Interoffice Memorandum

March 24, 2020

TO: Mayor Jerry L. Demings
-AND-
Board of County Commissioners

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

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

SUBJECT: March 24, 2020 – Public Hearing
Vineland Avenue Preliminary Design Study

The Orange County Transportation Planning Division has completed the Preliminary Design Study for the widening of Vineland Avenue from two to four lanes. Vineland Avenue is located in southern Orange County within the International Drive Activity Center. The project limits are from Marriott Village at Lake Buena Vista to the Basilica of the National Shrine of Mary, Queen of the Universe, a distance of approximately 0.65 miles. This study and subsequent production phase that completes the widening of Vineland Avenue will be funded under a Roadway Agreement Committee public – private partnership agreement.

The purpose of the study was to develop the most appropriate road alignment with stormwater facilities 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.

This project was presented to the Local Planning Agency (LPA) on February 20, 2020. The LPA found the project consistent with the Comprehensive Plan and recommended the Board find the Vineland Avenue Preliminary Design Study consistent with the Comprehensive Plan, approve the study, and approve initiation of design, right-of-way acquisition and construction.

Staff will present the results of the study for consideration and approval. The study is also available under the Roadway Project section of the County's Traffic and Transportation webpage:

http://www.orangecountyfl.net/TrafficTransportation/VinelandAvenuePreliminaryDesignStudy.aspx

Should the Board approve the study and initiation of design, right-of-way acquisition and construction, the project will advance to the Public Works Department, Engineering Division for acquisition of a consultant for design.

The backup documentation for this item is attached.

Action Requested: **Find the Vineland Avenue Preliminary Design Study consistent with the Comprehensive Plan; approval of the Study, and approval to initiate design, right-of-way acquisition, and construction. District 1.**

RN/gs/am
Attachments

C: Joseph Kunkel, P.E., Director, Public Works Department
Diana Almodovar, P.E., Deputy Director, Public Works Department
Brian Sanders, Assistant Manager Transportation Planning
Gregory A. Scott, A.I.C.P., P.M.P., Principal Planner

ORANGE COUNTY GOVERNMENT FLORIDA

MEMORANDUM

February 20, 2020

TO: Mayor Jerry L. Demings
-AND-
Board of County Commissioners

FROM: J. Gordon Spears, Chairperson
Planning and Zoning Commission (PZC) / Local Planning Agency (LPA) Members

SUBJ: **Vineland Avenue Preliminary Design Study**

On February 20, 2020, the Local Planning Agency (LPA) held a public hearing regarding the Preliminary Design Study for Vineland Avenue. Vineland Avenue is located in southwest Orange County. The project limits are from the Basilica of the National Shrine of Mary, Queen of the Universe to the Marriott Village at Lake Buena Vista, a distance of approximately 0.65 miles.

The purpose of the study was to add roadway capacity and develop the most appropriate road alignment with stormwater facilities 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.

cc: Local Planning Agency
Jon V. Weiss, P.E., Director, Planning, Environmental and Development Services Department
Joseph C. Kunkel, 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
Jason Sorensen, Chief Planner, Orange County Planning Division

Interoffice Memorandum

February 20, 2020

TO: Mayor Jerry L. Demings
-AND-
Board of County Commissioners

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

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

SUBJECT: **March 24, 2020 – Public Hearing**
Vineland Avenue Preliminary Design Study

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The purpose of the study was to develop the most appropriate road alignment with stormwater facilities 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.

Staff will present the results of the study for the Board of County Commissioners consideration and approval on March 24, 2020. The study is also available under the Roadway Project section of the county's Traffic and Transportation webpage:

http://www.orangecountyfl.net/TrafficTransportation/VinelandAvenuePreliminaryDesignStudy.aspx

The backup documentation for this item has been delivered under separate cover.

Please contact Renzo Nastasi, A.I.C.P., Manager of the Transportation Planning Division at 407-836-8070 or at Renzo.Nastasi@ocfl.net if you have any questions or comments.

Action Requested: Find the Vineland Avenue Preliminary Design Study consistent with the Comprehensive Plan, approval of the Study and approval to initiate design, right-of-way acquisition, and construction. District 1.

RN/gs/am

C: Joseph Kunkel, P.E., Director, Public Works Department
Diana Almodovar, P.E., Deputy Director, Public Works Department
Brian Sanders, Assistant Manager Transportation Planning
Gregory A. Scott, A.I.C.P., P.M.P., Principal Planner

ORANGE COUNTY GOVERNMENT FLORIDA

MEMORANDUM

February 20, 2020

TO: Mayor Jerry L. Demings
-AND-
Board of County Commissioners

FROM: J. Gordon Spears, Chairperson
Planning and Zoning Commission (PZC) / Local Planning Agency (LPA) Members

SUBJ: **Vineland Avenue Preliminary Design Study**

On February 20, 2020, the Local Planning Agency (LPA) held a public hearing regarding the Preliminary Design Study for Vineland Avenue. Vineland Avenue is located in southwest Orange County. The project limits are from the Basilica of the National Shrine of Mary, Queen of the Universe to the Marriott Village at Lake Buena Vista, a distance of approximately 0.65 miles.

The purpose of the study was to add roadway capacity and develop the most appropriate road alignment with stormwater facilities 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.

cc: Local Planning Agency
Jon V. Weiss, P.E., Director, Planning, Environmental and Development Services Department
Joseph C. Kunkel, 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
Jason Sorensen, Chief Planner, Orange County Planning Division

2020

Preliminary Design Study
Vineland Avenue
(Marriott Village at Lake Buena Vista to Basilica of the National Shrine of Mary, Queen of the Universe)

DRAFT

Prepared for:

ORANGE COUNTY GOVERNMENT FLORIDA

Prepared By:

HARRIS

Harris Civil Engineers, LLC

PRELIMINARY DESIGN STUDY

FOR

VINELAND AVENUE

(MARRIOTT VILLAGE AT LAKE BUENA VISTA TO BASILICA OF THE NATIONAL SHRINE OF MARY, QUEEN OF THE UNIVERSE)

PREPARED FOR

ORANGE COUNTY PUBLIC WORKS
TRANSPORTATION DIVISION
4200 S. John Young Parkway
Orlando, Florida 32839

PREPARED BY

HARRIS
Harris Civil Engineers, LLC

Harris Civil Engineers, LLC.
1200 Hillcrest Street, Ste. 200
Orlando, Florida 32803

MARCH 2020

PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify that I am a Registered Professional Engineer in the State of Florida practicing with Harris Civil Engineers, LLC., and that I have supervised the preparation and approve the evaluation findings, opinions, conclusions, and technical advice hereby reported for:

PROJECT: Vineland Avenue Preliminary Design Study (PDS)

LOCATION: Marriott Village at Lake Buena Vista to Basilica of the National Shrine of Mary, Queen of the Universe

This report includes a summary of data collection efforts, corridor analysis, conceptual design analyses and environmental evaluations for the above referenced project. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering and planning as applied through professional judgment and experience.

NAME: Timothy V. McCormick, P.E.
Florida P.E. Number 81660

SIGNATURE: _____
Date

TABLE OF CONTENTS

Appendices

1. Executive Summary

ES.1 Introduction

Harris Civil Engineers, LLC has been selected through an Orange County Road Agreement approved by the Orange County Board of County Commissioners to perform a Preliminary Design Study (PDS) for widening 0.65 miles of Vineland Avenue from the driveway of the Marriott Village at Lake Buena Vista to just slightly north of the north driveway to the Basilica of the National Shrine of Mary, Queen of the Universe (MQOTU).

The objective of this PDS is to identify full range of potential roadway improvements needed in order to address current traffic capacity deficiency and projected future traffic demands in the Vineland Avenue corridor. This PDS has summarized all aspects of the study including Public Involvement, Data Collection, Roadway Design, Drainage and Environmental Impacts and Corridor Alternatives Analysis.

The alternatives presented in this study were analyzed and documented in order to form design recommendations, move onto final design and preparation of construction documents for the project.

ES.2 Need for Project

There are several factors that contribute to the need of the project. First is to address current traffic capacity deficiencies in the project corridor. Second is to meet the traffic demand of nearby future developments; third is to enhance safety for the users of the project corridor, both vehicular and pedestrian alike.

These needs are further discussed in *Chapter 3* of this PDS.

ES.3 Existing Conditions

Vineland Avenue spans from Apopka-Vineland Road (CR 435) on the south end to International Drive on the north end. Currently Vineland Avenue is a four-lane roadway, with the exception of the portion between Marriott Village at Lake Buena Vista to MQOTU (the project corridor), which is two-lane. There are intermittent left turn lanes and yellow stripped islands throughout the project corridor. There is a sidewalk along the entire eastern side of the study area. Bicycle lanes are not present. The current right-of-way width varies from 75 feet to 102 feet. The project in question lies within the limits of the International Drive Activity Center within Orange County's transportation element of the Comprehensive Plan.

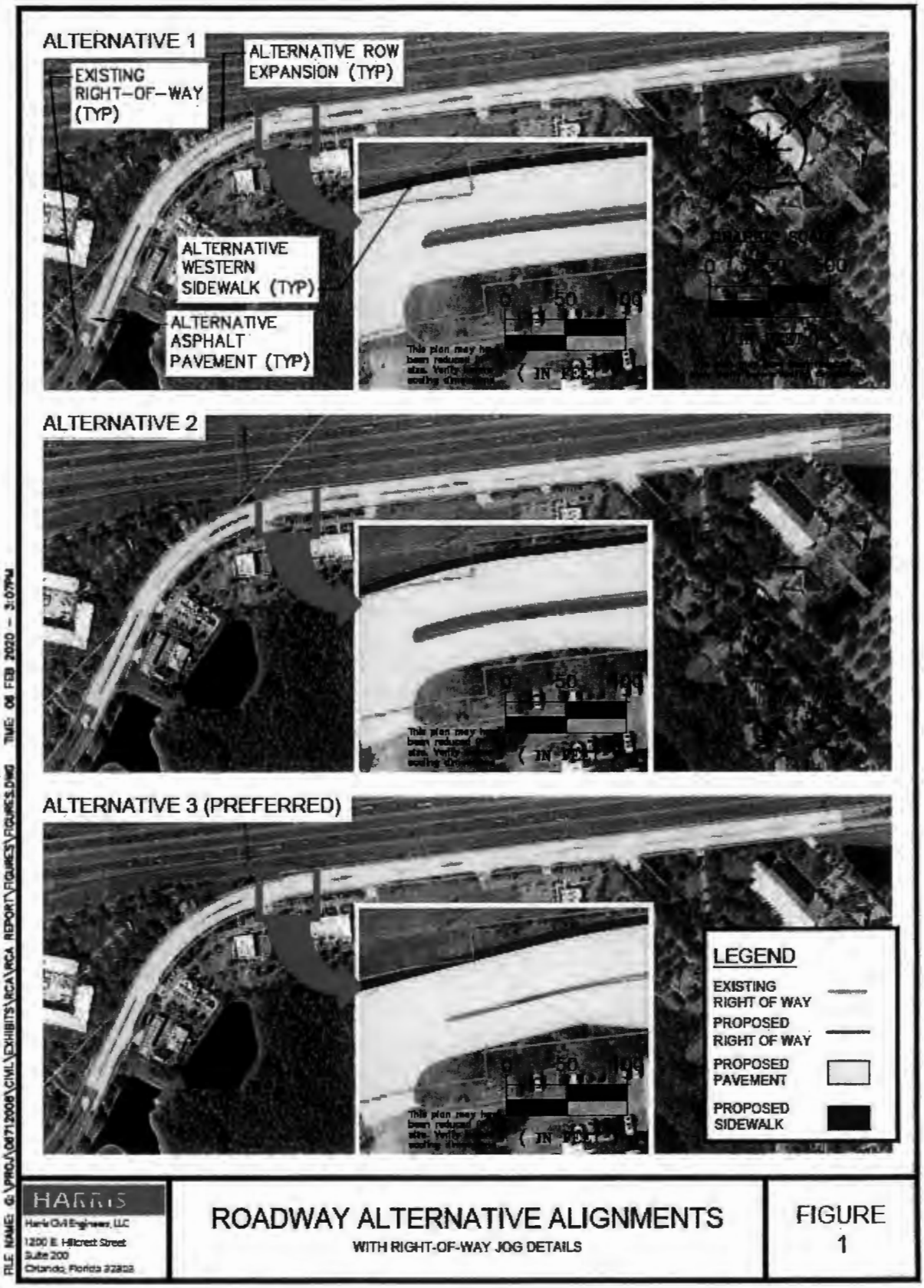
ES.4 Traffic

Detailed traffic information is provided in *Design Traffic Technical Memorandum (DTTM, see **Appendix F**),* prepared by Traffic & Mobility Consultants. This document summarizes the existing traffic conditions and evaluates a no-built and build scenarios for the project corridor. The study shows this area of the corridor to have a Level of Service (LOS) condition of F in the current year, with an annual average daily traffic (AADT) load of 23,000; the capacity for an acceptable level of service is 15,600. In addition to the capacity, a Crash Study is provided for the previous five (5) years showing a total of 377 crashes, with 111 resulting in injuries. The *Design Traffic Technical Memorandum* assists in advising solutions to remediate these issues including roadway widening, signalization of Vineland Avenue and Little Lake Bryan Parkway, and proper signage.

ES.5 Alternative Alignment Analysis

Several roadway alignments were considered during the PDS in order to provide the necessary roadway improvements while minimizing impacts. Three (3) alternatives were analyzed based on factors such as right-of-way acquisition, environmental impacts and estimated costs. Each of the alternatives propose a four-lane roadway with a landscaped median, sidewalk on the east side and additional sidewalk on the west side of the roadway, as well as additional lighting. The alternatives differ in the roadway geometry and their right-of-way acquisition. Each of the alternative will bring the project corridor to four-lane roadway consistent with the rest of Vineland Avenue.

- **Alternative 1** - Shift west
- **Alternative 2** - Shift east
- **Alternative 3** – Narrowed median / Shift east


ALTERNATIVE 1
EXISTING RIGHT-OF-WAY (TYP)
ALTERNATIVE ROW EXPANSION (TYP)
ALTERNATIVE WESTERN SIDEWALK (TYP)
ALTERNATIVE ASPHALT PAVEMENT (TYP)
ALTERNATIVE 2
ALTERNATIVE 3 (PREFERRED)
LEGEND
EXISTING RIGHT OF WAY
PROPOSED RIGHT OF WAY
PROPOSED PAVEMENT
PROPOSED SIDEWALK
HARRIS
Harris Civil Engineers, LLC
1200 E. Hillcrest Street
Suite 200
Orlando, Florida 32803
ROADWAY ALTERNATIVE ALIGNMENTS
WITH RIGHT-OF-WAY JOG DETAILS
FIGURE 1
FILE NAME: G:\PROJ\0871200\CIVIL\EXHIBITS\RCA\RCA REPORT\FIGURES\FIGURES.DWG TIME: 06 FEB 2020 - 3:07PM

ES.6 Drainage Alternatives Analysis

Stormwater management will need to be provided for the proposed Vineland Avenue widening. A stormwater pond will be needed to provide water quality storage for runoff from the additional impervious areas, prior to discharging to existing Little Lake Bryan (LLB) east of the project corridor for attenuation purposes.

Two drainage alternatives were considered during the PDS:

- **Alternative 1** - New pond in wetlands area adjacent to Little Lake Bryan
- **Alternative 2** - New pond within Fishbones'-owned parcel

In either alternative, permitting through South Florida Water Management District (SFWMD) by a modification to existing master stormwater permit will be required (SFWMD Environmental Resource Permit #48-00780-S).

ES.7 Recommended Improvements

The Vineland Avenue PDS analyzed the project traffic conditions, development of improvement alternatives, investigation of environmental and social impacts, and public involvement.

It is recommended that project corridor should be widened to a four-lane divided urban roadway while replacing and realigning the eastern sidewalk and installing a new western sidewalk. The recommended roadway alignment (Roadway Alternative #3) consists of the narrowed median / shift east with minimal right-of-way acquisition. The alternative also includes matching the Access Management Plan (outlined in *Chapter 8*) provided in the *Design Traffic Technical Memorandum,* installing a new traffic signal at Little Lake Bryan Parkway and providing new light fixtures to increase visibility. Per the LPA Public Hearing, future consideration will be given to a wider sidewalk on the east side of Vineland Avenue and will be evaluated and considered in the design phase of the project.

A drainage alternative is needed in conjunction with the roadway widening. It is recommended a stormwater wet detention pond be constructed in the wetland area adjacent to Little Lake Bryan (Drainage Alternative #2) for the treatment of stormwater runoff prior to discharging to Little Lake Bryan for attenuation.

The recommended improvements offer a balance between engineering considerations and impacts to the residences, businesses, and existing environment. The conceptual plan and proposed improvements can be found in ***Appendix A*** of this PDS.

ES.8 Supporting Documents

Supporting documents were prepared as part of the PDS process in order to demonstrate the need for the project, existing conditions, and alternative evaluation methods and results. The supporting documents include:

- Public Involvement Documents (Appendix C)
- Design Traffic Technical Memorandum (Appendix F)
- Environmental Assessment Report (Appendix G)
- Preliminary Geotechnical Report (Appendix H)
- Alternative Alignments (Appendix B)
- Pond Siting Report (Appendix I)
- Public Hearing Transcript and Summary (Appendix M)

ES.9 Impacts and Costs

The Overall Cost Matrix below (***Table 1***) summarizes the alternatives analyzes associated with the widening project.

Table 1 – Overall Cost Matrix (as shown in *Appendix E*)

Alternatives Evaluation Matrix
Summary of Project Costs and Impacts
Vineland Avenue Preliminary Design (PDS) Study
Marriott Village at Lake Buena Vista —to— Basilica of the National Shrine of Mary, Queen of the Universe

EVALUATION MEASURE	ROADWAY ALTERNATIVES (ONLY)			PREFERRED ALTERNATIVES	DRAINAGE ALTERNATIVES (ONLY)	
	No Build	Alt 1 Western Shift	Alt 2 Eastern Shift	Alt 3 Narrowed Median/East	Alt 1 Conservation Area Pond	Alt 2 Development Area Pond
COMMUNITY IMPACTS						
Right-of-Way Impacts						
Acres of Right-of-way/Acquisition	0	0.14	0.06	0	1.52	0
Acres of Easement	0	1.43	1.68	1.2	0.13	4.83
Total Acres	0	1.57	1.74	1.2	1.65	4.83
Properties						
Total Number of Relocations (Each)	0	0	0	0	0	0
Business Parcels Impacted (Each)	0	9	9	9	1	0
Residences Impacted (Each)	0	0	0	0	0	0
Vacant Parcels Impacted (Each)	0	3	3	3	3	4
ENVIRONMENTAL IMPACTS						
Wetlands (Acres)	0	0	0	0	1.5	0
Surface Water (Acres)	0	0	0	0	0	0
Flood Plains (Acres)	0	0	0	0	0	0
Potential Contamination Sites (each)	0	1	1	1	0	0
Threatended and Endangered Species	low	low	low	low	low	low
TRANSPORTATION IMPACTS						
Traffic Signals Added	0	1	1	1	N/A	N/A
Design Year Level of Service	F	D	D	D	N/A	N/A
New access restrictions	0	2	2	2	N/A	N/A
Sidewalk Added (Miles)	0	0.5	0.5	0.5	N/A	N/A
PROJECT COSTS (in $)						
Design Estimate	$0	$865,000	$865,000	$865,000	$75,000	$75,000
Rights-of-Way & Easements	$0	$2,874,564	$3,196,012	$2,164,468	$1,596,962	$9,901,112
Wetland Mitigation Banking	$0	$0	$0	$0	$217,500	$0
Construction	$0	$3,342,425	$3,342,425	$3,342,425	$142,000	$71,500
Reimbursable Utility Relocation	$0	$115,000	$115,000	$115,000	$0	$0
Construction Engineering & Inspection	$0	$518,614	$518,614	$518,614	$21,300	$10,725
Total Costs	$0	$7,715,603	$8,037,051	$7,005,507	$2,052,762	$10,058,337

CHAPTER 2

Introduction

2.0 Introduction

This section provides an overview of the study area as well as the purpose and need of the project.

2.1 Purpose

Harris Civil Engineers, LLC (HCE) been selected through an Orange County Road Agreement approved by the Orange County Board of County Commissioners to perform a Preliminary Design Study (PDS) for widening 0.65 miles of Vineland Avenue from the driveway of the Marriott Village at Lake Buena Vista to directly in front of the Basilica of the National Shrine of Mary, Queen of the Universe (MQOTU). The objective of the PDS is to analyze the impacts and implications of widening Vineland Avenue and to evaluate a no build and various build project alternatives and recommend a preliminary design alternative which will be used to develop final construction plans. The PDS report will summarize the study to include Public Involvement, Data Collection, Traffic Data, Roadway Design, and Drainage and Environmental Impacts.

Engineering and environmental data, Orange County goals and objectives, input from the public and local utility companies, and the application of current roadway design standards were evaluated and developed during the study process to provide potential alternatives to the improvement of Vineland Avenue. The alternatives were evaluated based on estimated right-of-way costs and environmental impacts. The criteria used for evaluation during the study is discussed in *Chapter 7*. The conceptual plans for the recommended improvements are included in ***Appendix A.***

2.2 Project Description

The Vineland Avenue corridor provides connection from Apopka-Vineland Road (CR 435) at Interstate 4 northward ultimately ending at International Drive. The section of Vineland Avenue under investigation spans from the driveway at Marriott Village at Lake Buena Vista to MQOTU. The existing section is developed and contained within existing commercial and residential areas to the east and Interstate 4 to the west. There is one northbound and one southbound travel lane with turn lanes throughout. There is currently only sidewalk on the east side of Vineland Avenue. ***Figure 2 below*** illustrates the limits of the project study.

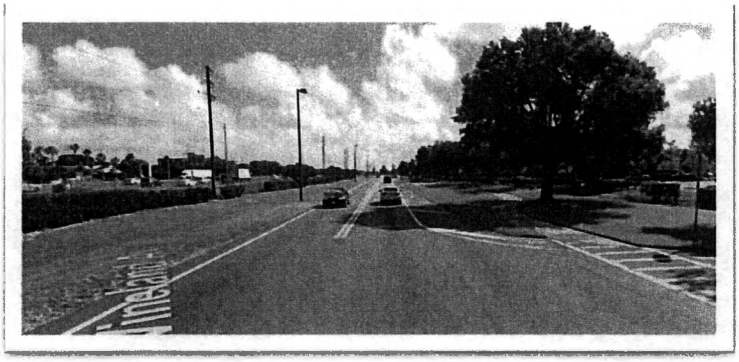
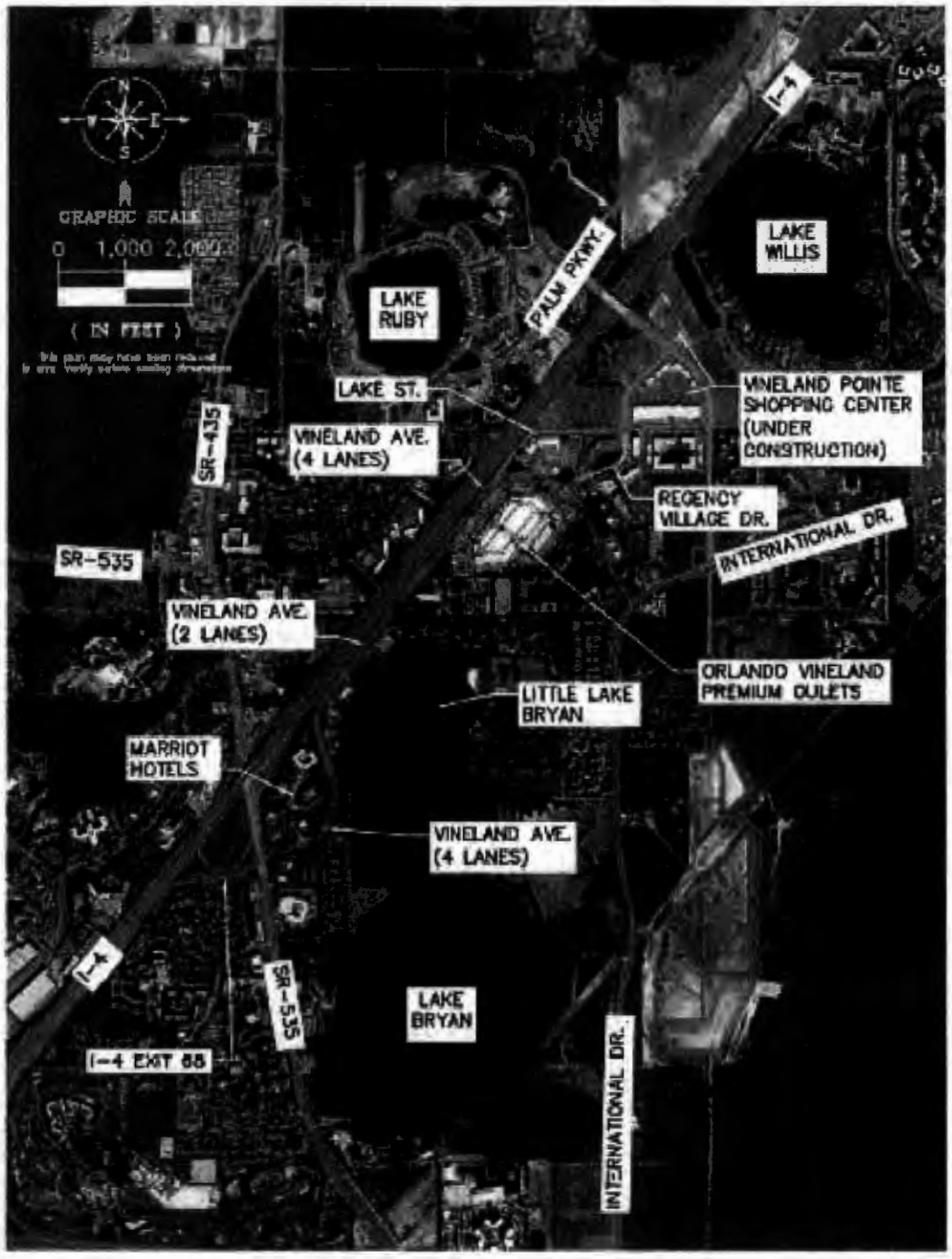


Figure 2- 1: Perspective View of Vineland Avenue looking North



HARRIS

LOCATION MAP

FIGURE 2

CHAPTER 3

Need for Improvements

3.0 Need for Improvements

This section focuses on the factors contributing to the need for improvements on Vineland Avenue.

