025 Turning Movement Volumes



### PM Peak Hour Build 2035 Turning Movement Volumes



**Figure 5-12**  
**PM Peak Hour Build 2045 Turning Movement Volumes**



## 5.4 Future Year Levels of Service

### 5.4.1 Future Signal Requirements

Under the No-Build and Build scenarios, the unsignalized intersections along Reams Road were evaluated for future signal requirements. The need for future signal requirements at these unsignalized locations was assessed using signal warrants #1, #2, #3 and #7 as specified in the latest MUTCD. The future intersection volumes at the unsignalized intersections were estimated using the same hourly percentages from the existing turning movement counts grown using the projected 2045 design hour volumes for the minor streets and the approved annual growth rates for Reams Road, to obtain the No-build and Build eight highest hourly volumes. As a conservative analysis, only the minor street left turn volumes were utilized in the warrant analysis procedure. Warrant 2 and Warrant 3 are included for informational purposes only, a signal would only be assumed to be warranted if Warrant 1 minimum volumes or Warrant 7 minimum volumes and accidents were met.

This procedure was initially performed using the design year 2045 volumes, because if a signal was not warrant based on the 2045 volumes, it would not be warranted in 2025 or 2035. However, if a signal was warranted in 2045, it was then checked to see if a signal would be warranted at mid-design year 2035 and opening year 2025.

The future No-Build and Build Scenario signal warrant summary is provided in Table 5-5. In addition to the existing signal at Floridian Place/Buena Place, two (2) intersections; Summerlake Park Boulevard and Newmarket Drive/Bay Court were assumed to be signalized for the No-build analysis scenario. Under the Build analysis scenario an additional traffic signal is warranted by 2045 for the intersection of Taborfield Avenue. The actual determination of when these locations will be signalized shall be based on actual traffic counts and other pertinent data required for signal warrant analysis. The summary of the future signal warrant worksheets for the design year 2045 (and 2025 and 2035 where appropriate) are provided in Appendix G the Draft Design Traffic Technical Memorandum, located in the project documents.

### 5.4.2 Operational and Level of Service Analysis

Mainline Level of Service (LOS) analysis was performed for the No-Build and Build scenarios. All conditions were analyzed using the most current adopted procedures as outlined in the Transportation Research Board's - Highway Capacity Manual (HCM) 2010 report procedures utilizing the Synchro Software (version 9). Specific analysis techniques utilized in this study include unsignalized intersections, signalized intersections and arterial analyses. It should be noted that detailed mainline operational LOS analysis was conducted using the Synchro software which is included in the Final Design Traffic Technical Memorandum.

Intersection operational analyses were performed for the opening year 2025, the interim year 2035 and the design year 2045 for the No-Build and Build scenarios. All the signalized and unsignalized intersections were analyzed using the most current adopted procedures as outlined in the Transportation Research Board's - Highway Capacity Manual (HCM) 2010 report procedures utilizing the Synchro version 9 software to perform the intersection operation analysis.

**Table 5-5**  
**2045 No-Build and Build Scenario Signal Warrant Summary**

**\*No-build-Two-Lane Reams Road**

<b>Study Intersections</b>	<b>Meets Warrant 1A</b>	<b>Meets Warrant 1B</b>	<b>Meets Warrant 2</b>	<b>Meets Warrant 3</b>	<b>Meets Warrant 7</b>
<b>Summerlake Park Boulevard</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Oasis Cove Boulevard	No	No	No	No	No
Greenbank Boulevard	No	No	<b>Yes</b>	<b>Yes</b>	No
Jayme Drive <sup>2</sup>	No	No	No	No	No
WDW Cast Parking/Community Driveway <sup>3</sup>	No	No	No	No	No
Center Drive/Community Driveway <sup>4</sup>	No	No	No	No	No
<b>Newmarket Drive/Bay Court</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Via Trieste Drive/Aldendale Street <sup>2</sup>	No	No	<b>Yes</b>	No	No
Royal Estates	No	No	No	No	No
Taborfield Avenue <sup>2</sup>	No	No	No	No	No

**\*Build-Four-Lane Reams Road**

<b>Study Intersections</b>	<b>Meets Warrant 1A</b>	<b>Meets Warrant 1B</b>	<b>Meets Warrant 2</b>	<b>Meets Warrant 3</b>	<b>Meets Warrant 7</b>
<b>Summerlake Park Boulevard</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Oasis Cove Boulevard	No	No	No	No	No
Greenbank Boulevard	No	No	<b>Yes</b>	<b>Yes</b>	No
Jayme Drive <sup>4</sup>	No	No	No	No	No
Community Driveway <sup>3</sup>	No	No	No	No	No
<b>Center Drive/Community Driveway<sup>5</sup></b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
<b>Newmarket Drive/Bay Court</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>No</b>
Via Trieste Drive/Aldendale Street <sup>2</sup>	No	No	<b>Yes</b>	No	No
Royal Estates <sup>3</sup>	No	No	No	No	No
Taborfield Avenue <sup>2</sup>	No	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	No

<sup>1</sup>Roadway speed posted 45 mph, therefore minimum volumes are 70% of the standard requirements (see table below). Warrant 1A- Eight-Hour Minimum Vehicular Volume, Warrant 1B- Eight-Hour Interruption of Continuous Traffic. Warrant 2- Four-Hour Vehicular Volume (Plotted Point). Warrant 3- Peak Hour Vehicular Volume (Plotted Point). Note no delay study performed, only volumes evaluated. Warrant 7- Crash Experience- 80% of Warrant 1 Minimum Threshold Volumes and 5 accidents. <sup>2</sup>Auxiliary left turn lane assumed for the minor street approach. <sup>3</sup>Right-in/Right-out only. <sup>4</sup>Directional Intersection-Left-in/Right-in/Right-out. <sup>5</sup>Under Build scenario, Directional Intersection converted to full access intersection.

**\*Signal Warrant Analysis- Minimum Vehicular Volumes**

Number of Lanes for Moving Traffic on Each Approach		Vehicles Per Hour on Major Street <sup>5</sup> (Total of Both Approaches)						Vehicles Per Hour on Minor Street <sup>5</sup> (One Direction Only)					
Major St	Minor St	Warrant 1A			Warrant 1B			Warrant 1A			Warrant 1B		
		100%	80%	70%	100%	80%	70%	100%	80%	70%	100%	80%	70%
1 Lane	1 Lane	500	400	(350)	750	600	(525)	150	120	(105)	75	60	(53)
2+ Lanes	1 Lane	600	480	(420)	900	720	(630)	150	120	(105)	75	60	(53)
1 Lane	2+ Lanes	500	400	(350)	750	600	(525)	200	160	(140)	100	80	(70)
2+ Lanes	2+ Lanes	600	480	(420)	900	720	(630)	200	160	(140)	100	80	(70)

<sup>5</sup>When the 85<sup>th</sup> percentile speed of the major street exceeds 40 mph; the minimum volumes are reduced to 70% of the standard requirements. Values in parentheses indicate lower (70%) threshold values.

### 5.4.3 No-Build Scenario

The No-Build geometry and traffic control for Reams Road from Summerlake Park Road to Taborfield Avenue as shown in Figure 5-13 maintains the same capacity of through-lanes and auxiliary turn lanes as the existing roadway and intersection geometries. Figure 5-14 presents the No-Build AADT for the study roadway segments. AADT volumes for the four locations that did not have existing counts were estimated based on a review of the existing PM peak hour intersection turning movements and adjacent roadway segments existing K factors.

Figure 5-15 to Figure 5-17 show the opening year, interim year, and design year LOS results for the No-Build scenario along the Reams Road project corridor.

#### Opening Year 2025

As shown in Figure 5-16 and Table 5-6, the signalized intersections are projected to operate at LOS E or better during the PM peak hour. The full access unsignalized intersections are projected to operate at LOS F or better for the minor street movements. The two right -in/right-out intersections are projected to operate at LOS E or better for the minor street movements.

Under the AM peak hour analysis, the Floridian Place signalized intersection will operate at LOS F, while the remaining signalized intersections will operate at LOS D or better. The full access unsignalized intersections are projected to operate at LOS F for the minor street movements. The two right -in/right-out intersections are projected to operate at LOS E or better for the minor street movements.

#### Interim Year 2035

As shown in Figure 5-17 and Table 5-6, two of the signalized intersections are projected to operate at LOS D or better during the PM peak hour. The signalized intersection of Floridian Place/Buena Place is projected to operate at LOS F. The full access unsignalized intersections are projected to operate at LOS F for the minor street movements. The two right -in/right-out intersections are projected to operate at LOS F or better for the minor street movements.



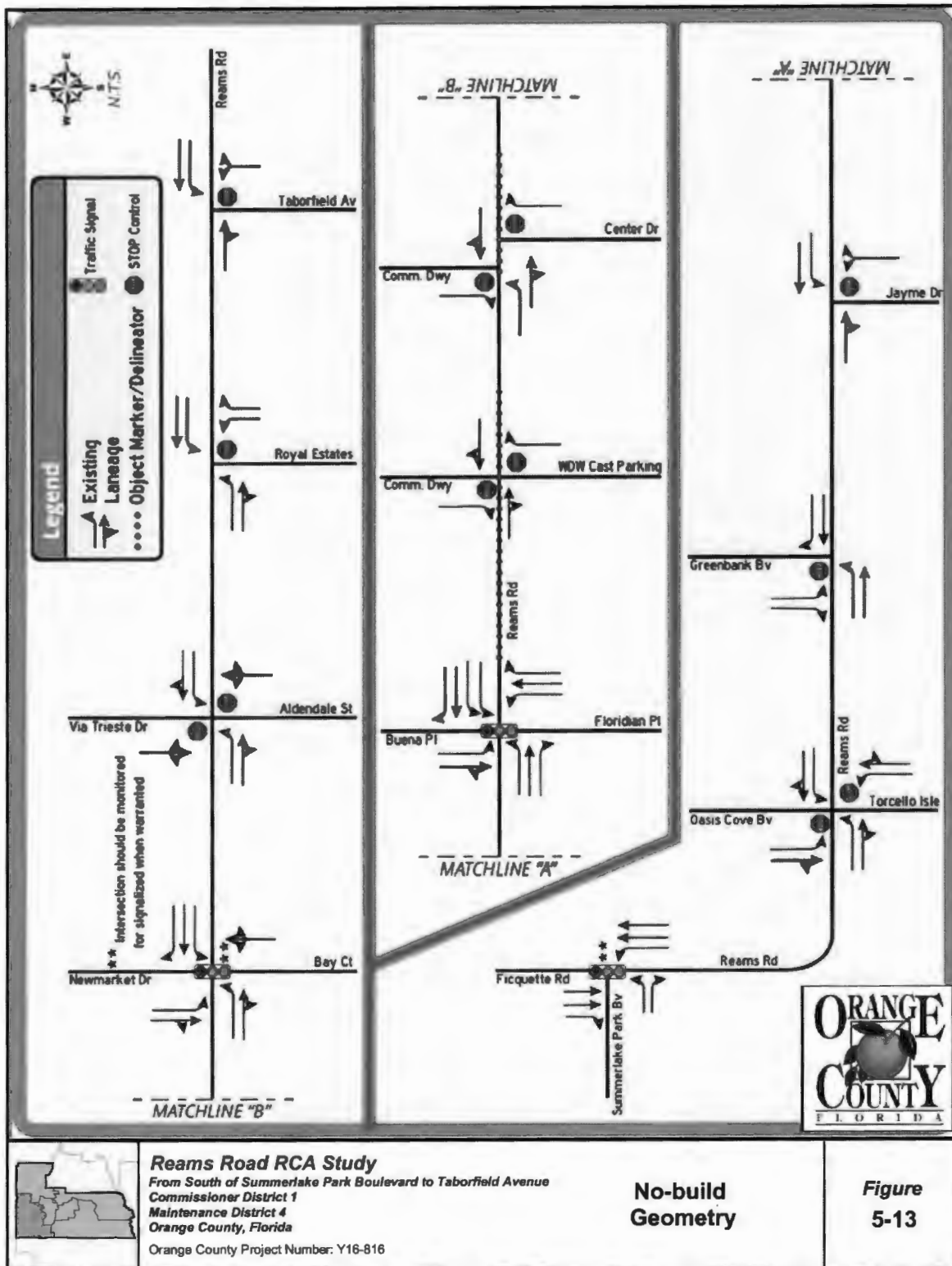
Under the AM peak hour analysis, the Floridian Place and Summerlake Park Boulevard signalized intersections will operate at LOS F, while the remaining signalized intersection will operate at LOS C. The full access unsignalized intersections are projected to operate at LOS F for the minor street movements. The two right - in/right-out intersections are projected to operate at LOS F or better for the minor street movements.

*Design Year 2045*

As shown in Figure 5-17 and Table 5-6, one of the signalized intersections is projected to operate at LOS D during the PM peak hour. In addition to Floridan Place/Buena Place, the signalized Summerlake Park Boulevard intersection is projected to operate at LOS F. The full access unsignalized intersections are projected to operate at LOS F for the minor street movements. The two right -in/right-out intersections are projected to operate at LOS F or better for the minor street movements.

Under the AM peak hour analysis, the Floridian Place and Summerlake Park Boulevard signalized intersections will operate at LOS F, while the remaining signalized intersection will operate at LOS D. The full access unsignalized intersections are projected to operate at LOS F for the minor street movements.

**Figure 5-13**  
**No-build Geometry**



**Figure 5-14**  
No-build AADT Volumes

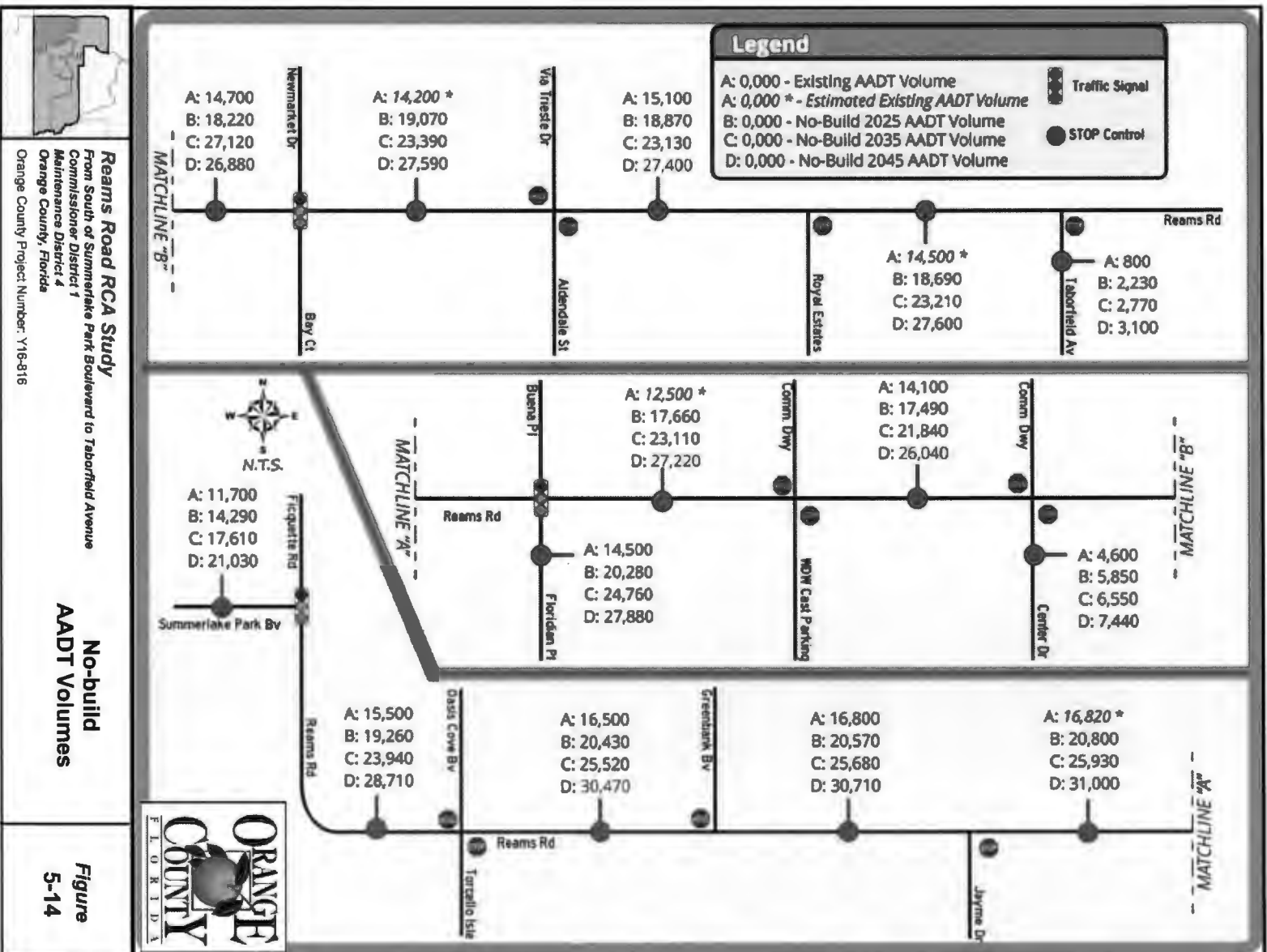
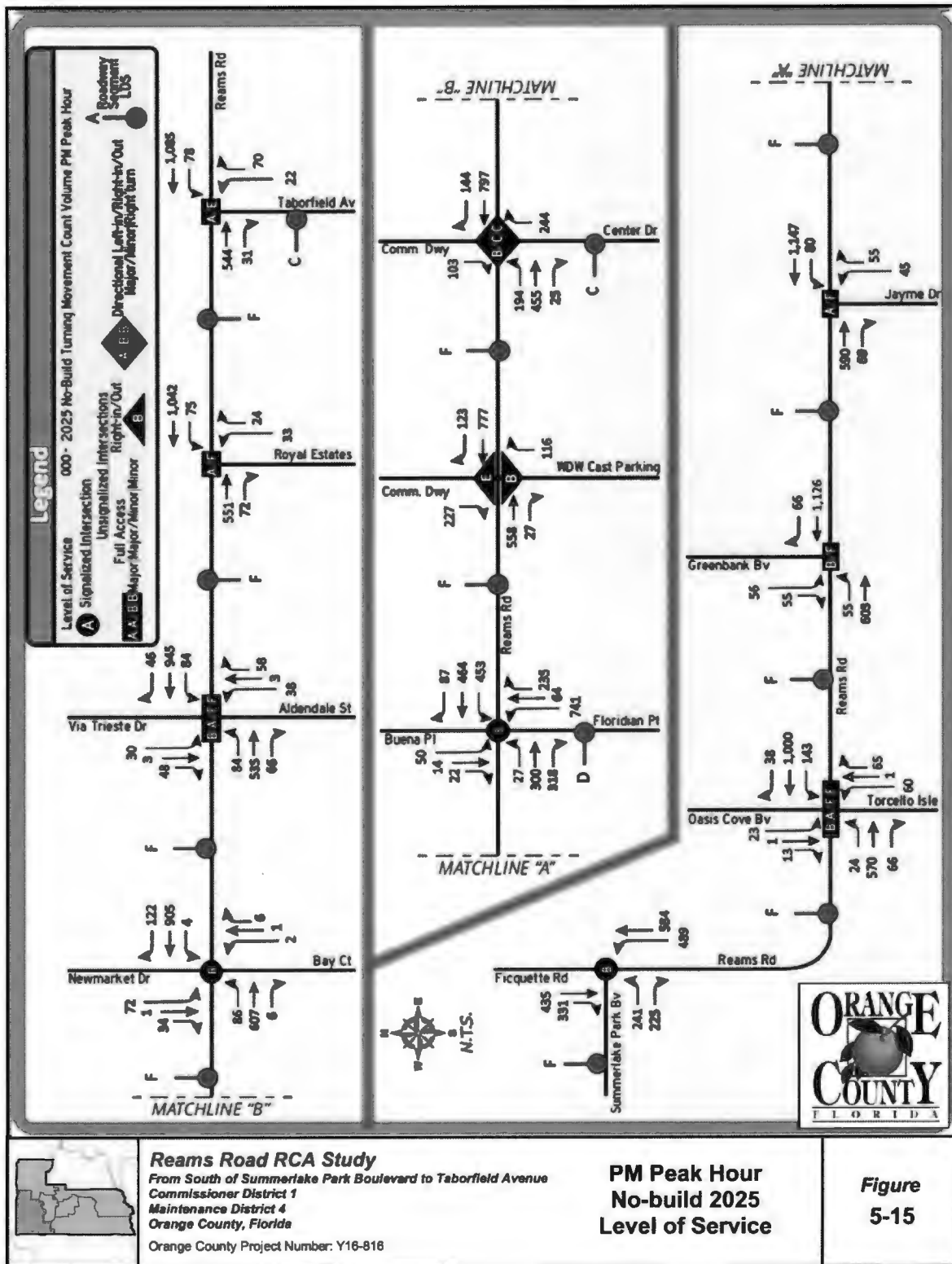
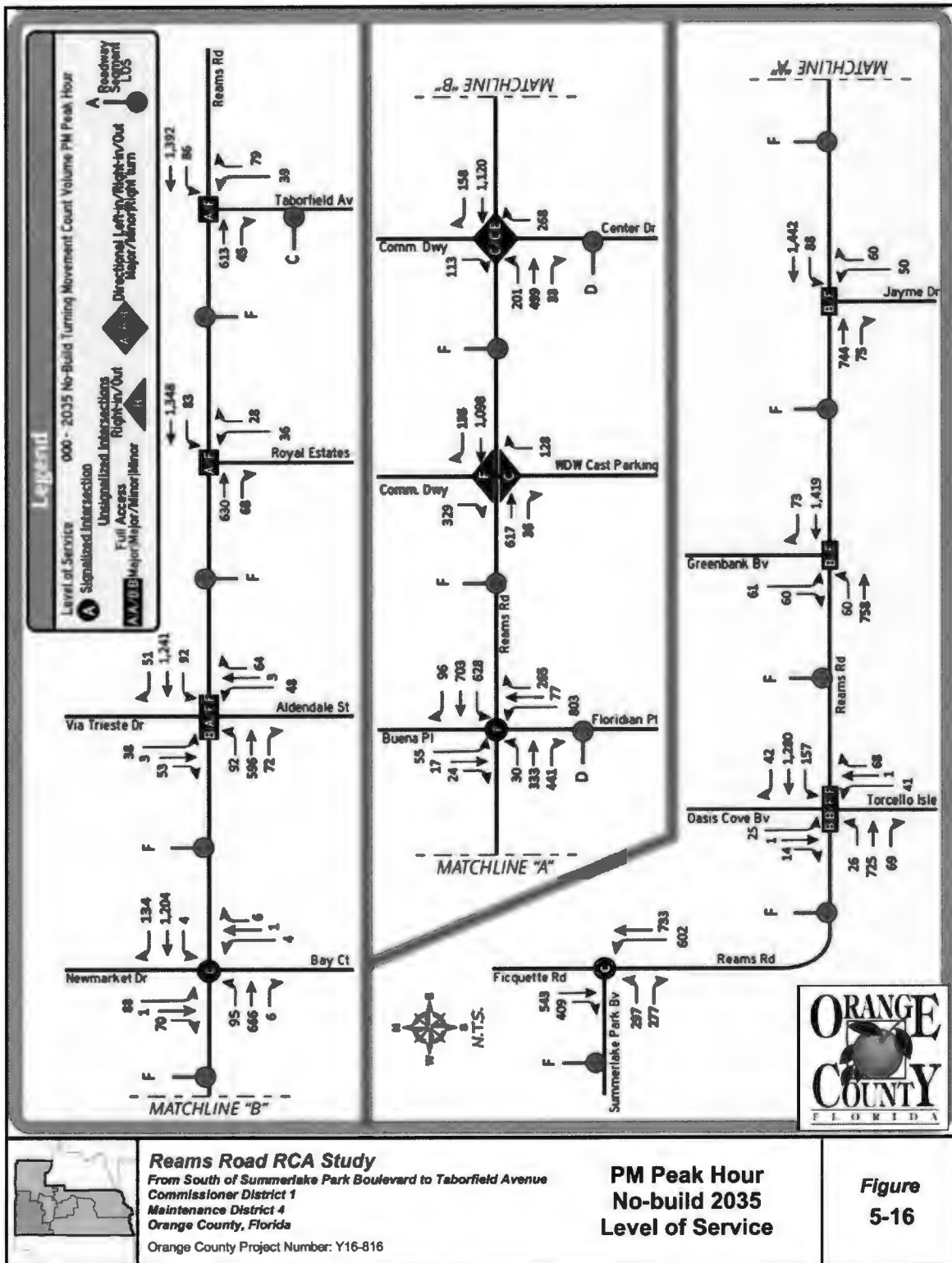


