ORANGE COUNTY GOVERNMENT FLORIDA

Interoffice Memorandum

AGENDA ITEM

March 13, 2018

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 26, 2019 – Work Session
Avalon Road Roadway Conceptual Analysis Study

The Transportation Planning Division has completed the Roadway Conceptual Analysis Study for the widening of Avalon Road from two to four lanes. Avalon Road is located in western Orange County and is bounded by both city and unincorporated county properties. The project limits are from Florida's Turnpike to West Colonial Drive, a distance of approximately 0.43 miles. This study and subsequent production phases that complete the widening of Avalon Road are being conducted in accordance with a 2007 interlocal agreement with the City of Winter Garden for the widening of Avalon Road from Tilden Road to West Colonial Drive.

At the March 26, 2019 Board meeting Transportation Planning will present the results of the study. The purpose of the study was to develop the most appropriate road alignment with stormwater facilities and bicycle and pedestrian accommodations, while minimizing environmental impacts. The need for this roadway is based on a variety of factors, including future traffic operations, safety, and social and economic demands.

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

JVW/RN/bh
Attachment

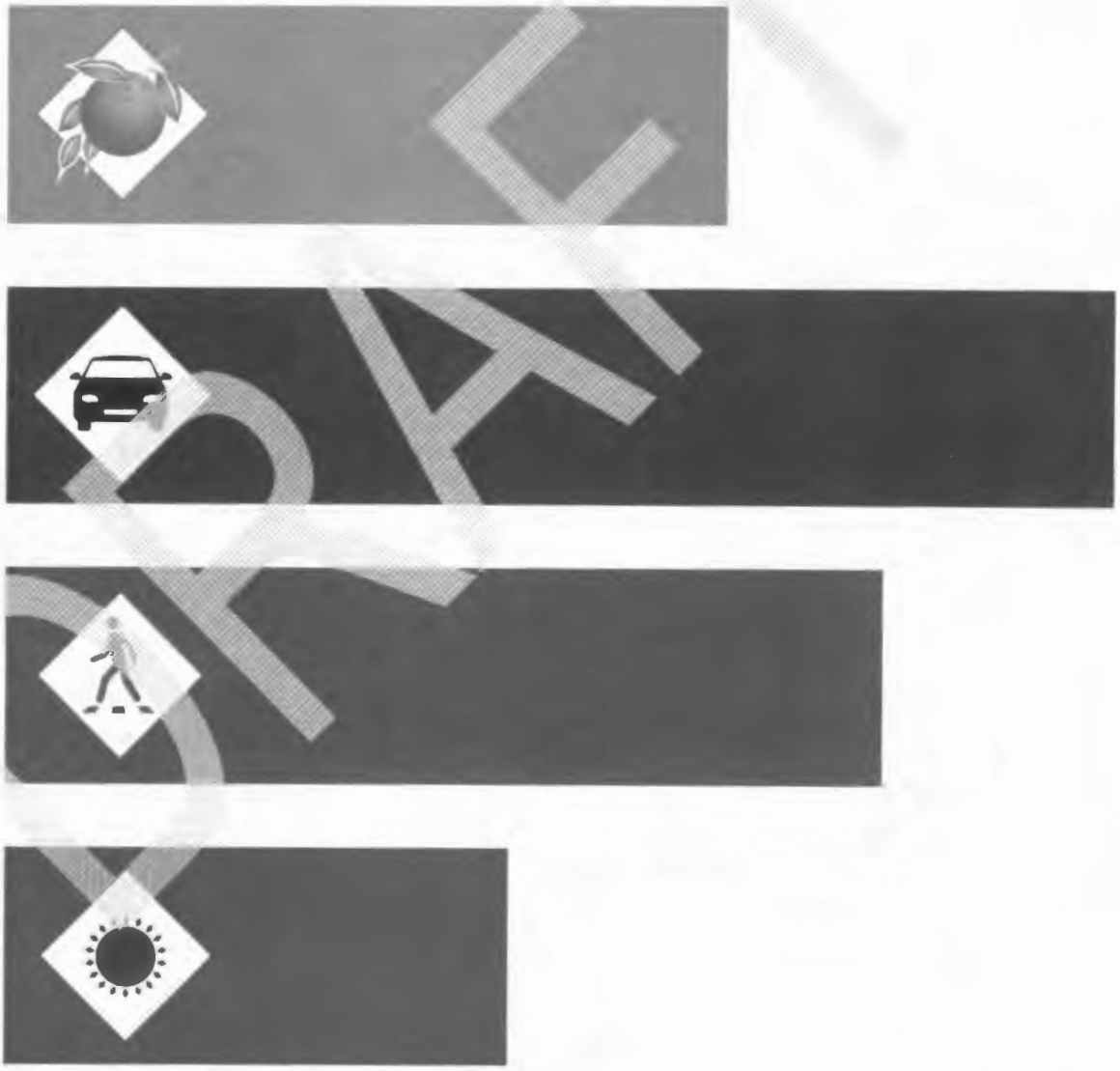
c: Mark V. Massaro, P.E., Director, Public Works
Diana Almodovar, P.E., County Engineer, Public Works
Brian Sanders, Assistant Manager, Transportation Planning Division
Blanche Hardy, P.G., Assistant Project Manager, Transportation Planning Division

Avalon Road RCA Study

FLORIDA'S TURNPIKE TO SR 50

Draft Roadway Conceptual Analysis Report

March | 2019



DRAFT

ORANGE COUNTY GOVERNMENT FLORIDA

wsp

DRAFT ROADWAY CONCEPTUAL ANALYSIS REPORT

Project Name:	Avalon Road Roadway Conceptual Analysis
Project Limits:	Florida's Turnpike to West Colonial Drive (SR 50)
County/State:	Orange County, Florida
County Contract:	Y17-809

This Draft Roadway Conceptual Analysis Report is submitted to Orange County for review and approval.

Submitted by: Alan R. Danaher

Alan Danaher, PE, PTOE, AICP, PTP – Consultant Project Manager
WSP

Date: March 7, 2019

Approved by: _____

Blanche Hardy, PG, Project Manager
Orange County Transportation Planning Division

Date: _____

Avalon Road Roadway Draft Conceptual Analysis (RCA) Report

On behalf of Orange County Mayor Jerry Demings and District 1 Commissioner Betsy VanderLey, Orange County is pleased to present this Roadway Conceptual Analysis (RCA) Report for the Avalon Road Roadway Conceptual Analysis (RCA) Study. The study limits are from Florida's Turnpike to West Colonial Drive (SR 50), a distance of approximately 0.43 miles.

Honorable Jerry Demings
Orange County Mayor

Betsy VanderLey
Orange County District 1 Commissioner

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Executive Summary

ES.1 Introduction

Orange County conducted a Roadway Conceptual Analysis (RCA) for the north end of the Avalon Road (CR 545) corridor from Florida's Turnpike to West Colonial Drive (SR 50) in west Orange County. The objective of the RCA is to identify a preferred improvement alternative to address the current and future transportation needs along the corridor. The preferred improvements identified in this report will serve as the basis for the subsequent design of the roadway improvements. This *RCA Report* summarizes the essential components of the study, including public involvement, data collection, traffic analysis, roadway design, drainage design, and environmental impacts.

ES.2 Purpose and Need for Improvement

The purpose and need for the project is based on three key factors: 1) provide traffic capacity to meet social/economic demands, 2) be consistent with transportation plans, and 3) to enhance safety. This segment of Avalon Road is currently operating at an acceptable level of service (LOS), but by the design year 2045, this segment of Avalon Road will operate at an unacceptable LOS F. Roadway improvements are needed to provide an acceptable level of service.