3.1 Need for Improvements

The need for improvements to Vineland Avenue is based on several factors

- ***Roadway Capacity*** – The existing roadway section capacity is at saturation level and currently operating at a Level of Service (LOS) F.

- ***Future Development*** – Vacant land surrounding the study corridor is expected to be developed in the near future, as well as the Vineland Pointe development to the north and the Interstate 4 widening and interchange.

- ***Safety*** – The reduction from 2 to 1 lane northbound on Vineland Avenue from Apopka-Vineland Road (CR 435) creates a safety concern for users of the corridor. In addition, portions of existing sidewalk do not meet Americans with Disabilities Act (ADA) standards and will need to be regraded. A west side sidewalk, median and additional lighting are needed to enhance safety.

3.2 Roadway Capacity

The existing operating conditions along Vineland Avenue and intersecting roadways during AM and PM peak hour periods were evaluated during the study, below are summaries of the finding. For details of the study, please refer to the *Design Traffic Technical Memorandum* included in the ***Appendix F*** of this PDS report.

3.2.1 Existing Condition Level of Service Analysis

Existing traffic volumes on Vineland Avenue is 23,000 AADT within the segment of question. Using the FDOT generalized AADT volume threshold, a roadway segment analysis was conducted. Based on the analysis, the area in question on Vineland Avenue is operating at a LOS of F.

The portion of Vineland Avenue where the project is located is currently operating at a Level of Service (LOS) F due to high traffic volume. The corridors immediately north and south of the project corridor are currently operating at a LOS C. The widening of this portion of Vineland Avenue is needed to bring LOS for the project corridor to an acceptable level, and to alleviate bottle the neck and allow the entire Vineland Avenue to be consistently four-lane. Currently the intersection of Vineland Avenue and Little Lake Bryan Parkway operates at LOS F, signalization is needed at this intersection, which is part of the project.

3.2.2 Future Condition Level of Service Analysis

By the design year, 2045, traffic volumes are expected to increase to 30,000 ADT. The study segments are anticipated to operate below the adopted LOS capacity by the opening year. With the proposed build scenario, the study segment is anticipated to operate at an adequate LOS in the design year.

3.3 Safety

Crash information was obtained from Signal Four Analytics for 2014 through 2018. A total of 377 crashes occurred during the five-year period between Apopka-Vineland Road (CR 435) and International Drive. The predominant crash type was the Rear End crashes (43%) followed by Left Turn crashes (19%). The Crash by Type information is summarized in ***Table 3-1***.

Table 3- 1: Vineland Avenue Crash Data from 2014 to 2018

Crash Type	2014	2015	2016	2017	2018	Total
Right Angle	24	13	5	3	-	**45**
Left Turn	-	-	28	16	26	**70**
Right Turn	-	-	4	1	5	**10**
U-turn	-	-	3	1	3	**7**
Sideswipe	6	8	17	10	14	**55**
Rear End	19	23	48	28	45	**163**
Backed Into	-	-	1	1	-	**2**
Pedestrian	2	-	1	2	1	**6**
Bicycle	-		-	1	-	**1**
Motorcycle	2	1				**3**
Head on	-	-	-	-	1	**1**
Hit Utility Pole	-	-	1	-	-	**1**
Off Road	-	-	-	1	-	**1**
Rollover	-	-	-	1	-	**1**
Other	6	5	-	-	-	**11**
Total	**59**	**50**	**108**	**65**	**95**	**377**

The reduction of lanes from two to one lane (in one direction) may have contributed to the Rear End and Sideswipe crashes. The proposed widening will address this issue.

Currently there is no sidewalk on the west side of the project corridor to provide for safe pedestrian traffic, therefore a west side sidewalk and median is needed. As part of this widening project, a west side sidewalk and median will be provided, along with additional lighting to enhance the safety for both motorist and pedestrians.

3.4 Future Development

The last remaining vacant parcel along the Vineland Avenue project segment has a new site plan application submitted to Orange County (by others). An increase in development will increase the need for improvements along this corridor.

A commercial development known as Vineland Pointe to the north of the project area, southwest of Lake Willis is currently being developed. It includes retail and restaurants. The widening of Vineland Avenue in the project area is needed to serve this development as it relates to increased traffic capacity.

In addition, this project will also serve the potential future interchange at Interstate 4 and Daryl Carter Parkway.

CHAPTER 4

Existing Corridor Conditions

4.0 Existing Corridor Conditions

This section presents an overview of the existing physical characteristics and conditions of the Vineland Avenue study corridor.

Vineland Avenue spans from Apopka-Vineland Road (CR 435) on the south end to International Drive on the north end. Currently Vineland Avenue is a four-lane roadway, with the exception of the portion between Marriott Village at Lake Buena Vista to MQOTU (the project corridor), which is two-lane. There are intermittent left turn lanes and yellow stripped islands throughout the project corridor. There is a sidewalk along the entire eastern side of the study area. Bicycle lanes are not present. The current right-of-way width varies from 75 feet to 102 feet. The existing roadway does not have curb and gutter.

The roadway segment currently operates at a failing Level of Service with an Annual Average Daily Traffic count of 23,000. Crash data for this area reveals a large percentage of rear-ending and side-swiping as a result of the sudden narrowing of lanes on either end of the study area. With the high capacity for the Little Lake Bryan Parkway intersection due to the Basilica, the *Design Traffic Technical Memorandum* addresses the possibility of signalizing that intersection with Vineland Avenue as well.

4.1 Roadway and Sidewalk Characteristics

The study corridor consists of a two-lane major collector roadway. The roadway contains 11 to 12-foot travel lanes and 0 to 4-foot paved shoulders.

There is a 5 to 7-foot wide sidewalk running along the east side of Vineland Avenue's entirety. There are no other pedestrian features in the remainder of the study area. Additionally, there are no bicycle lanes. There are ponding on portions of the sidewalk. Below is a table demonstrating the portions of existing Vineland Avenue eastern sidewalk that are non-compliant with ADA standards.

Preferred Alternative (3) Station	Non-ADA Compliant Sidewalk Cross Slope (%)	Side of Vineland Avenue
5+44	2.4	East
5+97	2.8	East
10+95	2.2	East
13+56	2.1	East
14+85	2.4	East
15+38	2.6	East
42+11	2.2	East
42+28	2.2	East
4+90	2.4	West

5+95	2.7	West
10+22	5.8	West
10+47	4.8	West
11+79	2.5	West
12+28	2.6	West
12+81	2.5	West
13+02	3.1	West
13+30	2.4	West

The existing right-of-way width is primarily 98 feet to 102 feet throughout the study area with a 75 foot wide pinch point near the Panera Bread location.

4.2 Crash Data

Crash information was obtained from Signal Four Analytics for 2014 through 2018. The information was previously summarized in *Table 3-1*. Please see *Design Traffic Technical Memorandum* dated 1/2020, prepared by Traffic & Mobility Consultants for detailed crash data.

4.3 Existing Transportation Network

The existing transportation network within the study area is comprised mainly of the current roadway system. Only Lynx Bus #8 and the I-Drive Trolley operate on the north end of Vineland Avenue out of the study area. Disney cast shuttles are utilized within the residential communities east of the project corridor along Little Lake Bryan Parkway. Interstate 4 runs parallel to the west, but it is not anticipated to have direct impact on the study area. The study area also is not included in any of the Orange County trails master plan; therefore, no improvements are necessary in order to comply with trails requirements. Correspondence documentation with Orange County Public Schools has received no feedback from the District transportation system on any potential conflicts the project may cause.

4.4 Long Range Transportation Improvements

Roadway improvements are already underway to the north and completed to the south of the study area. Below lists immediate area projects. See *Design Traffic Technical Memorandum* for more information.

4.4.1 Daryl Carter Parkway

4.4.1.1 Palm Parkway to Apopka Vineland Rd / Apopka-Vineland Road (CR 435)

Daryl Carter Parkway is planned to be extended from Palm Parkway westward to Apopka Vineland / Apopka-Vineland Road (CR 435) with a new four lane roadway. The buildout year is planned for 2021.

4.4.1.2 I-4 Beyond the Ultimate

A new interchange is in the planning stage for the Beyond the Ultimate portion of Interstate 4 to be connected to Daryl Carter Parkway. Widening of the Interstate is also in the planning stages; however, there are no anticipated impacts beyond the ROW line shared with Vineland Avenue.

The planned roadway and transportation improvements are summarized in ***Table 4-1*** below.

Table 4- 1: Programmed Roadway Improvements in the Vicinity of the Study Area

Roadway Facility	Project Limits	Work Description	Responsible Agency	Work Phase	Year of Completion
Daryl Carter Parkway Extension	Palm Parkway to Apopka Vineland Road	New 4-Lane Roadway	Orange County	Construction Underway	2021
I-4 Beyond the Ultimate	Daryl Carter Parkway	Full interchange	FDOT	Not Funded	N/A
I-4 Beyond the Ultimate	E of Osceola Parkway to W of SR 528	Add 4 Managed Lanes	FDOT	Not Funded	N/A

The proposed improvements stay consistent with the Long Range Plans of Orange County by providing an enhanced system of roads, public transit, pedestrian systems, while focusing on safety, accessibility, convenience and minimizing environmental impacts.

4.5 Lighting

There is currently lighting along the west side of Vineland Avenue for the entirety of the study area. The lighting fixtures are located on exclusive use light poles.

4.6 Existing Utilities

There are several existing utilities within the corridor which include electric lines, water lines, fiber optic cables and gravity mains. The details of the existing utilities are provided below in ***Table 4-2.*** As part of this Study, utility companies were contacted to provide feedback on any potential issues the future roadway may cause and how to mitigate. The costs for these mitigations are included in the Construction Cost Estimate. It is anticipated that the cost of utilities relocation will be similar in all of the roadway alignment alternatives.

Table 4- 2: Existing Utilities

Utility	Type
American Traffic Solutions	Electric / Communication Lines
Charter Communications	Fiber Optic, Telephone, CATV
Florida Gas Transmission	Gas
Duke Energy	Electric
MCI	Fiber / Communication Lines
OCU - Wastewater	Sewer Wastewater
OC Public Works	Fiber / Traffic Signals

OCU	Water
Summit Broadband	Fiber Optic / Telephone
TECO	Gas
Reedy Creek Energy	Gas, Water, Sewer, Communications, Fuel Oil
Smart City Telecom	Fiber / Telephone
Centurylink	Fiber / Telephone

4.7 Pavement Conditions

The existing pavement is in fair condition with minor cracking and rutting.

4.8 Geotechnical

Preliminary geotechnical evaluations for the roadway and for the pond were completed as part of the Vineland Avenue PDS, as documented in the ***Supporting Document*** titled *Roadway Soil Survey Report*, and *Geotechnical Engineering Report Vineland Avenue PDS – Stormwater Ponds.*

According to the "Lake Jessamine, FL" and "Windermere, FL" USGS Quadrangle Maps, the natural ground surface contours (5 foot), in the project area, are from +110 feet to +115 feet. The USGS Quadrangle Maps are shown in ***Figure A-1***.

4.8.1 Soil Exploration

The United States Department of Agriculture (USDA) Soil Survey map of the study area can be found in ***Figure A-2***. A summary of the soils in the study area is presented in ***Table 4-3.***

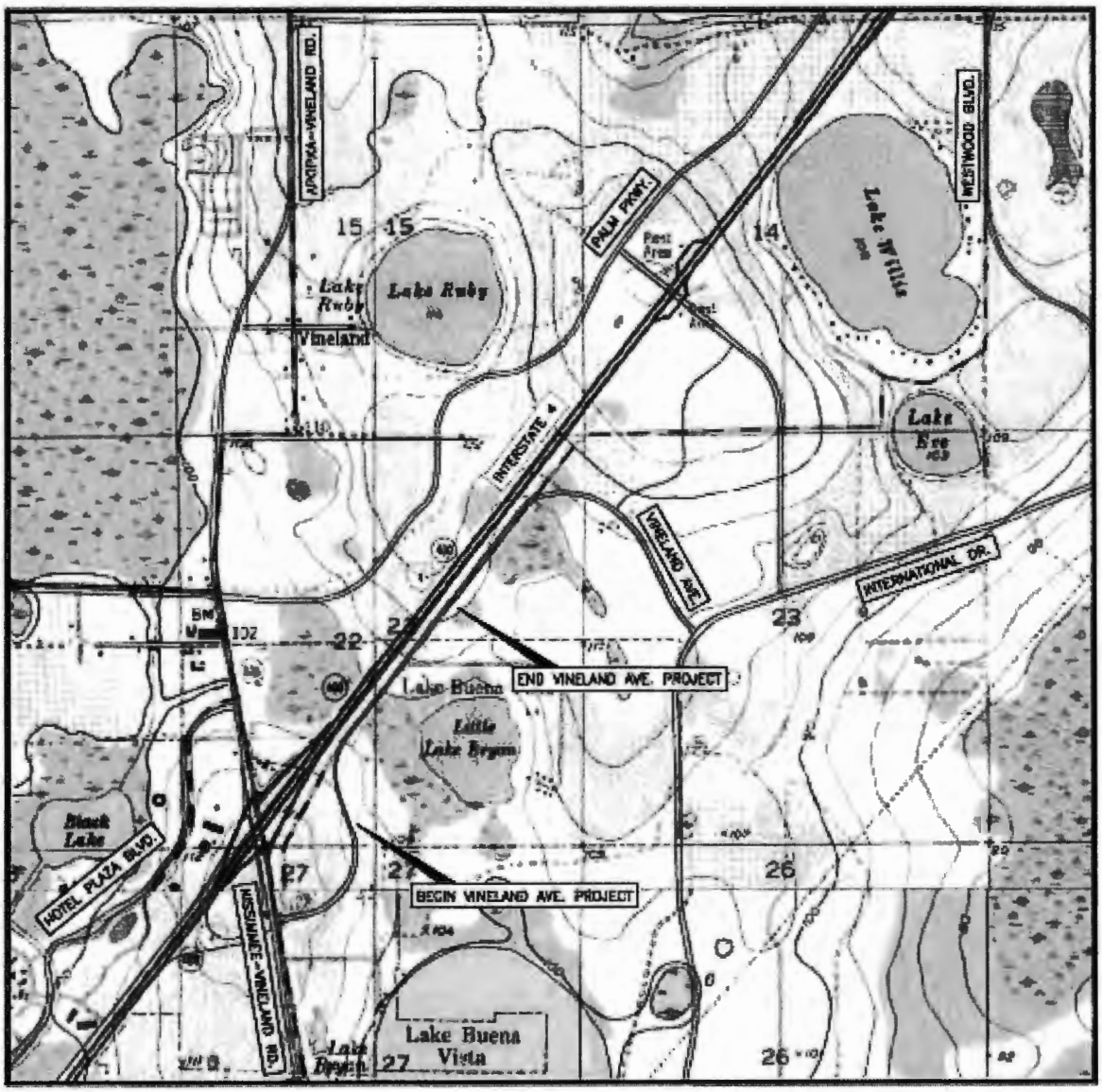
Table 4- 3: Near Surface Soil Units

USDA Map Symbol	USDA Soil Name	Depth of Season High Groundwater Table for Site Soils in Natural Conditions
20	Immaokalee fine sand	Within 10 inches
34	Pomello fine sand, 0 to 5 percent slopes	20 to 40 inches
38	St. Lucie fine sand, 0 to 5 percent slopes	More than 72 inches
44	Smyrna fine sand	Within 10 inches
54	Zolfo fine sand	24 to 40 inches

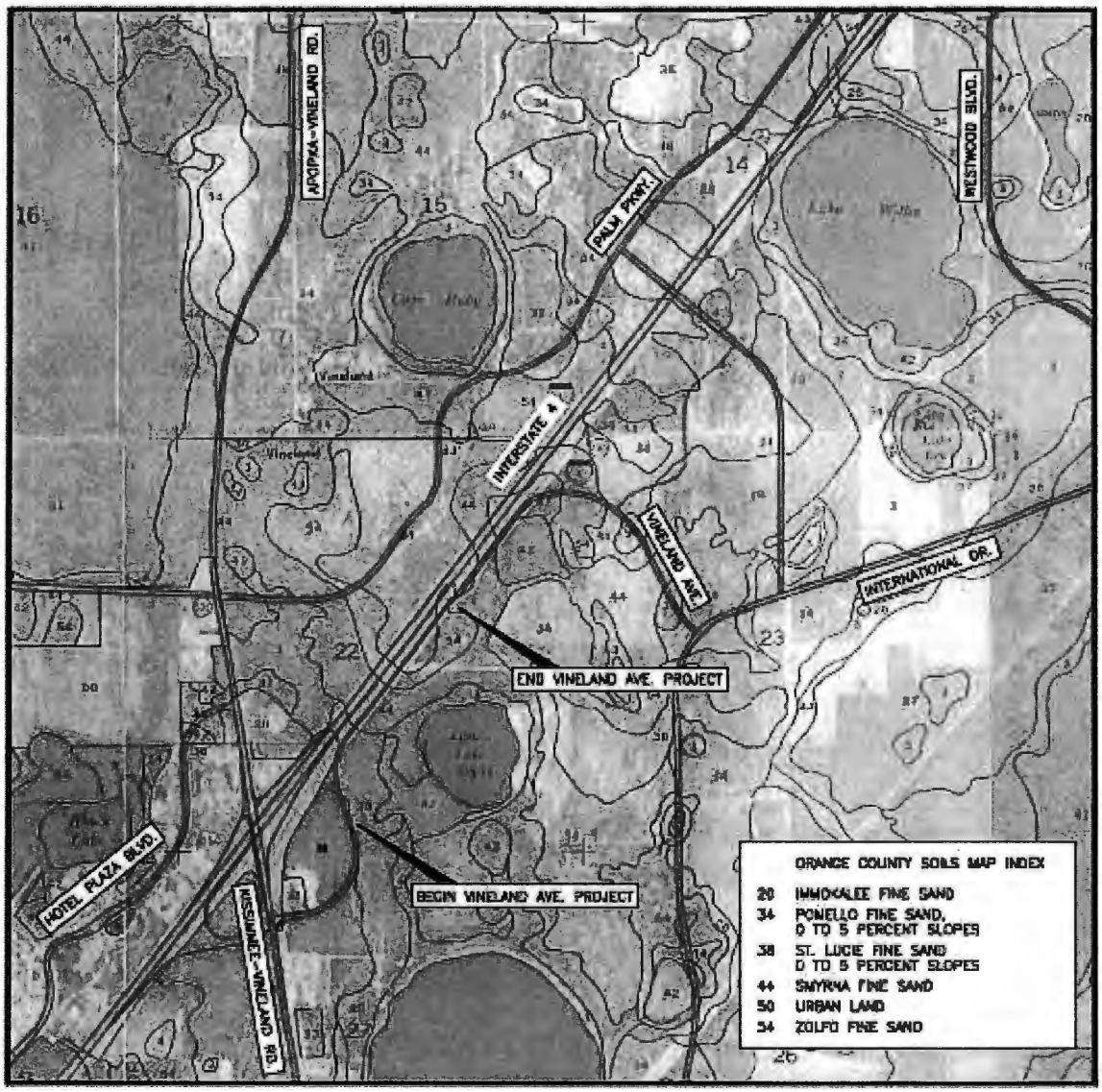
The subsurface exploration consisted of hand auger borings and Standard Penetration Test (SPT) borings to depths of 2 to 20 feet below the existing ground surface.

The hand auger boring procedure consisted of manually turning a 3-inch diameter, 6-inch long sample into the soil until it was full. The sampler was then retrieved and the soils in the sampler were visually examined and classified. The procedure was repeated until the desired termination depth was achieved. Samples of representative strata were obtained for further visual examination and classification in the laboratory.

There were several strata, visually identified and laboratory tested, that were found in the study area. Descriptions of the soils encountered in the borings, and the ASSHTO classification symbols are presented in ***Table 4-4***. It should be noted that soil transition between soil types is gradual and layer boundaries between soil types are considered approximate.



Project Mngr: XZ	Project No: H1165069	Terracon Consulting Engineers and Scientists	TOPOGRAPHIC VICINITY MAP	EXHIBIT
Drawn By: SW	Scale: AS SHOWN		GEOTECHNICAL ENGINEERING EVALUATION VINELAND AVENUE ROADWAY IMPROVEMENTS MULBERRY PARK DRIVE AND LITTLE LAKE BRYAN PARKWAY ORLANDO, ORANGE COUNTY, FLORIDA	A-1
Checked By: XZ	File No: H1165069-1			
Approved By: AMR S.	Date: 3-23-17			



U.S.D.A. SOIL SURVEY FOR ORANGE COUNTY, FLORIDA
ISSUED: 1989

SECTION: 22
TOWNSHIP: 24 SOUTH
RANGE: 28 EAST

Project Mngr: XZ	Project no: H1165069	Terracon Consulting Engineers and Scientists	U.S.D.A. SOILS MAP	EXHIBIT
Drawn By: SW	Scale: AS SHOWN		GEOTECHNICAL ENGINEERING EVALUATION VINELAND AVENUE ROADWAY IMPROVEMENTS MULBERRY PARK DRIVE AND LITTLE LAKE BRYAN PARKWAY ORLANDO, ORANGE COUNTY, FLORIDA	A-2
Checked By: XZ	File no: H1165069-2			
Approved By: AMR S.	Date: 3-23-17			

Table 4- 4: Soil Stratification

Stratum No.	Description	ASSHTO Classification
1	Gray to brown fine sand to fine sand with silt	A-3
2	Gray to dark brown fine sand to fine sand with silt, with occasional aggregates, limestone base and root organics	A-3
3	Gray to dark brown silty fine sand	A-2-4
4	Dark brown organic silty fine sand to sandy peat	A-8
5	Gray silty with sand	A-4

4.8.1.1 Roadway

The roadway borings typically encountered Stratum 1 and Stratum 2, with Stratum 3 intermittently encountered at various depths and thicknesses in the borings.

During drilling, the boreholes were observed for the presence and level of groundwater. In a majority of the borings, groundwater was observed at depths ranging from 1 to 7 feet below existing grade.

4.8.2 Preliminary Evaluation

The data obtained in the field exploration and experience with similar subsurface conditions and construction types were used to evaluate the project characteristics previously outlined. The evaluation is presented in this section.

4.8.2.1 Roadway Borings

The material from Strata 1, 2 and 3 (A-3, A-2-4) can be classified as Select (S) and can be used as embankment material in accordance with Index 505 of the Florida Department of Transportation (FDOT) Roadway and Traffic Design Standards. The material from Strata 3 (A-2-4) may retain excess moisture and may be difficult to compact.

The material from Stratum 4 (A-8) should be treated as muck (M) and removed in accordance with Index 500 and 505. This material should not be used in the portion of embankment inside the control line.

The material from Stratum 5 (A-4) should be classified as Plastic (P). This material should be treated in accordance with Index 500 and 505.