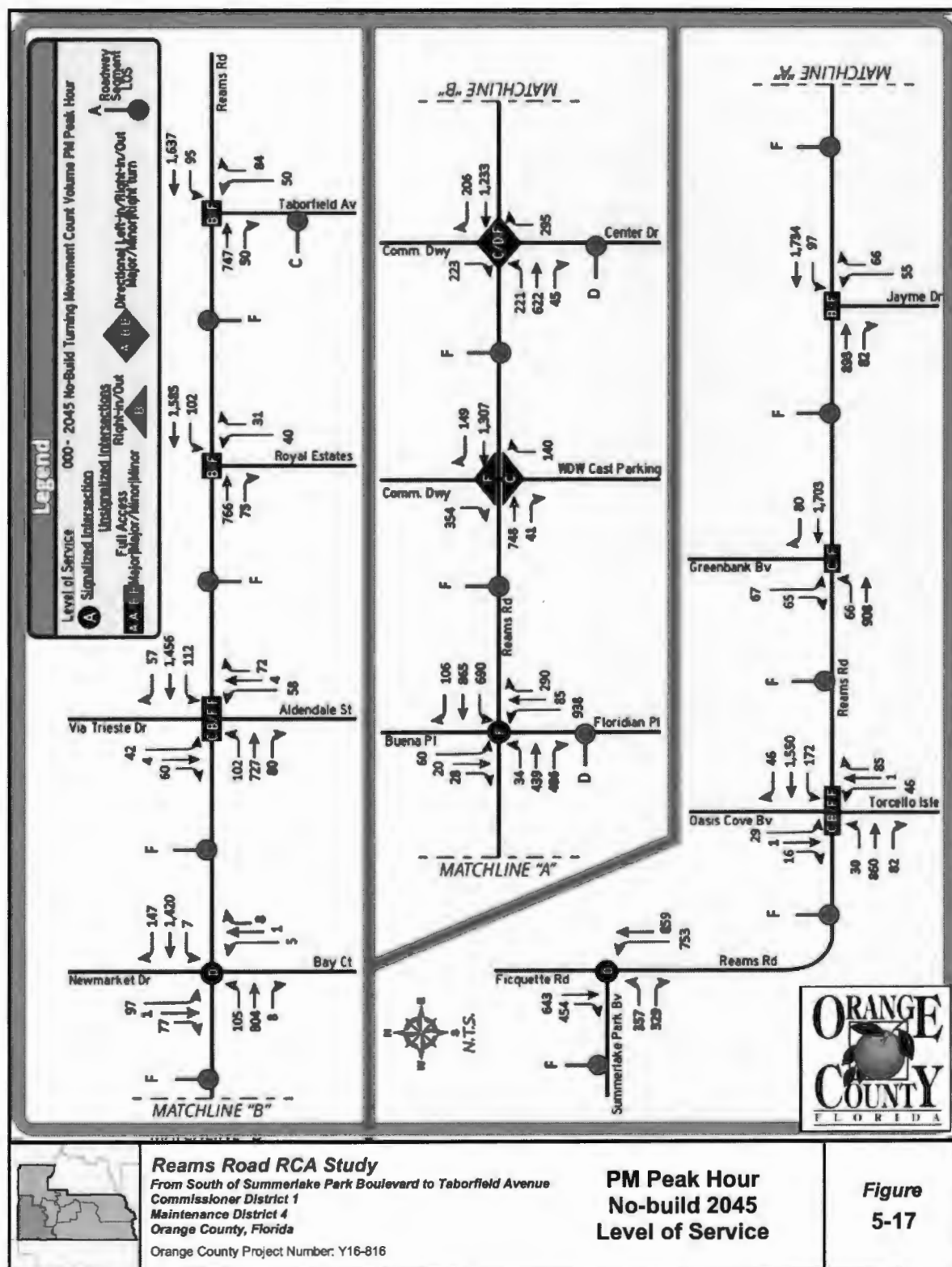
Figure 5-15  
PM Peak Hour No-build 2025 Level of Service



**Figure 5-16**  
**PM Peak Hour No-build 2035 Level of Service**



### PM Peak Hour No-build 2045 Level of Service



The two right-in/right-out intersections are projected to operate at LOS F or better for the minor street movements.

#### 5.4.4 Build Scenario

The proposed Build geometry and traffic control for Reams Road from Summerlake Park Road to Taborfield Avenue as shown in Figure 5-18 includes an additional through lane for the major street through- movements and turn lanes as required. Based on the programmed and planned improvements, Reams Road, between Summerlake Park Road to Taborfield Avenue will be widened to four lanes by the opening year 2025. In addition, as discussed above, the intersections at Reams Road and; Summerlake Park Boulevard/Ficquette Road, Floridian Place/Buena Place, Newmarket Drive/Bay Court and Taborfield Avenue (2045) were assumed to be signalized for analysis purposes. Figure 5-19 presents the Build AADT for the study roadway segments.

Figure 5-20 to Figure 5-22 show the opening year, interim year, and design year LOS results for the No-Build scenario along the Reams Road project corridor.

##### Opening Year 2025

As shown in Figure 5-20 and Table 5-6, the signalized intersections are projected to operate at LOS D or better during the PM peak hour. The full access unsignalized intersections are projected to operate at LOS F or better for the minor street movements. The two directional intersections are projected to operate at LOS B for the minor street movements. The two right -in/right-out intersections are also projected to operate at LOS B for the minor street movements.

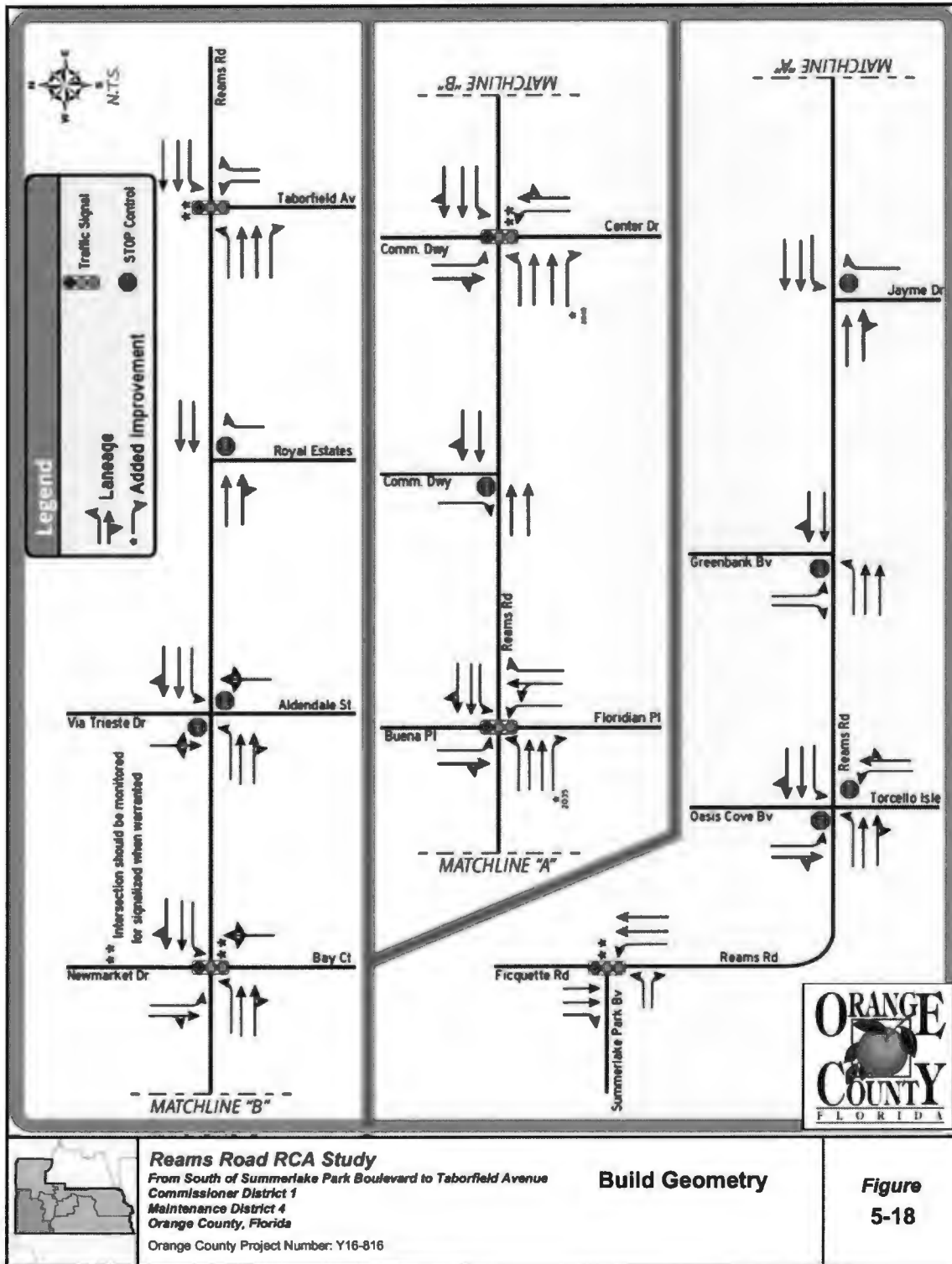
Under the AM peak hour analysis, the signalized intersections are projected to operate at LOS D or better. The full access unsignalized intersections are projected to operate at LOS F or better for the minor street movements. The two directional intersections are projected to operate at LOS C or better for the minor street movements. The two right -in/right-out intersections are also projected to operate at LOS B for the minor street movements.

##### Interim Year 2035

As shown in Figure 5-21 and Table 5-6, the signalized intersections are projected to operate at LOS E or better during the PM peak hour. The full access unsignalized intersections are projected to continue to operate at LOS F for the minor street movements. The two directional intersections are projected to operate at LOS D or better for the minor street movements. The two right-in/right-out intersections are projected to operate at LOS E or better for the minor street movements.

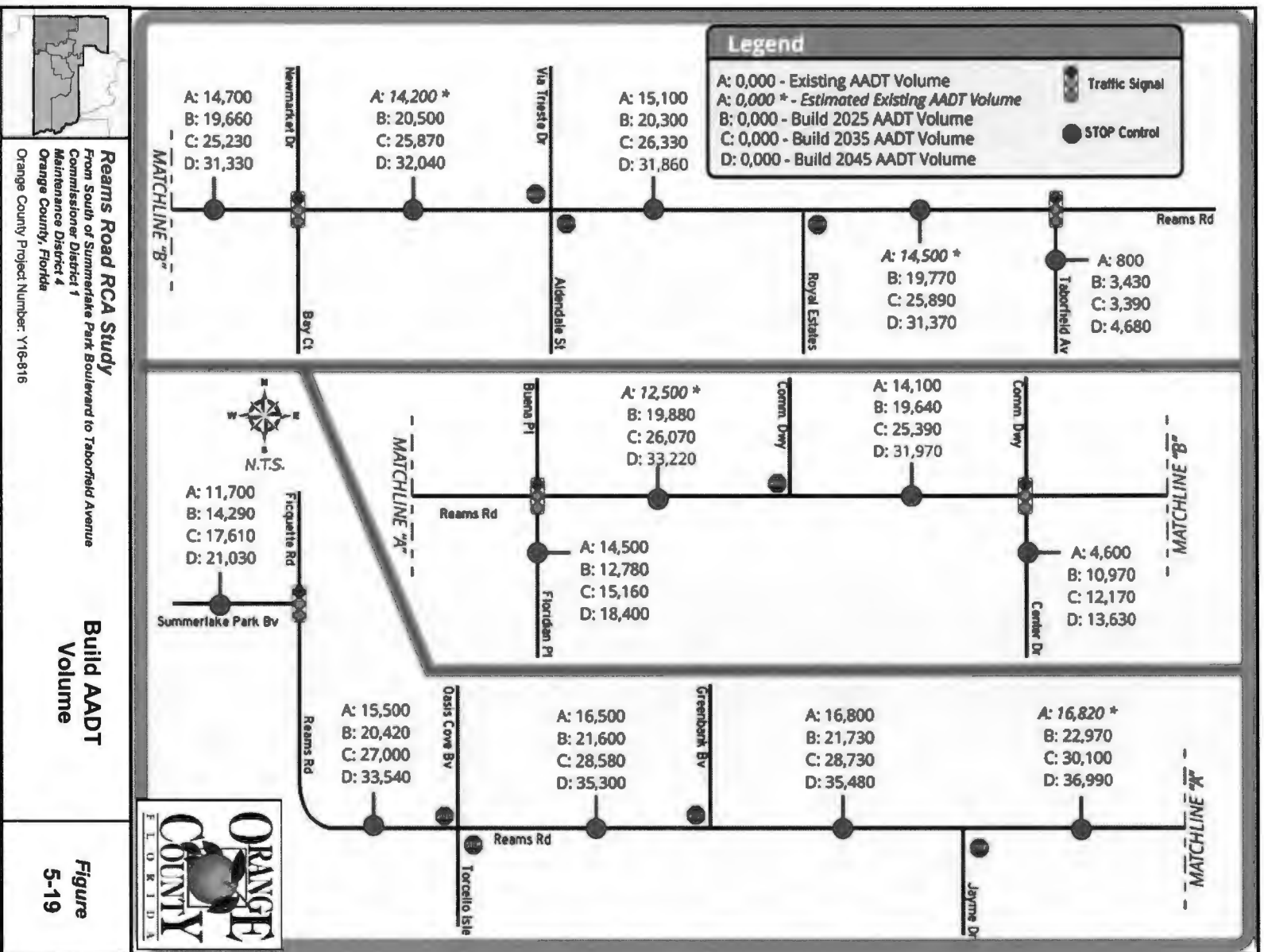
Under the AM peak hour analysis, the signalized intersections are projected to operate at LOS E or better. The full access unsignalized intersections are projected to operate at LOS F for the minor street movements. The two directional intersections are projected to operate at LOS C or better for the minor street movements. The two right -in/right-out intersections are also projected to operate at LOS E or better for the minor street movements.