The widening of Avalon Road, from Florida's Turnpike to SR 50, is included in the Orange County Capital Improvement Program (CIP), the Orange County 2030 Long-Range Transportation Plan (LRTP), and the Orange County 2017 Ten-Year Roadway Plan.

Crash reports for the three-year time period between September 18, 2014 and September 18, 2017 were obtained and reviewed. Crashes were considered to be associated with the SR 50 intersection if the crash occurred due to the operation of the intersection or was within the length of the turn lane bay. Forty-eight (48) crashes occurred at the study intersection over the three-year period, and eighteen (18) crashes occurred along the Avalon Road segment not associated with the operations of the SR 50 intersection. Capacity and intersection improvements will enhance safety along the corridor.

ES.3 Existing Conditions

Avalon Road within the project limits is a two-lane undivided roadway. Avalon Road is classified as a Major Collector Urban roadway, with a speed limit of 45 miles per hour (mph). There is a 4-foot existing sidewalk along the east side of Avalon Road through the study corridor.

The existing right-of-way along Avalon Road varies throughout the project corridor, but is primarily 47 feet in width, with 25 feet to the west of roadway centerline and 22 feet to the east of roadway centerline. SR 50 is the only signalized intersection within the study limits. The existing transportation network within the study corridor is comprised mainly of the current roadway system. Existing transit service in the area includes LYNX NeighborLink Route 612 and LakeXpress Route 50 East, which serve the area along SR 50, but do not utilize Avalon Road.

Eleven utility agency/owners have been identified within the project area through utility coordination efforts, with the majority of utilities running along the west side of Avalon Road.

The Avalon Road project area is located within the Ocklawaha River drainage basin, within the jurisdiction of the St. Johns River Water Management District (SJRWMD). The entire project area is a tributary of the Johns Lake Outlet. Stormwater runoff from the existing roadway is collected

in roadside ditches, which convey flows to a wetland area south of the Florida's Turnpike, and then discharge into nearby Johns Lake.

ES.4 Traffic Analysis

A detailed project traffic analysis is provided in the *Design Traffic Engineering Report.* This document provides the existing traffic conditions of the area, as well as an analysis of the improvement alternatives. A four-lane improvement to Avalon Road will result in an acceptable level of service along the corridor for the design year 2045.

ES.5 Alternatives

An evaluation matrix was developed to compare the No-Build Alternative and four Build Alternatives. The matrix, shown in **Table ES.1**, considers the social, natural, and physical impacts, and the capital costs of all of the alternatives.

ES.6 Preferred Alternative

The preferred alternative is the Center/Hybrid Alignment, which maximizes use of the right-of-way and minimizes impacts. The Center/Hybrid Alignment is shown in **Figure ES.1,** and contains the following design elements:

- Four 12-foot travel lanes
- A 5-foot sidewalk located on the east side of the roadway
- A 10-foot multi-purpose path located on the west side of the roadway
- Type E curb and gutter along the inside lanes
- Type F curb and gutter along the outside lanes
- A 22-foot raised median
- Two 6-foot utility strips between the curb and gutter and the sidewalk/multi-purpose path
- A grass strip between the sidewalk/multi-purpose path and the right-of-way line
- The proposed right-of-way is 108 feet

Figure ES.1: Preferred Build Alternative: Center/Hybrid Alignment

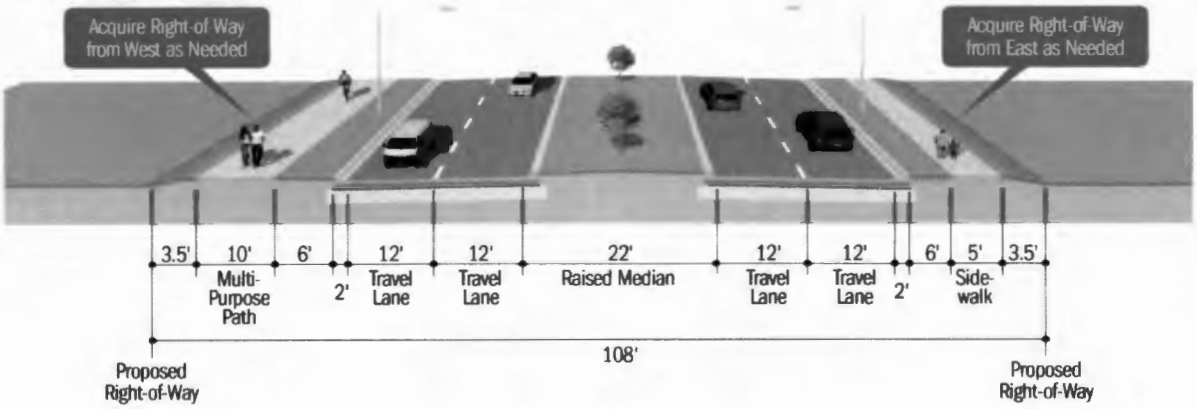


Table ES.1: Alternatives Comparison Matrix

Evaluation Criteria	No-Build Alternative	West Alignment	East Alignment	Center Alignment	Center/Hybrid Alignment (Preferred)
Right-of-Way Impacts					
Number of Residential Acquisitions	None	9	6	5	4
Right-of-Way Needed (acres)	None	5.41	5.64	5.13	5.55
Number of Parcels Impacted	None	25	23	30	30
Social, Natural, & Physical Impacts					
Social & Neighborhood	None	Moderate	Moderate	Moderate	Moderate
National Register Archaeological/Historic Sites	None	None	None	None	None
Threatened/Endangered Species	None	None	None	None	None
Acres of Wetlands	None	None	None	None	None
Acres of Floodplains	None	None	None	None	None
Potential Contamination Sites	None	1	1	1	1
Southbound Deflection Impacts at SR 50 Intersection	Yes	Yes	Yes	Yes	Yes
Meets County Level of Service Standard	No	Yes	Yes	Yes	Yes
Estimated Costs (Present Day Costs)					
Design (15% of Construction)	No Cost	$499,000	$501,000	$506,000	$495,000
Right-of-Way Acquisition*	No Cost	$529,000	$402,000	$316,000	$321,000
Roadway Construction	No Cost	$3,329,000	$3,341,000	$3,374,000	$3,302,000
CEI (15% of Construction)	No Cost	$499,000	$501,000	$506,000	$495,000
Total Cost **		**$4,856,000**	**$4,745,000**	**$4,702,000**	**$4,613,000**

** Right-of-way acquisition estimate does not include relocations or business damages, and is subject to change.*
*** Roadway construction cost estimate (in 2018 dollars) assumes underground utility relocation included in contingency within the cost, pending further engineering analysis during design.*
Shaded column represents the preferred alternative.

ES.7 Public Involvement

Critical to the success of this project is the feedback received from the local community. Public information for this project has been dispersed through the following methods:

- Five newsletters mailed to property owners and tenants along the study corridor, and other interested persons at the following study time periods:
  - Newsletter #1: February 2018 (Study Overview and Existing Conditions)
  - Newsletter #2: August 2018 (Alternatives Analysis)
  - Newsletter #3: April 2019 (LPA Hearing)
  - Newsletter #4: May 2019 (BCC Hearing)
  - Newsletter #5: June 2019 (Announcement of Adopted Alternatives)
- Public meeting advertisements were placed in the *Orlando Sentinel* and *El Sentinel*
- A project website was provided which contained information such as: project study area map, project schedule, meeting notices, newsletters, and study documents.

Small group meetings were held with private residents along the Avalon Road corridor. Two community public meetings were held for the project. The meeting format consisted of an open house that allowed informal discussions between the project team and the public, followed by a presentation and an open question and answer forum.