If plastic and/or organic materials are encountered along the project alignment during construction, at locations that were not indicated on this report or where soil borings were not preformed, these materials should be removed in accordance with FDOT Index 500 and 505.

For a non-lime rock base, typically, a minimum separation of 1 foot is recommended between the seasonal high groundwater level and the bottom of an asphalt or soil cement base. Once cross sections are available for review, an evaluation of the clearance between the estimated seasonal high groundwater level and the bottom of the roadway base will be performed.

4.8.2.2 Pond Borings

Subsurface exploration was also performed for the proposed pond locations. Please refer to *Geotechnical Engineering Report Vineland Avenue PDS – Stormwater Ponds* dated 9/27/2019, prepared by Terracon.

The subsurface exploration for the preferred pond location (Drainage Alternative #1, referred to as "Northern" in the Geotechnical Report) advanced to a depth of twenty (20) feet below existing grade. Groundwater was encountered at grade (Boring B-1 & B-2). Estimated Seasonal High Groundwater Table (ESHGWT) is anticipated to be above existing ground surface.

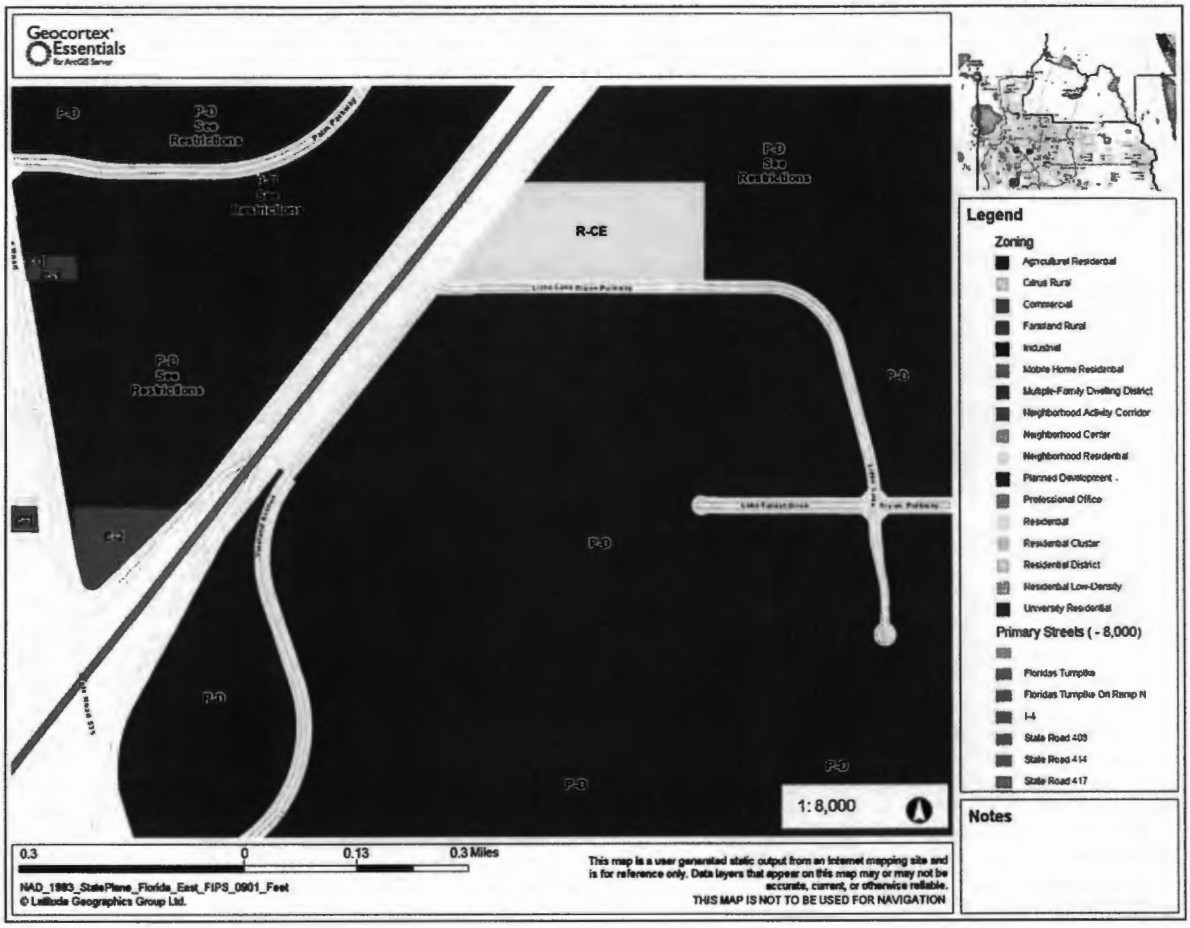
4.9 Potential Contamination Issues

The closest documented site is within the study area: LLB Convenience & Gas Inc. (Facility ID: 9809810) at 8788 Vineland Avenue is a listed Petroleum DEP Cleanup Site. No others are listed in ¼ mile radius. Florida Department of Environmental Protection's (FDEP) online Contamination Locator Map was used to locate and evaluate the study area.

4.10 Land Uses

4.10.1 Current Zoning

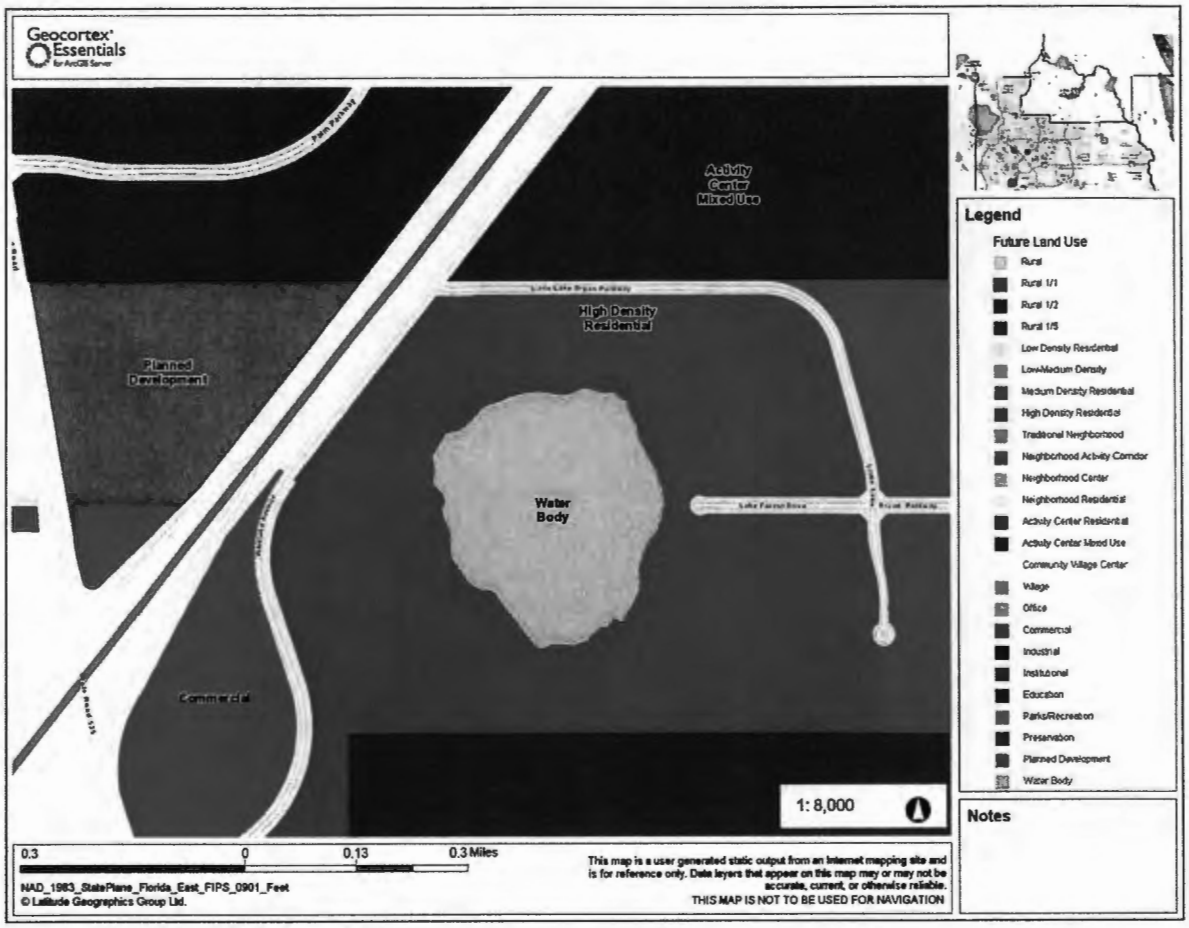
The current zoning along Vineland Avenue consists of Primary Road to the west (Interstate 4); on the east side of Vineland Avenue is predominantly Planned Development (PD) with one parcel (MQOTU) zoned Residential – Country Estates. There is no proposed zoning change due to the widening project.



4.10.2 Future Land Use

The Future Land Use in the Vicinity of the project corridor consists of Primary Streets on the west (Interstate 4); Activity Center Mixed Use on the northern end of the project corridor; High Density Residential adjacent to the middle portion of the project corridor; and Commercial on the southern end of the project corridor.

There is no proposed land use amendment due to the widening project.



4.11 Cultural Features

This section discussed cultural features that are found within the study area.

Schools

There are no schools that fall within the study area. The following schools are zoned for the area:

- Freedom High School
- Freedom Middle School
- Tangelo Park Elementary

Religious Institutions

The Basilica of the National Shrine of Mary, Queen of the Universe (MQOTU) is a religious institution within the project corridor. The church consists of 2,000 seats and requires the use of local authorities for traffic maintenance on a weekend basis. The campus consists of the main church, gardens, two chapels and a museum with gift shop.

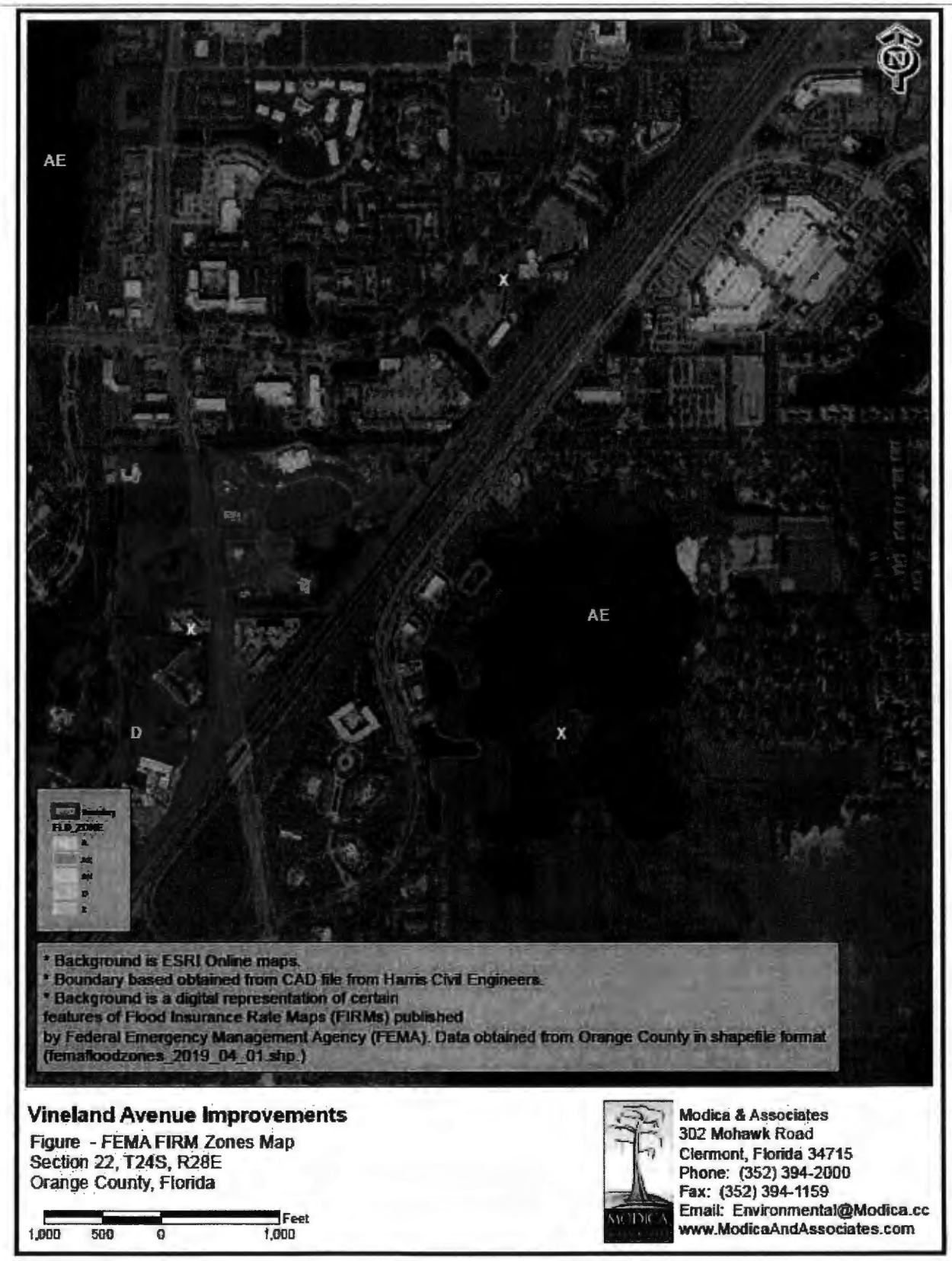
Community Centers
There are no community centers that fall within the study area.

Parks
There are no parks within the study area.

4.12 Archaeological and Historic Features
Based on the SFWMD permit for the nearby Little Lake Bryan Center, there were no archeological or historic features found in the study area. It should be noted that the Florida Department of State's Division of Historical Resources (DHR) may request a Cultural Resource Assessment Survey at the time of permitting for this proposed Vineland Avenue widening project.

4.13 Hydraulic and Natural Features
4.13.1 Existing Drainage Features
In the study area, stormwater flows off the roadway into adjacent swales which conveys the water to water quality ponds behind the commercial center. The pond then discharges to Little Lake Bryan where it is attenuated before discharging south to Lake Bryan. Two (2) soil borings in the wetlands were taken for the purposes of determining a Seasonal High Water Table for any potential stormwater pond feature.

4.13.2 Floodplains and Floodways
Based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM Maps #12095C0415F and #12095C0395F), the site is located in Zone X (500 Year) floodplain. The area beyond the roadway where the proposed pond is located near the Zone AE (100 year floodplain with established Base Flood Elevation (BFE) of 100.3) brought about by Little Lake Bryan. Efforts will be made to configurate the layout of the proposed pond in the final design phase to avoid encroachment into the 100-year floodplain. Therefore, floodplain compensation is not anticipated.


AE
X
AE
X
D
X
FLD_ZONE
* Background is ESRI Online maps.
* Boundary based obtained from CAD file from Harris Civil Engineers.
* Background is a digital representation of certain features of Flood Insurance Rate Maps (FIRMs) published by Federal Emergency Management Agency (FEMA). Data obtained from Orange County in shapefile format (femafloodzones_2019_04_01.shp.)
Vineland Avenue Improvements
Figure - FEMA FIRM Zones Map
Section 22, T24S, R28E
Orange County, Florida
Feet
1,000 500 0 1,000
Modica & Associates
302 Mohawk Road
Clermont, Florida 34715
Phone: (352) 394-2000
Fax: (352) 394-1159
Email: Environmental@Modica.cc
www.ModicaAndAssociates.com

4.13.3 Wetlands

The proposed roadway improvements result in an impact to surrounding wetlands and uplands. ***Figure 6*** displays the land use, defined by the Cover and Forms Classification System (FLUCFCS, FDOT 1999).

The jurisdictional wetlands are regulated and constrained by the South Florida Water Management District (SFWMD), the U.S. Army Corps of Engineers (ACOE), and Orange County Environmental Protection Division (OCEPD). Special permits and wetland mitigation are required when impacting wetlands. Additionally, because the wetlands and uplands buffers surrounding Little Lake Bryan are under a conservation easement, a conservation easement release would have to be obtained for the remainder of Drainage Alternative #1 not included in the Little Lake Bryan Center Permit (SFWMD Permit 48-00780-S-09 modified August 2017).

Drainage Alternative #1: 630 – Wetland Forested Mixed

This area consists of a wetland forested mixed community. Species found here include red maple, sweetbay magnolia, wax myrtle, primrose willow, and grapevine. Understory species consist of a variety of ferns such as royal fern, netted chain fern and cinnamon fern.

Drainage Alternative #2: 190 – Other Open Land

This category includes undeveloped land within urban areas and inactive land with street patterns but without structures. Open Land normally does not exhibit any structures or any indication of intended use. Often, urban inactive land may be in a transitional state and ultimately will be developed into one of the typical urban land uses although at the time of the inventory, the intended use may be impossible to determine from aerial photo interpretation alone.

This area would be classified as open land as at it consists of maintained bahiagrass. It is located directly west of the wetlands along Little Lake Bryan.

Vineland Avenue Improvements
Figure 6- Land Use Map
Section 22, T24S, R28E
Orange County, Florida

MODICA & ASSOCIATES
302 Mohawk Road
Clermont, Florida 34715
P: (352) 394-2000
F: (352) 394-1159
Email: Environmental@Modica.cc
www.ModicaAndAssociates.com

4.14 Threatened and Endangered Species

The project area was surveyed for the presence and potential of occurrence of protected wildlife and plants. The following section discusses the results.

4.14.1 Listed Wildlife

Based on the Florida Natural Areas Inventory (FNAI) species tracking list for Orange County, there were several species identified as having the potential for occurrence in or near the project area. ***Table 4-5*** summarizes the habitat descriptions and potential for occurrence of these species within the study area. The Environmental Report from SFWMD Application No. 170414-8, Little Lake Bryan Center (the Fishbones' parcel), has been included in ***Appendix K*** to also show the low occurrences of listed species.

Table 4- 5: Protected Wildlife Species, Habitat Descriptions, and Potential for Occurrence

Species	Status[1]		Habitat	Potential for Occurrence
	USFWS[2]	FFWCC[3]		
BIRDS				
Aphelocoma coreulescens Florida Scrub-Jay	T	T	Xeric oak scrub with low-growing oaks and a ground layer with 10-50% unvegetated, sandy openings	Low
Haliaeetus leucocephalus Bald Eagle	P	--	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Low
Mycteria americana Wood Stork	E	--	Freshwater wetlands, calm waters, no dense thickets of vegetation	Low
REPTILES				
Neoseps reynoldsi Sand Skink	T	T	Spends its lifecycle beneath the surface of sandy soils.	Low
Gopherus Polyphemus Gopher Tortoise	--	T	Dry upland areas such as sand hills, scrub, xeric oak hammock, and dry pine flatwoods.	Low

[1]T=Threatened; E=Endangered; P= Protected under Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act
[2]USFWS=U.S. Fish and Wildlife Service
[3]FFWCC= Florida Fish and Wildlife Conservation Commission

4.14.2 Protected Flora

No protected floral species were identified within the project area. There is a low potential for listed floral species to exist on the project site, due to the anthropogenically disturbed and maintained nature of a majority of the project site and vicinity. Further, there are typically no developmental constraints associated with listed floral species that occur on privately owned lands.

CHAPTER 5

Design Controls and Standards

5.0 Design Controls and Standards

5.1 Roadway Design Criteria

The FDOT Plans Preparation Manual, the FDOT Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System, and the Manual of Uniform Traffic Control Devices, as well as Orange County standards provide the basis of design criteria for the Vineland Avenue PDS.

Specific design criteria used for the development of the proposed design are shown in the ***Table 5-1*** below.

Table 5- 1: Vineland Avenue Roadway Design Criteria

Criteria	Value
Functional Classification	Urban Collector
Design Speed	40 mph (Posted 35 mph)
Level of Service	E or better
Lane Widths	12 feet
Sidewalk Width	6 feet
Median Width	28 feet
Curb Type	Type F (outside) Type E (inside)

5.2 Drainage Criteria

For the purposes of this study, stormwater design criteria will need to meet the requirements of the South Florida Water Management District (SFWMD) and Orange County. The following design criteria will be critical in determining the pond sizing property requirements for the stormwater ponds needed for the roadway widening project.

- Wet Detention: Treatment volume to be greater of one inch of runoff over basin or 2.5 inches of runoff over the increase in impervious area within the project limits (SFWMD criteria).

- Pond dimensional criteria: 0.5 acre minimum area, 100 feet minimum width for linear areas in excess of 200 feet length, and a 4:1 (horizontal: vertical) minimal slope from top of bank out to a minimum depth of two feet below the control elevation, or an equivalent substitute. Side slopes shall be top soiled and stabilized through seeding or planting from 2 feet below to 1 foot above the control elevation to promote vegetative growth.

The pond dimensional criteria for the pond sizing calculations, as discussed above, are based on standard slopes and dimensions that are commonly used for wet detention stormwater ponds.

CHAPTER 6

Traffic

6.0 Traffic

This chapter presents a summary of the existing traffic conditions as well as the future traffic projections for Vineland Avenue as documented within the *Design Traffic Technical Memorandum (DTTM)* developed as a ***Supporting Document*** of this study.

Traffic counts were conducted at pertinent roadway sections and intersections along the study area. The following intersections were evaluated:

- Apopka-Vineland Road (CR 435) at Vineland Avenue
- Vineland Avenue at Little Lake Bryan Parkway
- Vineland Avenue at Regency Village Drive
- International Drive at Vineland Avenue

Then a Level of Service (LOS) analysis was conducted using the existing traffic counts, signal timing data and roadway intersection geometry. The following sections provide details regarding the overall process and results.

6.1 Existing Conditions

6.1.1 Traffic Counts

Existing traffic count data was collected during the month of March 2019. The data collection included:

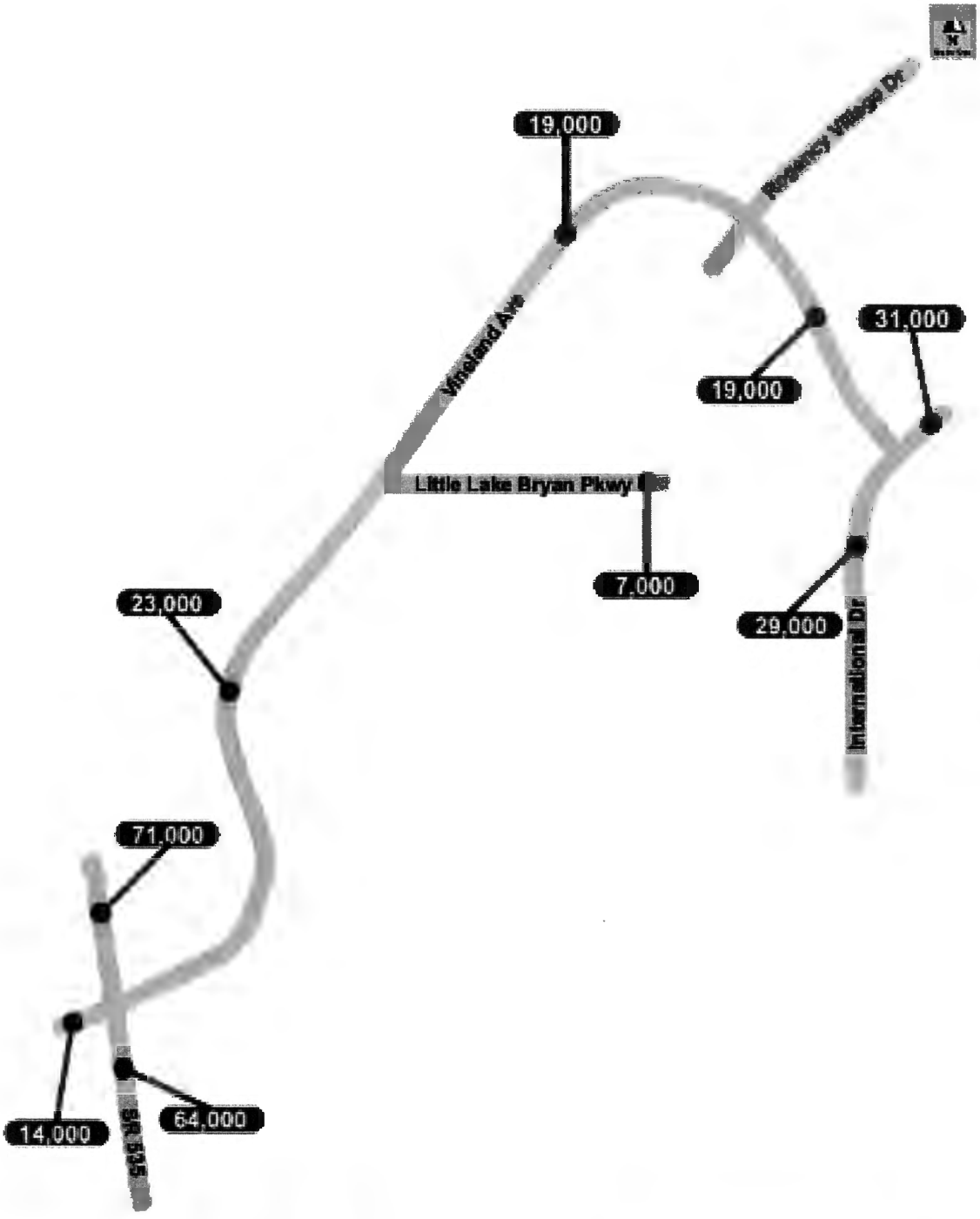
- 72-hour Classification Counts (5 locations)
- 8-hour intersection Turning Movement Counts (4 intersections)

The traffic count data collected was adjusted utilizing the FDOT axle and seasonal factor for Orange County to provide 2019 annual average conditions. As part of the traffic count program for this project, two locations north and south of Little Lake Bryan Parkway were utilized in this study for vehicle classification counts. Vehicle composition for the classification count was broken down into: passenger vehicles, medium truck and heavy trucks. The existing traffic counts are shown in ***Figure 3 below.***

6.1.2 Traffic Characteristics

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

- K—the proportion of AADT occurring in the peak design hour.
- D—the median value of the directional factors for the highest 200 hours of volumes for each continuous count station.
- T—represents the percentage composition of medium sized and heavy trucks occurring in the traffic stream. "DHT" is the percentage of truck traffic during the peak hour and is recommended as (0.5) of T-factor.