**Figure 5-18  
Build Geometry**

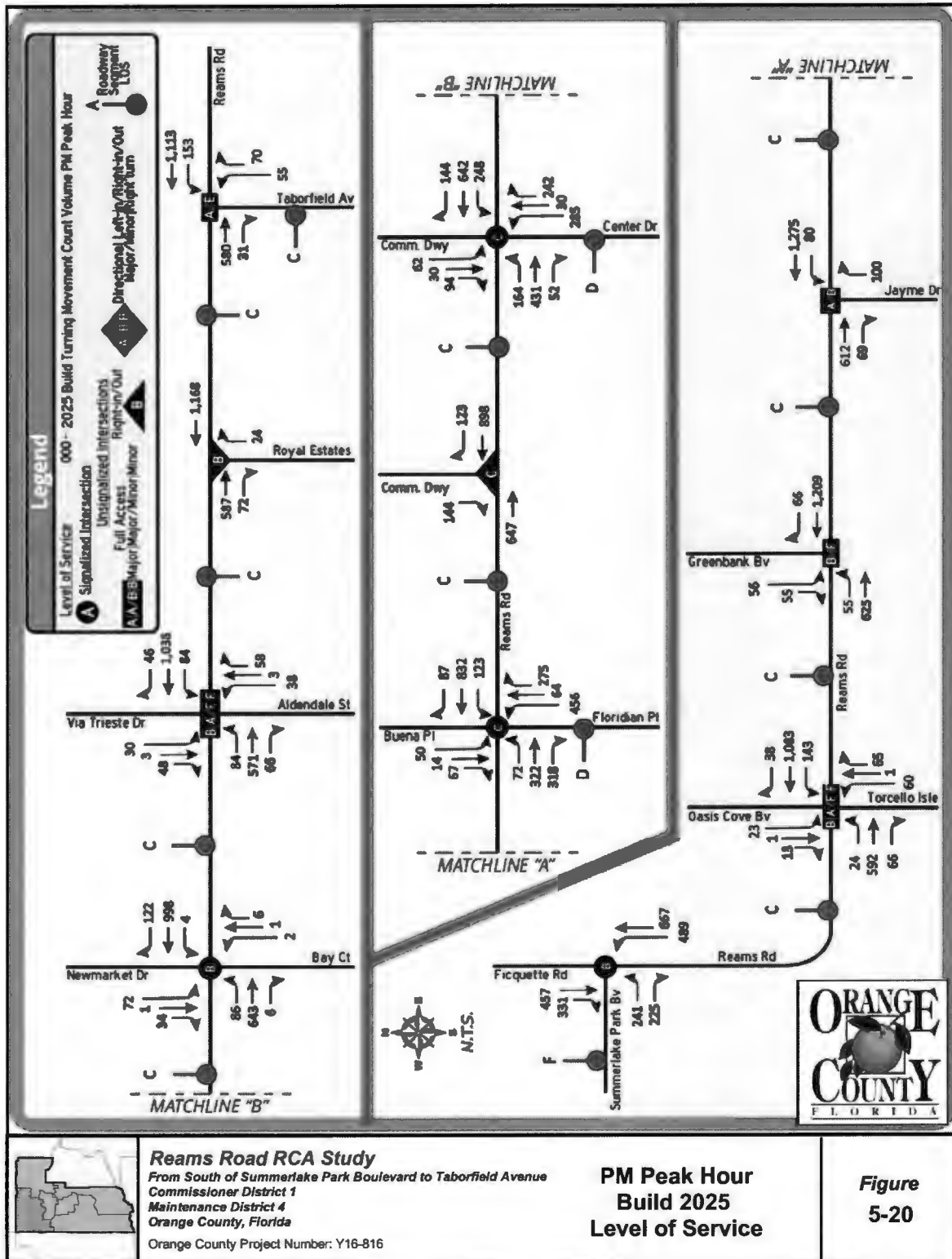




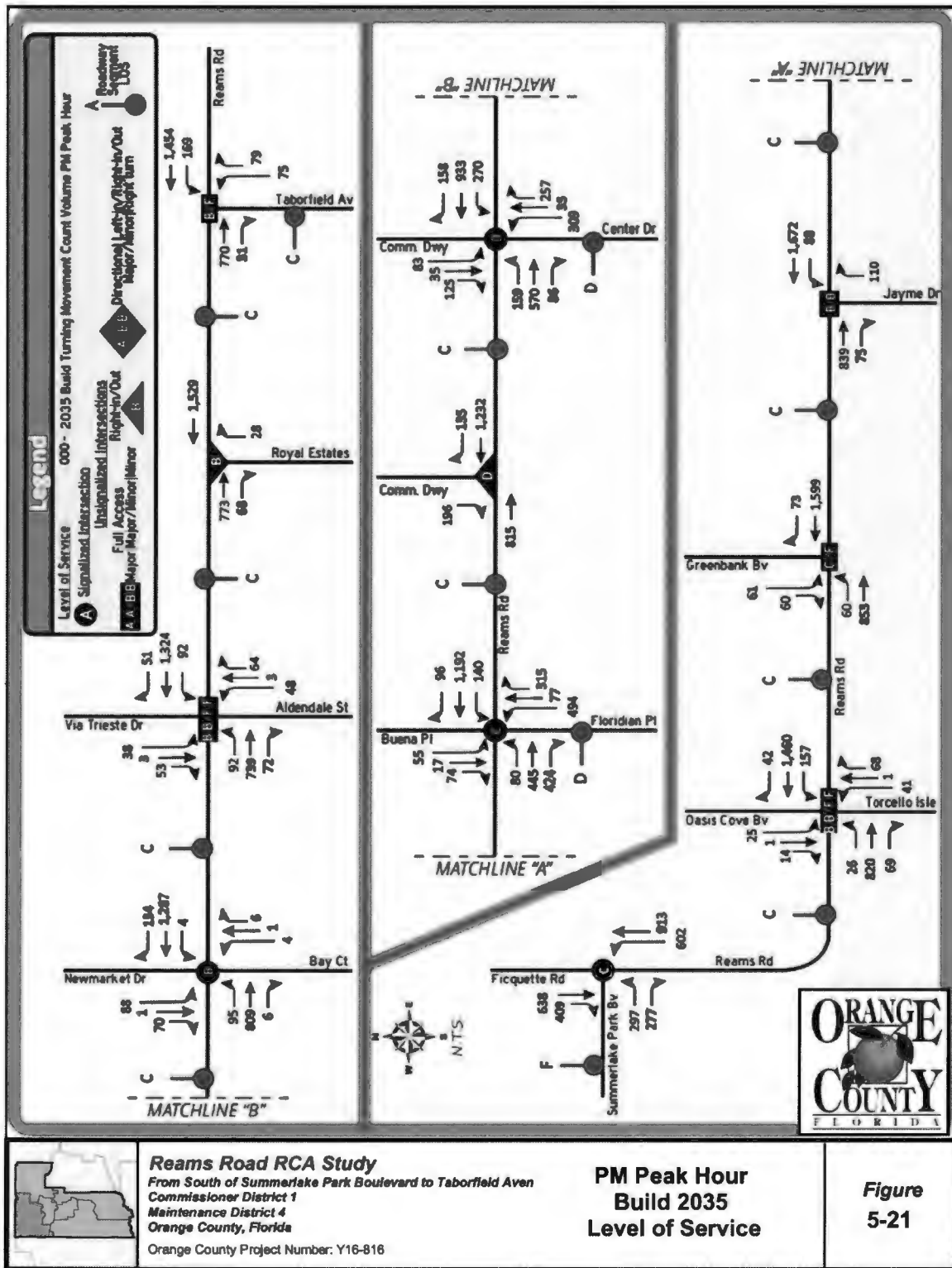
**Figure 5-19**  
**Build AADT Volume**



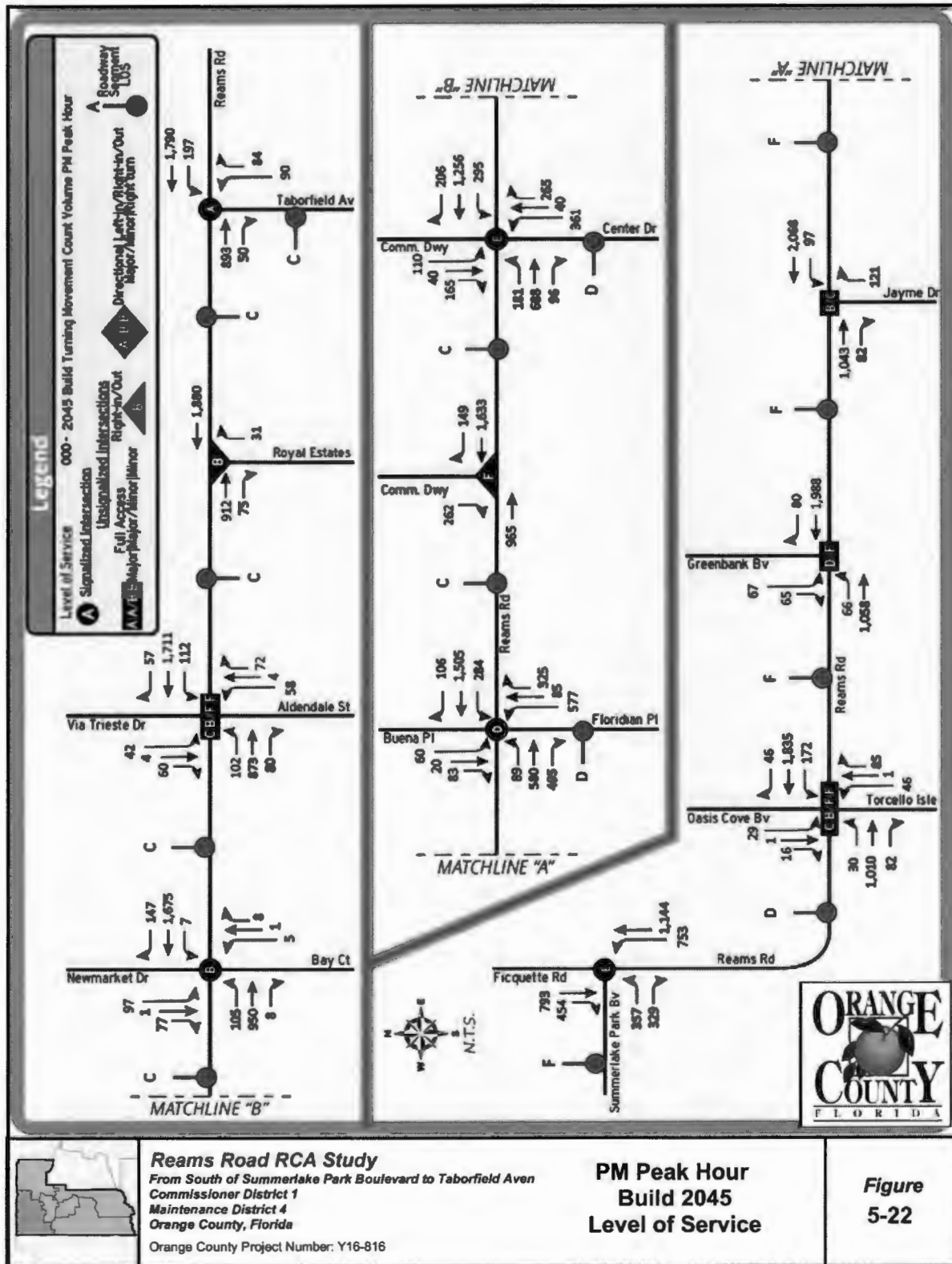
**Figure 5-20**  
**PM Peak Hour Build 2025 Level of Service**



**Figure 5-21**  
**PM Peak Hour Build 2035 Level of Service**



**Figure 5-22**  
**PM Peak Hour Build 2045 Level of Service**



**Table 5-6**  
**Build Intersection Delay and LOS for the Study Intersections**

Study Intersections	Traffic Control	Build AM Peak Hour - Proposed 4-Lane Divided Reams Road Cross Section					
		Opening Year 2025		Mid Year 2035		Build-out Year 2045	
		Delay (Sec/Veh)	LOS	Delay Sec Veh	LOS	Delay (Sec/Veh)	LOS
<b>Reams Road</b>							
Summerlake Park Boulevard	Signal	22.4	C	38.9	D	79.1	E
Oasis Cove Boulevard/Torcello Isle	Stop (1)	8.8   11.5 / 69.9   56.8	A   B / F   F	9.6   14.3 / 303.4   306.7	A   B / F   F	10.4   19.7 / 1288.7   1796.6	B   C / F   F
Greenbank Boulevard	Stop (2)	9.2 / 34.1	A / D	10.2 / 127.0	B / F	11.4 / 433.2	B / F
Jayme Drive (3)	Stop (4)	13.4   15.8	B   C	18.6   21.4	C   C	30.4   32.6	D   D
Floridian Place/Buena Place (5)	Signal	24.6	C	43.0	D	49.1	D
Commercial Entrance (6)	Stop (7)	13.0	B	14.3	B	18.9	C
Center Drive/Community Driveway (8)	Signal	28.5	C	39.7	D	47.3	D
Newmarket Drive/Bay Court	Signal	11.0	B	12.2	B	13.3	B
Via Trieste Drive/Aldendale Street	Stop (1)	8.8   11.0 / 232.1   55.4	A   B / F   F	9.5   13.1 / 972.4   317.8	A   B / F   F	17.0   16.9 / 693.9   586.8	C   C / F   F
Royal Estates (6)	Stop (9)	13.7	B	16.6	C	23.5	C
Taborfield Avenue (10)	Stop (11)	11.3 / 22.7	B / C	14.1 / 45.1	B / E	17.2	B

Study Intersections	Future Traffic Control	Build PM Peak Hour - Proposed 4-Lane Divided Reams Road Cross Section					
		Opening Year 2025		Mid Year 2035		Build-out Year 2045	
		Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS
<b>Reams Road</b>							
Summerlake Park Boulevard	Signal	17.2	B	29.5	C	58.1	E
Oasis Cove Boulevard/Torcello Isle	Stop (1)	11.4   9.8 / 131.9   151.1	B   A / F   F	14.4   11.4 / 318.4   837.8	B   B / F   F	19.0   13.5 / 1132.2   4068.0	C   B / F   F
Greenbank Boulevard	Stop (2)	13.0 / 95.9	B / F	17.5 / 482.7	C / F	25.9 / 1770.0	D / F
Jayme Drive (3)	Stop (4)	9.5   11.8	A   B	10.8   13.7	B   B	12.4   16.2	B   C
Floridian Place/Buena Place (5)	Signal	25.9	C	33.9	C	49.1	D
Commercial Entrance (6)	Stop (7)	15.7	C	26.2	D	106.7	F
Center Drive/Community Driveway (8)	Signal	32.0	C	40.9	D	65.5	E
Newmarket Drive/Bay Court	Signal	10.6	B	12.6	B	17.3	B
Via Trieste Drive/Aldendale Street	Stop (1)	11.9   9.4 / 132.9   206.9	B   A / F   F	14.8   10.3 / 872.3   1254.6	B   B / F   F	21.7   11.3 / 9647.8   11019.5	C   B / F   F
Royal Estates (6)	Stop (9)	10.8	B	11.8	B	12.7	B
Taborfield Avenue (10)	Stop (11)	9.5 / 47.8	A / E	10.7 / 277.9	B / F	9.2	A

**Notes:**

- (1) EB | WB Left Turn Major Street Movement / NB | SB Minor Street Movements
- (2) EB Left Turn Major Street Movement / SB Minor Street Movements
- (3) Directional Intersection - Left-in/Right-in/Right-out
- (4) WB Left Turn Major Street Movement / NB Minor Street Right Turn Movement
- (5) Auxiliary Eastbound Right Turn Lane Required by 2035
- (6) Right-in/Right-out only
- (7) SB Minor Street Right Turn Movement
- (8) Auxiliary Eastbound Right Turn Lane Required by 2045
- (9) NB Minor Street Right Turn Movement
- (10) Taborfield Avenue projected traffic warranted a traffic signal by 2045. Therefore, 2045 was analyzed under signal control.
- (11) 2025 & 2035 Under Stop Control - WB Left Turn Major Street Movement / NB Minor Street Movements

### Design Year 2045

As shown in Figure 5-22 and Table 5-6, three of the signalized intersections are projected to operate at LOS E or better during the PM peak hour. The signalized Summerlake Park Boulevard intersection is projected to operate at LOS F. The full access unsignalized intersections are projected to continue to operate at LOS F for the minor street movements. One of the directional intersections is projected to operate at LOS C for the minor street movement and the remaining directional intersections are projected to operate at LOS F for the minor street movements. One of the right-in/right-out intersections is projected to operate at LOS C for the minor street movement and the other right-in/right-out intersection is projected to operate at LOS F.

Under the AM peak hour analysis, the signalized intersection of Summerlake Park Boulevard is projected to operate at LOS F. The remaining two signalized intersections are projected to operate at LOS E or better. The full access unsignalized intersections are projected to operate at LOS F for the minor street movements. The two directional intersections are projected to operate at LOS F or better for the minor street movements. The two right-in/right-out intersections are projected to operate at LOS F for the minor street movements.

Based on the intersection level of service analyses, the Build scenario has a significant reduction in delay and better LOS. The Synchro printouts for the intersection LOS for the Opening Year, the Mid-Design Year, and Design Year for design hour for the No-Build and Build scenarios are provided in Appendix H of the Draft Design Traffic Technical Memorandum, located in the project documents.

## 5.5 Recommended Improvements

Based on the evaluation of operating conditions for the design year 2045 Build scenario, this study provides the following recommendations to improve the traffic flow along Reams Road from Summerlake Park Boulevard to Taborfield Avenue:

- Widen Reams Road from Summerlake Park Boulevard to Taborfield Avenue to provide a four-lane facility
- Include the intersection geometries along Reams Road as shown in the proposed build geometry in Figure 5-18

In addition to the above improvements, this study used the red time formula, to develop the queue length requirements at the signalized intersections along the study corridor. In case of the unsignalized intersections, calculated queue lengths were based on the 95th percentile queue lengths from the Synchro analysis using HCM methods. Actual design and implementation of these storage length requirements will be a function of design and the physical practicality of their construction. Further information on the intersection storage requirements can be found in DDTM.

## 6 ALTERNATIVES ANALYSIS

The objective of the alternatives analysis process is to identify technically and environmentally sound alternatives to provide a safe transportation facility that meets the purpose and need of the project, is acceptable to the community, minimizes impacts on the environment, and is cost effective. The process results in the selection of a Preferred Alternative, which can be advanced to the design phase. This section summarizes the alternatives considered for this project.

### 6.1 Opportunities and Constraints

Several opportunities and constraints should be taken into consideration in developing the improvement alternatives. These are discussed below.

#### 6.1.1 Right-of-Way Constraints

The Reams Road right-of-way, when originally constructed, was 60 feet in width. In June 2005, the Reams Road Alignment Study was completed by Professional Engineering Consultants, Inc. (PEC). This study identified and recommended future widening opportunities primarily consisting of 30 feet of right-of-way from both sides of the roadway. This would have resulted in a total right-of-way width of 120 feet and would provide for the 120-foot wide typical roadway section that Orange County normally requires. As development has occurred along the corridor, typically 30 feet of additional right-of-way has been acquired along the side of the roadway that the development has occurred. However, in the segment of roadway west and east of Oasis Cove Boulevard, the study recommended 40 feet of right-of-way acquisition from the south side of the roadway and no acquisition of right-of-way from the north side of the roadway. Development has since occurred on both sides of the roadway in this segment and 40 feet of additional right-of-way has been acquired from the south side of the roadway. Therefore, the existing right-of-way width is approximately 100 feet in width. This is approximately 20 feet less than the preferred Orange County four-lane roadway width.

The corridor has experienced significant development over the past several years and new development is still occurring. This has limited the available land for stormwater management facilities. As development continues to occur prior to the design and right-of-way acquisition for the roadway improvements, the available land for stormwater management facilities may continue to decrease.

#### 6.1.2 U-turns

The County has expressed a desire to provide for the ability of trucks (WB-40) to make U-turns along the corridor. The typical right-of-way width required at a median opening is approximately 178 feet. However, the County has already acquired right-of-way at several locations along the corridor in conformance with the 2005 Reams Road Alignment Study. In several areas along the corridor, additional right-of-way has been acquired from both sides of the roadway. The construction of a U-turn at any of the intersections within the project limits cannot be accomplished without additional right-of-way acquisition from parcels which right-of-way acquisition has already occurred. Therefore, U-turn provisions for trucks (WB-40) will not be provided within the limits of this project. U-turns for trucks can be accommodated at intersections east and west of the project limits.

### 6.1.3 Roundabout

A roundabout is a form of circular intersection in which traffic travels counterclockwise around a central island and entering traffic must yield to circulating traffic. The operation of vehicular traffic at a roundabout is determined by gap acceptance: entering vehicles look for and accept gaps in circulating traffic. The low speeds of a roundabout facilitate this gap acceptance process. Furthermore, the operational efficiency (capacity) of roundabouts is greater at lower circulating speed because of the following two phenomena:

1. The faster the circulating traffic, the larger the gaps that entering traffic will comfortably accept. This translates to fewer acceptable gaps and therefore more instances of entering vehicles stopping at the yield line.
2. Entering traffic, which is first stopped at the yield line, requires even larger gaps in the circulating traffic in order to accelerate and merge with the circulating traffic. The faster the circulating traffic, the larger this gap must be. This translates into fewer acceptable gaps and therefore longer delays for entering traffic.

The study intersection of Via Trieste Drive/Aldendale Street was analyzed as a two-lane roundabout under the future Build conditions using the procedures of the 2010 Highway Capacity Manual for unsignalized intersections. This analysis used the projected 2025, 2035 and 2045 Build traffic volumes and the proposed geometry.