- The Kick-off Alternative Public Information Meeting was held on March 28, 2018 from 6 to 8 p.m. at Winter Garden City Hall.
  - In addition to the project team, 16 stakeholders attended the Kick-off Alternative Public Information Meeting.
  - At the meeting, attendees expressed support for the proposed multi-use path, and had several questions on access management/driveway locations, existing right-of-way limits, and potential property takings. Attendees expressed a desire for the speed limit of Avalon Road to be reduced, and for U-Turn facilities to be incorporated into the conceptual design.
- The Preferred Alternative Public Information Meeting was held on September 12, 2018 from 6 to 8 p.m. at Winter Garden City Hall.
  - In addition to the project team, 40 stakeholders attended the Preferred Alternative Public Information Meeting.
  - At the meeting, attendees had questions about the width/nature of the proposed median, anticipated construction and drainage impacts, the location of dedicated turn lanes, and the estimated cost of the project. Attendees expressed a desire for the speed limit of Avalon Road to be reduced, for lighting along the roadway, and for U-Turn facilities to be incorporated in both directions of the roadway.

ES.8 Conclusions and Recommendations

The objective of the Avalon Road RCA is to develop and evaluate alternatives for improvement of Avalon Road from Florida's Turnpike to SR 50. The analysis sought to provide for cost-feasible improvements to the roadway, to balance the safety and mobility needs of all mode users in the corridor. The process incorporated the insights from planning, engineering, and the public to refine the alternatives and ultimately advance a preferred alternative into the design phase. It is recommended that the preferred Center/Hybrid Alignment Alternative be advanced by Orange County into the design phase.

1. Introduction

In October 2017, Orange County initiated a Roadway Conceptual Analysis (RCA) Study to identify the potential improvements needed to address current and future traffic demands of the north end of Avalon Road (CR 545) between Florida's Turnpike and West Colonial Drive (SR 50). This *Avalon Road RCA Report* summarizes the preferred alternative for the Avalon Road study area, a 0.43-mile section beginning at Florida's Turnpike at the southern end and terminating at SR 50 to the north (illustrated in **Figure 1.1**). This report presents existing and future conditions, purpose and need, design controls and standards, alternatives analysis, preferred alternative, and public involvement.

Provided below is a brief summary of each chapter of the report:

- **Purpose and Need:** This chapter presents the purpose and need for the project.
- **Existing Conditions:** This chapter presents existing conditions, including roadway characteristics, crash data, public transportation, long-range transportation improvements, utilities, geotechnical and contamination findings, land use, cultural features, archaeological/historic features, hydrologic features, and wetlands/species.
- **Design Controls and Standards:** This chapter presents roadway design criteria and drainage design criteria applicable to the study area.
- **Traffic Conditions:** This chapter presents existing and future traffic volumes and pedestrian/bicycle volumes in the study area.
- **Alternatives Analysis:** This chapter presents an analysis of the No-Build Alternative and the four Build Alternatives as well as opportunities and constraints.
- **Preferred Alternative:** This chapter presents the results of the preliminary design analysis, and details of the Preferred Alternative.
- **Public Involvement:** This chapter presents a summary of the public involvement process through the project, including information distribution, community meetings, small group meetings, and Orange County meetings.

Documents reviewed as part of the development of this report include:

- Interlocal Agreement between Orange County/City of Winter Garden - October 2007
- Orange County 2030 Long-Range Transportation Plan (LRTP) – May 2017
- Orange County Multi-Modal Corridor Plan – August 2014
- Orange County 2017 Ten-Year Roadway Plan – April 2017
- MetroPlan Orlando 2040 Long-Range Transportation Plan (LRTP) – January 2016
- MetroPlan Orlando 2019-2023 Transportation Improvement Program (TIP) – July 2018
- Orange County Americans with Disabilities (ADA) Transition Plan – April 2016
- City of Winter Garden 2020 Comprehensive Plan – June 2010
- LYNX Transit Development Plan (TDP) – April 2018

Figure 1.1: Project Location Map

2. Purpose and Need for Project

2.1 Traffic Capacity

Portions of Avalon Road within the study area are currently operating at an unacceptable LOS E. Without improvements, all of Avalon Road, within the project limits, will operate at an unacceptable LOS F by design year 2045.

The study intersections were analyzed for existing conditions using the procedures of the 2010 Highway Capacity Manual (HCM) for signalized and unsignalized intersections. This analysis used existing traffic volumes and geometric conditions. **Table 2.1** includes the summary results for the weekday AM and PM peak hour intersection delay and LOS. All of the existing study intersections within the project limits currently operate at satisfactory levels of service (LOS D or better).

Table 2.1: Existing Intersection Weekday LOS

#	Intersection	Control Type	AM LOS	PM LOS
1	SR 50	Signal	D	D
2	Country Gardens	Stop	A/C*	A/D*
3	Rolling Rock Way	Stop	A/E*	A/D*
4	Possum Holler Road	Stop	A/A*	A/B*

** Unsignalized Intersection LOS are reported for "Major Street Left Turn Movement / Minor Street Movement."*

In design year 2045 without capacity improvements, all intersections (signalized and unsignalized) are projected to operate at LOS F during both the weekday peak hours, as listed in **Table 2.2**. The right-in/right-out intersections at Rolling Rock Way and Possum Holler Road are projected to operate at LOS F for the minor street movements. Therefore, capacity improvements are needed to achieve an acceptable level of service along Avalon Road.

Table 2.2: Future No-Build Intersection Weekday LOS (2045)

#	Intersection	Control Type	AM LOS	PM LOS
1	SR 50	Signal	F	F
2	Country Gardens	Stop	B/F*	C/F*
3	Rolling Rock Way	Stop	C/F*	B/F*
4	Possum Holler Road	Stop	B/F*	B/F*

** Unsignalized Intersection LOS are reported for "Major Street Left Turn Movement / Minor Street Movement."*

2.2 Social/Economic Demands

Avalon Road runs through the City of Winter Garden, and connects the Horizon West mixed use villages to commercial activity along SR 50 and downtown Winter Garden. Existing City of Winter Garden zoning along the project corridor is predominantly residential, with one school to the north of the study area (Tildenville Elementary School), and two schools to the south of the study area (SunRidge Elementary School and SunRidge Middle School). Within ½ mile of Avalon Road, there are an estimated 1,157 households with a population density of 7.08 persons/acre.

2.3 Consistency with Transportation Plans

The widening of Avalon Road, from Florida's Turnpike to SR 50, is included in the Orange County Capital Improvement Program (CIP), and Map 1 of the Orange County 2030 Long-Range Transportation Plan designates the study segment as a "County Partnership Project."

2.4 Safety

Crash reports for the three-year time period between September 18, 2014 and September 18, 2017 were obtained and reviewed. The SR 50 intersection was analyzed separately from the Avalon Road segment. Crashes were considered to be associated with the intersection if the crash occurred due to the operation of the intersection or was within the length of the turn lane bays. A total of 48 crashes occurred at the Avalon Road/SR 50 intersection over the three-year period, and a total of 18 crashes occurred along the segment not associated with the intersection. Mainline capacity and intersection improvements will enhance safety along the corridor.