TMC

Base Year 2019 AADT
Vineland Avenue Widening PDS
19029 v1.1

Figure 3

The characteristics determined by the traffic count were compared with the factors reported in the FDOT traffic counts data. The K, D and T factors used in the analysis are provided in ***Table 6-1.***

Table 6- 1: Design Characteristics for Vineland Avenue

Factor	Measured	FDOT	Recommended
K	7.6%	9.00%	7.6%
D	55.3%	52.94%	55.3%
T Factor	2.1%	4.42%	3%

6.1.3 Existing Geometry

The existing geometry is used in evaluating the need for improvements based on projected future travel demands. The existing geometry along the study area can be found in ***Figure 6-2.***

6.1.4 Existing Year Traffic Volumes

The Adjusted Average Daily Traffic (AADT) for segments within the study area are provided in ***Table 6-2***.

Table 6- 2: Existing Traffic Volumes[†]

Roadway Name	Segment	No. of Lanes	AADT	LOS Cap	LOS
Vineland Avenue	SR 535 to Marriott Village Entrance	4	23,000	39,800	C
	Marriott to MQOTU Parking	2	23,000	15,600	F
	MQOTU Parking to Regency Village Drive	4	19,000	39,800	C
	Regency Village Drive to International Drive	4	19,000	39,800	C
Little Lake Bryan Parkway	E of Vineland Avenue	2	7,000	15,600	C
SR 535	N of Vineland Avenue	6	71,000	62,900	F
	S of Vineland Avenue	6	64,000	62,900	F
International Drive	N of Vineland Avenue	6	31,000	59,900	C
	S of Vineland Avenue	6	29,000	59,900	C

[†]Table Source: Design Traffic Technical Memorandum Prepared by TMC, 2019
MQOTU = Basilica of the National Shrine of Mary, Queen of the Universe

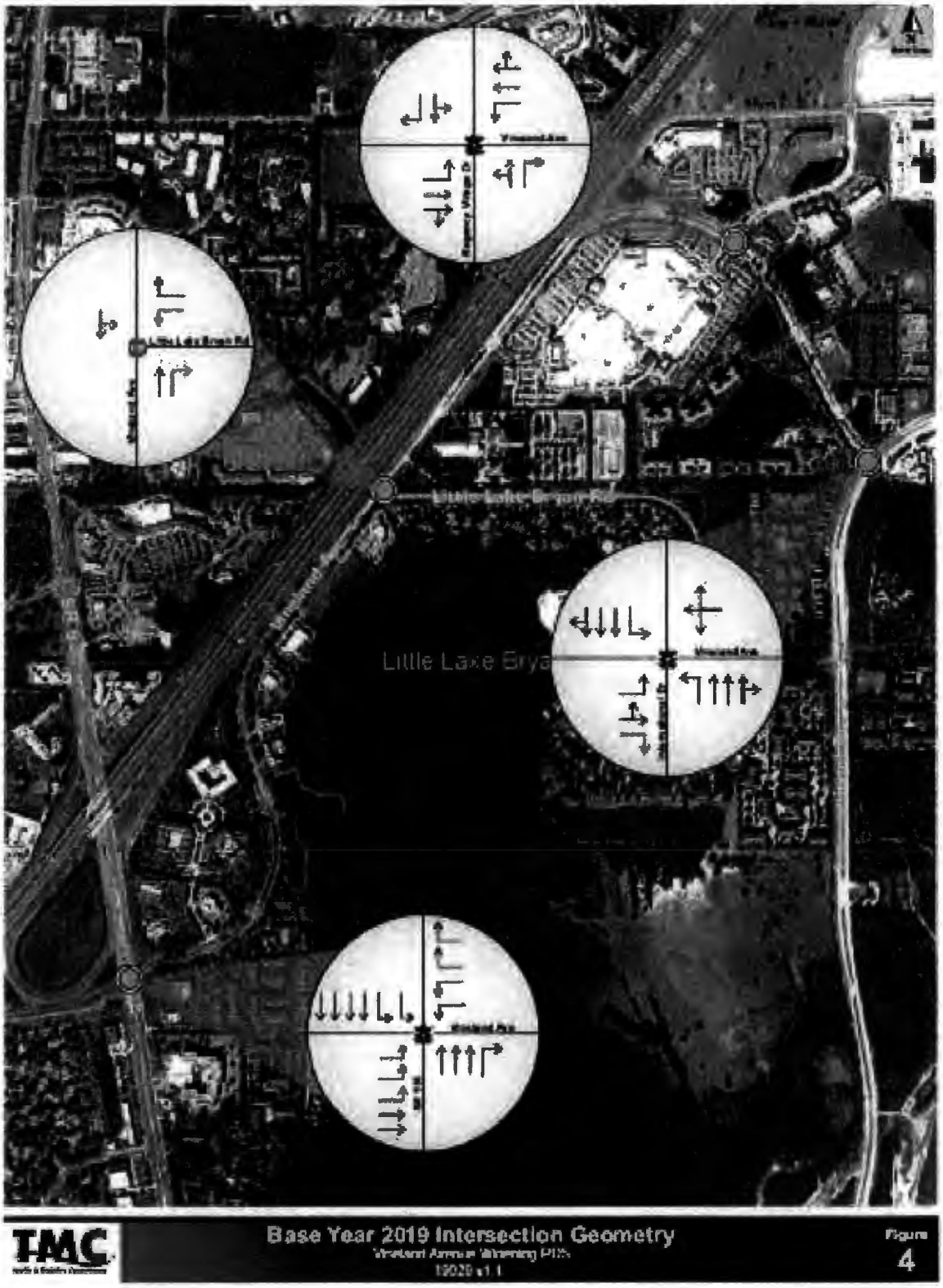


Figure 6- 1: Existing Roadway Geometry

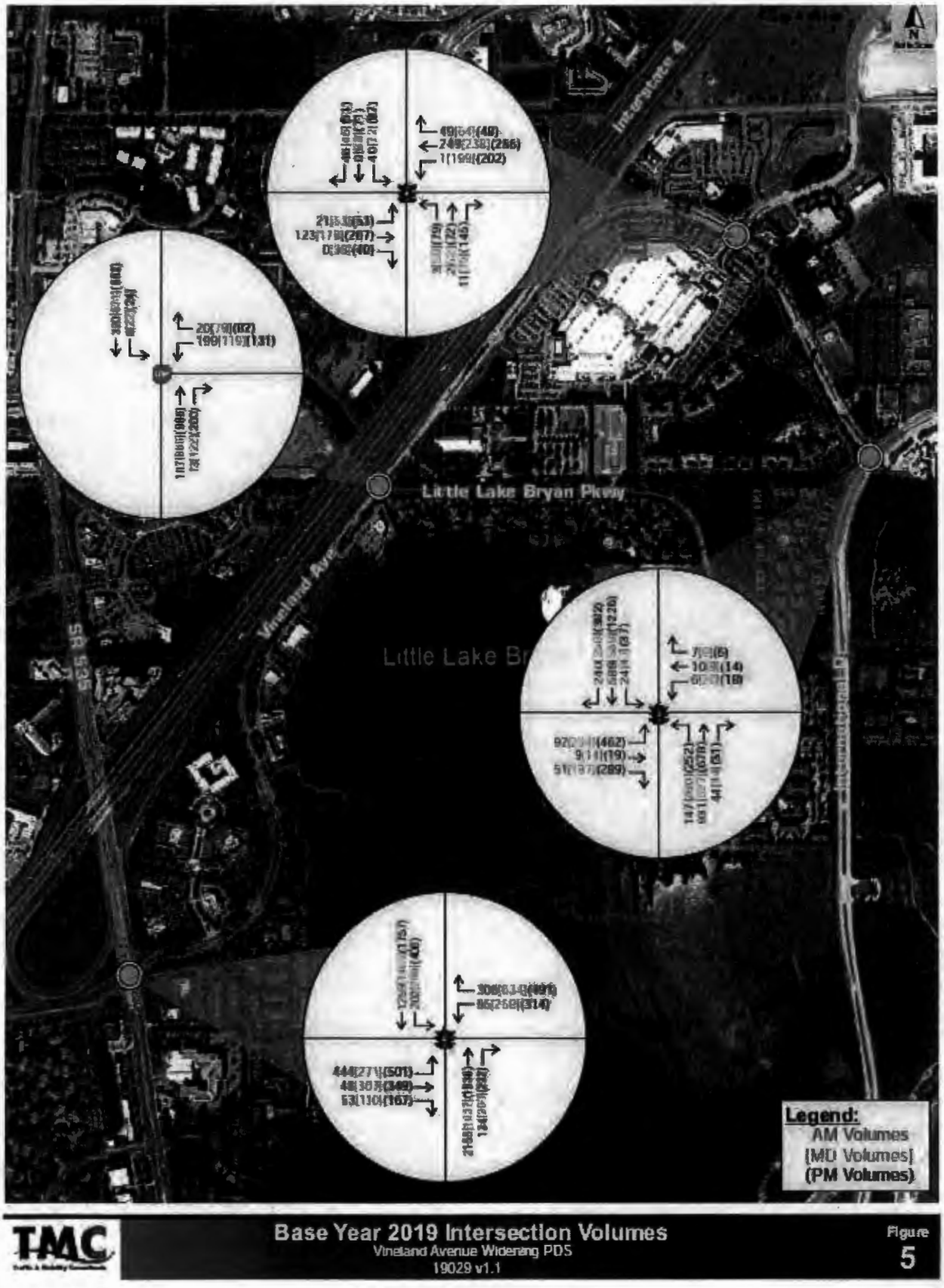


Figure 6- 2: Existing Turning Movement Counts

6.1.5 Existing Condition Level of Service Analysis

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

Vineland Avenue was evaluated to determine the existing roadway and intersection operating conditions. The results are provided and discussed in the following sections.

6.1.5.1 Roadway Segment

The study corridor was analyzed by comparing the existing daily traffic volume on Vineland Avenue and the corresponding capacity at the adopted LOS standard. The existing volumes on Vineland Avenue, as determined from the 72-hour were utilized for the analysis. From ***Table 6.2*** above, it is seen that the study area of Vineland Avenue is currently operating at an LOS of F.

6.1.5.2 Intersections

The capacity analysis at each intersection was performed using existing intersection geometry, traffic volumes during the AM and PM peak hours, and signal timing data.

Table 6-3: Existing AM/PM Intersection Capacity Analysis and LOS

Intersection	Control	Time Period	EB		WB		NB		SB		Overall	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Vineland Ave & SR 535	Signal	AM	84.1	F	--	--	20.8	C	18.9	B	28.9	C
		MD	79.4	E	--	--	28.8	C	26.3	C	37.9	D
		PM	76.7	E	--	--	37.5	D	30.7	C	44.1	D
Vineland Ave & Little Lake Bryan Pkwy	TWSC	AM	--	--	40.9	E	--	--	8.1	A	--	--
		MD	--	--	134.9	F	--	--	10.7	B	--	--
		PM	--	--	284.6	F	--	--	11.9	B	--	--
Vineland Ave & Regency Village Drive	Signal	AM	27.8	C	35.6	D	7.5	A	12.6	B	13.0	B
		MD	196.6	F	>300	F	43.6	D	28.1	C	122.0	F
		PM	250.0	F	412.6	F	36.7	D	26.1	C	137.5	F
Vineland Ave & International Dr	Signal	AM	42.4	D	40.1	D	18.3	B	9.4	A	16.7	B
		MD	34.4	C	28.8	C	91.2	F	14.9	B	48.0	D
		PM	40.9	D	26.8	C	85.2	F	21.7	C	43.9	D

The results of the analysis concluded that the intersections under investigation are generally currently operating at satisfactory overall LOS. The intersections with failing conditions are Little Lake Bryan Parkway and Vineland Avenue in the westbound approach for the Midday and PM Peak Hours, as well as the intersection of Vineland Avenue and Regency Village Drive during the Midday and PM Peak Hours.

6.2 Future Analysis Scenarios

6.2.1 Design Period

Orange County estimates the opening year target for the widening of Vineland Avenue is 2025. The following years were used to provide future traffic forecasts for the corridor:

- Existing Year—2019
- Opening Year—2025
- Mid-Year—2035
- Design Year—2045

6.2.2 Analysis Scenarios

Design traffic volumes were developed for both a no-build and build scenario. The no-build scenario assumes the roadway will maintain the existing geometry and intersection configurations. The build scenario includes widening Vineland Avenue to four lanes under three alternative geometries.

6.3 Future Year Traffic Projections

6.3.1 Future Corridor Travel Demands

Examination of historical traffic growth, proposed development in the study area, and a basic understanding of traffic circulation patterns are required for the development of traffic projections. The following sections discuss growth rates for various method, and the recommended growth factor.

6.3.2 Trends Analysis

The Trends Analysis method for determining traffic projections uses historical growth patterns to determine traffic projections. Based on the historical count information obtained from the FDOT 2018 FTO, and the 2018 Orange County Annual Traffic Counts, linear regression trends were performed for the roadway segments within the study area using historical AADT volumes; however, due to a lack of number of stations and inconsistent growth rates, the Trends Analysis is not reliable for use in this study.

6.3.3 BEBR Model

Low, medium and high population projections for Orange County were obtained from the most current population projections from *Bureau of Economics and Business Research (BEBR) Volume 52, Bulletin 183*, dated April 2019. As

outlined in the Memorandum, the BEBR reported an annual growth rate of 0.54%, 1.42% and 2.08% per year for the low, medium and high projections, respectively. The high growth rate of 2.08% was selected to be included in the final growth rate evaluation.

6.3.4 OUATS Model

Simple annual growth rates were calculated using the OUATS Cost Feasible (CF) model networks CF2025 and CF2045 Peak Season Weekly Average Daily Traffic (PSWADT) volumes at the same roadway segments for the No-Build scenario. This model generated an annual growth rate of 0.82%, which was then used in the final growth rate evaluation.

A comparison of the annual traffic growth rates, using the trend analysis and BEBR model, OUATS model and the recommended growth rate are shown in ***Table 6-4.***

Table 6- 3: Establishment of Growth Rate

	Trends	BEBR	OUATS
Vineland Avenue Study Corridor	--	2.08%	1.06%
Corridor Average and Recommended Rate			**1.6%**

6.3.5 Mainline Traffic Volume Projections

Table 6-5 shows the future year Annual Average Daily Traffic (AADT) projections for the existing year 2019, opening year 2025, interim year 2035, and design year 2045.

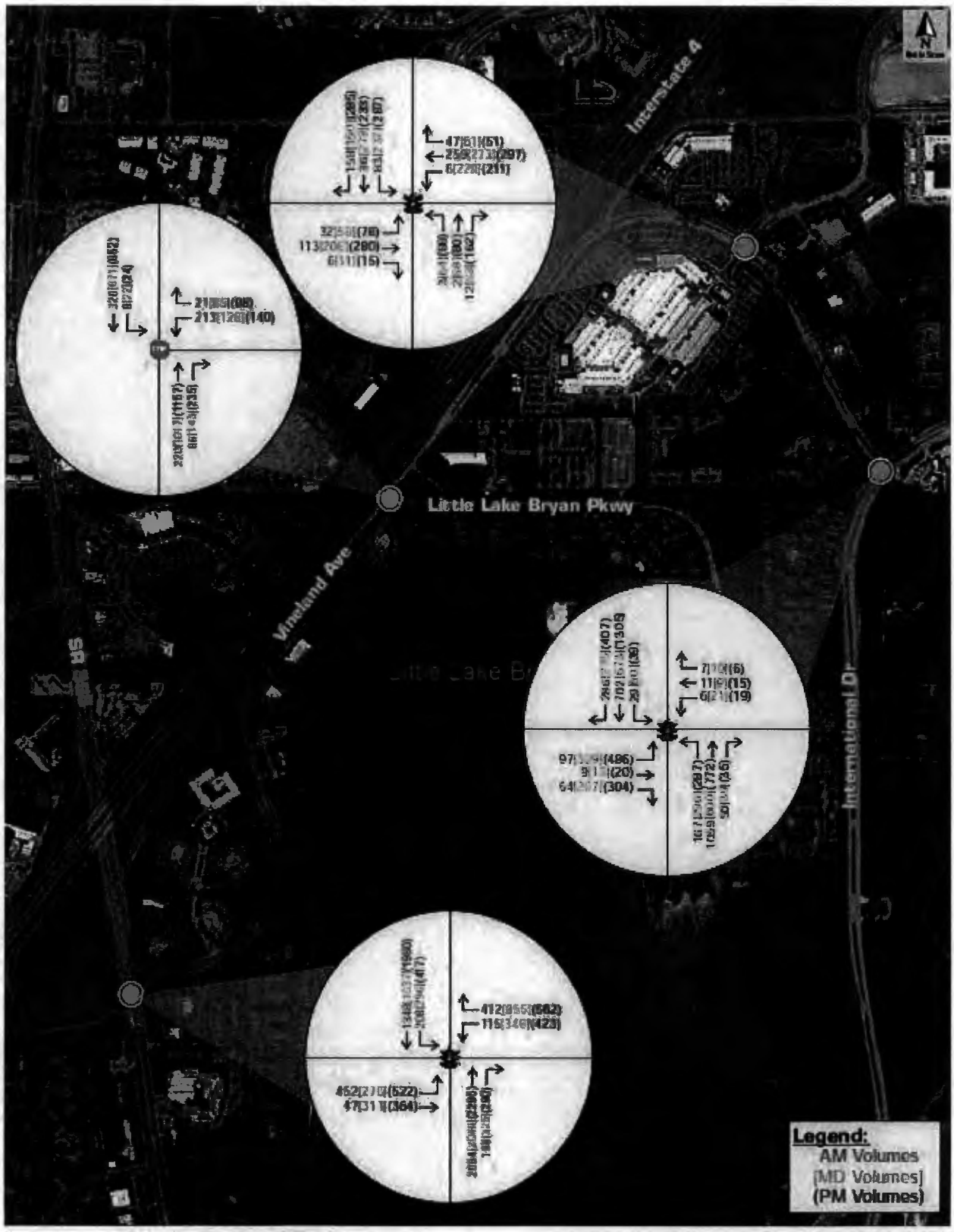
Table 6- 4: Vineland Avenue (Marriott to MQOTU) Traffic Projections

Year	AADT
Existing (2019)	23,000*
Opening (2025)	27,000
Interim (2035)	30,000
Design (2045)	30,000

*AADT Obtained from the Orange County Traffic Concurrency Management Program

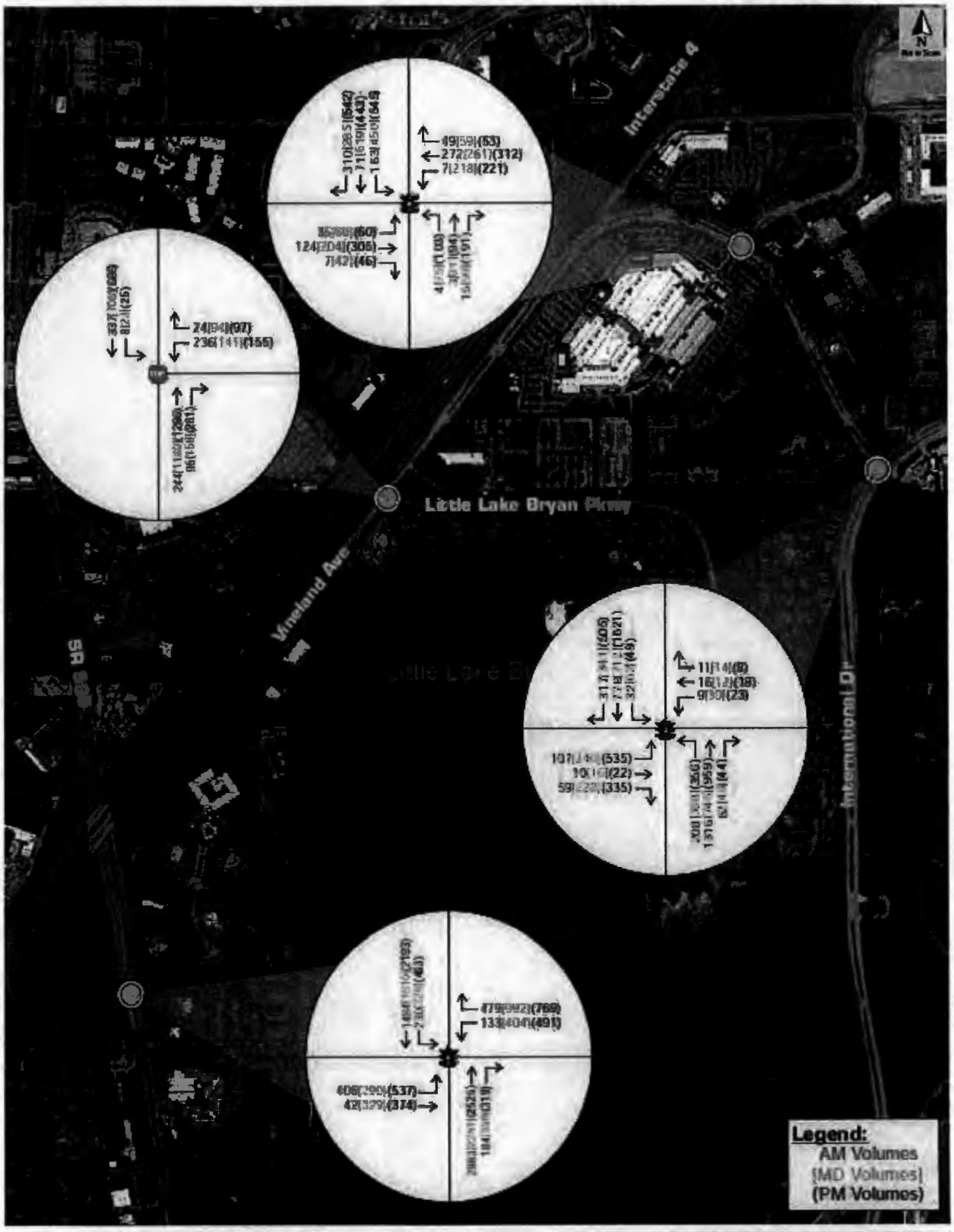
6.3.6 Intersection Turning Movement Volume Projections

Figure 11, Figure 14 and Figure 17 below show the intersection movement volumes projected for the, opening year 2025, interim year 2035, and design year 2045 for the build scenario along Vineland Avenue.