Table 6-1 is a summary of the results for the AM and PM peak hour intersection delay and level of service. As can be seen, under all analysis scenarios, a roundabout option will result in long delays and an intersection LOS of F. Therefore, the roundabout is not recommended.



**Table 6-1  
Trieste Drive Roundabout Intersection Delay and LOS Analysis Results**

Study Intersections	Future Traffic Control	Build AM Peak Hour-Proposed 4-Lane Divided Reams Road Cross Section					
		Opening Year 2025		Mid-Year 2035		Build-Out Year 2045	
		Delay (sec/Veh)	LOS	Delay (sec/Veh)	LOS	Delay (sec/Veh)	LOS
<b>Reams Road</b> Via Trieste Drive/Aldendale Street	Roundabout <sup>1</sup>	59.6	F	139.7	F	404.0	F

Study Intersections	Future Traffic Control	Build PM Peak Hour-Proposed 4-Lane Divided Reams Road Cross Section					
		Opening Year 2025		Mid-Year 2035		Build-Out Year 2045	
		Delay (sec/Veh)	LOS	Delay (sec/Veh)	LOS	Delay (sec/Veh)	LOS
<b>Reams Road</b> Via Trieste Drive/Aldendale Street	Roundabout <sup>1</sup>	74.1	F	163.5	F	312.0	F

<sup>1</sup>Roundabout under yield control.

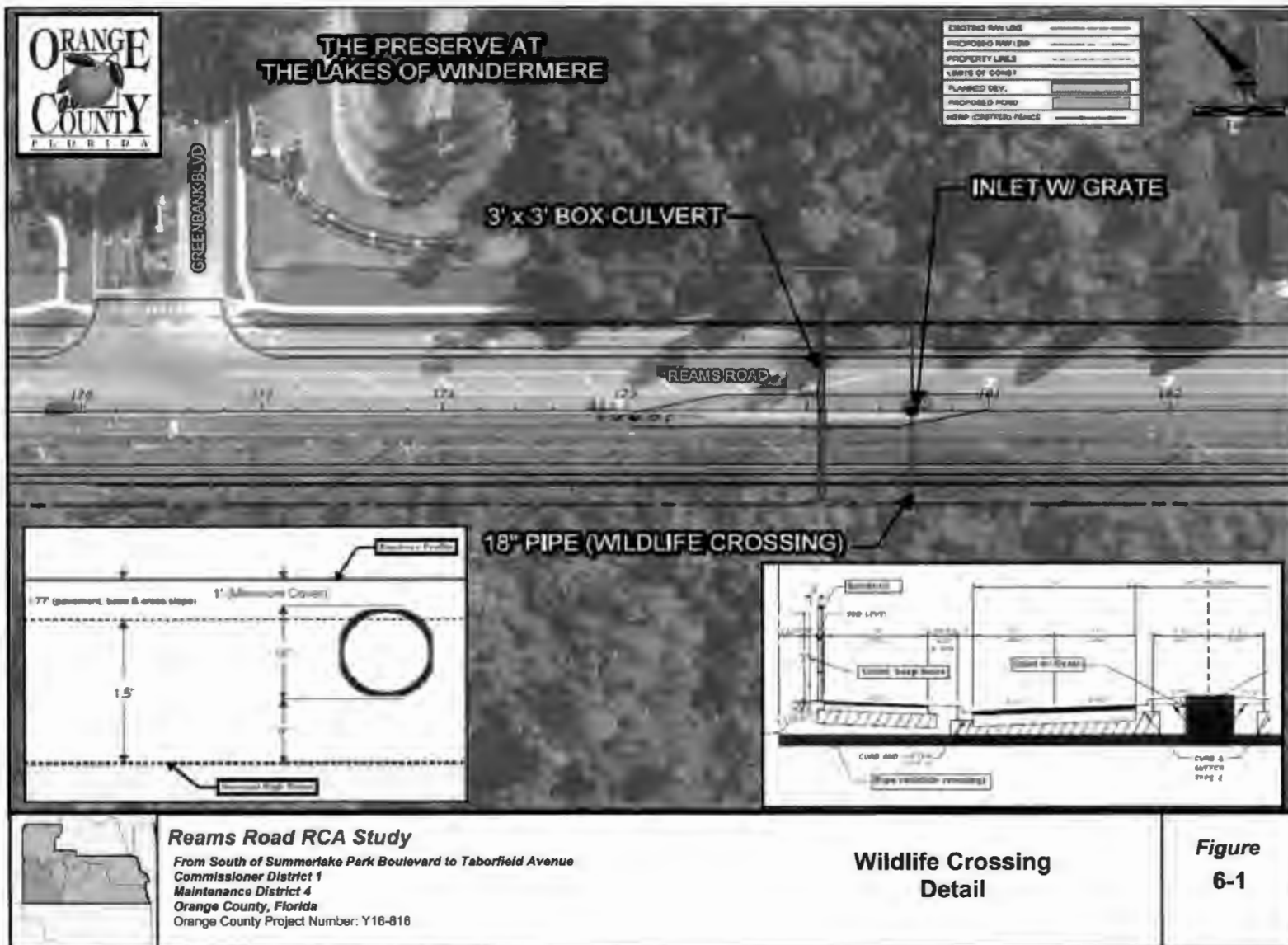
#### 6.1.4 Center Drive and 7-Eleven Median Opening

Center Drive and the driveway entrance to the recently constructed 7-Eleven are offset. Due to the need to provide the ability for pedestrians to cross safely in this area, Orange County, in concert with Walt Disney Parks and Resorts US, Inc., has decided to realign Center Drive to achieve a plus intersection with the 7-Eleven driveway entrance. The signals at Floridian Place and Center Drive will be interconnected.

#### 6.1.5 Wildlife Crossing at Cross Drain East of Greenbank Boulevard

As previously discussed in Section 3.13.4 Wildlife Corridors, common species wildlife mortality has been observed along the corridor, particularly at the cross-drain location east of Greenbank Boulevard. When Reams Road is widened, an appropriately sized RCP could be constructed above the seasonal high-water table to allow common species to safely cross under the roadway. Roadside (herpetological) fencing constructed on either side of the roadway through the cross-drain area would assist in directing wildlife to the wildlife crossing. Figure 6-1 provides a detail of the wildlife crossing.

**Figure 6-1  
Wildlife Crossing Detail**



## 6.2 Alternatives Analysis

Three alternatives were evaluated to determine if they can meet the purpose and needs of this project. These alternatives include the following:

- No-Build Alternative
- Transportation Systems Management and Operations (TSMO)
- Build Alternatives
  - Build Alternative 1 – Centered/Hybrid Alignment 4-lane Widening
  - Build Alternative 2 – South 4-lane Alignment Widening
  - Build Alternative 3 – North 4-lane Alignment Widening

These alternatives are described below.

### 6.2.1 No-Build Alternative

The No-Build Alternative assumes that no modifications or improvements will be implemented for the mainline of Reams Road within the limits of the study. The primary advantages of the No-Build Alternative are that it does not directly require any capital or expenditure of funds and it produces no physical or social impacts.

Certain advantages would be associated with the implementation of the No-Build Alternative:

- No acquisition of right-of-way
- No design, right-of-way, or construction costs
- No inconvenience to the traveling public and property owners during construction
- No impacts to utilities
- No impacts to the adjacent natural, physical, and human environment
- No additional noise impacts

The potential disadvantages of the No-Build Alternative include:

- Not consistent with the Orange County Comprehensive Plan and the MetroPlan Orlando 2040 LRTP Unfunded Needs Plan, and the MetroPlan Orlando FY 2017/18-2021-22 Orlando Urban Area Transportation Improvement Program
- Does not improve multimodal mobility
- Results in reduced LOS and increased traffic congestion
- Motor vehicle crashes, property damage, injuries, and fatalities may increase due to increased congestion
- Emergency vehicle access is degraded
- User costs are increased due to congestion

### 6.2.2 Transportation Systems Management and Operations (TSMO)

TSMO alternatives involve improvements designed to maximize the utilization and efficiency of the existing facility through improved system and demand management. The various TSMO options generally include traffic signal and intersection improvements, access management, and transit improvements. The additional

capacity required to meet the projected traffic volumes along Reams Road in the design year cannot be provided solely through the implementation of TSMO improvements only. TSMO improvements have been incorporated into the build alternatives

### 6.2.3 Build Alternatives

In conducting the alternatives analysis, typical section and alignment alternatives were first identified to meet the identified capacity needs. These alternatives were developed with consideration of future traffic needs, input from the public, input from local governments, and standard engineering practice, including compliance with requirements of the Americans with Disabilities Act (ADA).

#### 6.2.3.1 *Typical Sections*

Typical section alternatives were developed for the Centered/Hybrid Build Alignment, the South Build Alignment, and the North Build Alignment alternatives. The basic elements of the typical section include the full reconstruction of Reams Road and consist of two 11-foot travel lanes in each direction separated by a 19.5-foot median, Type E curb and gutter along the inside lanes, Type F curb and gutter is used along the outside lanes. A five-foot-wide sidewalk is along the south side of the roadway, and a 14-foot-wide multiuse trail along the north side. The typical right-of-way width would be 120 feet but would vary depending on the alignment alternative and the width of the existing right-of-way. Figure 6-2, 6-3, and Figure 6-4 depict the typical sections for the Centered/Hybrid Build Alignment, the South Build Alignment, and the North Build Alignment alternatives, respectively.

**Figure 6-2**  
**Typical Section Centered/Hybrid Build Alignment**

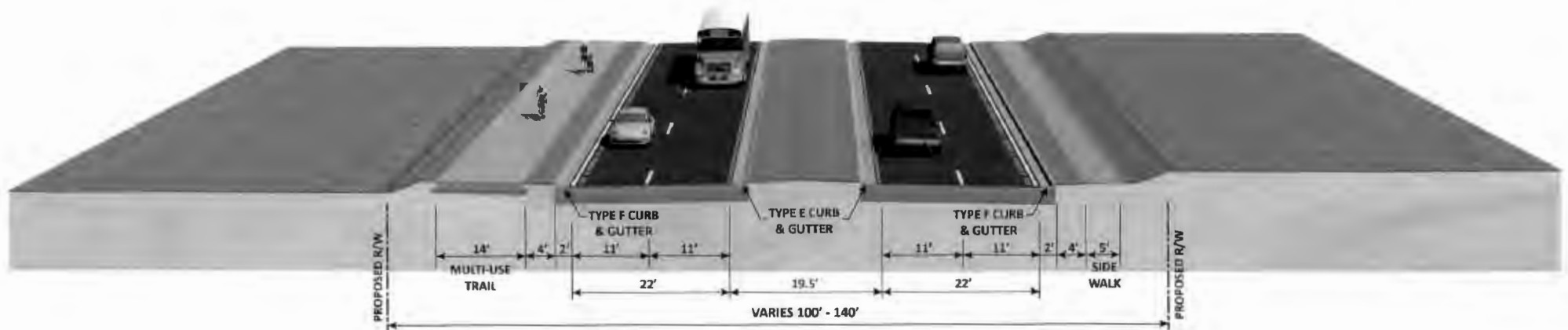
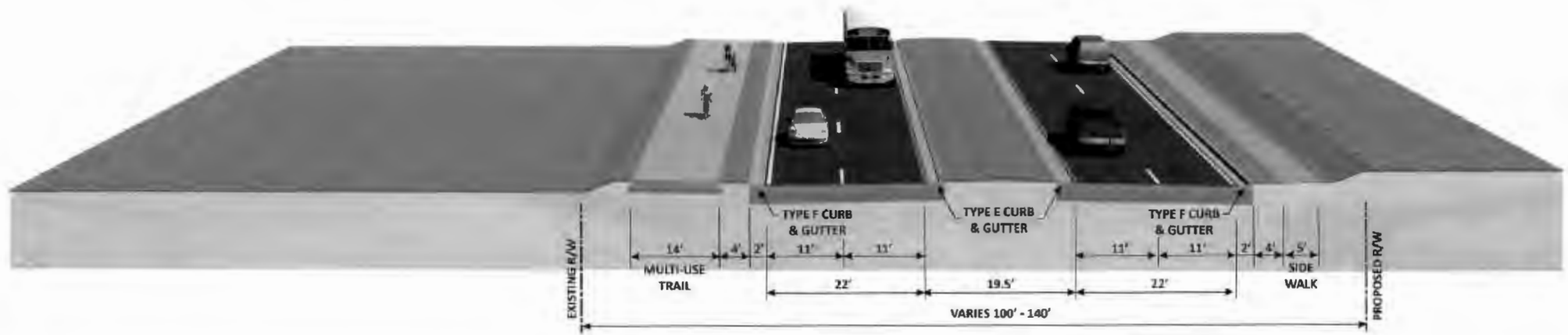
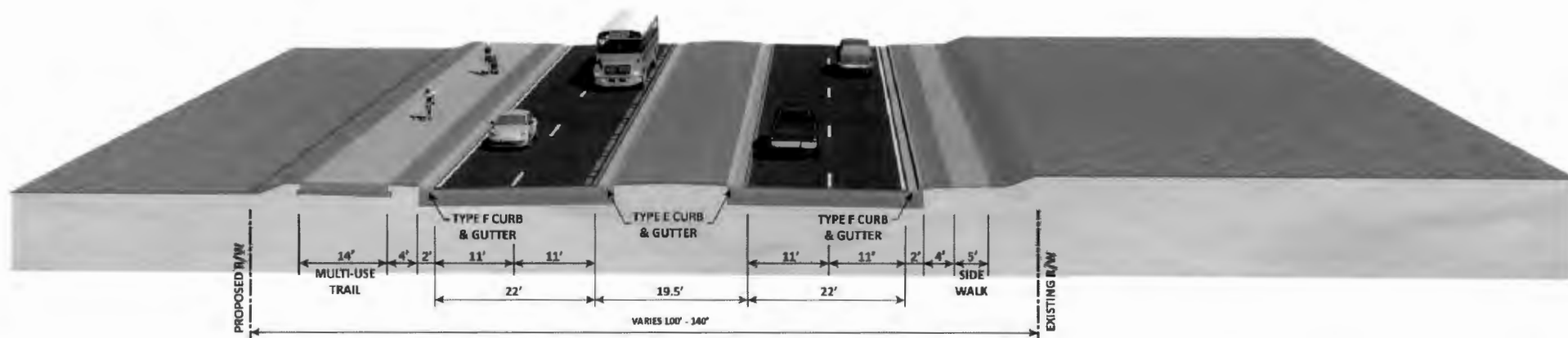


Figure 6-3  
Typical Section South Build Alignment



**Figure 6-4**  
**Typical Section North Build Alignment**



### 6.2.3.2 Alignment Alternatives

#### *Centered/Hybrid Build Alignment*

The Centered/Hybrid Build Alignment utilizes the existing right-of-way to its fullest extent. The 2005 Reams Road Alignment Study identified and recommended future widening opportunities primarily consisting of 30 feet of right-of-way from both sides of the roadway. This would have resulted in a total right-of-way width of 120 feet and would provide for the 120-foot wide typical roadway section that Orange County normally requires. As development has occurred along the corridor, typically 30 feet of additional right-of-way has been acquired along the side of the roadway that the development has occurred. The Centered/Hybrid alignment generally follows the existing centerline of Reams Road and the remaining right-of-way would be acquired from either side of the roadway as needed.

#### *South Build Alignment*

The South Build Alignment holds the north existing right-of-way line and would acquire the additional right-of-way from the south side of the roadway.

#### *North Build Horizontal Alignment*

The North Build Alignment holds the south existing right-of-way line and would acquire the additional right-of-way from the north side of the roadway.

## 6.3 Evaluation of Build Alternatives

Each of the three Build Alignments was evaluated based on impacts to the social, natural, and physical environment; and costs. The evaluation is summarized in a matrix evaluation as shown in Table 6-2.

## 6.4 Preferred Alternative

Based on the matrix evaluation and public involvement activities, the Preferred Alternative is the Centered/Hybrid Build Typical Section and Alignment Alternative. The preferred alternative minimizes right-of-way impacts, social impacts as measured by relocations, and project costs. The Preferred Alternative is shown on the concept plans contained in Appendix A as well as described in more detail in Section 7.0 Preliminary Design Analysis. The right-of-way identification maps are contained in Appendix B.



**Table 6-2**  
**Alternatives Matrix Evaluation**

## Reams Road RCA

From South of Summerlake Park Boulevard to Taborfield Avenue

### Alternatives Evaluation Matrix

	<b>No-Build Alternative</b>	<b>Centered/Hybrid Alignment</b>	<b>South Alignment</b>	<b>North Alignment</b>
<b>Evaluation Criteria</b>	<b>No Improvements</b>	<b>4-Lane Urban with 5-Foot Sidewalk and 14-foot Multi-use Trail</b>	<b>4-Lane Urban with 5-Foot Sidewalk and 14-foot Multiuse Trail</b>	<b>4-Lane Urban with 5-Foot Sidewalk and 14-foot Multiuse Trail</b>
<b>Relocations</b>				
<b>Number of Residential Acquisitions</b>	None	0	73	16
<b>Number of Business Business Acquisitions</b>	None	0	2	0
<b>Number of Parcels Impacted</b>	None	41	52	42
<b>Social, Natural, &amp; Physical Impacts</b>				
<b>Social &amp; Neighborhood</b>	None	Low	High	High
<b>Archaeological/Historical Sites</b>	None	0	0	0
<b>Threatened and Endangered Species</b>	None	No adverse impacts	No adverse impacts	No adverse impacts
<b>Archaeological/Historical Sites</b>	None	0	0	0
<b>Wetlands (acres)</b>	None	6.80	7.49	5.69
<b>Floodplains (acre-feet)</b>	None	13.22	13.22	14.37
<b>Potential High or Medium Ranked Contamination Cites</b>	None	3	3	3
<b>Estimated Costs (Present Day Costs)</b>				
<b>Design (15% of Construction)</b>	No cost	\$3,787,000	\$3,653,000	\$3,637,000
<b>Right-of-Way Acquisition</b>	No cost	\$7,175,000	\$18,660,000	\$10,980,000
<b>Wetland Mitigation</b>	No cost	\$690,000	\$760,000	\$578,000
<b>Roadway Construction</b>	No cost	\$25,244,000	\$24,354,000	\$24,248,000
<b>Reimbursable Utility Relocation</b>	No cost	\$4,200,000	\$4,250,000	\$0
<b>CEI (15% of Construction)</b>	No cost	\$3,787,000	\$3,653,000	\$3,637,000
<b>Total Cost</b>	No cost	\$44,883,000	\$55,330,000	\$43,080,000

## 7 PREFERRED ALTERNATIVE

This section presents the results of the preliminary design analysis that was conducted for the preferred alternative identified in Section 6.4 above. The proposed project improvements will address the increased mobility demands and safety needs along the corridor, while minimizing impacts to the social, natural, and physical environment.

### 7.1 Design Traffic Volumes

The Reams Road Roadway Conceptual Analysis Design Traffic Technical Memorandum (December 2017) documents the existing traffic conditions and the analysis of the No-Build and Build scenarios. The existing and future traffic conditions and the analysis are summarized in Section 5 of this report. All roadway segments and intersections will operate at an acceptable level of service in the design year of 2045.