3. Existing Conditions

3.1 Roadway Characteristics

3.1.1 Functional Classification

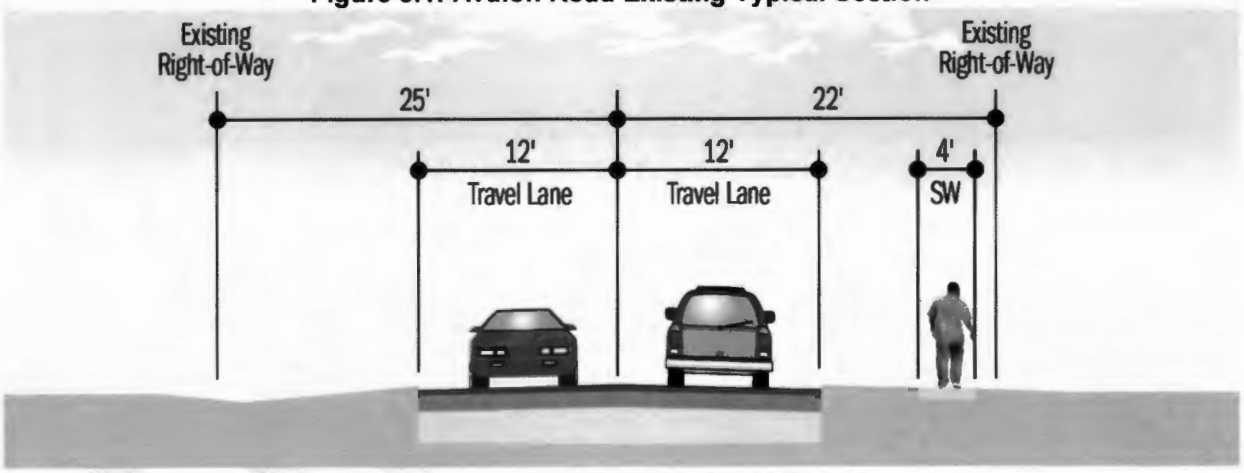
Avalon Road (CR 545) is classified as a Major Collector Urban roadway and is owned and maintained by Orange County. The posted speed limit on the corridor is 45 miles per hour (mph).

3.1.2 Typical Section

The roadway right-of-way information was obtained using available property appraiser parcel data and title searches. The right-of-way varies along the corridor, but is primarily 47 feet in width, with 25 feet to the west of roadway centerline and 22 feet to the east of roadway centerline.

Through the study area, Avalon Road is generally a two-lane arterial with one 12-foot travel lane in each direction. Along the corridor, there is a continuous 4-foot sidewalk along the east side of the Avalon Road existing right-of-way. The distance from the edge of roadway to the sidewalk varies. **Figure 3.1** illustrates the existing typical section for Avalon Road.

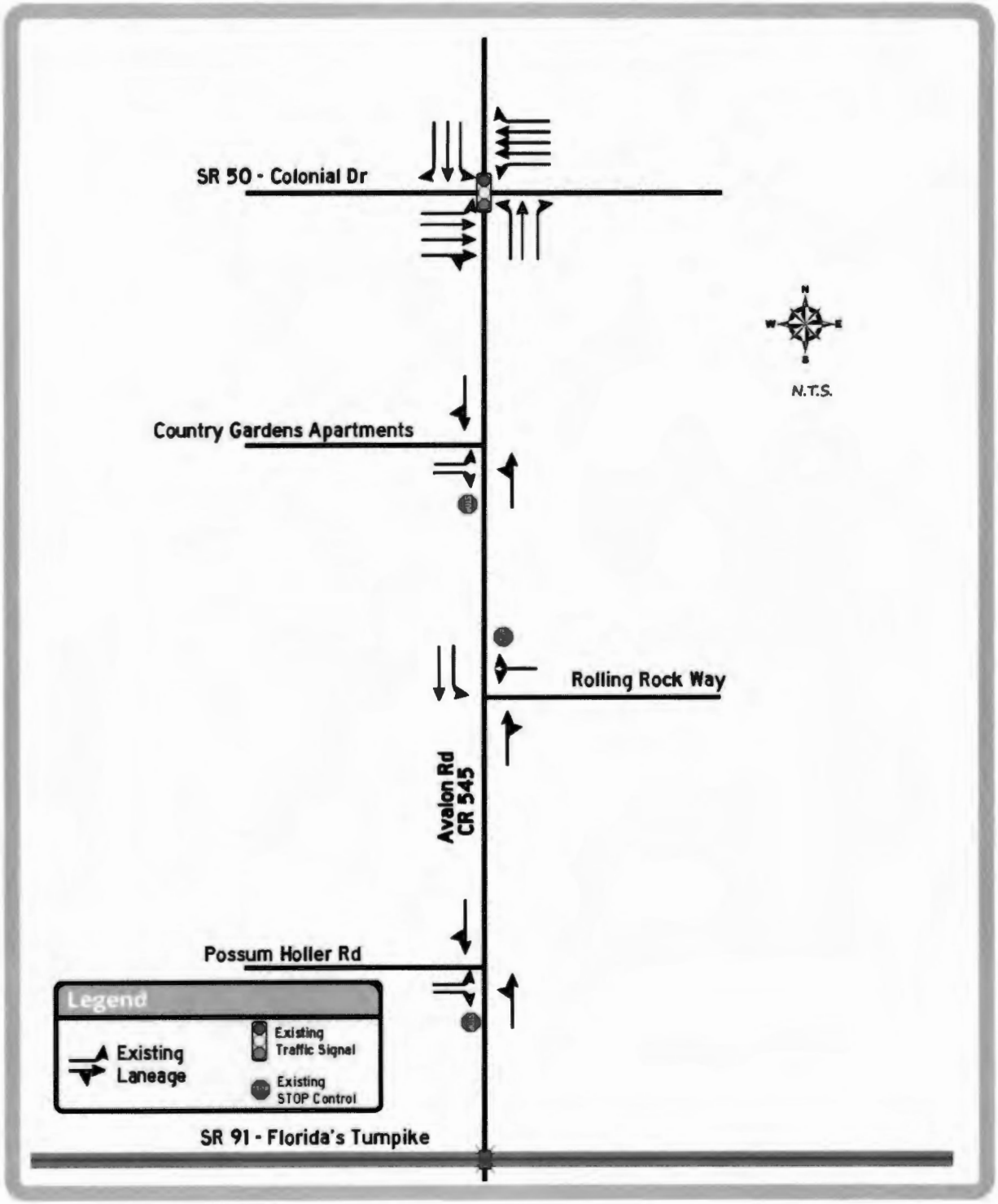
Figure 3.1: Avalon Road Existing Typical Section



3.1.3 Intersection Geometry

Figure 3.2 illustrates existing road laneage along Avalon Road for the following intersections: Possum Holler Road, Rolling Rock Way, Country Gardens Apartments driveway, and SR 50. Left- and right-turn lanes on Avalon Road are provided at the northbound approach of the signalized SR 50 intersection. A left-turn lane is also provided on the southbound approach of the Rolling Rock Way intersection. Orange County is responsible for the operation and maintenance of the SR 50 traffic signal within the study area.

Figure 3.2: Existing Roadway Configuration and Traffic Control within Study Area



3.1.4 Pedestrian and Bicycle Facilities

Through the study area, existing bicycle and pedestrian infrastructure consists of a 4-foot sidewalk along the east side of Avalon Road (**Figure 3.3**) and along the west side of Avalon Road from SR 50 to the entrance of Country Gardens Apartments. There are no roadway shoulders available for bicycles to use. There are pedestrian crosswalks at the Rolling Rock Way intersection and the SR 50 intersection. There is an existing bench on the east side of the roadway that was likely part of a former LYNX transit stop located approximately 250 feet south of the SR 50 intersection (there is no LYNX service on Avalon Road today). Approximately 250 feet to the north of Rolling Rock Way, there are school pedestrian crosswalk warning signs (S1-1 and W16-9P) on the northbound lane, and a "SCHOOL" pavement marking (**Figure 3.4**).

Figure 3.3: Sidewalk along Northbound Avalon Road

Figure 3.4: Pavement Markings along Northbound Avalon Road

3.1.5 Existing Right-of-Way

The roadway right-of-way information was obtained using available Orange County property appraiser parcel data and title searches. The right-of-way varies along the corridor, but is primarily 47 feet in width, with 25 feet to the west of roadway centerline and 22 feet to the east of roadway centerline.