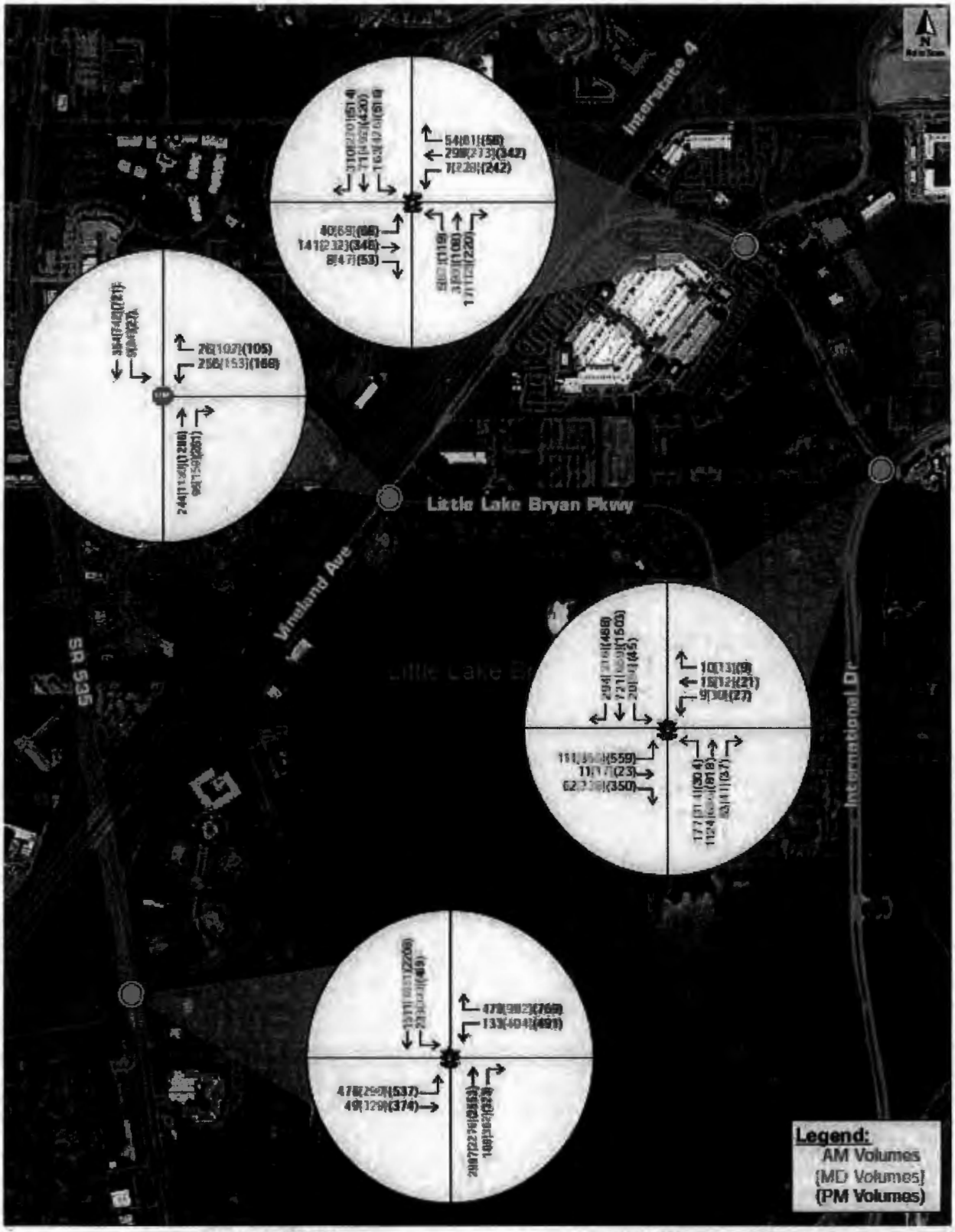
2025 Intersection No-Build Volumes
Vineland Avenue Widening PDS
19029 v1.1

Figure 11



2035 Intersection No-Build Volumes
Vineland Avenue Widening PDS
19029 v1.1

Figure 14



2045 Intersection No-Build Volumes
Vineland Avenue Widening PDS
19029 v1.1

Figure 17

6.4 Future Year Level of Service

6.4.1 Future Signal Recommendations

The intersection of Vineland Avenue and Little Lake Bryan Parkway currently has a failing LOS with a significant number of crashes and will need to be signalized to operate under adequate LOS and increase safety; no further improvements are needed. All the signalized intersections will require to be retimed under the Build Scenario by the opening year of 2025 to meet the adopted LOS standard of E.

6.4.2 Operational and Level of Service Analysis

A detailed Level of Service Analysis was conducted using the procedures of the Highway Capacity Manual (HCM) and Synchro 10 software. The LOS was determined based on the comparison of traffic volumes and roadway capacity. Roadway segment and intersection operational analyses were performed for the opening year 2025, interim year 2035, and design year 2045. A peak hour factor of 0.95 was assumed at all intersections, as recommended by FDOT. A truck percentage of 1.5% was used along Vineland Avenue, International Drive, Little Lake Bryan Parkway and Regency Park Drive.

6.4.3 No-Build Scenario

The No-Build geometry will affect the LOS as discussed below.

6.4.3.1 Segment Level of Service Analysis

Future roadway capacity for a two-lane divided roadway was established from the Generalized Level of Service Volume Tables provided in the 2012 FDOT Level of Service Handbook. LOS were derived for opening, interim, and design years. The results are shown in ***Table 6-6*** and indicated that in the No-Build scenario, the study segment is anticipated to operate below the LOS capacity by the opening year.

Table 6- 5: Projected Daily Roadway Capacity Analysis (No-Build) – Marriott to MQOTU

Future Year	No. of Lanes	LOS Standard	PM Peak-Hour Peak-Direction		
			Volume	Capacity	Meet LOS Standard?
Opening (2025)	2U	E	1,130	800	No
Interim (2035)	2U	E	1,260	800	No
Design (2045)	2U	E	1,260	800	No

6.4.3.2 Intersection Level of Service Analysis

Intersection analysis was conducted similar to the existing conditions analysis utilizing the procedures of the Highway Capacity Manual (HCM) and Synchro software. The projected year volumes were derived by applying the previously discussed growth rate to the existing turning movement volumes. ***Table 6-7*** displays the projected levels of service for the No-Build scenario.

Table 6-7: Projected A.M./P.M. Intersection Capacity Analysis (No-Build)

Intersection	Control	Time Period	EB		WB		NB		SB		Overall	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
2025 No-Build												
Vineland Ave & SR 535	Signal	AM	62.7	E	--	--	24.9	C	15.6	B	26.8	C
		MD	79.9	E	--	--	38.7	D	25.9	C	40.3	D
		PM	101.9	F	--	--	68.7	E	34.1	C	62.3	E
Vineland Ave & Little Lake Bryan Parkway	TWSC	AM	--	--	19.7	C	--	--	7.9	A	--	--
		MD	--	--	>300	F	--	--	11.6	B	--	--
		PM	--	--	>300	F	--	--	13.3	B	--	--
Vineland Ave & Regency Village Dr	Signal	AM	13.5	B	28.7	C	12.5	B	14.0	B	16.9	B
		MD	>300	F	>300	F	93.7	F	71.6	E	>300	F
		PM	>300	F	>300	F	86.8	F	79.2	E	>300	F
Vineland Ave & International Drive	Signal	AM	19.7	B	19.2	B	11.3	B	13.7	B	12.4	B
		MD	22.5	C	20.2	C	17.8	B	17.7	B	18.8	B
		PM	37.5	D	31.2	C	23.9	C	28.2	C	28.6	C
2035 No-Build												
Vineland Ave & SR 535	Signal	AM	64.9	E	--	--	35.4	D	18.9	B	33.5	C
		MD	93.1	F	--	--	57.5	E	33.2	C	52.7	D
		PM	106.5	F	--	--	106.5	F	41.8	D	84.4	F
Vineland Ave & Little Lake Bryan Parkway	TWSC	AM	--	--	23.0	C	--	--	8.0	A	--	--
		MD	--	--	>300	F	--	--	12.5	B	--	--
		PM	--	--	>300	F	--	--	14.7	B	--	--
Vineland Ave & Regency Village Dr	Signal	AM	13.5	B	193.5	F	12.8	B	14.1	B	97.3	F
		MD	245.4	F	>300	F	87.6	F	76.6	E	>300	F
		PM	>300	F	>300	F	93.2	F	92.4	F	>300	F
Vineland Ave & International Drive	Signal	AM	19.7	B	19.2	B	11.4	B	13.3	B	12.7	B
		MD	22.5	C	20.3	C	18.0	B	18.1	B	19.0	C
		PM	41.0	D	33.5	C	26.2	C	31.3	C	31.6	C
2045 No-Build												
Vineland Ave & SR 535	Signal	AM	63.9	E	--	--	37.0	D	19.3	B	34.8	C
		MD	93.1	F	--	--	60.6	E	34.2	C	54.4	D
		PM	106.5	F	--	--	111.5	F	43.1	D	86.7	F
Vineland Ave & Little Lake Bryan Parkway	TWSC	AM	--	--	26.3	D	--	--	8.0	A	--	--
		MD	--	--	>300	F	--	--	12.5	B	--	--
		PM	--	--	>300	F	--	--	14.7	B	--	--
Vineland Ave & Regency Village Dr	Signal	AM	13.6	B	196.7	F	13.0	B	14.1	B	93.9	F
		MD	>300	F	>300	F	94.4	F	84.3	F	>300	F
		PM	>300	F	>300	F	110.1	F	104.6	F	>300	F
Vineland Ave & International Drive	Signal	AM	19.8	B	19.4	B	11.7	B	13.9	B	13.1	B
		MD	23.1	C	20.5	C	19.4	B	19.2	B	20.1	C
		PM	48.0	D	37.4	D	31.0	C	39.1	D	38.3	D

The No-Build scenario indicates that some intersections are anticipated to operate below the LOS by the opening year.

6.4.4 Build Scenario

The build geometry will affect the LOS as discussed below.

6.4.4.1 Segment Level of Service Analysis

Future roadway capacity for a four-lane divided roadway was established from the Generalized Level of Service Volume Tables provided in the 2012 FDOT Level of Service Handbook. LOS were derived for opening, interim, and design years. The results are shown in ***Table 6-8A and Table 6-8B*** and indicated that in the Build scenarios, the study segment is anticipated to operate within the LOS capacity by the design year.

Table 6- 8A: Projected Daily Roadway Capacity Analysis (Build Alternative 1) – Marriott to MQOTU

Future Year	No. of Lanes	LOS Standard	PM Peak-Hour Peak-Direction		
			Volume	Capacity	Meet LOS Standard?
Opening (2025)	4U	D	1,510	2,000	Yes
Interim (2035)	4U	D	1,680	2,000	Yes
Design (2045)	4U	D	1,680	2,000	Yes

Table 6- 8B: Projected Daily Roadway Capacity Analysis (Build Alternative 2) – Marriott to MQOTU

Future Year	No. of Lanes	LOS Standard	PM Peak-Hour Peak-Direction		
			Volume	Capacity	Meet LOS Standard?
Opening (2025)	4U	D	1,600	2,000	Yes
Interim (2035)	4U	D	1,720	2,000	Yes
Design (2045)	4U	D	1,680	2,000	Yes

6.4.4.2 Intersection Level of Service Analysis

Intersection analysis was conducted similar to the existing conditions analysis utilizing the procedures of the Highway Capacity Manual (HCM) and Synchro software. The projected year volumes were derived by applying the previously discussed growth rate to the existing turning movement volumes. ***Table 6-9A and Table 6-9B*** display the projected levels of service for the Build scenarios for each Alternative.

Table 6-9A: Projected A.M./P.M. Intersection Capacity Analysis (Build Alternative 1)

Intersection	Control	Time Period	EB		WB		NB		SB		Overall	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
2025 Build												
Vineland Ave & SR 535	Signal	AM	52.2	D	--	--	39.4	D	13.2	B	33.0	C
		MD	97.2	F	--	--	44.3	D	25.2	C	46.0	D
		PM	115.5	F	--	--	80.6	F	40.3	D	72.3	E
Vineland Ave & Little Lake Bryan Parkway	TWSC	AM	--	--	21.7	C	--	--	8.2	A	--	--
		MD	--	--	>300	F	--	--	14.9	B	--	--
		PM	--	--	>300	F	--	--	18.9	C	--	--
Vineland Ave & Regency Village Dr	Signal	AM	13.4	B	58.0	E	28.0	C	27.9	C	37.0	D
		MD	>300	F	>300	F	117.7	F	81.6	F	>300	F
		PM	>300	F	>300	F	118.1	F	102.7	F	>300	F
Vineland Ave & International Drive	Signal	AM	20.6	C	19.9	B	11.3	B	13.8	B	13.0	B
		MD	24.3	C	21.3	C	17.2	B	21.6	C	20.5	C
		PM	54.5	D	41.2	D	34.2	C	42.1	D	42.4	D
2035 Build												
Vineland Ave & SR 535	Signal	AM	52.7	D	--	--	97.9	F	13.6	B	66.6	E
		MD	109.3	F	--	--	87.9	F	27.3	C	62.9	E
		PM	120.9	F	--	--	143.2	F	48.2	D	105.1	F
Vineland Ave & Little Lake Bryan Parkway	TWSC	AM	--	--	28.8	D	--	--	8.4	A	--	--
		MD	--	--	>300	F	--	--	17.1	C	--	--
		PM	--	--	>300	F	--	--	23.0	C	--	--
Vineland Ave & Regency Village Dr	Signal	AM	16.2	B	275.2	F	47.6	D	42.1	D	140.6	F
		MD	>300	F	>300	F	172.7	F	81.6	F	>300	F
		PM	>300	F	>300	F	174.3	F	102.7	F	>300	F
Vineland Ave & International Drive	Signal	AM	24.3	C	23.2	C	11.8	B	14.6	B	14.0	B
		MD	31.2	C	26.3	C	22.8	C	27.4	C	26.6	C
		PM	80.7	F	44.2	D	49.4	D	69.8	E	66.5	E
2045 Build												
Vineland Ave & SR 535	Signal	AM	63.0	E	--	--	52.1	D	20.2	C	43.9	D
		MD	105.1	F	--	--	111.1	F	30.9	C	75.6	E
		PM	120.9	F	--	--	143.2	F	48.2	D	105.1	F
Vineland Ave & Little Lake Bryan Parkway	TWSC	AM	--	--	79.7	F	--	--	9.3	A	--	--
		MD	--	--	>300	F	--	--	17.1	C	--	--
		PM	--	--	>300	F	--	--	23.0	C	--	--
Vineland Ave & Regency Village Dr	Signal	AM	12.9	B	258.0	F	16.2	B	16.6	B	119.0	F
		MD	>300	F	>300	F	142.8	F	77.6	E	>300	F
		PM	>300	F	>300	F	174.8	F	109.3	F	>300	F
Vineland Ave & International Drive	Signal	AM	22.1	C	21.2	C	12.4	B	15.8	B	14.5	B
		MD	29.8	C	25.2	C	23.0	C	30.5	C	27.4	C
		PM	80.7	F	44.5	D	63.8	E	76.7	E	73.4	E

Table 6-9B: Projected A.M./P.M. Intersection Capacity Analysis (Build Alternative 2)

Intersection	Control	Time Period	EB		WB		NB		SB		Overall	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
2025 Build												
Vineland Ave & SR 535	Signal	AM	52.5	D	--	--	47.6	D	13.3	B	37.4	D
		MD	94.5	F	--	--	48.5	D	25.7	C	47.5	D
		PM	109.8	F	--	--	249.0	F	42.2	D	152.8	F
Vineland Ave & Little Lake Bryan Parkway	TWSC	AM	--	--	25.0	D	--	--	0.8	A	--	--
		MD	--	--	>300	F	--	--	16.1	C	--	--
		PM	--	--	>300	F	--	--	20.9	C	--	--
Vineland Ave & Regency Village Dr	Signal	AM	14.3	B	>300	F	40.7	D	40.6	D	192.6	F
		MD	296.4	F	>300	F	79.1	E	52.0	D	>300	F
		PM	>300	F	>300	F	78.9	E	62.8	E	>300	F
Vineland Ave & International Drive	Signal	AM	88.8	F	20.3	C	10.2	B	12.3	B	12.0	B
		MD	23.1	C	20.7	C	16.0	B	20.5	C	19.1	B
		PM	46.8	D	37.5	D	8.3	A	34.1	C	34.6	C
2035 Build												
Vineland Ave & SR 535	Signal	AM	52.9	D	--	--	93.6	F	13.6	B	63.8	E
		MD	100.4	F	--	--	83.1	F	27.1	C	64.2	E
		PM	111.7	F	--	--	137.9	F	47.3	D	100.4	F
Vineland Ave & Little Lake Bryan Parkway	TWSC	AM	--	--	28.5	D	--	--	8.4	A	--	--
		MD	--	--	>300	F	--	--	17.6	C	--	--
		PM	--	--	>300	F	--	--	23.9	C	--	--
Vineland Ave & Regency Village Dr	Signal	AM	15.2	B	>300	F	48.5	D	41.2	D	>300	C
		MD	>300	F	>300	F	157.1	F	51.4	D	>300	F
		PM	>300	F	>300	F	155.7	F	59.7	E	>300	F
Vineland Ave & International Drive	Signal	AM	41.0	D	24.4	C	11.6	B	14.7	B	14.0	B
		MD	33.7	C	28.7	C	24.8	C	29.0	C	28.5	C
		PM	91.3	F	43.5	D	47.3	D	92.8	F	79.6	E
2045 Build												
Vineland Ave & SR 535	Signal	AM	52.8	D	--	--	93.8	F	13.6	B	63.7	E
		MD	102.9	F	--	--	83.4	F	27.2	C	64.6	E
		PM	113.5	F	--	--	137.9	F	47.8	D	100.8	F
Vineland Ave & Little Lake Bryan Parkway	TWSC	AM	--	--	34.1	D	--	--	8.4	A	--	--
		MD	--	--	>300	F	--	--	17.2	C	--	--
		PM	--	--	>300	F	--	--	23.2	C	--	--
Vineland Ave & Regency Village Dr	Signal	AM	15.6	B	>300	F	48.5	D	41.3	D	>300	F
		MD	>300	F	>300	F	157.5	F	52.9	D	>300	F
		PM	>300	F	>300	F	156.3	F	66.6	E	>300	F
Vineland Ave & International Drive	Signal	AM	43.2	D	25.7	C	12.2	B	15.5	B	14.5	B
		MD	37.4	D	31.9	C	30.2	C	32.5	C	32.5	C
		PM	91.2	F	43.5	D	71.7	E	92.8	F	85.4	F

6.5 Recommended Improvements

Based on evaluation of operating conditions for the No-Build and Build conditions, it is recommended that, in the study area:

- Widen the study area of Vineland Avenue from 2 to 4 lanes.
- The most important contribution of the interchange is to shift the Apopka-Vineland Road (CR 435) traffic from I-4 (south of Daryl Carter Parkway) to the projected Daryl Carter Parkway extension.
- It is recommended that Vineland Avenue and Little Lake Bryan Parkway be signalized.
- The addition of the Daryl Carter Parkway interchange will not affect the Vineland Avenue corridor.
- Provide additional guidance to the presence of pedestrians and bicyclists as well as updating features, identifying a pedestrian zone by adding "Pedestrian Crossing" signs with supplemental "Next 2 miles" on both north and southbound at the beginning of the study area.
- Provide additional speed limit awareness by adding 35 MPH posted speed limit signs on Vineland Avenue between Little Lake Bryan Parkway and Apopka-Vineland Road (CR 435) (both directions) north and south of signalized intersections.

See *Design Traffic Technical Memorandum* in ***Appendix F*** for additional recommendations not within this study area for future use.

CHAPTER 7

Alternative Analysis – Alignment & Drainage

7.0 Alternative Analysis – Alignment & Drainage

After determining the need to improve Vineland Avenue, the next step in the PDS process is to identify alternatives to provide a safe transportation facility that meets the purpose and need of the project, is acceptable to the community, minimizes the impacts on the environment, is cost effective, minimizes the need for right-of-way acquisition, and meets applicable water quality and attenuation standards. After analyzing the options, a recommended alternative for an alignment and a stormwater facility is selected to be advanced into the design phase. This section summaries the alternatives considered for this project.

7.1 Roadway Characteristics and Constraints

Various characteristics and constraints are considered during the assessment of the improvements. The characteristics and constraints are discussed in the subsequent sections.

7.1.1 Right-of-Way Constraints

The existing right-of-way width is primarily 98 to 102 feet throughout the study area, with a 75 foot wide pinch point in the area of the Panera Bread location. The alternatives are required to minimize the right-of-way impacts to this area.

7.1.2 Potential Physical and Natural Environmental Impacts

Stormwater swale facilities belonging to FDOT are present on the west side of the roadway, very closely abutting the ROW line. Wetlands are present on the east side of the existing roadway. The impacts to these wetlands and facilities, along with the drainage patterns associated with them, must be taken into consideration while developing the alternatives.

7.1.3 Cross Section Consistency

The areas to the north and south of the study area have undergone improvements. The alternatives presented in this report will take the cross sections into consideration while developing the alternatives. It is important to provide consistency and safety to users throughout the corridor.

7.2 Alternatives Analysis - Alignment

Three Alternatives were evaluated to determine the ability to meet the purpose and needs of the study area. The alternatives include:

- No Build Alternative
- Build Alternatives (all include superelevated section)
  - Alternative 1 – Shift West
  - Alternative 2 – Shift East
  - Alternative 3 – Narrowed median/Shift East

7.2.1 No-Build Alternative

The No Build alternative includes maintaining the existing conditions along Vineland Avenue in the study limits. Based on the projected travel forecast and development plans, this alternative can be expected to provide poor operating conditions, higher travel times, and a higher potential for accidents.

7.2.2 Advantages of the No-Build Alternative

Benefits to the No Build Alternative are as follows:

- No design and right-of-way acquisition costs.
- No construction or utility relocation costs.
- No commercial property impacts, including slope/fill easements, temporary construction easements or joint-use utility agreements.
- No direct impacts to the natural environment and wetlands (existing conservation easements).
- No roadway construction inconveniences.

7.2.3 Disadvantages of the No-Build Alternative

The following implications are anticipated if there are no improvements made to Vineland Avenue. The disadvantages are as follows:

- The level of service will continue to deteriorate as the capacity along Vineland Avenue increases with anticipated development.
- There will be a lack of lane and capacity consistency throughout the corridor due to current improvements being made to the north and south of the study area.

7.2.2 Alternative Roadway Alignment Considerations

Additional right-of-way is needed for two of the alternatives in order to construct the proposed improvements, and the three react to the jog in the right-of-way differently. Different roadway geometry and alignments were analyzed in order to minimize additional right-of-way needs and environmental impacts to the surrounding wetlands. ***Figure 1 below*** details each Alternative, with ***Figures 15, 17 and 19*** outlining the needed easements for each Alternative.

7.2.2.1 Alternative 1 – Shift West

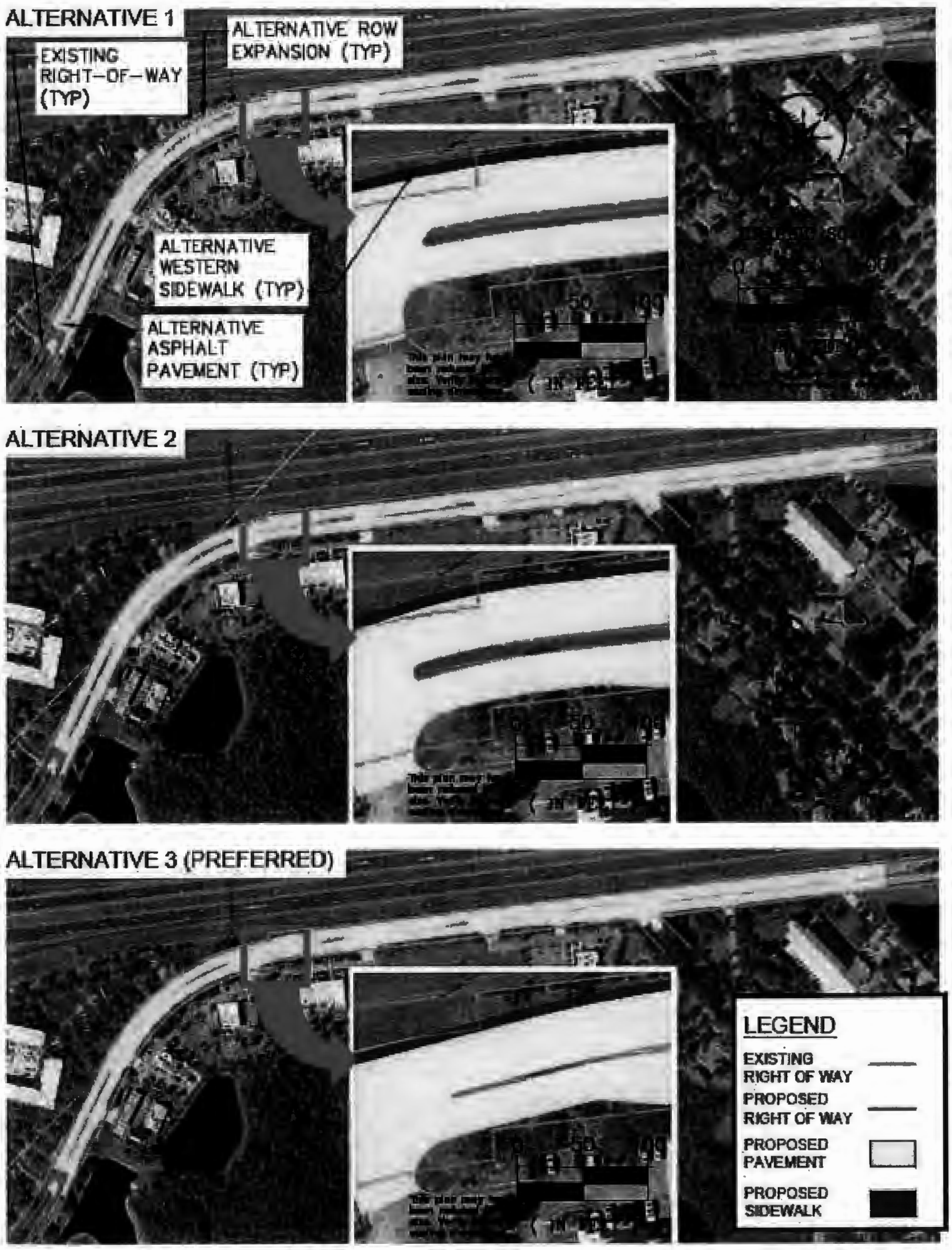
Alternative 1 consists of a standard 28 foot wide median. The roadway mostly stays within the existing ROW north of the ROW jog, except for a small stretch just north of the pinch point in front of Panera. There, the proposed roadway encroaches beyond existing eastern ROW line; the ROW must be expanded eastward to contain the road. The superelevation at the horizontal curve will require ROW acquisition along the west side of the roadway.