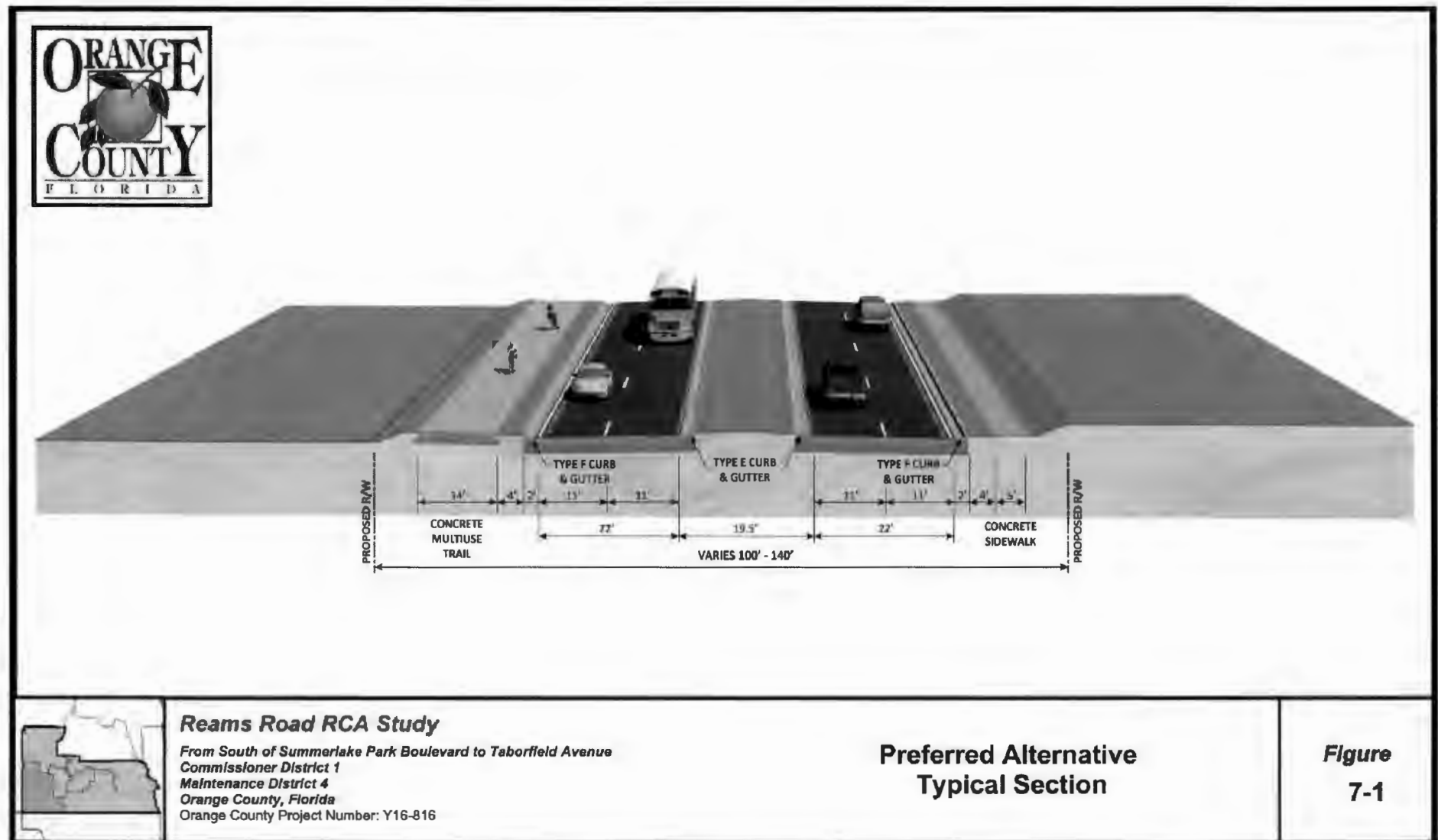
### 7.2 Typical Section and Alignment

The preferred typical section and alignment is the Centered/Hybrid Alternative. The preferred typical section is shown in Figure 7-1 and the preferred alignment is shown on the concept plans contained in Appendix A. Figure 7-2 shows a photographic rendering of how the roadway may look after construction.

The roadway design elements incorporated into the preferred alternative include the following:

- Four 11-foot travel lanes
- A five-foot sidewalk located on the south side of the roadway
- A 14-foot multiuse trail located on the north side of the roadway
- Type E curb and gutter along the inside lanes
- Type F curb and gutter along the outside lanes
- A 19.5-foot raised median
- Two 4-foot utility strips between the Type F curb and gutter and the sidewalk or multiuse trail
- A grass strip between the multiuse trail or sidewalk and the right-of-way line of varying width
- The proposed right-of-way varies in width between 100 feet and 140 feet but is typically 120 feet

**Figure 7-1**  
**Preferred Alternative Typical Section**



**Figure 7-2**  
**Photographic Rendering of Reams Road After Construction**



### 7.3 Intersection Concepts and Signal Analysis

Within the project limits, the proposed signalized intersections are at Floridian Place/Lake Buena Place, Center Drive, Newmarket Drive/Bay Court, and at Taborfield Avenue. The proposed improvements at these intersections are as follows:

- Floridian Place/Lake Buena Place
  - Two 11-foot through lanes in eastbound and westbound directions
  - Eastbound left turn lane
  - Westbound left turn lane
  - Westbound right turn lane
  - Northbound left turn lane
  - Northbound left/through lane
  - Northbound right turn lane
  - Southbound left turn lane
  - Southbound through/right turn lane
- Center Drive
  - Two 11-foot through lanes in both eastbound and westbound directions
  - Eastbound left turn lane
  - Eastbound right turn lane
  - Westbound left turn lane
  - Northbound left turn lane
  - Northbound through/right lane
  - Southbound left turn lane
  - Southbound through/right lane
- Newmarket Drive/Bay Court
  - Two 11-foot through lanes in both eastbound and westbound directions
  - Eastbound left turn lane
  - Westbound left turn lane
  - Southbound left turn lane
  - Southbound through/right turn lane
  - Northbound combined through/left/right lane
- Taborfield Avenue
  - Two 11-foot through lanes in both eastbound and westbound directions
  - Eastbound left turn lane (U-turns)
  - Eastbound right turn lane
  - Westbound left turn lane
  - Northbound left/right lane

### 7.4 Alignment and Right-of-Way Needs

The preferred alignment is the Centered/Hybrid alignment. Right-of-way will be acquired from both sides of the roadway as needed. The right-of-way requirements are shown in the concept plans contained in Appendix A and on the right-of-way identification maps contained in Appendix B.

## 7.5 Drainage

### 7.5.1 Preliminary Design Analysis

Analysis of the proposed ponds was performed calculating the runoff volume of the existing and proposed basins, using Soil Conservation Service (SCS) runoff methodology. Preliminary pond sizes and locations were established for each drainage basin, with all ponds using wet detention due to the high ground water elevations. Curve numbers for the existing and proposed conditions were developed for each roadway drainage basin, within the right-of-way, and included the preliminary pond sizes utilizing their existing soil properties. Precipitation amounts for the Orange County 25-year/24-hour event of 8.6 inches and RCID 50-year/72-hour event of 12.91 inches were used with the developed curve numbers to calculate the volumes of runoff produced by the basins.

Runoff volumes for the proposed conditions were compared with the runoff volumes for the existing conditions. The additional runoff generated from the proposed condition for each basin and pond alternative were used in the development of the sizing of the preliminary pond. Water quality volumes for each basin and pond alternative were also calculated. The largest of the three volumes (water quality, 25-year/24-hour event, and 50-year/72-hour event) were used to govern the minimum volume capacity of the preliminary ponds, thus ensuring that both water quality volume requirements and peak attenuation requirements (through retaining all additional runoff volume generated by the additional impervious area) would be met.

Preliminary analysis of the pond sites show that the ponds will need to be enlarged to account for RCID's 13 CSM rule and forego payment of the additional permit fees for the excess runoff. Because the ponds would be required to be enlarged by a minimum factor of 4, meeting RCID's runoff requirement is not practical. Other projects within the area have also not met RCID's runoff requirement and paying the additional permit fees.

### 7.5.2 Stormwater Management Facilities

The preliminary stormwater ponds have been sized based upon the proposed typical sections to determine the impervious surface for each segment of the road. The impervious surface was then used to determine the required treatment volume and runoff volume for the basins. The ponds were only sized for the right of way areas that will drain to each pond.

The pond sites were selected based upon several criteria. This criterion included existing land use, right-of-way and drainage easements, topography, wetland impacts, and flood plain impacts. Topography was reviewed to provide sufficient elevation change for conveyance of the run-off from the roadway to the pond site. The preliminary road grades were used to control maximum pond stages, ensuring positive flow from the roadway to the ponds. Where possible wetland and flood plain impacts have been avoided.

Existing permits adjacent to the preliminary ponds and existing topography were used to determine the seasonal high / control elevations. Top of berm elevations were established using the adjacent existing grade. In some locations, top of berm elevations were raised slightly from existing ground, but only where required to increase volume of the pond and keep the peak stage below the roadway base elevation within the drainage basin. In all basins, the peak stage in each pond was kept below the bottom of the lowest base elevation within the drainage basin.

After establishing the berm and control elevations of the pond sites, each berm was sloped towards the inside, using a 20:1 slope for 20 feet and then at a 4:1 slope to the control elevation to get the pond area at

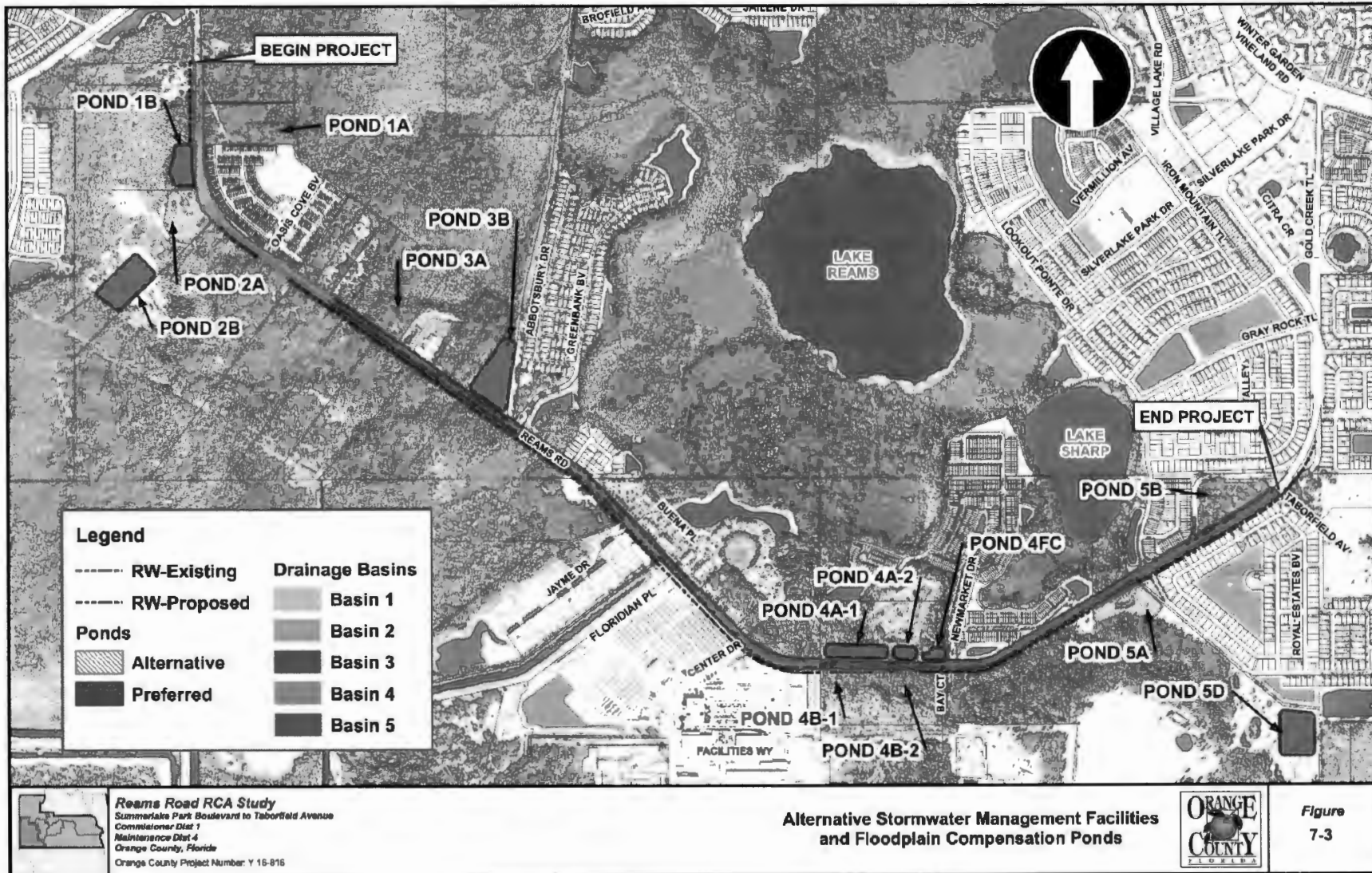
this elevation. These pond stages and areas were incorporated into a pond stage-storage spreadsheet to ensure that the maximum required volume could be maintained within the pond.

The alternative stormwater management facilities and floodplain compensation ponds are shown in Figure 7-3. The preferred ponds are:

- Pond 1B
- Pond 2B
- Pond 3B
- Pond 4A-1
- Pond 4A-2
- Pond 4FC
- Pond 5D

During final design, pond bottom elevations, pond control elevations, pond sizes and pond configurations could vary from the preliminary ponds based upon final topographic survey and geotechnical information.

**Figure 7-3**  
**Alternative Stormwater Management Facilities and Floodplain Compensation Ponds**





### 7.5.3 Cross Drains

The existing cross drains were analyzed, and a preliminary determination was made regarding the need for replacement. The proposed cross drains types and sizes are shown in Table 7-1. CD #1 is outside the project limits but is provided for informational purposes.

**Table 7-1  
Proposed Cross Drains Types and Sizes**

Culvert	Station	Existing Conditions #	Existing Size / Type	Proposed Size / Type	Comments
CD #1	116+06	1	15" / RCP	18" RCP	Replace with minimum cross drain size per FDOT
CD #2	128+68	1	15" / RCP	18" RCP	Replace with minimum cross drain size per FDOT
CD #3	140+17	1	18" / RCP	18" RCP	Replace in-kind
CD #4	180+09	4	(2) 18"/RCP (2) 21"/PVC	3'x3' Concrete Box Culvert	Minimum Precast CBC size, equivalent flow area = 8.35 sf, final design will determine actual size
CD #5 (NEW)	226+00	N/A	N/A	3'x3' Concrete Box Culvert	Minimum Precast CBC Size, final design will determine actual size

#### 7.5.4 Floodplain and Floodways

Table 7-2 and Table 7-3 summarize floodplain impacts, and floodplain compensation provided in each pond.

**Table 7-2  
Floodplain Impacts**

Fill			13.224
Station to Station			Volume (Ac-Ft)
123+00.00	TO	132+00.00	0.575
138+00.00	TO	144+00.00	0.788
156+00.00	TO	161+00.00	0.328
174+00.00	TO	184+00.00	2.624
199+00.00	TO	230+00.00	7.677
231+00.00	TO	233+00.00	0.005
234+00.00	TO	241+00.00	0.182
242+00.00	TO	245+00.00	0.182
249+00.00	TO	256+00.00	0.862

**Table 7-3  
Floodplain Compensation Provided**

Pond Floodplain Compensation Summary			
Pond	Recommended	Volume	
1A		0.70	ac-ft
1B	Yes	2.31	ac-ft
2A		5.42	ac-ft
2B	Yes	5.23	ac-ft
3A		0.83	ac-ft
3B	Yes	2.21	ac-ft
4A-1 & 4A-2	Yes	5.65	ac-ft
4B-1 & 4B-2		6.15	ac-ft
4FC	Yes	2.31	ac-ft
5A		2.39	ac-ft
5B		N/A	
5C		6.20	ac-ft
5D	Yes	8.23	ac-ft
Total Impacts = 13.22 ac-ft			
Compensation Provided = 25.94 ac-ft			

### 7.5.5 Stormwater Permits

The project is within the Reedy Creek Improvement District. Five roadway drainage basins have been identified and preferred and alternative stormwater management ponds have been identified for each basin. Floodplain compensation will be provided for in the stormwater management ponds or in separate floodplain compensation ponds. Figure 7-2 shows the locations of the preferred stormwater management and floodplain compensation ponds.

### 7.6 Displacements

The preferred Center/Hybrid alignment has no business or residential displacements resulting from the project.

### 7.7 Estimated Project Costs

The estimated project costs for the preferred alternative are \$3,787,000 for design, \$7,175,000 for roadway and pond right-of-way acquisition, \$690,000 for wetland mitigation, \$25,244,000 for construction, \$4,200,000 for reimbursable utility relocations, and \$3,787,000 for construction engineering and Inspection (CEI). The total estimated project costs are \$44,883,000 as shown in Table 7-4.

**Table 7-4**  
**Total Estimated Project Costs**

<b>Project Item</b>	<b>Cost</b>
Design (15% of Construction)	\$3,787,000
Right-of-Way Acquisition	\$7,175,000
Wetland Mitigation	\$690,000
Roadway Construction	\$25,244,000
Reimbursable Utility Relocation	\$4,200,000
CEI (15% of Construction)	\$3,787,000
<b>Total Cost</b>	<b>\$44,883,000</b>

### 7.8 Recycling of Salvageable Materials

The opportunity to recycle any salvageable materials by the contractor is encouraged by Orange County. Such materials may include old asphaltic concrete pavement, base material and drainage structures.

The existing pavement on existing roadways, may be milled for recycling during the construction of the project. Any other salvageable materials will be identified during the design of the project. If these materials should be removed from the construction site, it is to be done as specified in the current FDOT Standard Specifications for Road and Bridge Construction.

### 7.9 User Benefits

Highway user costs are defined by AASHTO's A Manual on User Benefit Analysis of Highway and Bus-Transit Improvements, 1977, as the sum of (1) motor vehicle running cost, (2) the value of the vehicle user travel time and (3) traffic accident cost. User benefits are the cost reductions and other advantages that occur to

highway motor vehicle users through the use of a particular transportation facility as compared with the use of another. Benefits are generally measured in terms of a decrease in user costs. It is anticipated that the preferred alternative will provide user benefits due to a reduction in roadway congestion as compared to the “No Build” alternative. In addition, the improved horizontal geometry and access management provided with the project should reduce the occurrence rate of many crash types on the roadway.

## 7.10 Pedestrian and Bicycle Facilities

A continuous five-foot wide sidewalk will be provided on the south side of Reams Road and a 14-foot wide multiuse trail will be provided along the north side of Reams Road. The sidewalk and the multiuse trail will be separated from the roadway by curb and gutter and a four-foot wide grass/utility strip. Pedestrian features, including crosswalks and pedestrian signals, will be provided at each signalized intersection. The pedestrian and bicycle facilities will comply with the Americans with Disabilities Act (ADA).

## 7.11 Environmental Impacts

Detailed studies and evaluations were conducted to determine the potential for adverse impacts that may result from the proposed project. Baseline data, evaluation procedures and analysis of results are contained in the project files and the following reports: “Cultural Resource Assessment Survey”, “Ecological Summary Report” and “Contamination Screening Evaluation Report”.

### 7.11.1 Land Use

The land use along the corridor is primarily residential, commercial (Walt Disney World cast member parking area), and open space. The project is consistent with the existing and future land use along the corridor.

### 7.11.2 Community Cohesion

The project does not bifurcate any neighborhoods or developments.

### 7.11.3 Cultural Impacts

Based on the analysis conducted for this study, there are no cultural resources listed, determined eligible, or appear to be potentially eligible for listing in the NRHP. As such, historic resources will not be a critical issue. In addition, based on the research, there is a potential for discovery of one or more prehistoric sites. Sites in this area are typically small lithic and/or artifact scatters which are not considered eligible for listing in the NRHP.

### 7.11.4 Wetlands

The project is anticipated to impact approximately 6.8 acres of wetlands (roadway and ponds). Federal, state, and local government agencies with regulatory authority over wetland and/or other surface waters generally require mitigation to offset unavoidable impacts as a condition of the permit. Mitigation requirements are based on a compilation of wetland parameters including quality, type, function, and size. Impacts to wetlands and/or other surface waters will be avoided and minimized to the maximum extent possible while maintaining safe and sound engineering and construction practices. Primarily, avoidance and minimization efforts are related to the proposed stormwater management pond locations.

A mitigation plan that adequately offsets adverse impacts will be developed and implemented during the design phase. Adverse wetland impacts that may result from the construction of this project will be mitigated, satisfying the requirements of Part IV, Chapter 373, F.S. and 33 U.S.C.S.1344. Compensatory mitigation for

this project will be completed through the use of mitigation banks and/or any other mitigation options that satisfy federal and state requirements.