The Avalon Road right-of-way, when originally constructed, was 47 feet in width. FDOT previously owned the Avalon Road right-of-way up until 1951, when it was given to Orange County. Around the same time, David Zook, the owner of the parcel on the east side of Avalon Road subdivided the former grove into several lots, holding to the right-of-way line set by the County. In 2018, upon detailed investigation, it was discovered that at the time of subdivision, a total of 8 feet of right-of-way that has been thought of as owned by the private residents along the east side of Avalon Road still belongs to David Zook.

3.2 Crash Data

A historical crash review was performed for the corridor to identify vehicular crash patterns and hotspots. To identify crash patterns along the corridor, crash data was obtained from the Orange County Traffic Engineering Division for vehicular crashes for the previous three years (September 18, 2014 to September 18, 2017) along Avalon Road between Florida's Turnpike and SR 50, including the Avalon Road/SR 50 intersection. Crash diagrams indicating the locations of crashes are shown in **Appendix A** and a summary of the crash data is included in **Tables 3.1** and **3.2**.

Table 3.1: Crash Data Summary by Year

Date Range	Total	No. of Crashes			
		With Injury	With Fatality	Nighttime	Wet Conditions
9/2014 – 9/2015	21	2	0	7	4
9/2015 – 9/2016	19	4	0	9	5
9/2016 – 9/2017	26	9	0	6	2
Total	***66***	***15***	***0***	***22***	***11***
Percent	***100%***	***23%***	***0%***	***33%***	***17%***

For the entire corridor, the majority of crashes were rear-end crashes (68 percent), followed by left turns (14 percent), sideswipes (9 percent), and other (which included backing up and right turns) (9 percent). A separate assessment of SR 50 intersection vs. Avalon Road south of SR 50 follows:

- Avalon Road at SR 50 (Intersection): A total of 48 crashes were reported at this intersection as detailed below:
    - The majority of crashes occurred in dry conditions (only seven crashes occurred in wet conditions).
    - Just under 40 percent of crashes (19 crashes) occurred at night (including dusk), and of those, only three crashes occurred in an unlit area.
    - The majority of crashes were rear end collisions, seven were left turning movements, five were sideswipes, and two were backing movements.
    - All crashes that occurred under the influence (alcohol) were at dusk or nighttime.
    - The average property damage resulting from each crash was $3,065.

- SR 50 to Florida's Turnpike (Roadway Segment): A total of 18 crashes were reported in this segment as detailed below:
    - The majority of crashes occurred in dry conditions (only four crashes occurred in wet conditions), and only two crashes occurred at night (both with existing lighting).
    - The majority of crashes were rear end collisions, two were left turning movements, one was a sideswipe, and one was a right turning movement.
    - The average property damage resulting from each crash in this segment was $4,260.

Table 3.2: Crash Summary

#	Date	Day	Time	Type	Fatalities	Injuries	Property Damage	Day/Night/ Lighting	Wet/ Dry	Cause
1	10/13/2014	Monday	9:40 PM	Rear End	0	4	$ 10,000	Dark - Not Lighted	Dry	Careless Driving (DUI)
2	11/1/2014	Saturday	2:10 AM	Left Turn	0	0	$ 7,000	Dark - Lighted	Dry	FTY ROW (DUI)
3	11/6/2014	Thursday	8:22 PM	Sideswipe	0	0	$ 2,000	Dark - Lighted	Dry	Careless Driving
4	11/19/2014	Wednesday	9:20 AM	Rear End	0	0	$ 2,000	Daylight	Dry	FTYROW
5	1/23/2015	Friday	5:55 PM	Left Turn	0	0	$ 4,000	Dusk	Dry	Careless Driving
6	1/27/2015	Tuesday	6:50 PM	Rear End	0	0	$ 600	Dark - Lighted	Dry	Careless Driving
7	5/10/2015	Sunday	1:27 PM	Rear End	0	0	$ 2,000	Daylight	Dry	Careless Driving
8	5/21/2015	Thursday	1:13 PM	Sideswipe	0	0	$ 1,000	Daylight	Wet	Careless Driving
9	7/6/2015	Monday	4:50 PM	Rear End	0	0	$ 200	Daylight	Dry	None
10	7/10/2015	Friday	1:30 PM	Rear End	0	0	$ 350	Daylight	Dry	None
11	8/16/2015	Sunday	1:10 AM	Sideswipe	0	0	$ 1,100	Dark – Lighted	Wet	Careless Driving (DUI)
12	8/27/2015	Thursday	8:15 AM	Rear End	0	0	$ 150	Daylight	Dry	Careless Driving
13	9/2/2015	Wednesday	8:01 AM	Sideswipe	0	0	$ 3,000	Daylight	Dry	FTY ROW
49	10/31/2014	Friday	9:54 AM	Rear End	0	0	$ 400	Daylight	Dry	Careless Driving
50	1/2/2015	Monday	8:38 AM	Rear End	0	0	$ 6,000	Daylight	Wet	Careless Driving
51	1/13/2015	Tuesday	6:03 PM	Right Turn	0	0	$ 7,000	Dark – Lighted	Dry	FTY ROW
52	4/30/2015	Thursday	12:25 PM	Sideswipe	0	0	$ 2,000	Daylight	Dry	Careless Driving
53	5/20/2015	Wednesday	3:12 PM	Rear End	0	1	$ 12,000	Daylight	Dry	Improper Passing
54	6/23/2015	Tuesday	5:50 PM	Rear End	0	0	$ 1,001	Daylight	Wet	Following Too Closely
55	6/25/2015	Thursday	12:00 PM	Rear End	0	0	$ 100	Daylight	Dry	Disregard TCD
56	7/7/2015	Tuesday	1:00 PM	Rear End	0	0	$ 2,000	Daylight	Dry	Careless Driving
14	10/23/2015	Friday	6:41 AM	Rear End	0	0	$ 1,500	Dark – Lighted	Dry	FTY ROW
15	11/19/2015	Thursday	9:03 PM	Rear End	0	1	$ 1,500	Dark – Lighted	Wet	Careless Driving (DUI)
16	11/21/2015	Saturday	11:55 AM	Left Turn	0	0	$ 6,000	Daylight	Dry	None
17	11/27/2015	Friday	6:35 PM	Right Turn	0	0	$ 3,000	Dark - Not Lighted	Dry	FTY ROW
18	1/4/2016	Monday	4:53 PM	Rear End	0	1	$ 1,000	Daylight	Dry	Careless Driving
19	2/5/2016	Friday	6:15 PM	Left Turn	0	0	$ 2,500	Dusk	Dry	FTY ROW
20	2/12/2016	Friday	11:15 PM	Rear End	0	0	$ 2,000	Dark - Lighted	Dry	Careless Driving
21	3/28/2016	Monday	10:50 PM	Sideswipe	0	0	$ 2,000	Dark - Not Lighted	Dry	Improper Lane Change
22	4/5/2016	Tuesday	9:40 PM	Left Turn	0	0	$ 1,400	Dark - Lighted	Dry	FTY ROW
23	5/17/2016	Tuesday	4:45 PM	Rear End	0	0	$ 3,000	Daylight	Wet	Careless Driving
24	8/11/2016	Thursday	6:30 PM	Backed Into	0	0	$ 2,502	Dawn	Wet	Illegal Backing
25	8/22/2016	Monday	8:00 AM	Rear End	0	0	$ 2,000	Daylight	Dry	Careless Driving
26	9/6/2016	Tuesday	3:50 PM	Rear End	0	0	$ 200	Daylight	Dry	Careless Driving
57	1/9/2016	Saturday	7:32 PM	Left Turn	0	1	$ 2,000	Dark - Lighted	Wet	Careless Driving