7.2.2.2 Alternative 2 – Shift East

Alternative 2 again utilizes a standard median width of 28 feet; however, in contrast to Alternatives 1 and 3, Alternative 2 does not take into account existing ROW. Instead, Alternative 2 is designed to maintain a minimum allowable separation from the commercial parking lots to the east. Like Alternative 1, the superelevation at the horizontal curve will require ROW acquisition along the west side of the roadway. North of the horizontal curve, the ROW in Alternative 2 is slightly expanded to the east for the purposes of deceleration lanes.

7.2.2.3 Alternative 3 – Narrowed Median / Shift East

Alternative 3 is the only alternative contained within the existing ROW (with the exception of a proposed sidewalk to the west which is shared by every Alternative), south of the jog. It features a narrow, 20-foot wide median at the jog. Although the superelevation section still exists, the median allows for passage through the existing ROW. From the jog, the median slowly transitions to the standard 28 foot width.

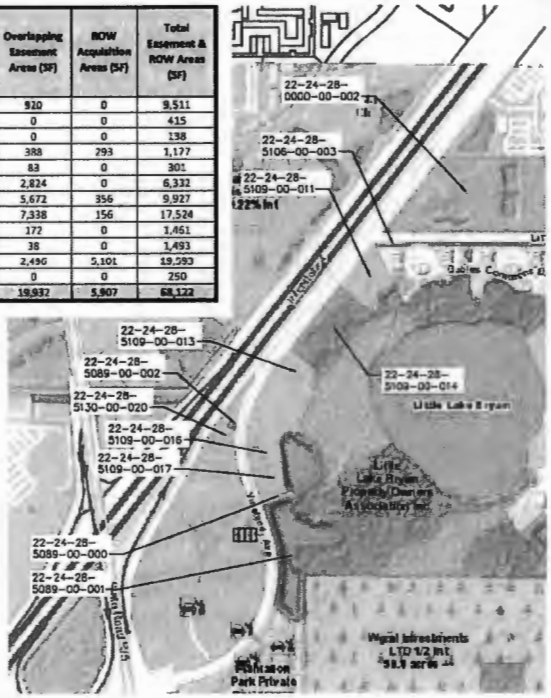


HARRIS
Harris Civil Engineers, LLC
1200 E. Hillcrest Street
Suite 200
Orlando, Florida 32803

ROADWAY ALTERNATIVE ALIGNMENTS
WITH RIGHT-OF-WAY JOG DETAILS

FIGURE 1

Number	Parcel ID	Non-Overlapping, Permanent Easement Areas (SF)			Total Non-Overlapping, Permanent Easement Areas (SF)	Non-Overlapping, Temporary Construction Easement Areas (SF)	Total Non-Overlapping Easement Areas (SF)	Overlapping Easement Areas (SF)	ROW Acquisition Areas (SF)	Total Easement & ROW Areas (SF)
		Slope/Fill	Drainage	Utility Relocation						
1	22-24-28-0000-00-002	6,465	111	233	6,808	1,783	8,591	920	0	9,511
2	22-24-28-5089-00-000	0	415	0	415	0	415	0	0	415
3	22-24-28-5089-00-001	0	138	0	138	0	138	0	0	138
4	22-24-28-5089-00-002	496	0	0	496	0	496	388	293	1,177
5	22-24-28-5106-00-003	218	0	0	218	0	218	83	0	301
6	22-24-28-5109-00-011	3,297	0	0	3,297	211	3,508	2,824	0	6,332
7	22-24-28-5109-00-013	632	1,727	0	2,359	1,540	3,899	5,672	356	9,927
8	22-24-28-5109-00-014	1,888	5,061	0	6,949	3,081	10,030	7,338	156	17,524
9	22-24-28-5109-00-016	0	336	0	336	953	1,289	172	0	1,461
10	22-24-28-5109-00-017	0	682	0	682	773	1,455	38	0	1,493
11	22-24-28-5130-00-020	11,339	329	0	11,668	307	11,995	2,496	5,101	19,593
12	FDOT	0	250	0	250	0	250	0	0	250
	Total	24,355	9,049	233	33,637	8,647	42,284	19,932	5,907	68,122



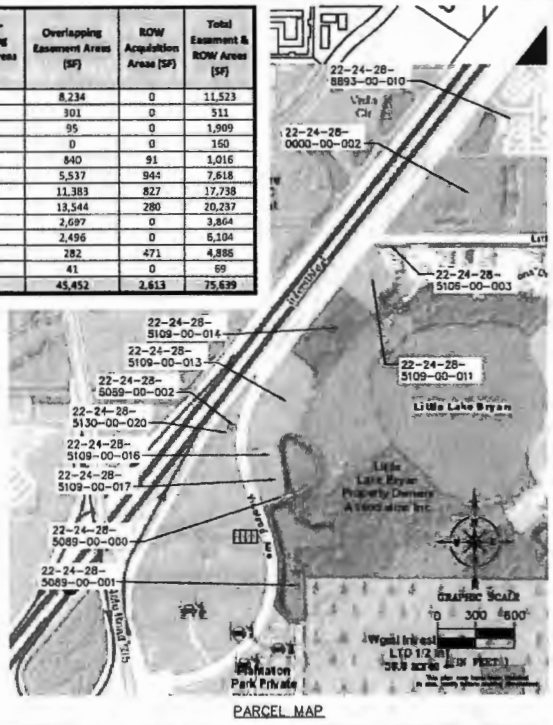
PARCEL MAP

HARRIS

ROADWAY ALTERNATIVE 1: EASEMENT AND ROW AREAS (OVERLAP ACCOUNTED FOR)

FIGURE 15

Number	Parcel ID	Non-Overlapping, Permanent Easement Areas (SF)			Total Non-Overlapping, Permanent Easement Areas (SF)	Non-Overlapping, Temporary Construction Easement Areas (SF)	Total Non-Overlapping Easement Areas (SF)	Overlapping Easement Areas (SF)	ROW Acquisition Areas (SF)	Total Easement & ROW Areas (SF)
		Slope/Fill	Drainage	Utility Relocation						
1	22-24-28-0000-00-002	3,022	74	6	3,103	186	3,289	8,234	0	11,523
2	22-24-28-5089-00-000	0	210	0	210	0	210	301	0	511
3	22-24-28-5089-00-001	1,747	67	0	1,814	0	1,814	95	0	1,909
4	22-24-28-5089-00-002	160	0	0	160	0	160	0	0	160
5	22-24-28-5106-00-003	43	0	0	43	42	85	840	91	1,016
6	22-24-28-5109-00-011	877	61	0	938	198	1,136	5,537	944	7,618
7	22-24-28-5109-00-013	2,850	1,354	0	4,204	1,324	5,528	11,383	827	17,738
8	22-24-28-5109-00-014	243	4,343	0	4,587	1,827	6,414	13,544	280	20,237
9	22-24-28-5109-00-016	574	130	0	704	463	1,167	2,697	0	3,864
10	22-24-28-5109-00-017	2,927	240	0	3,168	441	3,608	2,496	0	6,104
11	22-24-28-5130-00-020	4,135	0	0	4,135	0	4,135	282	471	4,888
12	22-24-28-8893-00-010	28	0	0	28	0	28	41	0	69
	Total	16,607	5,479	6	23,093	4,481	27,575	45,452	2,613	75,639



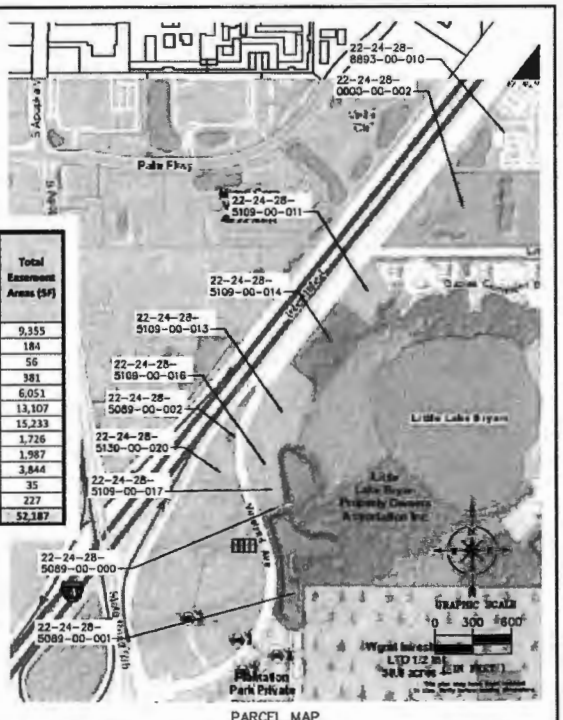
PARCEL MAP

HARRIS

ROADWAY ALTERNATIVE 2: EASEMENT AND ROW AREAS (OVERLAP ACCOUNTED FOR)

FIGURE 17

Number	Parcel ID	Non-Overlapping, Permanent Easement Areas (SF)			Total Non-Overlapping, Permanent Easement Areas (SF)	Non-Overlapping, Temporary Construction Easement Areas (SF)	Overlapping Easement Areas (SF)	Total Easement Areas (SF)
		Slope/Fill	Drainage	Utility Relocation				
1	22-24-28-0000-00-002	5,705	362	233	6,300	2,162	893	9,355
2	22-24-28-5089-00-000	0	184	0	184	0	0	184
3	22-24-28-5089-00-001	0	56	0	56	0	0	56
4	22-24-28-5089-00-002	381	0	0	381	0	0	381
5	22-24-28-5109-00-011	3,203	0	0	3,203	191	2,657	6,051
6	22-24-28-5108-00-013	1,905	2,582	0	4,487	3,128	5,492	13,107
7	22-24-28-5109-00-014	608	4,535	0	5,143	2,526	7,564	15,233
8	22-24-28-5109-00-016	0	601	0	601	953	172	1,726
9	22-24-28-5109-00-017	0	251	0	251	1,150	586	1,987
10	22-24-28-5130-00-020	3,844	0	0	3,844	0	0	3,844
11	22-24-28-8893-00-010	0	0	0	0	35	0	35
12	FDOT	0	227	0	227	0	0	227
	Total	15,646	8,797	233	24,676	10,147	17,364	52,187



PARCEL MAP

HARRIS

ROADWAY ALTERNATIVE 3: EASEMENT AREAS (OVERLAP ACCOUNTED FOR)

FIGURE 19

7.2.3 Recommended Vineland Avenue Alternative - Alignment

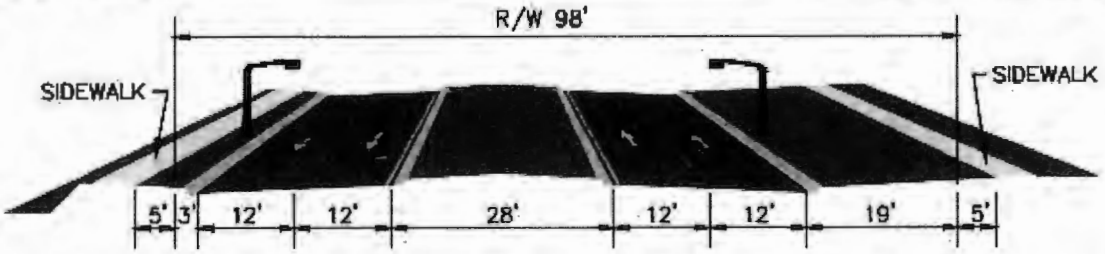
It is recommended that Orange County proceeds with Alternative 3 as the recommended alternative for two reasons. First, its narrow median permits the passage of the roadway through the existing jog in the ROW. Second, north of the horizontal curve, Alternative 3 is still contained within the existing ROW. These two advantages translate into a relatively low land acquisition cost and, more importantly, prevents any potential encroachment into adjacent properties and respects the owners' interests.

7.3 Typical Sections

It is recommended alternatives from the Vineland Avenue improvements consist of a four-lane divided typical section. The design elements are:

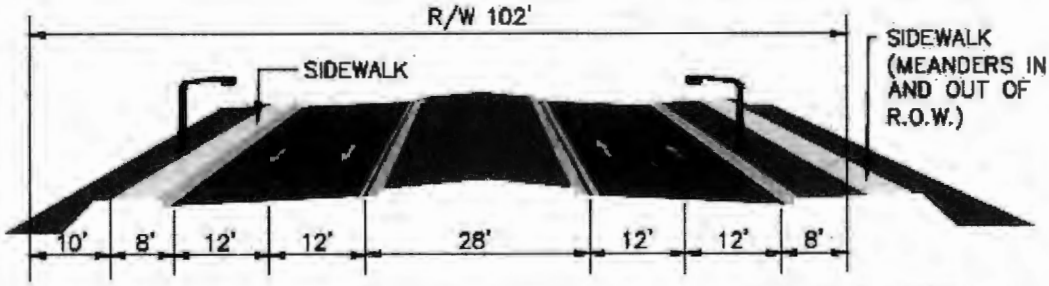
- 12-foot travel lanes
- 5-7-foot sidewalk on east side; a wider sidewalk will be evaluated on the east side of Vineland Avenue in the design phase of this project.
- 6-foot sidewalk on the west side
- 2.0 -foot Type F curb and gutter
- 20- to 28-foot raised median
- grass utility strip between the edge of pavement and sidewalk

The required right-of-way width for the recommended improvements is between 98 to 113 feet. Depending on the location along the study area, the proposed widening falls outside the current right-of-way. ***See Figures A-1, A-2 and A-3 below*** for the typical sections.



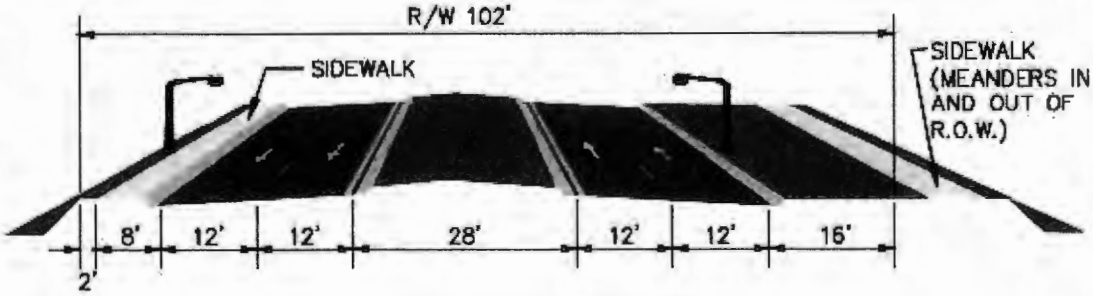
TYPICAL SECTION 1
NTS

NOTE: SUPERELEVATION NOT SHOWN



TYPICAL SECTION 2
NTS

NOTE: SUPERELEVATION NOT SHOWN



TYPICAL SECTION 3
NTS

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Suite 200
Orlando, Florida 32803

ROADWAY ALTERNATIVE 1 SECTIONS

FIGURE A-1

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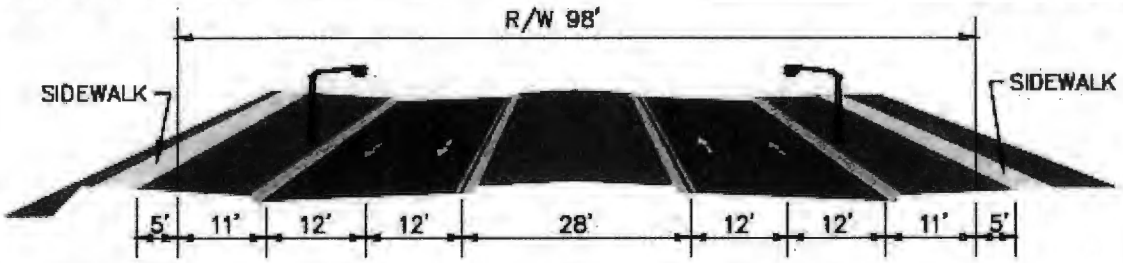
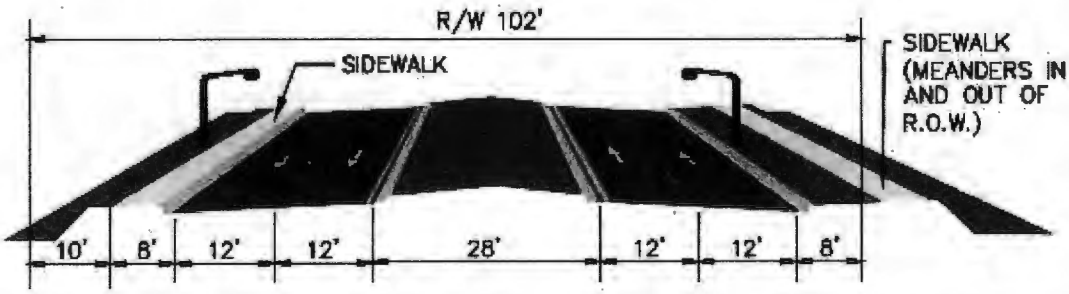


TYPICAL SECTION 1
NTS

NOTE: SUPERELEVATION NOT SHOWN



TYPICAL SECTION 2
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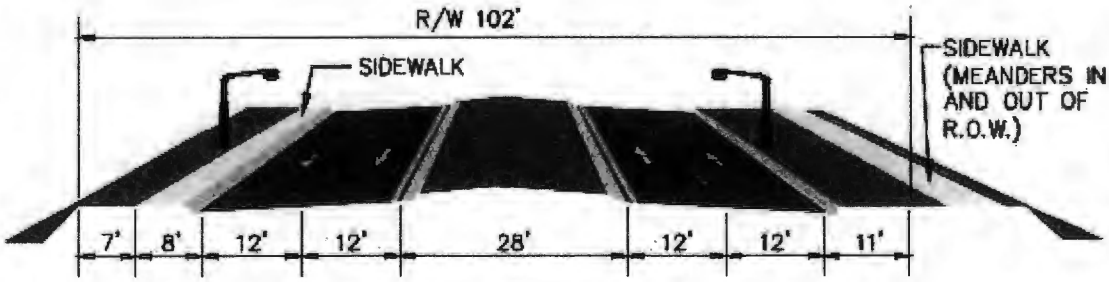

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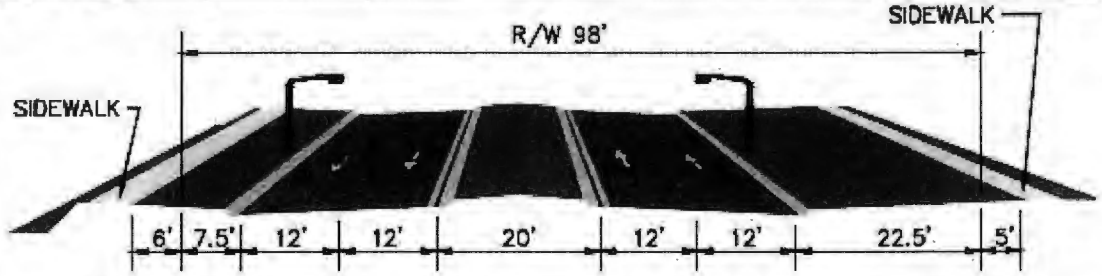
HARRIS
Harris Civil Engineers, LLC
1200 E. Hillcrest Street
Suite 200
Orlando, Florida 32803

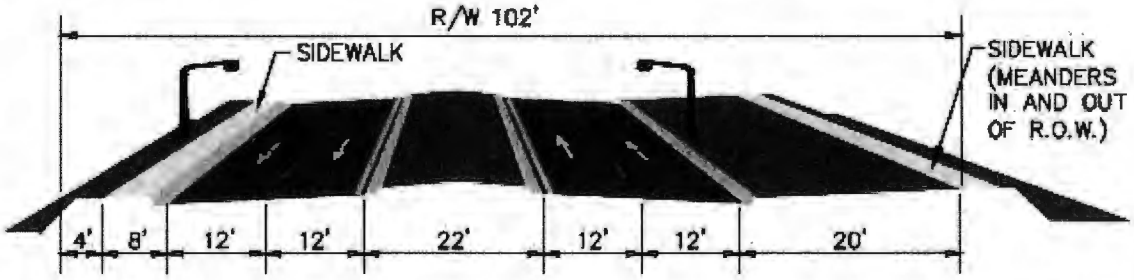
ROADWAY ALTERNATIVE 2 SECTIONS

FIGURE A-2



TYPICAL SECTION 1
NTS

NOTE: SUPERELEVATION NOT SHOWN



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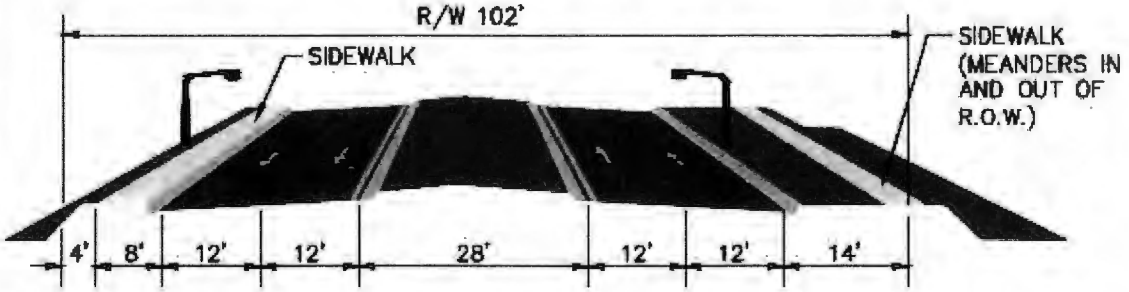

TYPICAL SECTION 3
NTS

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Orlando, Florida 32803

ROADWAY ALTERNATIVE 3 (PREFERRED) SECTIONS

FIGURE A-3

7.4 Drainage Characteristics and Constraints

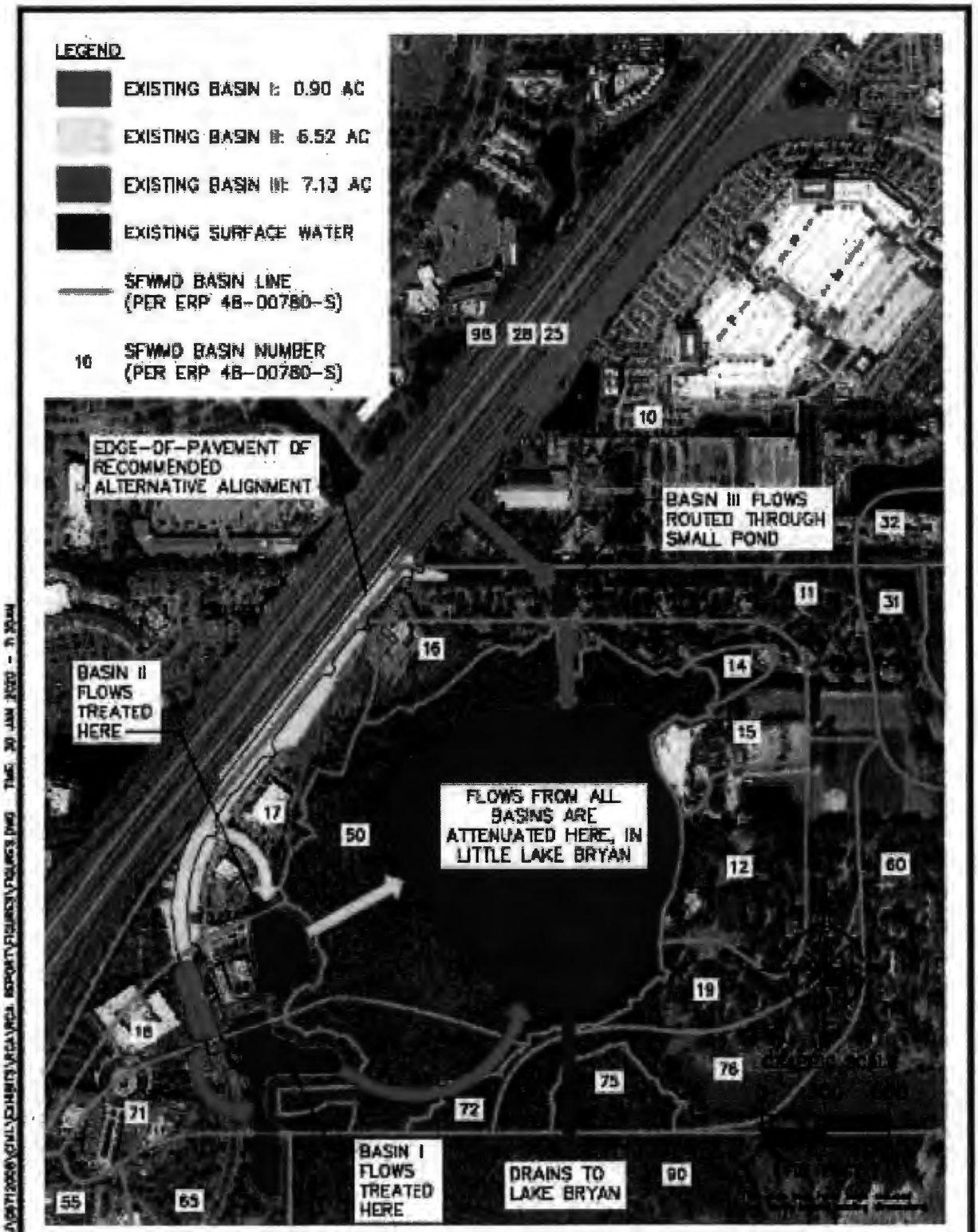
In the existing drainage system, the portion of the roadway to be widened can be divided into three distinct basins, based on three distinct discharge points (water quality ponds). The northernmost basin includes a significant amount of roadway that is outside the area of the proposed improvements, but which drains into it. ***Figure 10 below*** illustrates the existing drainage patterns.