#### 7.11.5 Wildlife and Habitat

The potential impact to federal and/or state-listed wildlife species was evaluated based upon the occurrence determinations for Orange County, Florida. Further analysis will be required to specifically address quantities of impact, current status of wildlife species, and other design and/or construction measures which can be incorporated to reduce or eliminate the potential impact.

#### 7.12 Utility Impacts

The preferred alternative will impact existing utilities along the corridor. Table 7-5 summarizes the potential utility impacts and provides the total estimated cost for each utility relocation and the estimated reimbursable cost to the UAO.

**Table 7-5  
Preferred Alternative Utility Impacts and Costs**

<b>UAO Contact</b>	<b>Relocation Cost Estimate</b>	<b>Reimbursable Relocation Cost Estimate</b>	<b>Total Relocation Cost Estimate</b>	<b>Remarks / Utility Cost Basis</b>
AT&T Corporation	\$0	\$0	\$0	No impacts anticipated
Bright House	\$600,000	\$110,000	\$710,000	<b><u>Reimbursable</u></b> 1,100 LF of Fiber/Coax @ \$100/LF (includes vaults and pedestals) <b><u>Non-Reimbursable</u></b> 4,800 LF of Overhead Fiber/Coax @ \$50/LF 3,600 LF of Buried Fiber/Coax @ \$100/LF
Century Link	\$1,183,000	\$0	\$1,183,000	<b><u>Non-Reimbursable</u></b> 9,100 LF of Overhead Fiber/Coax @ \$130/LF (includes 3 ducts, fiber, copper, vaults and pedestals)
Florida Gas Transmission	\$0	\$375,000	\$375,000	<b><u>Non-Reimbursable</u></b> 2,500 LF of 4" Gas Main @ \$150/LF Unit cost includes removal of old main
Duke Energy - Distribution	\$870,000	\$150,000	\$1,020,000	<b><u>Reimbursable</u></b> 13 Distribution poles @ 10k/pole 200 LF of BE @ \$100/LF <b><u>Non-Reimbursable</u></b> 52 Distribution poles @ 10k/pole 3,500 LF of BE @ \$100/LF
Duke Energy - Transmission	\$0	\$3,300,000	\$3,300,000	<b><u>Reimbursable</u></b> 11 Transmission poles @ \$300k/pole
Lake Apopka Natural Gas (LANG)	\$0	\$0	\$0	LANG plans to install a new 4" poly gas main on the project. This is not a relocation and will not be included in this evaluation.
Orange County Utilities	\$4,500,000	\$0	\$4,500,000	<b><u>Non-Reimbursable</u></b> 15,000 of 24" WM (Upsize) @ \$150/LF 15,000 of 16" RCW @ \$75/LF 15,000 of 16" FM @ \$75/LF

UAO Contact	Relocation Cost Estimate	Reimbursable Relocation Cost Estimate	Total Relocation Cost Estimate	Remarks / Utility Cost Basis
Summit Broadband	\$550,000	\$220,000	\$770,000	<u>Reimbursable</u> 2,200 LF of Fiber @ \$100/LF (includes vaults and pedestals) <u>Non-Reimbursable</u> 5,500 LF of Buried Fiber @ \$100/LF
Reedy Creek Energy Services	\$0	\$0	\$0	No impacts anticipated
Smart City Telecom	\$50,000	\$45,000	\$95,000	<u>Reimbursable</u> 450 LF of Fiber @ \$100/LF (includes vaults and pedestals) <u>Non-Reimbursable</u> 500 LF of Buried Fiber @ \$100/LF
Totals:	\$7,753,000	\$4,200,000	\$11,953,000	

## 7.13 Traffic Control Plan

The traffic control plan will be developed during the design process.

## 7.14 Special Features

### 7.14.1 Retaining Walls

Retaining walls are recommended between Jayme Drive and Floridian Place, and between Floridian Place and Center Drive along the south side. The use of the retaining walls will reduce right-of-way acquisition impacts to adjacent properties. It is recommended that the County discuss with the adjacent property owners the possibility of utilizing a harmonizing agreement to allow regrading the adjacent property to eliminate the need for a retaining wall.

### 7.14.2 Access Management

The access management plan for Reams Road is generally based on the Florida Department of Transportation (FDOT) Access Class 5 criteria. The median opening spacing distances for the Class 5 criteria are as follows:

- Directional median opening spacing – 660 feet
- Full median opening spacing criteria – 1320 feet

The access management plan for Reams Road is shown on the concept plans contained in Appendix A.

### 7.14.3 Wildlife Crossing

Based on biodiversity mapping, field surveys, and public input, a wildlife crossing under Reams Road is proposed. The wildlife crossing is proposed to be located adjacent to the cross-drains east of Greenbank

Boulevard. The wildlife crossing will consist of an 18 inch in diameter concrete culvert under Reams Road with an invert elevation set above the seasonal high-water level. A four-foot mesh herpetological fence (one foot buried) will be located behind and offset from the pedestrian handrails for the sidewalk and multiuse trail. The fence will run the length of the wetlands adjacent to Reams Road in this location and be of equal length on both sides of the roadway.

#### 7.14.4 Street Lighting

It is the County's policy to provide street lighting along the corridor. Street lighting will be addressed during the design phase.



## 8 PUBLIC INVOLVEMENT

### 8.1 Public Involvement Plan

In May of 2017 a Public Involvement Plan (PIP) was created for the Reams Road RCA and implemented into the project's public involvement approach. The PIP identifies key local and state agency, elected, and appointed officials; and property owners and tenants for the study area, in addition to outlining public outreach strategies. Specific strategies established in the PIP are: project newsletter mailouts; contact with the media; community and small group stakeholder meetings; presentation to Orange County Planning and Zoning Commission/Local Planning Agency; Presentation to Orange County Board of County Commissioners. All public involvement documents can be found in Appendix D.

### 8.2 Public Information Distribution

Public information for this project has been dispersed through the following methods:

- Two Newsletters mailed to property owners, tenants, and other interested persons
- Public meeting advertisements were placed in *The Orlando Sentinel*, and *El Sentinel*
- A project website was provided which contains information such as: project study area map, project schedule, meeting notices, newsletters, and other study documents.

### 8.3 Coordination and Small Group Meetings

Small group meetings were held with representatives from Walt Disney Parks and Resorts, RCID, and Noah's Notes. Minutes from these meetings are included in Appendix D.

### 8.4 Public Meetings

Two community public meetings were held for the project. The meetings format consisted of an open house that allowed informal discussions between the project team and the public, followed by a presentation and an open question and answer forum. The Kick-off Alternative Public Information Meeting was held on October 5<sup>th</sup>, 2017 from 6 to 8 p.m. in the Media Center at Bridgewater Middle School. The second meeting was held on December 13<sup>th</sup>, 2017 from 6 to 8 p.m. at the same location. The public meeting summaries are contained in Appendix D. Two public hearings will be scheduled before the study's conclusion; one for the Orange County Local Planning Agency, and the second with the Orange County Board of County Commissioners.

## **Appendix A Concept Plans**

FICQUETTE ROAD  
REALIGNMENT  
(ORANGE COUNTY  
PROJECT No. 5140)

DUKE ENERGY  
TRANSMISSION LINE

REAMS ROAD

125+90.00



EXISTING R/W LINE	——— · ———
PROPOSED R/W LINE	—————
PROPERTY LINES	- - - - -
PLANNED DEV.	■
PREFERRED POND	■
ALTERNATE POND	■

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD  
Mark D. Adams, PE  
PE No. 62430  
Inwood Consulting Engineers, Inc.  
Certificate of Authorization No. 7074  
3000 Dovera Drive, Suite 200, Oviedo, Florida 32765  
P-001 981 8810

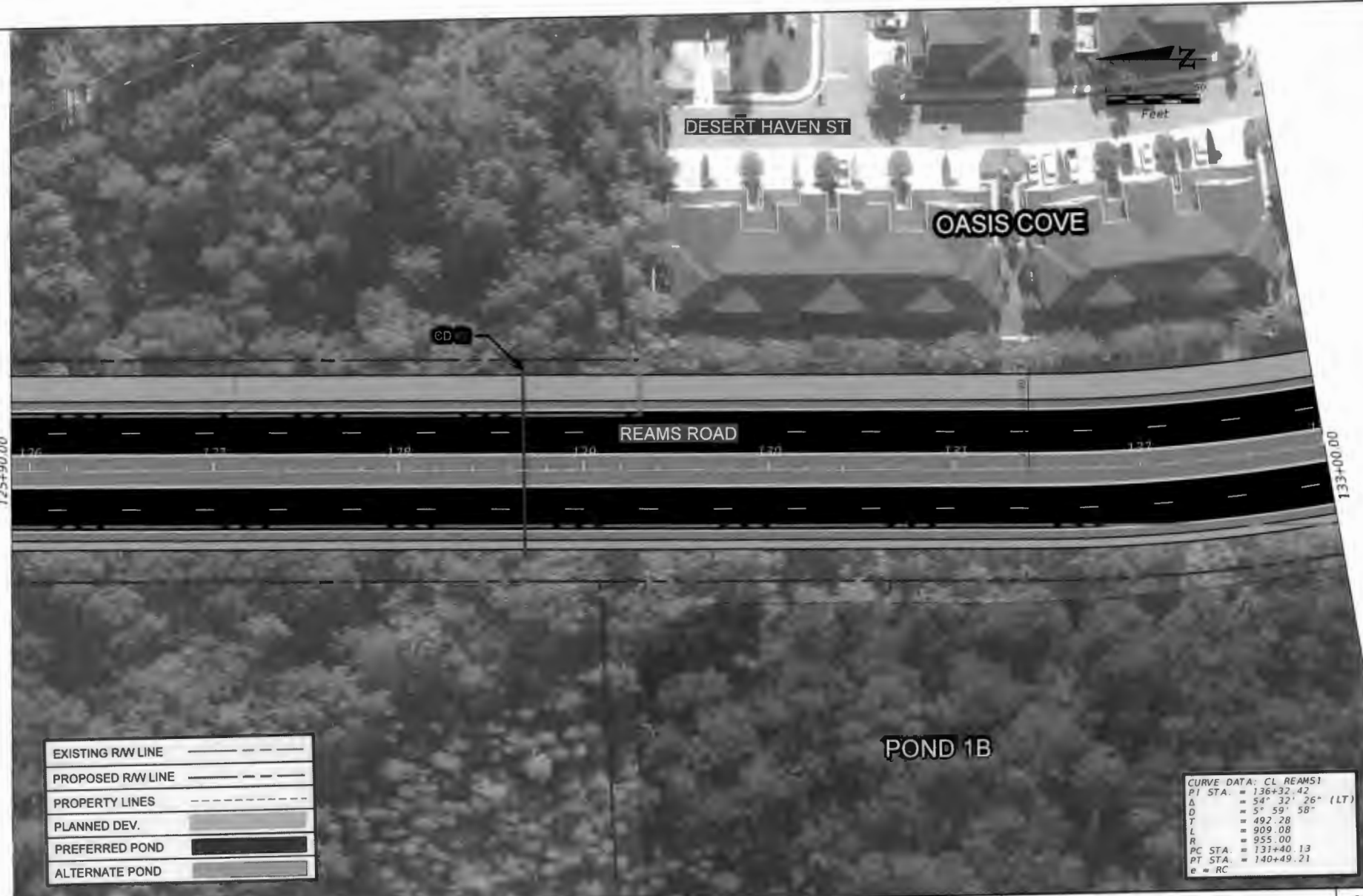


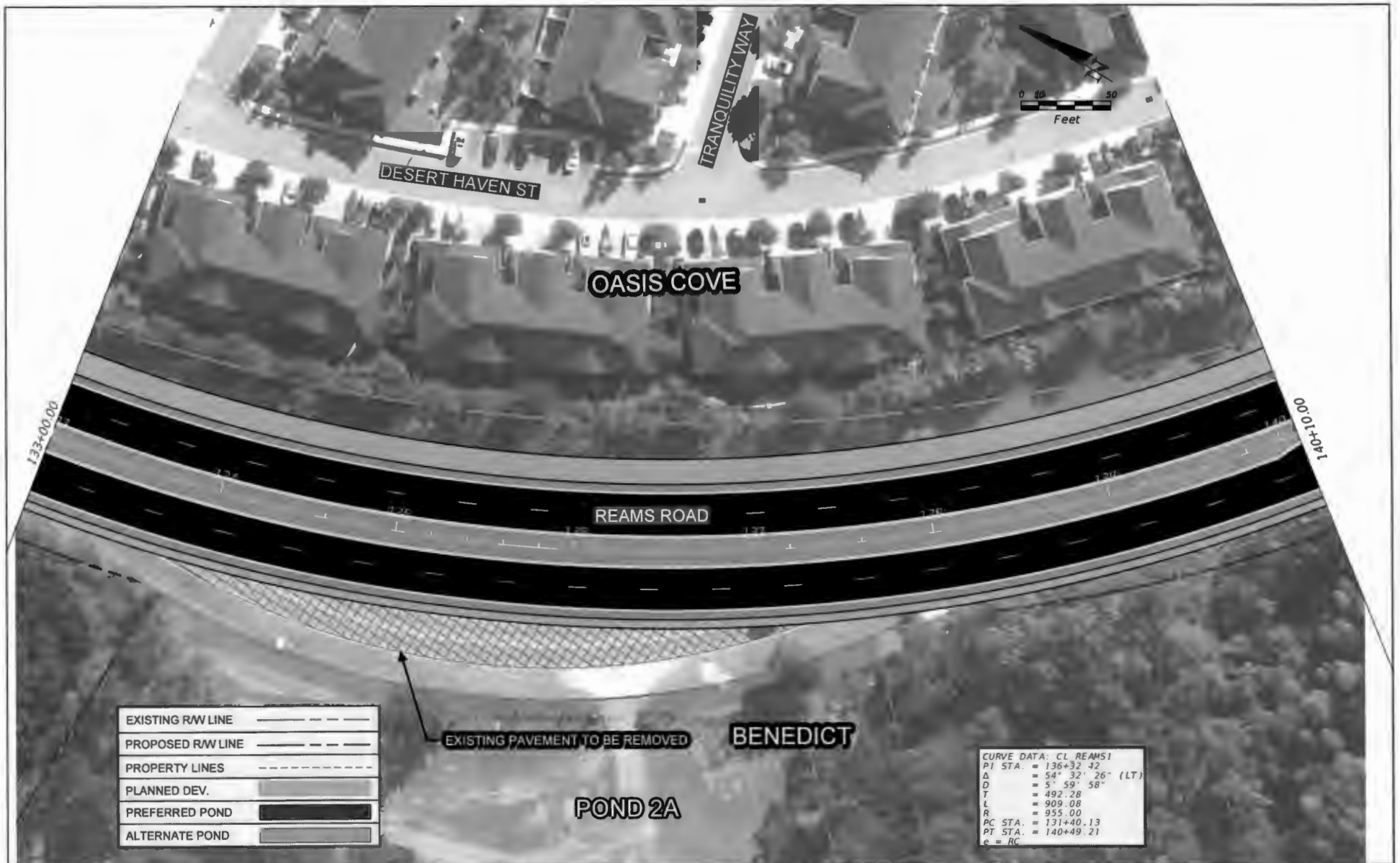
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GOVERNMENT  
FLORIDA

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DATE		DESCRIPTION		REVISIONS		DATE		DESCRIPTION		ENGINEER OF RECORD		ORANGE COUNTY GOVERNMENT FLORIDA		CONCEPT PLAN		SHEET NO.	

ENGINEER OF RECORD  
 Mark G. Malone, PE  
 PE No. 62430  
 Inwood Consulting Engineers, Inc.  
 Certificate of Authorization No. 7074  
 3000 Dovers Drive, Suite 200, Oviedo, Florida 32765  
 P 407-877-8850



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 3



CURVE DATA: CL REAMS  
 P1 STA = 120+32.42  
 Δ = 54° 33' 26" (LT)  
 D = 57.89' 86"  
 T = 48.12'  
 L = 100.00'  
 R = 355.00'  
 AC (TS) = 131+40.13  
 PT STA = 140+09.21  
 P = 10'

EXISTING R/W LINE	_____
PROPOSED R/W LINE	_____
PROPERTY LINES	-----
PLANNED DEV.	_____
PREFERRED POND	_____
ALTERNATE POND	_____

REVISIONS	
DATE	DESCRIPTION

ENGINEER OF RECORD  
 NAME: D. INWOOD, PE  
 PE No. 62430  
 Inwood Consulting Engineers, Inc.  
 Certificate of Authorization No. 7074  
 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765  
 P-007157-0000



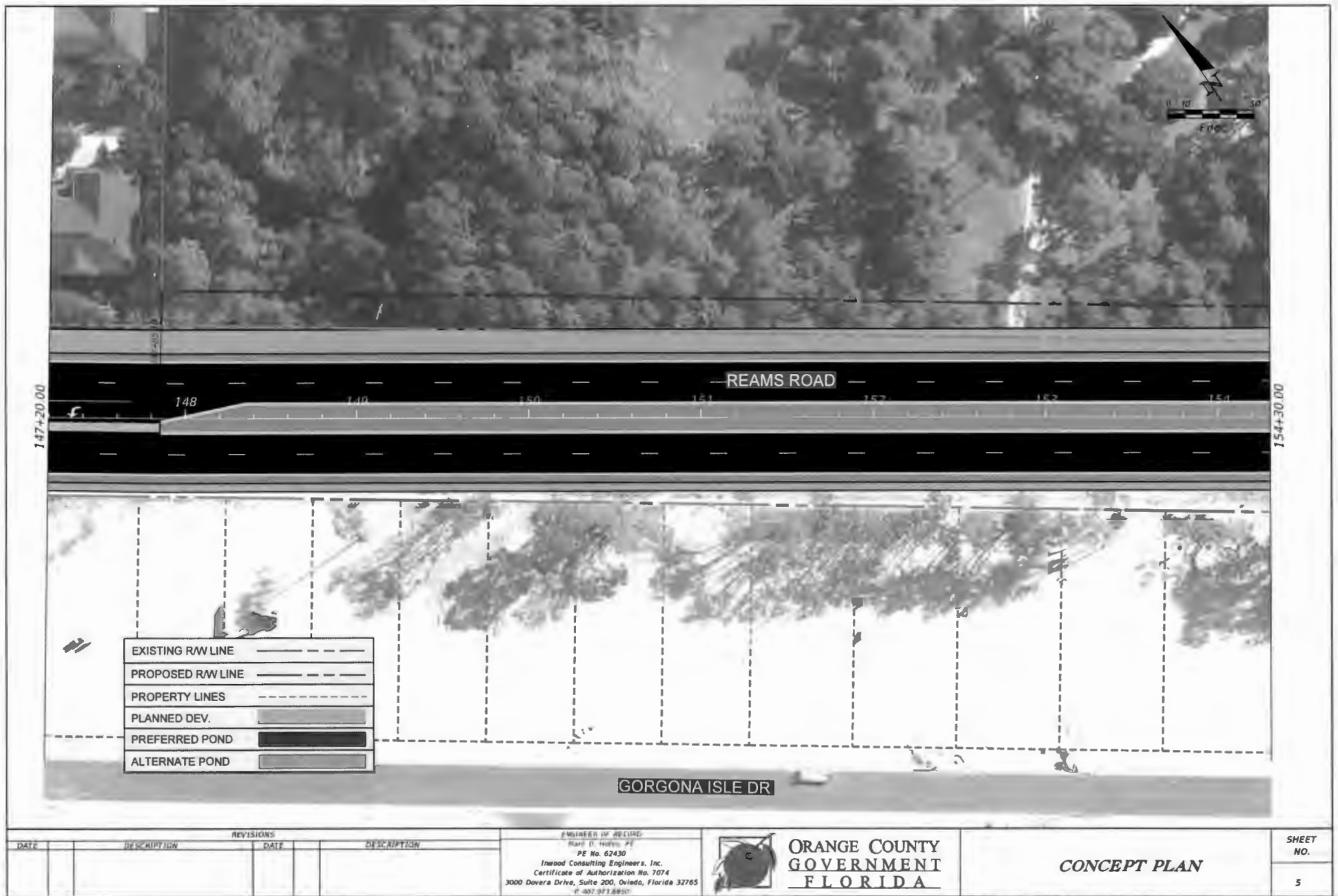
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DATE	DESCRIPTION	DATE	DESCRIPTION