Table 3.2, continued: Crash Summary

#	Date	Day	Time	Type	Fatalities	Injuries	Property Damage	Day/Night/ Lighting	Wet/ Dry	Cause
58	1/20/2016	Wednesday	8:45 AM	Rear End	0	0	$ 5,500	Daylight	Dry	Careless Driving
59	4/17/2016	Sunday	6:55 PM	Rear End	0	1	$ 17,900	Daylight	Dry	Careless Driving
60	6/3/2016	Friday	8:39 AM	Rear End	0	0	$ 10,000	Daylight	Dry	Careless Driving
61	8/18/2016	Thursday	4:00 PM	Rear End	0	0	$ 2,000	Daylight	Wet	Careless Driving
62	8/26/2016	Friday	4:14 PM	Rear End	0	0	$ 1,000	Daylight	Dry	None Assigned
27	10/15/2016	Saturday	4:15 PM	Backed Into	0	0	$ 600	Daylight	Dry	Illegal Backing
28	1/20/2017	Friday	6:30 PM	Rear End	0	1	$ 1,500	Daylight	Dry	Careless Driving
29	1/31/2017	Tuesday	3:15 PM	Rear End	0	0	$ 600	Daylight	Dry	Following Too Closely
30	2/9/2017	Thursday	10:40 AM	Left Turn	0	2	$ 34,500	Daylight	Dry	Disregard TCD
31	3/6/2017	Monday	4:53 PM	Left Turn	0	0	$ 7,000	Daylight	Dry	FTY ROW
32	3/7/2017	Tuesday	1:53 PM	Rear End	0	0	$ 500	Daylight	Dry	Careless Driving
33	3/8/2017	Wednesday	3:15 PM	Rear End	0	0	$ 2,500	Daylight	Dry	Careless Driving
34	3/27/2017	Monday	2:36 AM	Rear End	0	0	$ 6,000	Dark – Lighted	Dry	Careless Driving (DUI)
35	4/9/2017	Sunday	5:16 PM	Rear End	0	1	$ 5,000	Daylight	Dry	Careless Driving
36	4/12/2017	Wednesday	10:16 PM	Rear End	0	0	$ 1,500	Dark – Lighted	Dry	Careless Driving
37	4/24/2017	Monday	12:00 AM	Rear End	0	1	$ 4,000	Dark – Lighted	Dry	Disregard TCD
38	5/1/2017	Monday	1:19 PM	Rear End	0	1	$ 2,000	Daylight	Dry	Careless Driving
39	5/13/2017	Saturday	2:05 PM	Rear End	0	0	$ 300	Daylight	Dry	Careless Driving
40	5/24/2017	Wednesday	5:45 PM	Rear End	0	0	$ 1,000	Daylight	Wet	Careless Driving
41	5/31/2017	Wednesday	12:10 PM	Rear End	0	0	$ 2,100	Daylight	Dry	Careless Driving
42	6/15/2017	Thursday	3:50 PM	Rear End	0	0	$ 4,000	Daylight	Wet	Careless Driving
43	6/18/2017	Sunday	10:40 PM	Rear End	0	1	$ 2,000	Dark - Lighted	Dry	Disregard TCD
44	6/19/2017	Monday	11:18 AM	Rear End	0	0	$ 26	Daylight	Dry	Other (Sneeze)
45	7/5/2017	Wednesday	1:49 PM	Backed Into	0	0	$ 1,000	Daylight	Dry	Illegal Backing
46	7/6/2017	Thursday	7:30 PM	Rear End	0	3	$ 5,000	Dusk	Dry	Careless Driving (DUI)
47	8/17/2017	Thursday	9:29 AM	Rear End	0	0	$ 2,000	Daylight	Dry	Careless Driving
48	9/18/2017	Monday	7:30 PM	Other	0	1	$ 2,000	Dark - Lighted	Dry	Careless Driving
63	1/9/2017	Monday	7:50 AM	Left Turn	0	1	$ 4,000	Daylight	Dry	FTY ROW
64	4/3/2017	Monday	9:31 AM	Rear End	0	0	$ 500	Daylight	Dry	Careless Driving
65	8/10/2017	Thursday	10:55 AM	Rear End	0	1	$ 2,000	Daylight	Dry	Hit Wrong Pedal
66	8/21/2017	Monday	7:41 AM	Rear End	0	1	$ 3,500	Daylight	Dry	Mechanical Malfunction

3.3 Public Transportation

The Avalon Road RCA Study area is served by two transit agencies – the Central Florida Regional Transportation Authority (LYNX) and the Lake County Connection (LakeXpress). The City of Winter Garden 2020 Comprehensive Plan has an adopted Transit Level of Service (LOS) standard of 30-minute headways during weekday peak periods.

LYNX does not provide fixed-route service to the Avalon Road RCA Study area, but does provide NeighborLink Route 612, a flex-service route in the neighboring area. This route is based out of the West Oaks Mall bus transfer center, and provides flex-service within the Winter Garden area (bordered by the Florida's Turnpike, US 429, Lake Apopka, and Park Avenue).

LakeXpress provides Route 50 East/West service along SR 50, along the northern border of the study area, which serves the Clermont Park-and-Ride, South Lake Hospital, Lake-Sumter State College, Winter Garden Regional Shopping Center, and the Shoppes at West Point. The closest eastbound LakeXpress stop is located at SR 50/West Pointe Villas Boulevard (0.25 miles to the east), and the closest LakeXpress westbound stop is located at SR 50/Hyde Park Circle (0.75 miles to the west).

Table 3.3 presents the span of service, frequency, and ridership for each of the routes in the study area. The frequencies presented in the table represent the typical range for the service.

Table 3.3: Transit Routes Summary

Route	Span of Service	Service Frequency	Annual Ridership (FY 2016)
LYNX NeighborLink 612	6:00 am – 7:30 pm (Weekday) 6:00 am – 7:30 pm (Saturday)	Flex-Service	13,784
LakeXpress Route 50	5:30 am – 8:30 pm (Weekday)	30 minutes	N/A

3.4 Long-Range Transportation Improvements

A review of various transportation plans was performed to identify planned improvements throughout the study area. The following plans are currently being considered or are underway that may have an effect on this study in the future:

- Orange County 2017 Ten-Year Roadway Plan
  - Avalon Road, from Florida's Turnpike to SR 50, is slated for Design in 2023 and Right-of-Way acquisition from 2024-2026.
- Orange County 2030 Long-Range Transportation Plan (LRTP)
  - Avalon Road, from Florida's Turnpike to SR 50, is designated as a "County Partnership."
- Orange County Development Projects

3.5 Utilities

Within the Avalon Road RCA Study area, there are 11 utility providers (shown in **Table 3.4**). The majority of utilities run along the south side of SR 50 (AT&T Florida, CenturyLink, Charter/Brighthouse, Duke Energy Distribution/Transmission, and Lake Apopka Natural Gas), or the west side of Avalon Road (Charter/Brighthouse, City of Winter Garden, Duke Energy Distribution, Lake Apopka Natural Gas). On the east side of Avalon Road, there is a City water main outside the right-of-way, and a Lake Apopka Natural Gas main within the right-of-way. Just north of the Florida's Turnpike on the west side of Avalon Road, there is a joint use power pole used by Duke Energy, Charter/Brighthouse, Smart City Telecom, and AT&T.