7.4.1 Use Constraints

Space is limited along the Vineland Avenue corridor for additional stormwater storage; depending on the Alternative chosen, there may be agreements in place for County access to the drainage system through privately-owned properties, which affects the cost of the project.

7.4.2 Potential Physical and Natural Environmental Impacts

Stormwater swale facilities belonging to FDOT are present on the west side of the roadway, very closely abutting the ROW line. Wetlands are present on the east side of the existing roadway. The impacts to these wetlands and facilities, along with the drainage patterns associated with them, must be taken into consideration while developing the alternatives.



EXISTING DRAINAGE PATTERN

FIGURE 10

7.5 Alternatives Analysis – Drainage

The proposed stormwater detention pond in Alternative 1 will be situated on a wetland on property currently owned by Walt Disney World Co. (Disney). SFWMD has a conservation easement over this wetland. Based on previous discussion with Disney, Disney is opened to the idea of sales of the property to Orange County for the benefit of this roadway widening project. Similarly, SFWMD is willing to consider transferring the conservation easement to Orange County. This is the recommended alternative.

In Alternative 2, Orange County would have to acquire the vacant parcel currently owned by Fishbones-LLB LLC. Fishbones has submitted development plan for the construction of a restaurant (Little Lake Bryan PD/Parcel 4/Lot 1 Little Lake Bryan Center DP). The application is currently being review by Orange County.

An analysis was performed to determine the effects of the additional runoff to LLB. The results of the analysis show the impact to LLB by the widening project is negligible. A copy summarizes the analysis, titled *Vineland Ave. Widening – LLB Analysis* prepared by Singhofen & Associates is included in ***Appendix L***.

Two Build Alternatives were evaluated to determine the ability to meet the purpose and needs of the study area. The alternatives include:

- No Build Alternative
- Build Alternatives
  - Alternative 1 – New Treatment Pond in Wetlands Area
  - Alternative 2 – New Pond within Fishbone's Parcel

7.5.1 No-Build Alternative

The No Build alternative for drainage only exists in the event that Vineland Avenue is not widened; otherwise, Orange County will be required to meet the water quality requirements of SFWMD.

7.5.2 Alternative Drainage Considerations

Easements are needed for two of the alternatives in order to construct the proposed improvements. These alternatives were analyzed in order to minimize additional right-of-way needs and environmental impacts to the surrounding wetlands. ***Figures 11 and 12 below*** detail each Alternative, with easement areas outlined in ***Figure 20***.

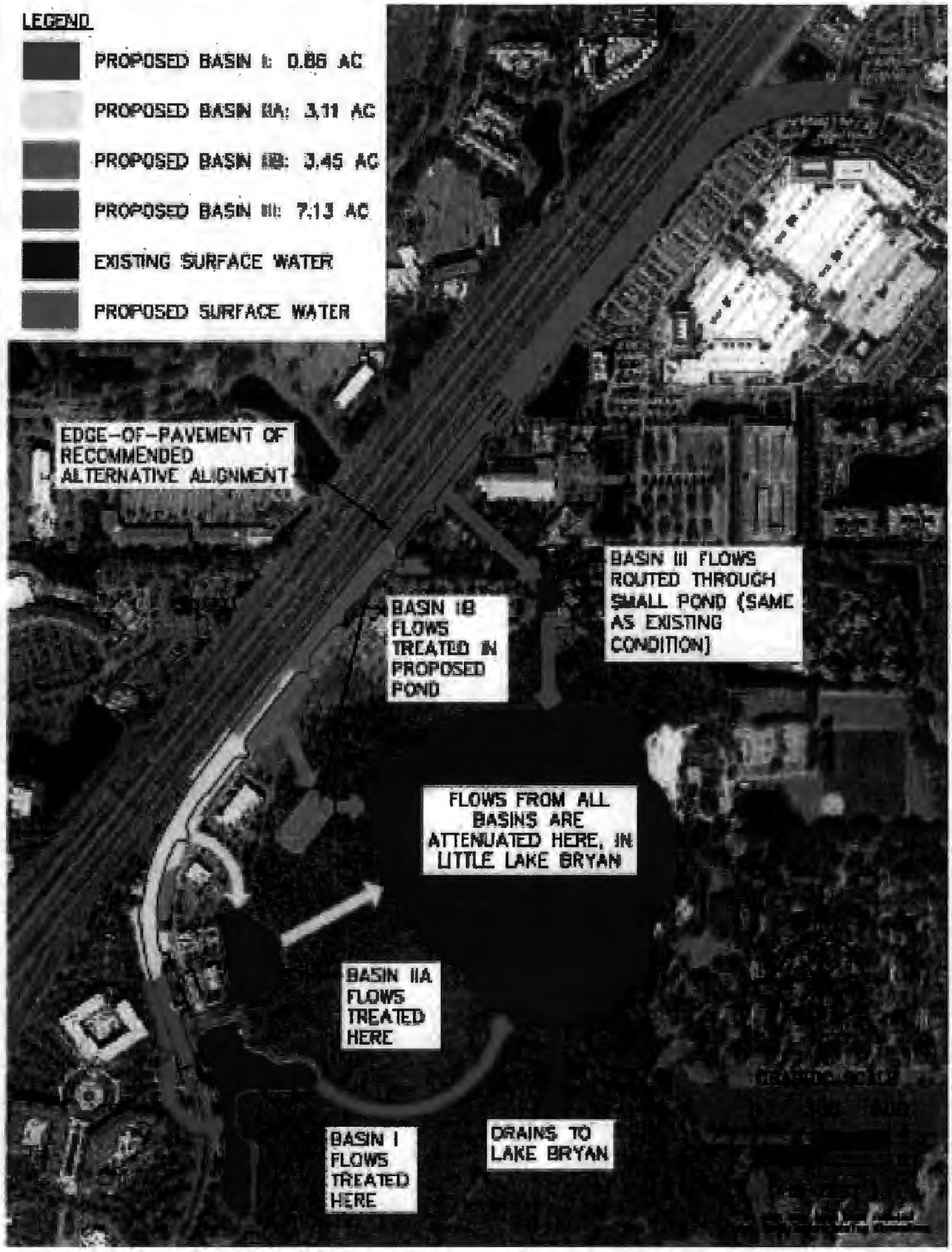
7.5.2.1 Alternative 1 – New Treatment Pond in Wetlands Area

Alternative 1 consists creating a new water quality treatment pond in the area of the adjacent wetlands. Besides wetlands mitigation and releasing SFWMD conservation easements, this Alternative may also require de-mucking (Geotech Report provided), dewatering process and permitting, and costs associated with excavating unsuitable soils off-site. Because

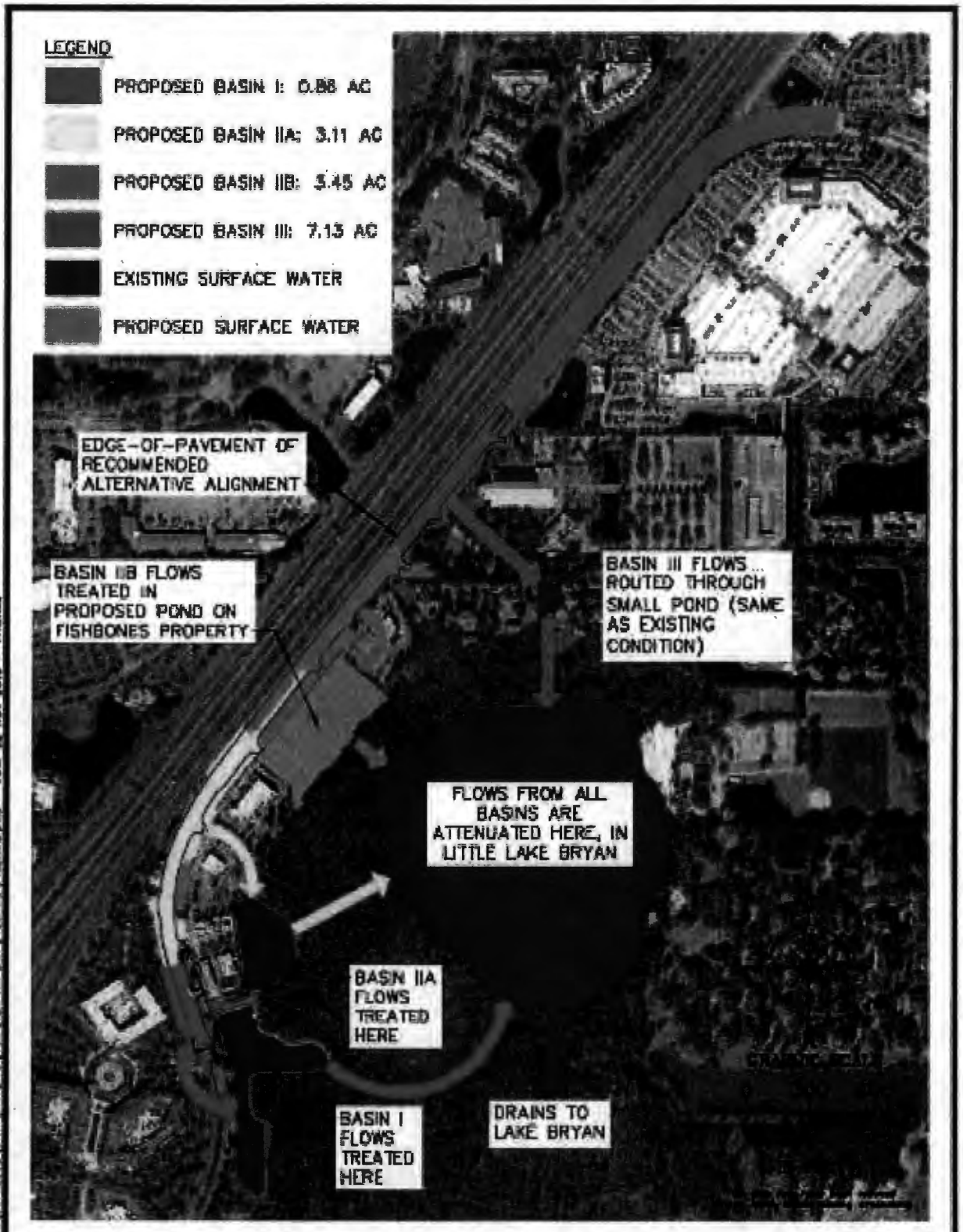
this is a wetlands area, it is assumed the soils could not be used for embankment. The biggest advantage is acquisition of land that is not earmarked for future development.

7.5.2.2 Alternative 2 – New Pond within Fishbones' Parcel

Alternative 2 involves purchasing the parcel belonging to Fishbones' directly east of the Panera Bread. The County would then allow for a wet pond to collect the Vineland Avenue additional impervious area and provide the water quality necessary before discharging to Little Lake Bryan's wetlands area. This option will be costly in terms of purchasing land from the private owner in a developing area; however, no wetlands mitigation or conservation easement release would be required.



	DRAINAGE ALTERNATIVE 1: DETENTION POND FOR BASIN IIB	FIGURE 11



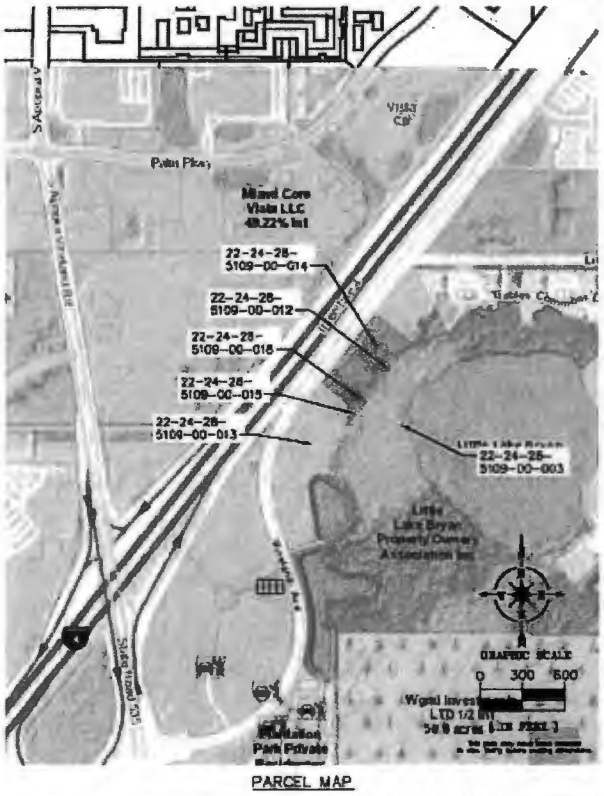
HARRIS

DRAINAGE ALTERNATIVE 2:
DETENTION POND FOR BASIN IIB, ON FISHBONES PROPERTY

FIGURE 12

Drainage Alternative 1: Easements and Land Purchase			
Number	Parcel ID	Drainage Easements (SF)	Land Purchase (SF)
1	22-24-28-5109-00-005	0	61,100
2	22-24-28-5109-00-013	0	5,154
3	22-24-28-5109-00-014	3,721	0
4	22-24-28-5109-00-018	1,662	0
	Total	5,383	66,254

Drainage Alternative 2: Easement and Land Purchase		
Number	Parcel ID	Land Purchase (SF)
1	22-24-28-5109-00-012	12,089
2	22-24-28-5109-00-014	180,328
3	22-24-28-5109-00-015	4,325
4	22-24-28-5109-00-018	13,582
	Total	210,304



PARCEL MAP

DRAINAGE ALTERNATIVES: EASEMENT AND LAND PURCHASE AREAS

FIGURE 20

7.5.3 Recommended Vineland Avenue Alternative - Drainage

Despite the cost advantages of Drainage Alternative 2, it is recommended Orange County proceed with Drainage Alternative 1 for two reasons. First, it is beneficial to the County to acquire land from a willing Seller for the purposes of this pond. Second, the uncertainties with Drainage Alternatives 2 are high: if the seller is unwilling, the risk lies with condemning a zoned-commercial property in a high developing area.

7.6 Recommended Improvements

The recommended improvements for Vineland Avenue will generally follow the existing roadway geometry. This recommendation is based upon the results of the engineering considerations, social and natural environment analyses, and input received from the public.

The Cost Matrix below reflects the estimated costs for the recommended improvements. The summary is based on right-of-way costs using current dollars with adjustments for legal fees and administrative costs. Also included in the evaluation are environmental and social impacts.

The recommended Vineland Avenue improvements are shown in the Concept Plans in ***Appendix A***. A detailed discussion on the recommended improvements is also provided in *Chapter 8-Recommended Improvements*.

Table 1. Construction Cost Estimate: Roadway (Typical for All Alternatives – in 2019 dollars)

Roadway Construction Cost				
General Conditions				
	Quantity	Unit	Unit Price	Total Price
Mobilization	1	LS	$105,000.00	$105,000.00
General Conditions	1	LS	$102,000.00	$102,000.00
Owner Indemnification	1	LS	$1,000.00	$1,000.00
Subtotal				$208,000.00
Earthwork				
	Quantity	Unit	Unit Price	Total Price
Construction Staking	1	LS	$35,000.00	$35,000.00
Demolition	1	LS	$65,000.00	$65,000.00
Import & Place for Roadway Construction	9,800	CY	$15.00	$147,000.00
Construction Entrance	2	EA	$5,875.00	$11,750.00
Silt Fence	7,450	LF	$1.50	$11,175.00
Inlet Protection	43	EA	$200.00	$8,600.00
Sawcut Existing Pavement	7,000	LF	$2.00	$14,000.00
Dewatering	1	LS	$35,000.00	$35,000.00
Subtotal				$327,525.00
Storm				
	Quantity	Unit	Unit Price	Total Price
8" HDPE	93	LF	$18.00	$1,674.00
12" RCP	37	LF	$35.00	$1,295.00
15" RCP	27	LF	$45.00	$1,215.00
18" RCP	2,073	LF	$55.00	$114,015.00
36" RCP	61	LF	$85.00	$5,185.00
19" x 30" ERCP	514	LF	$110.00	$56,540.00
24" x 38" ERCP	721	LF	$120.00	$86,520.00
Type C Inlet	4	EA	$3,750.00	$15,000.00
Type E Inlet	2	EA	$5,400.00	$10,800.00
Storm Manholes, 5' Diameter	5	EA	$6,000.00	$30,000.00
Doghouse Manhole	2	EA	$7,200.00	$14,400.00
Doghouse Inlet	1	EA	$7,000.00	$7,000.00
Type 1 and 2 Inlet	22	EA	$5,250.00	$115,500.00
Type 3 and 4 Inlet	12	EA	$4,500.00	$54,000.00
Type 5 Inlet	2	EA	$5,000.00	$10,000.00
Type 9 Inlet	7	EA	$4,500.00	$31,500.00
Mitered-End Section	2	EA	$2,500.00	$5,000.00
TV and Clean Drainage Pipe	1	LS	$35,000.00	$35,000.00
6" Stone, Outlet Protection	91	CY	$50.00	$4,550.00
Subtotal				$599,194.00

Paving				
	Quantity	Unit	Unit Price	Total Price
Heavy Duty Asphalt	26,583	SY	$20.00	$531,660.00
Heavy Duty Soil Cement	26,583	SY	$22.00	$584,826.00
Heavy Duty Stabilized	26,583	SY	$7.00	$186,081.00
Type F Curb	7,472	LF	$18.00	$134,496.00
Type E Curb	5,607	LF	$18.00	$100,926.00
Subtotal				$1,537,989.00
Miscellaneous				
	Quantity	Unit	Unit Price	Total Price
Striping	1	LS	$115,000.00	$115,000.00
MOT-Traffic Control	1	LS	$235,000.00	$235,000.00
Sidewalk	30,531	SF	$7.00	$213,717.00
HC Ramps	22	EA	$1,750.00	$38,500.00
Utility Relocations and Adjustments	1	EA	$115,000.00	$115,000.00
Pavers Crosswalk	1	EA	$15,000.00	$15,000.00
Maintain Erosion Control	1	LS	$30,000.00	$30,000.00
Grade and Sod	1	LS	$22,500.00	$22,500.00
Subtotal				$784,717.00
Total				$3,457,425.00

Table 2. Construction Cost Estimates: Drainage Alternatives (in 2019 Dollars)

Drainage Alternative 1				
	Quantity	Unit	Unit Price	Total Price
Dewatering	1	LS	$25,000	$25,000
Clearing	1	LS	$15,000	$15,000
Demucking	1	LS	$5,000	$5,000
Cut/Fill	3,500	CY	$15	$52,500
24"x38" ERCP Pipe	350	LF	$120	$42,000
MES	1	EA	$2,500	$2,500
Total				$142,000

Table 2.1. Construction cost estimate for Drainage Alternative 1.

Drainage Alternative 2				
	Quantity	Unit	Unit Price	Total Price
Clearing	1	LS	$3,000	$3,000
Cut/Fill	4,000	CY	$15	$60,000
24"x38" ERCP Pipe	50	LF	$120	$6,000
MES	1	EA	$2,500	$2,500
Total				$71,500

Table 2.2. Construction cost estimate for Drainage Alternative 2.

Table 3. Easement, ROW, Land Purchase, and Wetland Mitigation Costs (in 2019 dollars)

Roadway Alternative	Non-Overlapping, Permanent Easement Costs			Total Non-Overlapping, Permanent Easement Costs	Non-Overlapping, Temporary Construction Easement Costs	Total Non-Overlapping Easement Costs	Overlapping Easement Costs	ROW Acquisition Costs	Total Easement & ROW Costs
	Slope/Fill	Drainage	Utility Relocation						
1	$1,031,921	$383,406	$10,970	$1,426,297	$325,646	$1,751,943	$844,519	$278,102	$2,874,564
2	$703,639	$274,515	$282	$978,436	$168,754	$1,147,191	$1,925,801	$123,020	$3,196,012
3	$662,921	$372,729	$10,970	$1,046,620	$382,136	$1,428,756	$735,713	$0	$2,164,468

Table 3.1. Roadway alternatives: easement and ROW costs. Refer to figures 15, 17, and 19 for roadway easement and ROW areas. Per Orange County estimate, slope/fill, drainage, and overlapping easements are $42.37/SF; utility easements and ROW acquisition are $47.08/SF; and temporary construction easements are $37.66/SF.

Drainage Alternative	Drainage Alternative Easement Costs	Land Purchase Costs	Wetland Mitigation Credit Costs	Total Drainage Alternative Easement & Mitigation Costs
1	$228,078	$1,368,884	$217,500	$1,814,462
2	$0	$9,901,112	$0	$9,901,112

Table 3.2. Drainage alternatives: easement, land purchase, and wetland mitigation costs. Refer to figure 20 for drainage alternative easement and land purchase areas. Per Orange County estimate, drainage easements are $42.37/SF, land purchase for the Fishbones' parcel is $47.08/SF, and land purchase for the pond area in the wetlands is $900,000/acre. The wetland mitigation credit cost was estimated by Modica and Associates at $145,000/acre.