PREPARED BY: J. W. BELL  
 ROAD DESIGNER  
 PE No. 62430  
 Inroad Consulting Engineers, Inc.  
 Certificate of Authorization No. 7074  
 3000 Dovers Drive, Suite 200, Oviedo, Florida 32765  
 (407) 371-8800



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5

# LAKE REAMS NEIGHBORHOOD



## POND 3A

### REAMS ROAD

## LEGADO

EXISTING RW LINE	---
PROPOSED RW LINE	---
PROPERTY LINES	----
PLANNED DEV.	
PREFERRED POND	
ALTERNATE POND	

REVISIONS	
DATE	DESCRIPTION

ENGINEER OF RECORD  
 MARK D. HINES, P.E.  
 PE No. 62430  
 Inwood Consulting Engineers, Inc.  
 Certificate of Authorization No. 7074  
 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765  
 P-4027873.0000

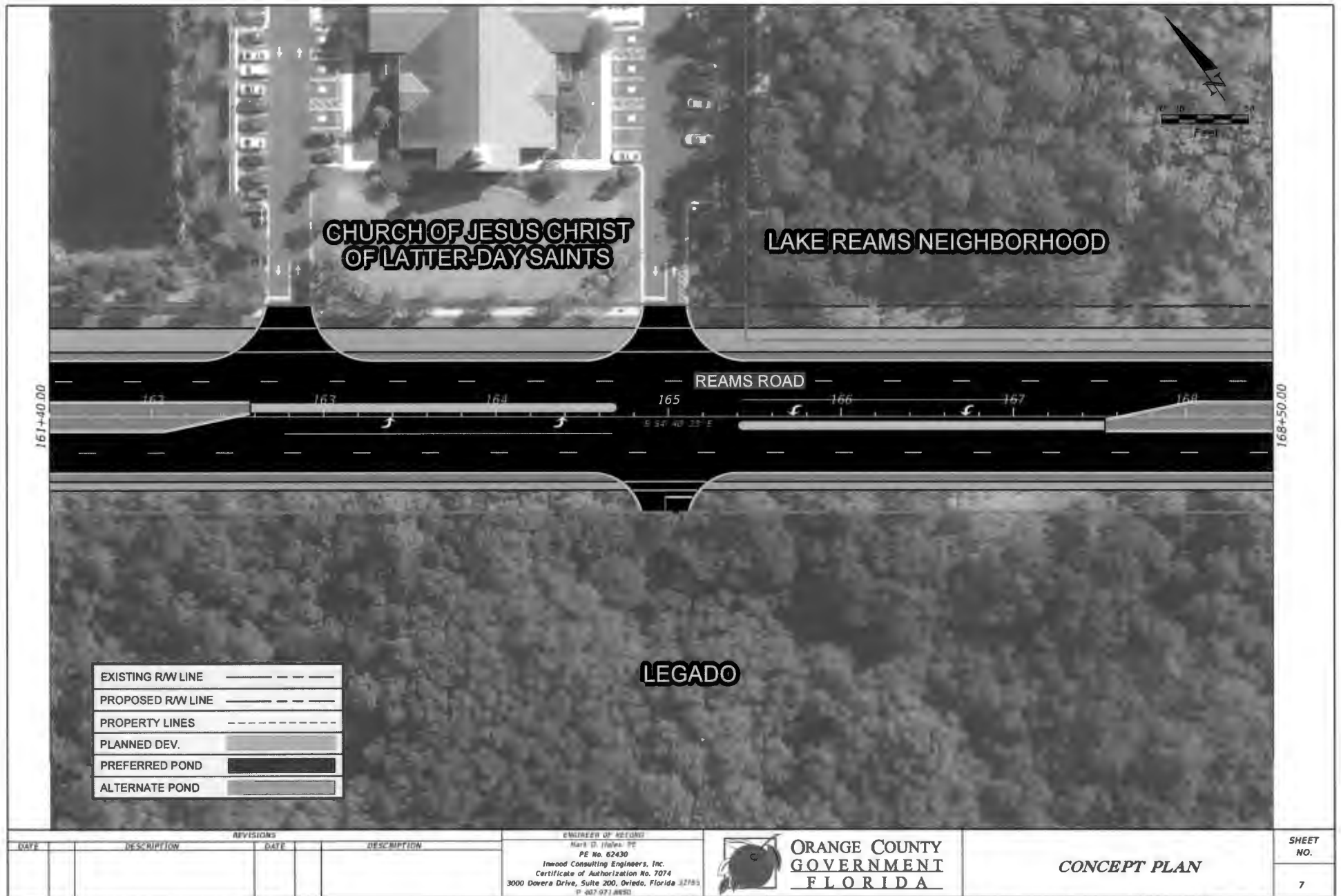


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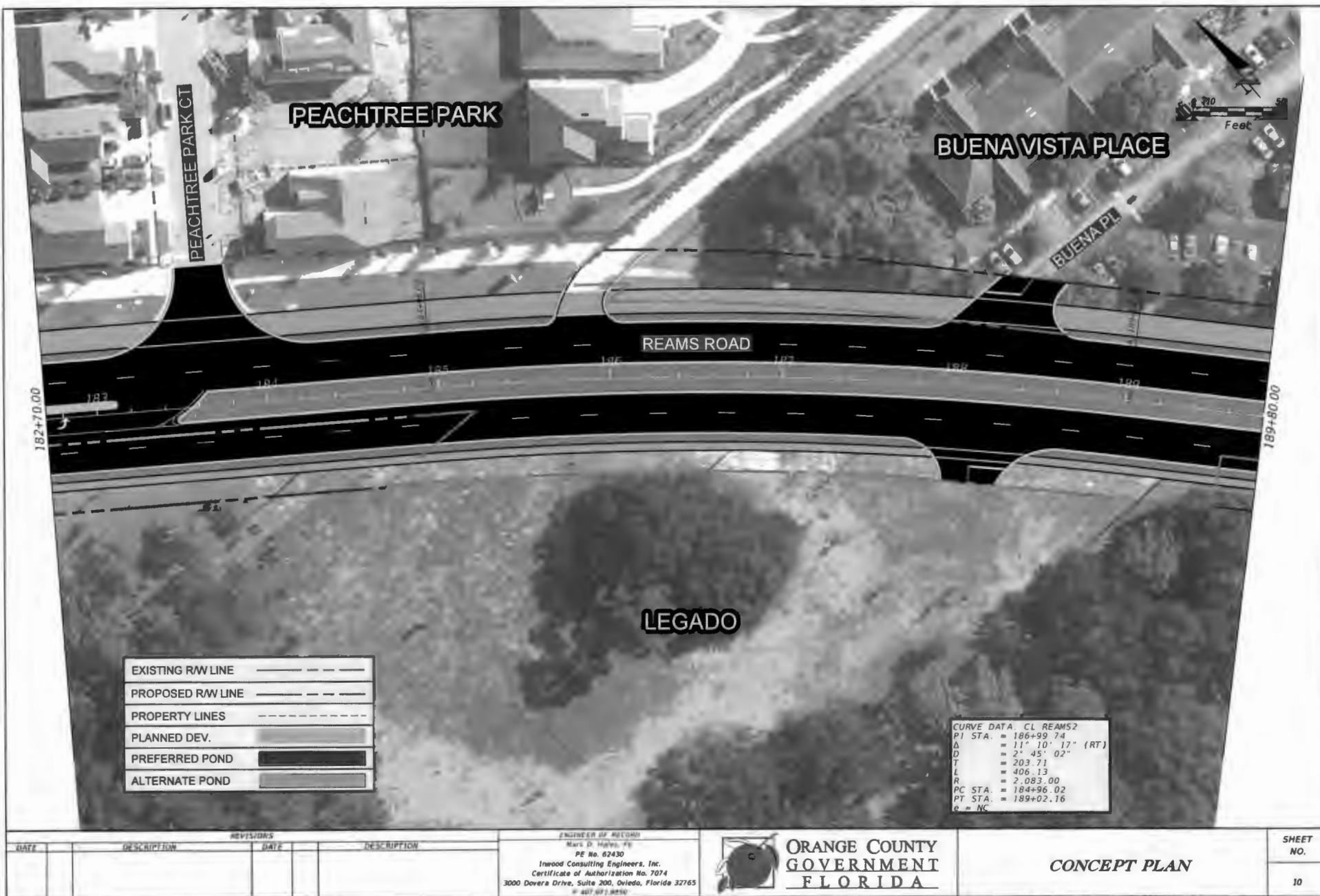
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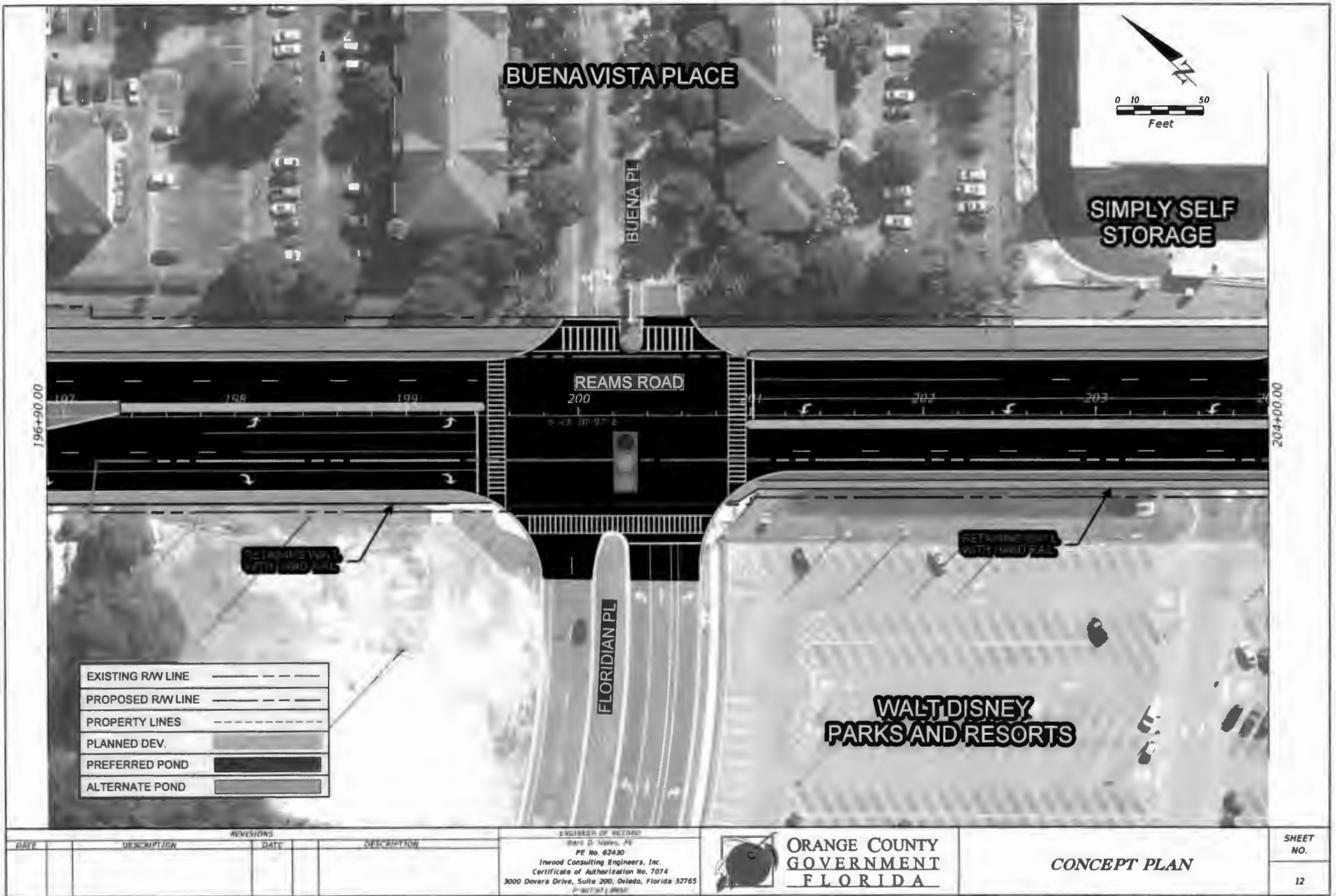