Table 3.4: Utilities within Study Area

Utility Agency/Owner		Facilities within Project Area
1	AT&T Corp	FOC in 2-2" PVC* conduits within a 10' easement along Florida's Turnpike.
2	AT&T Florida	Buried FOC* and aerial FOC along south side of SR 50.
3	CenturyLink	Underground 2-2" HDPE* conduits and 1-96 CT FOC along south side of SR 50 and 3-1.25" HDPE conduits and 1-48 CT FOC along north side of SR 50 with associated handholes.
4	Charter/Brighthouse	Aerial CATV* along south side of SR 50, aerial along west side of Avalon Rd. with underground crossing of SR 50 and Florida's Turnpike.
5	City of Winter Garden	Existing 18" PVC* force main along west side of Avalon Rd. is within right-of-way. Existing force main along the east side of Avalon Rd. was placed out of service, but the existing 12" water main is located outside the right-of-way.
6	Duke Energy Distribution	12.47 kv BE* along south side of SR 50 crossing Avalon Rd. 12.47 kv OE along west side of Avalon Rd.
7	Duke Energy Transmission	69 kv OE along south side of SR 50 crossing Avalon Rd.
8	Lake Apopka Natural Gas	6" high pressure steel gas main along south side of SR 50. A 2" steel gas main along west side of Avalon Rd. and a 4" steel gas main along the east side of Avalon Rd.
9	Level 3	Level 3 facilities have been taken over by CenturyLink and are shown and described with CenturyLink's facilities.
10	Smart City Telecom	Aerial FOC on Duke Energy Distribution pole line along the west side of Avalon Rd. with a direction bore in a 2" conduit crossing SR 50 and the Florida's Turnpike.
11	Verizon	No Response to Date.

** PVC – Polyvinyl Chloride, FOC – Fiber Optic Cable, HDPE – High-Density Polyethylene, OE – Overhead Electric, CATV – Cable TV, BE – Buried Electric*

3.6 Geotechnical Findings

Subsurface exploration was undertaken in the study to identify soil conditions in the Avalon Road corridor. This consisted of auger borings to depths of six feet generally performed at about 350-foot centers along the project alignment and adjacent to the existing pavement, for a total of eight borings. The results of the geotechnical exploration indicate that the near-surface soils encountered along the Avalon Road corridor are generally sandy soils that are characterized as nearly level and poorly drained. Seasonal high groundwater levels are anticipated to be about one foot below the existing ground surface. These soils are classified as A-3 and A-2-6, and are considered Select and Plastic, respectively. However, the A-2-6 soils consist of sands with a significant amount of clay and exhibit slightly plastic to plastic texture. These soils do not drain as Select (S) soils. These soils may be used for embankment construction above the existing ground water level, as long as they are kept out of the subgrade portion of the roadbed. The encountered soils are suitable for roadway construction provided plastic materials are not within two feet of proposed base material. Plastic material utilized in embankment construction shall be in

accordance with FDOT Standard Plans 120-002 (formerly FDOT Standard Index 500). They require close attention to moisture content to use successfully as fill. The full *Geotechnical Report* is available in **Appendix B**.

3.7 Contamination Findings

The results of the *Contamination Screening Evaluation Report* (*CSER*) indicate that three sites were identified within or adjacent to the Avalon Road RCA Study area. Two of the sites, the former Highway USA site (high risk) and the 7-Eleven site (medium risk), lie on the north side of the Avalon Road/SR 50 intersection, and recommendations for those facilities are outside of the scope of this study. The Circle K site (medium risk) lies within the Avalon Road RCA Study area. The *Site Rehabilitation Completion Orders* (SRCO) for the 7-Eleven site and the Circle K site are provided in **Appendix C**.

The full *Contamination Screening Evaluation Report* is available in **Appendix C**.

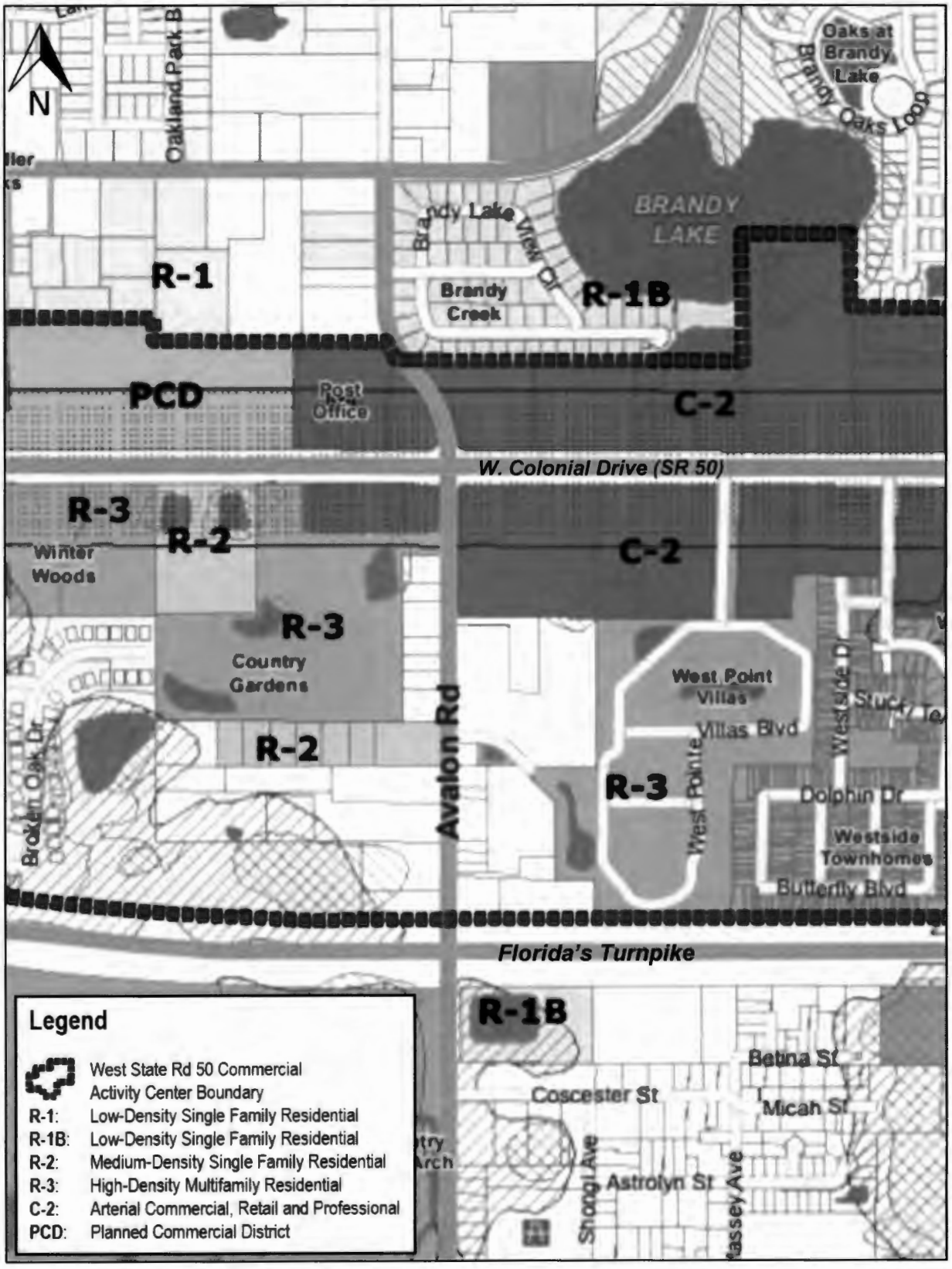
3.8 Land Use and Current Development Plans

Existing and future land use patterns along the Avalon Road corridor are very important to consider when evaluating potential improvements to the roadway. The highest share of existing land uses within the Avalon Road RCA Study area are residential. There are several schools and churches found within one mile of the corridor, including:

- Schools
  - Tildenville Elementary School, to the north of the study area
  - SunRidge Elementary School, to the south of the study area
  - SunRidge Middle School, to the south of the study area
- Churches
  - Tildenville Church of God in Christ, to the south of the study area
  - Tildenville Missionary Baptist Church, to the south of the study area
  - Oasis Community Church, to the south of the study area

The Future Land Use (FLU) designations assigned to the study area are generally consistent with the existing land uses. The majority of residential land uses directly along Avalon Road are not zoned, per the City of Winter Garden Zoning Map (January 2019), but both Country Gardens and West Pointe Villas are zoned R-3 **(Figure 3.5)**.