Alternatives Evaluation Matrix
Summary of Project Costs and Impacts
Vineland Avenue Preliminary Design (PDS) Study
Marriott Village at Lake Buena Vista —to— Basilica of the National Shrine of Mary, Queen of the Universe

EVALUATION MEASURE	ROADWAY ALTERNATIVES (ONLY)			PREFERRED ALTERNATIVES		DRAINAGE ALTERNATIVES (ONLY)
	No Build	Alt 1 Western Shift	Alt 2 Eastern Shift	Alt 3 Narrowed Median/East	Alt 1 Conservation Area Pond	Alt 2 Development Area Pond
COMMUNITY IMPACTS						
Right-of-Way Impacts						
Acres of Right-of-way/Acquisition	0	0.14	0.06	0	1.52	0
Acres of Easement	0	1.43	1.68	1.2	0.13	4.83
Total Acres	0	1.57	1.74	1.2	1.65	4.83
Properties						
Total Number of Relocations (Each)	0	0	0	0	0	0
Business Parcels Impacted (Each)	0	9	9	9	1	0
Residences Impacted (Each)	0	0	0	0	0	0
Vacant Parcels Impacted (Each)	0	3	3	3	3	4
ENVIRONMENTAL IMPACTS						
Wetlands (Acres)	0	0	0	0	1.9	0
Surface Water (Acres)	0	0	0	0	0	0
Flood Plains (Acres)	0	0	0	0	0	0
Potential Contamination Sites (each)	0	1	1	1	0	0
Threatended and Endangered Species	low	low	low	low	low	low
TRANSPORTATION IMPACTS						
Traffic Signals Added	0	1	1	1	N/A	N/A
Design Year Level of Service	F	D	D	D	N/A	N/A
New access restrictions	0	2	2	2	N/A	N/A
Sidewalk Added (Miles)	0	0.5	0.5	0.5	N/A	N/A
PROJECT COSTS (in $)						
Design Estimate	$0	$865,000	$865,000	$865,000	$75,000	$75,000
Rights-of-Way & Easements	$0	$2,874,564	$3,198,012	$2,164,468	$1,596,962	$9,981,132
Wetland Mitigation Banking	$0	$0	$0	$0	$217,500	$0
Construction	$0	$3,342,425	$3,342,425	$3,342,425	$142,000	$71,500
Reimbursable Utility Relocation	$0	$115,000	$115,000	$115,000	$0	$0
Construction Engineering & Inspection	$0	$518,614	$518,614	$518,614	$21,300	$10,725
Total Costs	$0	$7,715,603	$8,037,051	$7,005,507	$2,052,762	$10,058,357

CHAPTER 8

Recommended Improvements

8.0 Recommended Improvements

This section discusses the results of the preliminary design analysis and the preferred alternative as recommended in ***Section 7.4 & 7.5.***

8.1 Design Traffic Volumes

The Vineland Avenue *Design Traffic Technical Memorandum* documents the existing traffic conditions and analysis of the Build vs No-Build scenario. The design factors from the traffic analysis, which were utilized in the development of roadway improvements, can be found in ***Table 8-1.***

Table 8- 1: Recommended Design Factors

Segment	K	D	T	DHT
Vineland Avenue	7.6%	55.3%	3%	1.5%
Other County Roads	7.8%	55.9%	3%	1.5%
SR 535	9%	53.2%	3%	1.5%

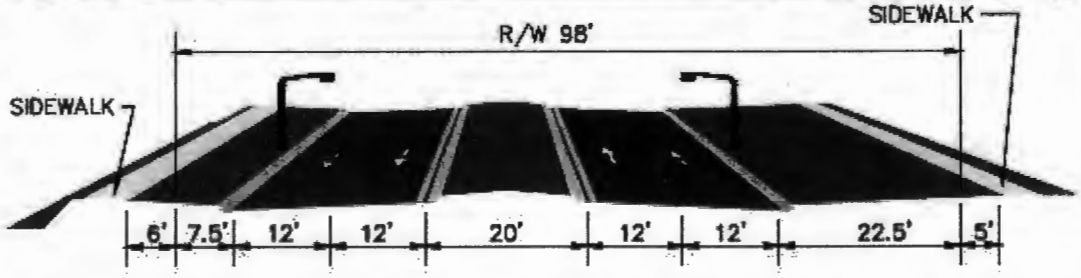
Under the No-Build scenario, traffic volumes are expected to reach over 27,000 ADT by year 2025 resulting in a LOS F throughout the corridor from Marriott Village to MQOTU.

8.2 Typical Section

It is recommended alternatives from the Vineland Avenue improvements consist of a four-lane divided typical section, shown in ***Figure A-3.*** The design elements are:

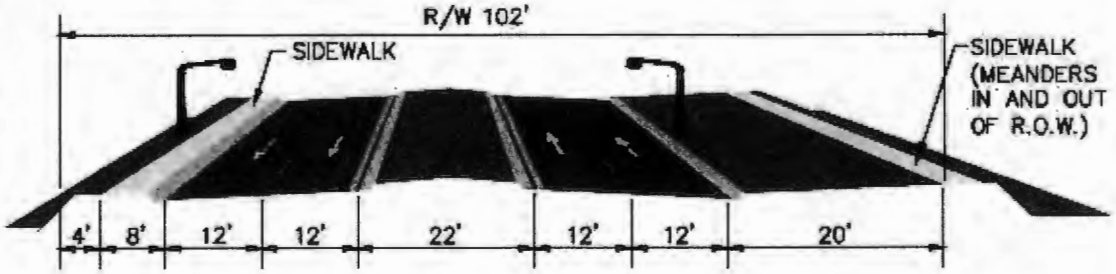
- 12-foot travel lanes
- 5-7-foot sidewalk on east side; 6-foot sidewalk on west side; there is potential for widening this sidewalk to 10-foot for the purposes of future multi-use trail.
- 2.0 -foot Type F curb and gutter
- 20-foot or 28-foot raised median (with curb): depends on Alternative
- grass utility strip between the edge of pavement and sidewalk

The required right-of-way width for the recommended improvements varies between 98 feet and 113 feet. Depending on the location along the study area, the proposed widening falls outside the current right-of-way. Easements have been outlined in ***Appendix B***; a future widening of the eastern sidewalk to 10 feet will result in another assessment of needed easements in addition to potential revisions to any utility and grading design.



TYPICAL SECTION 1
NTS

NOTE: SUPERELEVATION NOT SHOWN



TYPICAL SECTION 2
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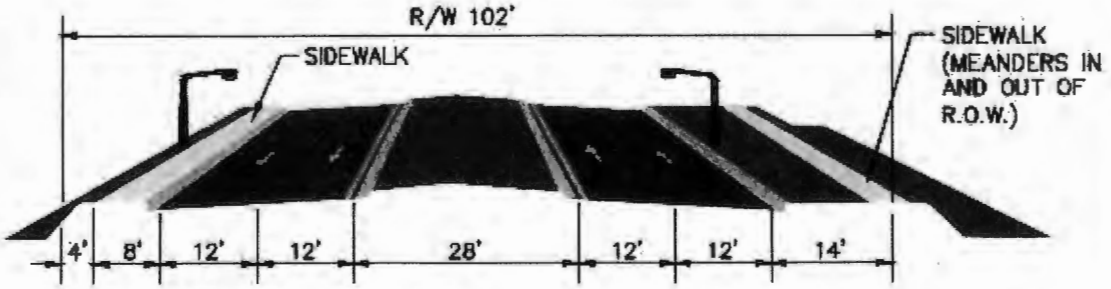

TYPICAL SECTION 3
NTS

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HARRIS
Harris Civil Engineers, LLC
1200 E. Hillcrest Street
Suite 200
Orlando, Florida 32803

ROADWAY ALTERNATIVE 3 (PREFERRED) SECTIONS

FIGURE A-3

8.3 Intersection Concepts and Signal Analysis

The recommended roadway improvements and geometry are shown in ***Appendix A.*** The exhibits indicate the roadway geometry required to provide improved LOS throughout the study corridor. All intersections and roadway segments can expect to operate at a LOS of E or higher by the design year, 2045 with the exception of Apopka-Vineland Road (CR 435).

There is a continued recommendation to signalize the intersection between Vineland Avenue and Little Lake Bryan Parkway.

8.4 Alignment and Right-of-Way Needs

The existing right of way varies along the study corridor. The preliminary right-of-way needs are outlined in the Easement Exhibits in ***Appendix B***.

8.5 Displacements

The preferred alignment and drainage alternative are not anticipated to result in any residential or commercial displacements.

8.6 Project Costs

The estimated projected costs identified in this section are based on 2019 dollars. Similar projects within Orange County areas and historical pricing information from FDOT were used to estimate construction costs.

8.6.1 Engineering Design Costs

Engineering costs typically include components for topographic and design surveys, geotechnical investigations, right-of-way engineering, roadway and drainage design, and post design services during construction. Engineering design costs are estimated at $940,000.00.

8.6.2 Right-of-Way Costs

Orange County Real Estates Management estimates the preliminary right-of-way costs to be a maximum of $3,196,012 plus approximately $9,901,112 for the land acquisition associated with the drainage design (for Drainage Alternative #2 acquisition of Fishbones' parcel; Drainage Alternative #1 considerably less expensive with $1,596,962 in easement costs). Please note that this is only an estimate of land-only costs in 2019 dollars. In any acquisition (whether "under threat" or not), additional costs for improvements, costs to cure, severance damages, attorney's fees, owner costs, etc. may (and likely would) be incurred.

8.6.3 Construction Costs

The maximum construction cost for the proposed improvements is $3,599,425.00. A detailed cost estimate is provided in ***Appendix E.***

8.6.4 Total Project Costs

Depending on the alternative combination chosen, the estimated improvement costs for Vineland Avenue range from $9,058,269 up to $18,095,388.

8.7 Recycling of Salvageable Materials

The County encourages contractors to recycle salvageable materials, such as old asphaltic concrete pavement, base material, and drainage structures. During construction, the existing pavement will be completely removed and recycled. Any salvageable materials, such as the existing pipe culverts, will be identified during the design of the project.

Any materials removed from the construction site will meet current FDOT Standard Specifications for Road and Bridge Construction. During the final design of the project, the opportunity to utilize existing pavement will be evaluated.

8.8 User Benefits

AASHTO's Manual on user Benefit Analysis of Highway and Bus-Transit Improvements (1977) defines highway user costs as the sum of: (1) motor vehicle running cost, (2) the value of the vehicle user travel time, and (3) traffic accident costs. User benefits, usually measured in terms of a decrease in user costs, include the cost reductions and other advantages that occur to highway motor vehicle users through the use of a particular transportation facility when compared to the use of another.

The recommended alternative provides significant benefits to the project when compared to the no-build scenario. The following benefits are expected to occur with the recommended build alternative:

- Expected reduction in motor vehicle running costs.
- Expected reduction in user travel time.
- Potential for reduction in traffic accident costs.

Also, the addition of sidewalks will benefit the non-motorist user by providing additional safety while traveling through the study corridor.

8.9 Pedestrian

Pedestrian facilities will be incorporated into the study area. Five-foot to seven-foot sidewalks will be maintained along the east side of the roadway, and six-foot sidewalk is proposed for the west. The east sidewalk and Type F curb will be separated by a variable width utility strip to provide more safety between motorists and pedestrians. The current non-compliance with ADA standards will be improved upon within the study area including adding detectable warning surfaces. The crossing at Little Lake Bryan Parkway will be provided with signalization, adequate signage and cautions.

8.10 Enhancements

Improved pavement conditions, adequate drainage systems, roadway geometry, access management, pedestrian facilities, landscaping, and roadway lighting were all major aspects in the development of the roadway improvements. These enhancements allow for an increase in traffic operations and the movement of motorists and pedestrians.

8.11 Economic and Community Development

The land use through the study corridor is commercial developed. Any improvements made to Vineland Avenue will have a positive effect on the future economic vitality of the area due to more positive circulation. The improvements are expected to benefit the surrounding community by providing a safe and efficient means of transportation as the study area is developed. In addition, no direct damage impacts are anticipated to any properties as a result of design and construction; easement impacts for temporary construction, sloping and grading, and utility have been outlined in the Appendices.

8.12 Environmental Impacts

Detailed studied and evaluations were performed throughout the study corridor to determine the adverse impacts that may result from the project. The *Geotechnical Report* and *Environmental Analysis* contain data, evaluation procedures, and an analysis of results.

8.12.1 Land Use

The existing land use along the Vineland Avenue study area consists almost entirely of commercial complexes (11 businesses and 1 Church) on the east side and Interstate 4 and the Marriott Village complex on the west. There is a wetlands area with attached residential community adjacent to the area. The proposed improvements to Vineland Avenue are not anticipated to alter the current land use within the study area.

8.12.2 Wetlands

The *Environmental Assessment Report* included as part of this study, addressed the surrounding wetlands and the impacts from roadway improvements. In total, approximately 1.5 acres of wetland will be impacted based on the preferred improvements of Drainage Alternative #1. The recommended method of wetland mitigation is purchasing credits from a mitigation bank. The final design will dictate the mitigation costs, and those provided are susceptible to change. Wetlands will not be impacted using Drainage Alternative #2, with the exception of ultimate discharge to Little Lake Bryan.

From the results of the study, there are no practical alternatives to the construction within wetlands using Alternative #1. Further minimization to wetland impacts will be implemented where possible during the design phase of the roadway. All unavoidable wetland impacts will be mitigated through the ACOE, SFWMD and OCEPD prior to approval of the final project. ***Figure 6 below*** displays the potential wetland impacts for the preferred roadway improvements.

8.12.3 Wildlife and Habitat

The proposed improvements are expected to have minimal impacts to the existing wildlife and their habitat. The proposed improvements are not expected to impact any listed species.

Per the *Environmental Assessment Report*, there is potential for threatened and endangered species but none were observed. The Report from the SFWMD permit for Fishbones (Little Lake Bryan Center) has also been provided. In the event the Vineland Avenue widening is permitted through SFWMD at a later date, additional survey on wildlife may be required. Please refer to ***Appendix G.***

8.12.4 Construction

Construction activities will have temporary air, noise, water quality, traffic flow and visual impacts for the travelers within the immediate vicinity of the project. Adherence to all State and local regulations, and the FDOT Standard Specification for Road and Bridge Construction, current edition, will minimize these impacts.

There should be no direct impacts to wetlands other than those falling within the expanded right-of-way. Ingress/egress of construction vehicles, materials storage and other secondary-construction related activities are not expected to infringe on the wetland boundaries any more than necessary.

Industry-standard precautions and methods will keep secondary impacts to a minimum. Such items as silt fences and turbidity barriers, in appropriate locations, will aid in minimizing effects outside of the construction zone.

Vineland Avenue Improvements
Figure 6- Land Use Map
Section 22, T24S, R28E
Orange County, Florida

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8.12.7 Utility Impacts

There are several existing utilities within the project corridor including underground electric lines, water and sewer lines, cable television and telephone lines. The details of existing utilities are summarized in ***Table 8-2***. It should be noted that coordination measures have been initiated and will be taken into consideration during the design phase to successfully relocate any existing utilities. Estimated utility relocation costs have been included in the construction costs, based on correspondence with the applicable utility companies.

Table 8- 6: Existing Utilities

Utility	Type
American Traffic Solutions	Electric / Communication Lines
Charter Communications	Fiber Optic, Telephone, CATV
Florida Gas Transmission	Gas
Duke Energy	Electric
MCI	Fiber / Communication Lines
OCU - Wastewater	Sewer Wastewater
OC Public Works	Fiber / Traffic Signals
OCU	Water
Summit Broadband	Fiber Optic / Telephone
TECO	Gas
Reedy Creek Energy	Gas, Water, Sewer, Communications, Fuel Oil
Smart City Telecom	Fiber / Telephone
Centurylink	Fiber / Telephone

8.13 Traffic Control Plan

The maintenance of traffic during the construction of the proposed improvements will minimize impacts to motorists and pedestrians using the project corridor. Additionally, it will maintain acceptable access to residents and business owners living and working adjacent to the roadway. The maintenance of traffic plan is developed based on the existing conditions and the proposed improvements.

Traffic Control Through Work Zones from The FDOT Design Standards will be followed when creating the traffic control plan. Orange County strives to complete roadway projects with minimal impact to the current traffic. It is anticipated that the project will be completed in two phases. Phase one will likely consist of the northbound lanes and stormwater management facilities, while the southbound lanes would be constructed as phase two.

8.14 Stormwater and Drainage

8.14.1 Preliminary Drainage Analysis

As part of the master outfall permit for Little Lake Bryan (SFWMD Permit 48-00780-S), Vineland Avenue drains to water quality ponds where it is treated before being discharged into Little Lake Bryan where it is then attenuated. The future improvements intend to follow this direction, as stormwater improvements will account for the water quality being needed for the increase in impervious

area. Disney, the adjacent property owner for Little Lake Bryan, has assured Orange County that this widening will not adversely affect the staging and attenuation in Little Lake Bryan.

8.14.2 Pond Locations

The proposed storm water facilities will provide the needed water quality for the increase in impervious for Vineland Avenue in order to meet SFWMD requirements. From there, it will follow the same direction as the master outfall permit, being discharged to Little Lake Bryan.

Two storm water options were analyzed as part of this study. A detailed *Pond Siting Report* can be found in the ***Appendix I*** of this report. The PDS recommends to the County based upon the best option includes an independent wet pond built within the adjacent wetlands. The analysis included as part of this study is preliminary in nature. Final size and location of stormwater ponds and outfall structures will be determined in the design phase of the project.

8.14.4 Floodplains and Floodways

Based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM's), the site is located in Zone X (500 Year) floodplain. Zone AE encompasses Little Lake Bryan; efforts will be made to keep the proposed wet detention pond for the widening project out of the 100-year floodplain (Zone AE).

8.14.5 Stormwater Permits

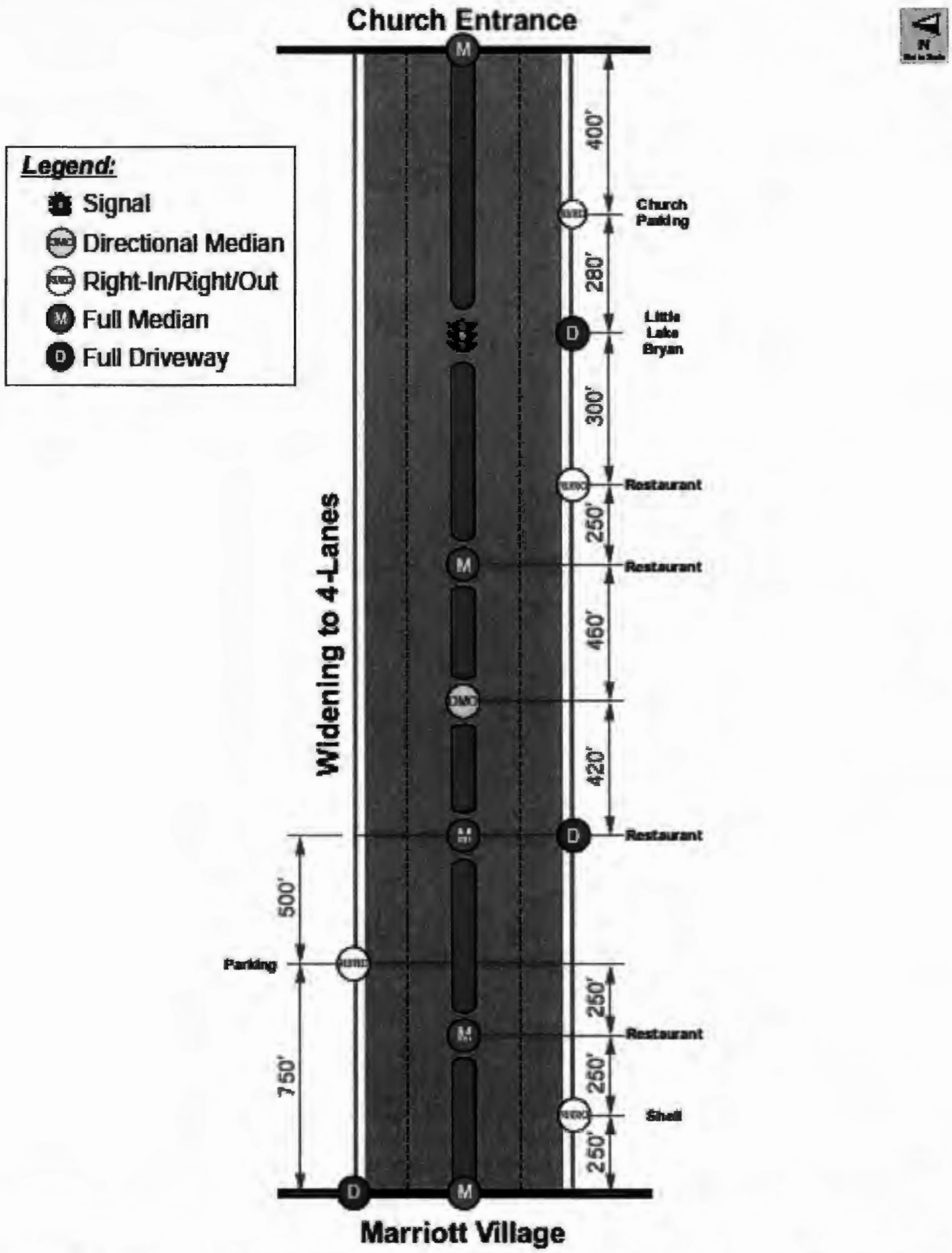
Permitting considerations for the stormwater management facilities will involve the South Florida Water Management District (SFWMD), the Army Corps of Engineers (ACOE), and the Department of Environmental Protection (DEP) criteria. The proposed project will require securing a Permit Modification through the SFWMD. Construction activities will require development of a Stormwater Pollution Prevention Plan (SWPPP) and proper coordination for NPDES requirements.

8.15 Access Management

Access management refers to the coordination between roadway design and land use to improve transportation. Access management includes strategies such as: limiting the number of driveways per lot, locating driveways away from intersections, increasing minimum lot frontage on major streets, and regulation the location, spacing and design of driveways. These strategies, along with the input from Orange County, have been implemented into the PDS.

A full access management review was performed to determine appropriate median opening types and placement along the corridor, as well as directional left-turn locations. With the widening of the current 2-lane section of Vineland Avenue, the proposed access management plan limits access by incorporating a raised median throughout the length of the widening section; however, connections, directional median openings and full median openings are provided at spacing intervals that do not comply

with FDOT Access Class 5 requirements. These intervals were based on a joint meeting held with County Planning Staff held on 11/15/19, where the three roadway alternatives were updated to reflect connection spacing that the public would find acceptable based on their existing access. Future considerations will be given to the access management for MQOTU during the design phase of this project.



Proposed Access Management Concept Plan
Vineland Avenue Widening PDS
19029 v1.3

Figure 22

8.16 Aesthetics and Landscaping

The final design phase will investigate aesthetic and landscaping improvements. The typical section shows options for landscape enhancements in the medians. All landscaping and pedestrian/roadway lighting improvements should be developed in conformance with the design for appropriate maintenance of the required clear zones and lines of sight at intersections, as well as conform to the standards within the International Drive Activity Center.

CHAPTER 9

Public Involvement

9.0 Public Involvement

This section of the report provides an overview of the public involvement activates during the Vineland Avenue Preliminary Design Study (PDS) project. ***Appendix C*** contains the newsletters, newspaper ads, and PowerPoint presentations.

9.1 Public Involvement Plan

Community involvement is critical in the roadway study. The inclusion of the public allows for Orange County to implement transportation improvements that meet the needs of the area, and that are supported by the community. The ***Public Involvement Plan*** sets the framework to involve the public, local businesses and other interested parties, and the methods used to respond and record various input. The ***Public Involvement Plan*** was developed to inform and involve the citizens of Orange County, the State and local agencies, and the responsible appointed and elected public officials in the project planning, review and approval process.

9.2 Public Information

Public Information included public notifications, coordination meetings, public meetings, small group (informal) meetings, Orange County staff presentations, and the LPA/BCC public hearings. The following methods were used to reach those affected by the roadway improvements and to solicit public input throughout the study:

- Development and maintenance of a property owners and elected/appointed officials mailing list.
- A Newsletter is mailed to property owners and interest stakeholders prior to the public meeting and LPA/BCC public hearings.
- A project website was created and maintained by the County. The website was updated with the latest study-related information on project issues. It included newsletters, meeting minutes, and schedules.
- Public meeting advertisements were placed in local newspapers (in English and Spanish) prior to each public meeting and hearing.
- Local elected and appointed officials were notified of all public events via the project newsletter.

9.3 Coordination and Small Group Meetings

Meetings were held with any groups, or concerned individuals, in order to discuss the improvement alternatives.

Coordination meetings where held with Orange County throughout the duration of the study. Meeting attendees included South Florida Water Management District, Reedy Creek Improvement District, and Orange County Utilities, representatives of the Fishbones' parcel, traffic and environmental consultants.

Coordination Meetings with Orange County were held on the dates listed below:

- 03/27/2019
- 04/23/2019
- 06/14/2019
- 06/21/2019
- 09/06/2019
- 12/13/2019

Utilities Coordination Meetings/Conference Call/Correspondence took place on the dates listed below:

- 09/25/2019
- 09/26/2019
- 10/03/2019
- 10/15/2019
- 11/14/2019

9.4 Public Meetings

The following public meetings were held throughout the duration of the study:

- Preferred alternative meeting was held on January 23, 2020.
- LPA Public Hearing was held on February 20, 2020. The LPA found the Study to be consistent with the Comprehensive Plan and recommended the approval of the Study. Meeting minutes can be found in *Appendix M,* notably the discussion of sidewalk necessity on the north side.
- BCC Hearing to be held on March 24, 2020.

9.5 Board of County Commissioners Public Hearing

The Board of County Commissioners (BCC) Public Hearing is scheduled. ***Appendix C*** will include the PowerPoint presentation and meeting minutes.

9.6 PDS Study Documentation

The Final Preliminary Design Study Report and ***Supporting Documents*** can be obtained from Orange County Public Works.