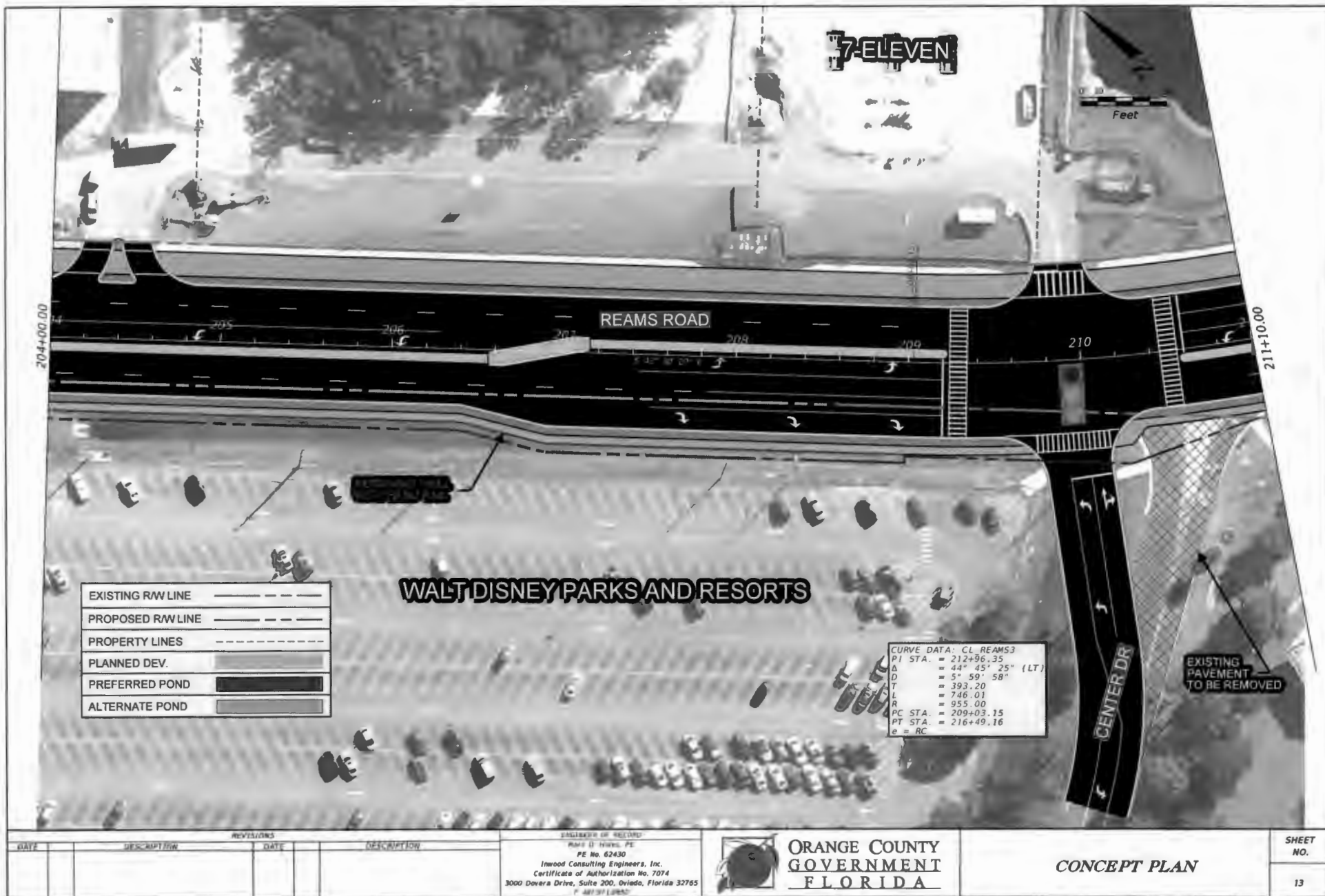


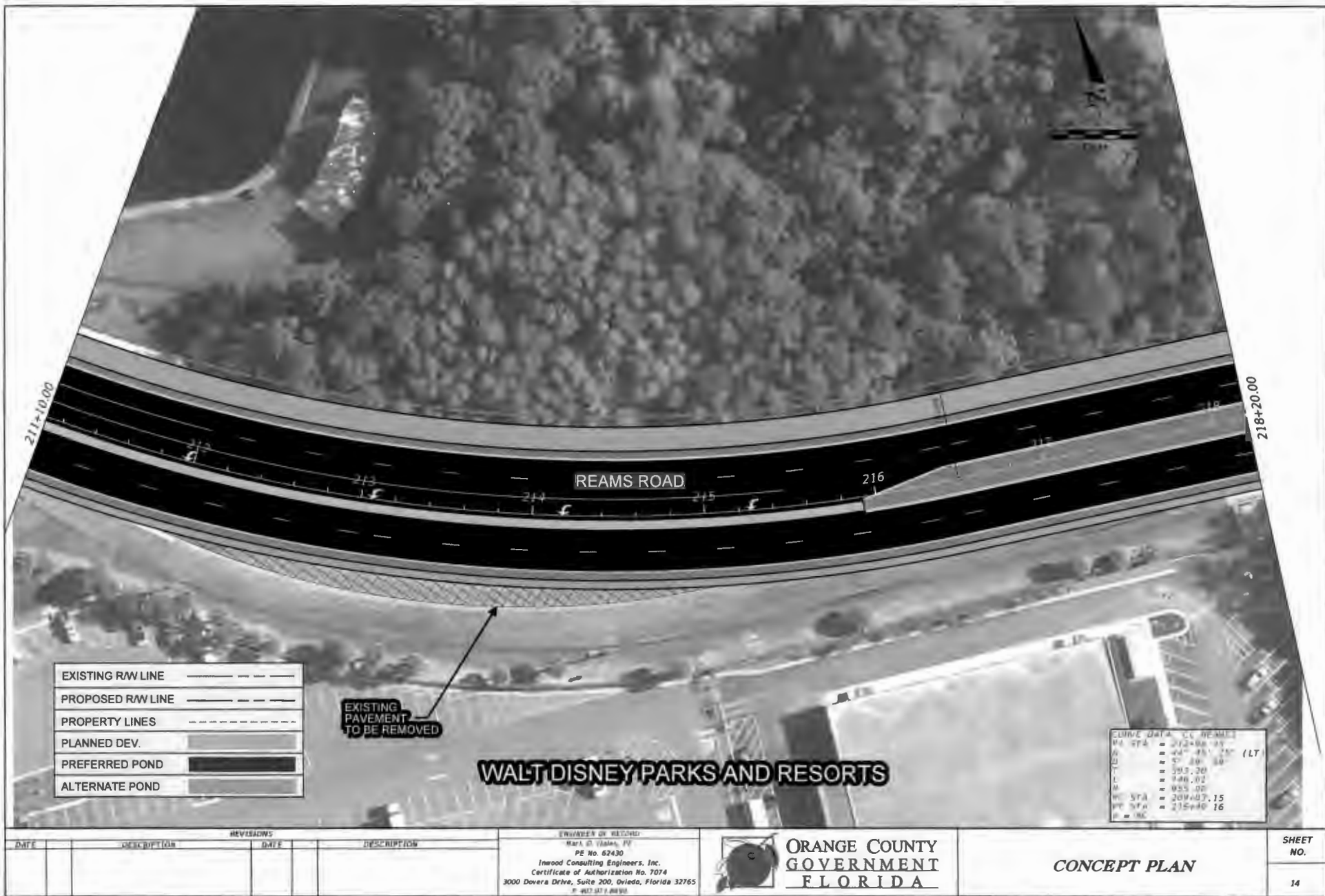








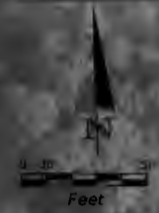






PARK PLAZA

POND 4A-1



218+20.00

225+30.00

REAMS ROAD

POND 4B-1

PARK PLAZA

EXISTING RW LINE	---
PROPOSED RW LINE	---
PROPERTY LINES	---
PLANNED DEV.	---
PREFERRED POND	---
ALTERNATE POND	---

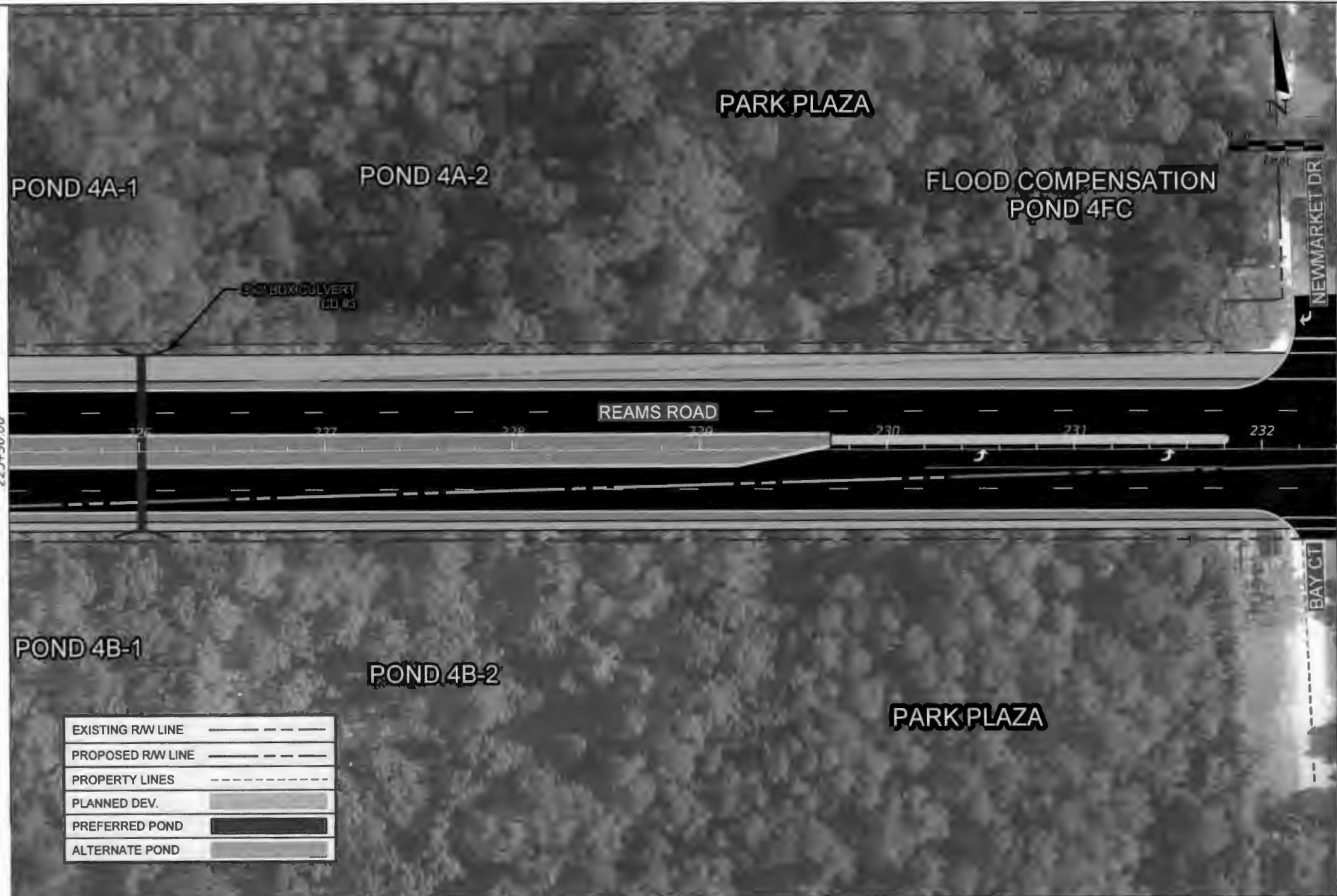
REVISIONS	
DATE	DESCRIPTION


ENGINEER OF RECORD  
 NAME: G. HARRIS, PE  
 PE No. 62430  
 Inwood Consulting Engineers, Inc.  
 Certificate of Authorization No. 7074  
 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765  
 P. 407.927.2850



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15



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						16

ENGINEER OF RECORD  
 Mark G. Hines, PE  
 PE No. 62430  
 Inwood Consulting Engineers, Inc.  
 Certificate of Authorization No. 7074  
 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765  
 P: 407.971.4880

# LAKE REAMS TOWNHOMES AT LAKES OF WINDERMERE

NEWMARKET DR

REAMS ROAD

EXISTING R/W LINE	-----
PROPOSED R/W LINE	-----
PROPERTY LINES	-----
PLANNED DEV.	-----
PREFERRED POND	-----
ALTERNATE POND	-----

PI STA	= 232+74.55
Δ	= 12° 13' 46" (LT)
Q	= 87.50' 45"
L	= 236.90'
R	= 481.31'
Δ	= 819.60'
PC STA	= 233+37.65
PT STA	= 237+48.86
n	= 11.030

REVISIONS		DESCRIPTION	
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD  
MAY 18 2005 P.E.  
PE No. 62430  
Inwood Consulting Engineers, Inc.  
Certificate of Authorization No. 7074  
3000 Dovera Drive, Suite 200, Oviedo, Florida 32765  
P. 407.871.8850



ORANGE COUNTY  
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FLORIDA

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NO.  
17



**LAKE REAMS TOWNHOMES  
AT LAKES OF WINDERMERE**

**CRUXBURY DR**

**REAMS ROAD**

EXISTING R/W LINE	---
PROPOSED R/W LINE	---
PROPERTY LINES	----
PLANNED DEV.	■
PREFERRED POND	■
ALTERNATE POND	■

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD  
 Mark G. Hanks, PE  
 PE No. 62430  
 Inwood Consulting Engineers, Inc.  
 Certificate of Authorization No. 7074  
 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765  
 P. 407.371.4950




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FLORIDA**

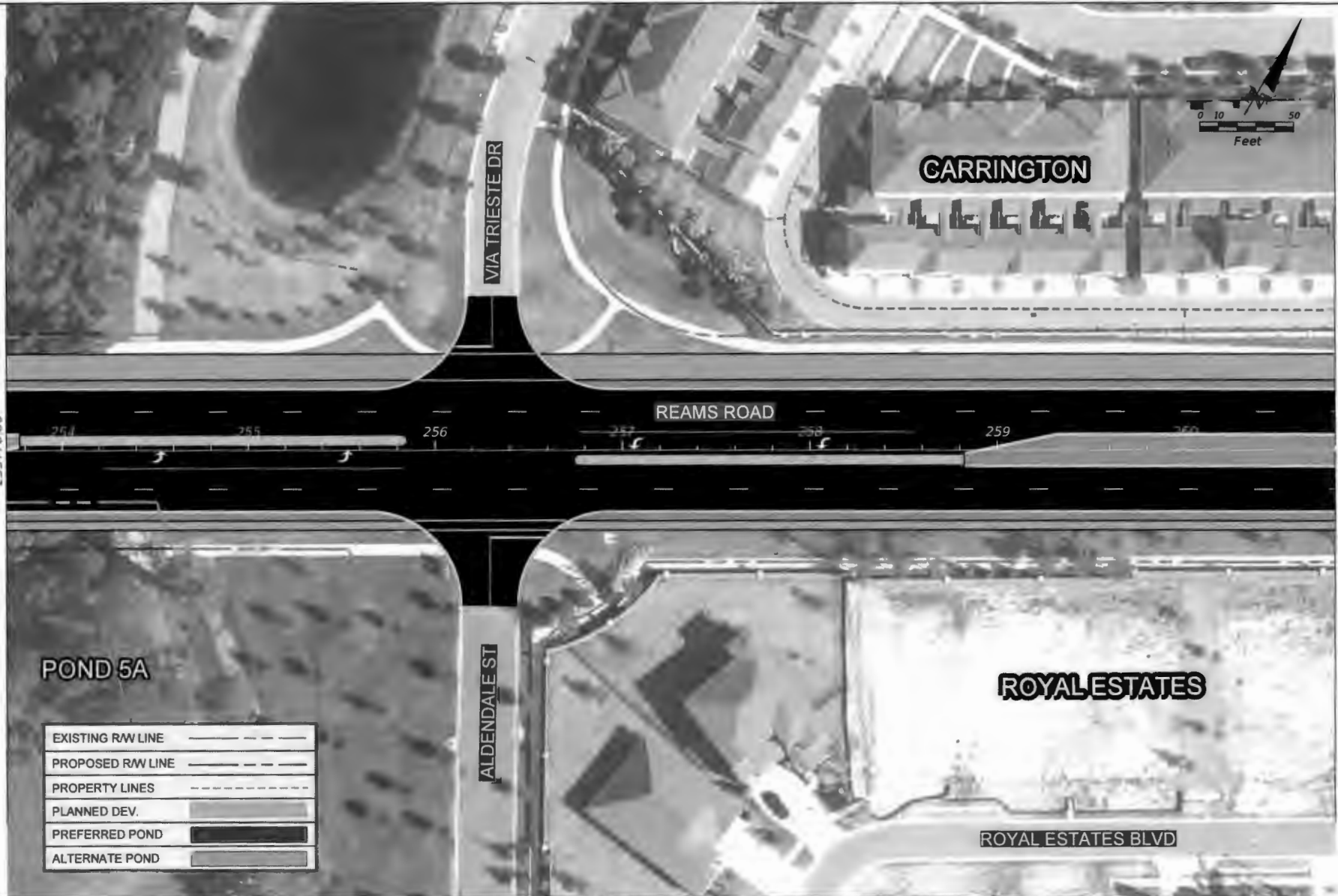
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18**

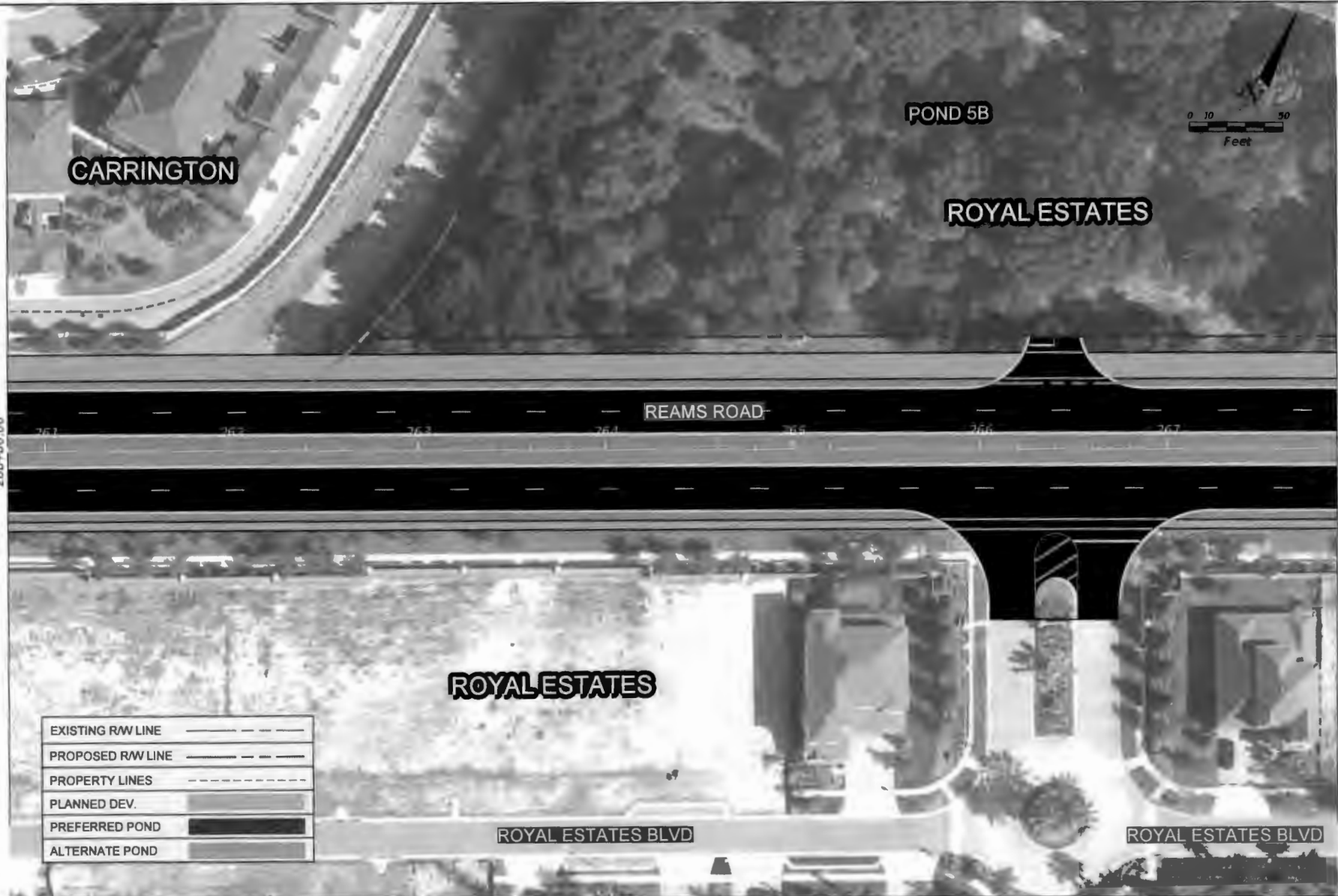


REVISIONS		DESCRIPTION		<div> <div>ENGINEER OF RECORD</div> <div>Mark D. Harris, P.E.</div> <div>PE No. 62430</div> <div>Inwood Consulting Engineers, Inc.</div> <div>Certificate of Authorization No. 7074</div> <div>3000 Dovers Drive, Suite 200, Oviedo, Florida 32765</div> <div>P-607 937 BASS</div> </div>	<div>  <div>ORANGE COUNTY GOVERNMENT FLORIDA</div> </div>	<div>CONCEPT PLAN</div>	<div>SHEET NO.</div> <div>19</div>
DATE	DESCRIPTION	DATE	DESCRIPTION				





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DATE	DESCRIPTION	DATE	DESCRIPTION			
				<small>           Mark D. Hines, P.E.            PE No. 62430            Inwood Consulting Engineers, Inc.            Certificate of Authorization No. 7074            3000 Dovera Drive, Suite 200, Oviedo, Florida 32765            P-001 977 8850         </small>		



EXISTING R/W LINE	---
PROPOSED R/W LINE	---
PROPERTY LINES	---
PLANNED DEV.	---
PREFERRED POND	■
ALTERNATE POND	▨

REVISIONS		REVISIONS	
DATE	DESCRIPTION	DATE	DESCRIPTION

PREPARED BY: M. E. HARRIS, P.E.  
 M. E. HARRIS, P.E.  
 PE No. 62430  
 Inwood Consulting Engineers, Inc.  
 Certificate of Authorization No. 7074  
 3000 Dovers Drive, Suite 200, Oviedo, Florida 32765  
 P. 407.321.8856

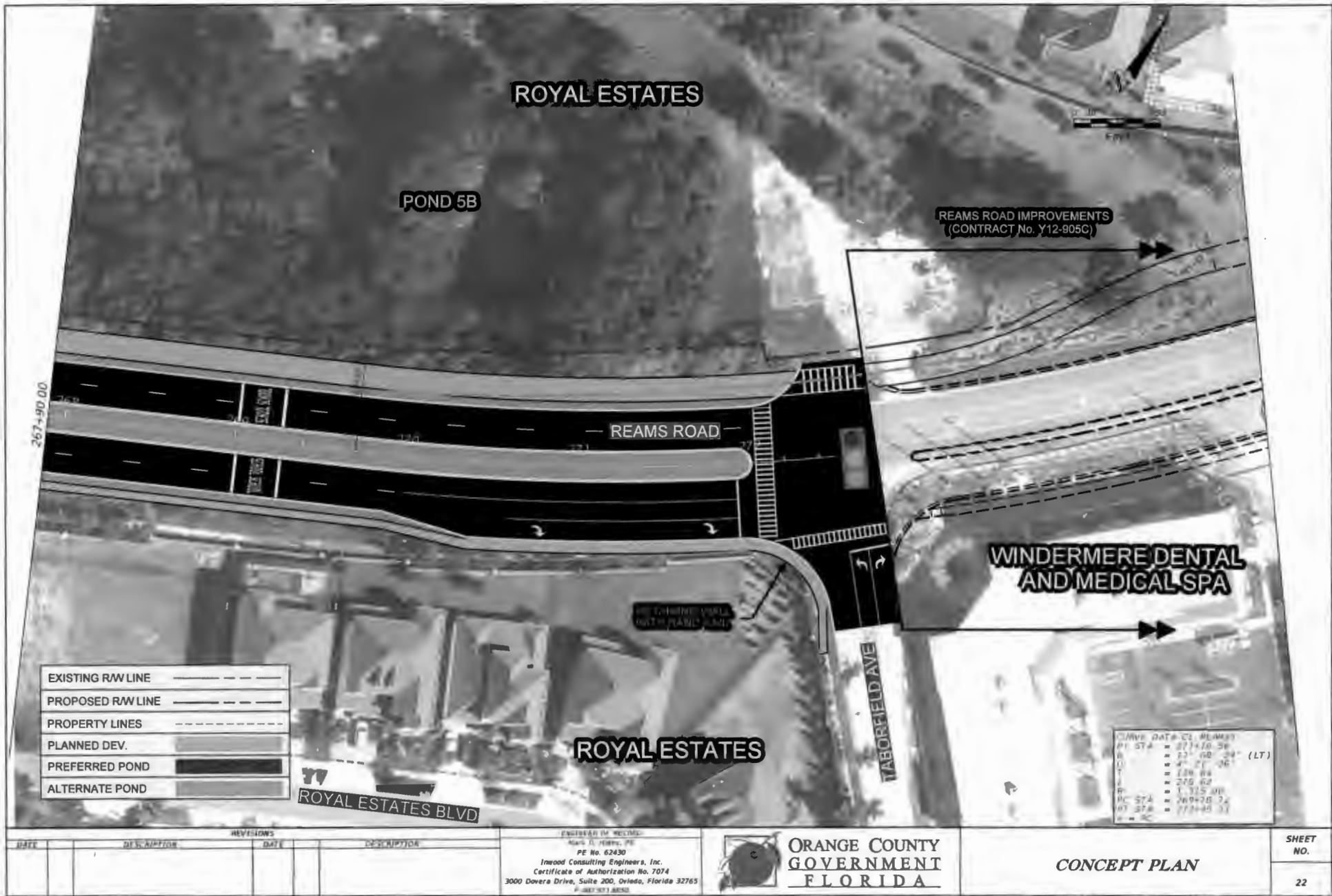


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**FLORIDA**

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21







## MEMORANDUM

March 15, 2018

TO: Mayor Teresa Jacobs  
-AND-  
Board of County Commissioners

FROM: James Dunn, Chairman  
Planning and Zoning Commission (PZC) /Local *JD*  
Planning Agency (LPA) Members

SUBJ: **Reams Road Roadway Conceptual Analysis Study**

On March 15, 2018 the Local Planning Agency (LPA) held a public hearing regarding the Roadway Conceptual Analysis Study for Reams Road. Reams Road is located in western Orange County within the Horizon West Special Planning Area and is part of the Lakeside Village Specific Area Plan. The project limits are from south of the intersection of Summerlake Park Boulevard and Ficquette Road to Taborfield Avenue, a distance of approximately 3.1 miles. This study and subsequent production phase that completes the widening of Reams Road will be funded under Mayor Jacob's Invest in Our Homes for Life Program.

The purpose of the study was to develop the most appropriate road alignment with stormwater facilities and bicycle and pedestrian accommodations while minimizing environmental impacts. The need for this roadway is based on variety of factors including future traffic demand, safety, and social and economic factors.

The LPA approved the findings of the study and found them consistent with the Comprehensive Plan.

RN/bh/am

cc: Local Planning Agency  
Jon V. Weiss, P.E., Director, CEDS Department  
Mark V. Massaro, P.E., Director, Public Works Department  
Renzo Nastasi, AICP, Manager, Public Works Transportation Planning Division  
Raymond L. Williams, P.E., Manager, Public Works Engineering Division