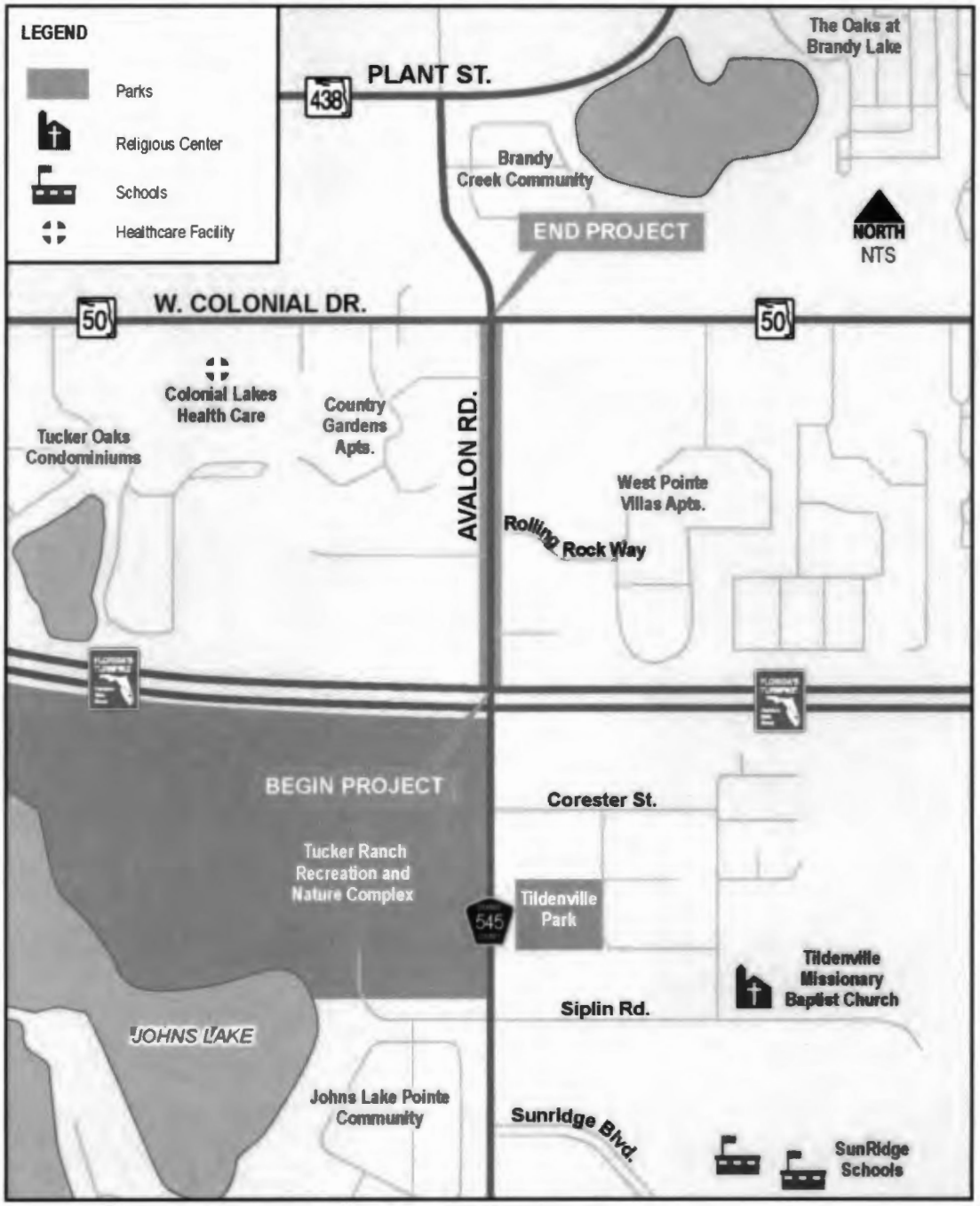
Figure 3.5: Study Area Zoning (City of Winter Garden, January 2019)



3.9 Cultural Features

A desktop review of cultural features within one mile of the study area corridor was conducted using data obtained from the Florida Geographic Data Library (FGDL). In addition to the schools and churches mentioned in Section 3.8, one health care facility and two parks are located near the corridor as shown in **Figure 3.6**. The West Orange Path is located approximately 0.75 miles north of the corridor.

Figure 3.6: Cultural and Recreational Features



3.10 Archaeological and Historic Features

A cultural resources desktop analysis was completed in December 2017 to locate any previously recorded cultural resources that may be impacted by the project. Within the overall study area, the Florida Master Site File (FMSF) GIS data indicate that a total of 21 historic structures have been previously recorded in the vicinity of the project, with one structure evaluated by the Division of Historical Resources as eligible for listing in the National Register of Historic Places (NRHP) that falls outside of the right-of-way. These features are displayed in **Figure 3.7**. No archaeological sites have been previously recorded within the study area. The Orange County Property Appraiser GIS data was also examined for any parcels with potentially historic age (pre-1969) structures. A total of 17 parcels were identified but eight of these parcels have one or more structures that have been previously recorded in the FMSF. The full FMSF submission to the Division of Historical Resources is included in the final document under separate cover.

Commissioner VanderLey is working with study area residents on applying for a Florida Historical Marker along the study area segment of Avalon Road to raise public awareness of the area's rich history and enhance the enjoyment of historic sites by citizens and tourists.

The full *Cultural Resource and Archaeological Report* is included in **Appendix D**.

3.11 Hydrologic Features

3.11.1 Drainage Features

The Avalon Road corridor is located in the Ocklawaha River drainage basin within the jurisdiction of the St. Johns River Water Management District (SJRWMD). In 2002, the Johns Lake Stormwater Master Plan was developed for the area surrounding the project (Orange County Contract No. Y9-810-MK). The 2002 Master Plan does not accurately reflect the current drainage patterns due to substantial development over the past 15 years within lands adjacent to the project. Runoff from the surrounding area flows in a southwestern direction to a series of existing ditches and pipes that ultimately outfall to Johns Lake. The United States Geological Survey (USGS) Quadrangle Map for the project area is provided in **Figure 3.8**, and shows elevations within the study area.

The existing roadway is an undivided two-lane facility with 12-foot travel lanes and a 4-foot sidewalk along the northbound lane. Runoff flows to interconnected roadside ditches which convey flows south to a wetland area and an outfall ditch that runs south of the Florida's Turnpike and discharges west to Johns Lake. The Hydrologic and Natural Features Map is provided in **Figure 3.9.**

Most of the corridor lies within Johns Lake Outlet *(Water Body Identification (WBID) 2873)* while the northernmost portion of the project is located in the Tildenville Drainage Basin *(WBID 2871)*. Each of these WBIDs lies within the limits of the Wekiva River Basin Management Action Plan (BMAP) and Upper Ocklawaha River BMAP. These BMAPs were established to address nutrient levels within each respective basin. A nutrient loading analysis will be required to demonstrate the post-development pollutant loadings will not exceed the loadings in the pre-development condition. The BMAP documents for each of these watersheds are available on the Florida Department of Environmental Protection (FDEP) website. The Pond Siting Report is located in **Appendix E**.

Figure 3.7: Historical Features Map

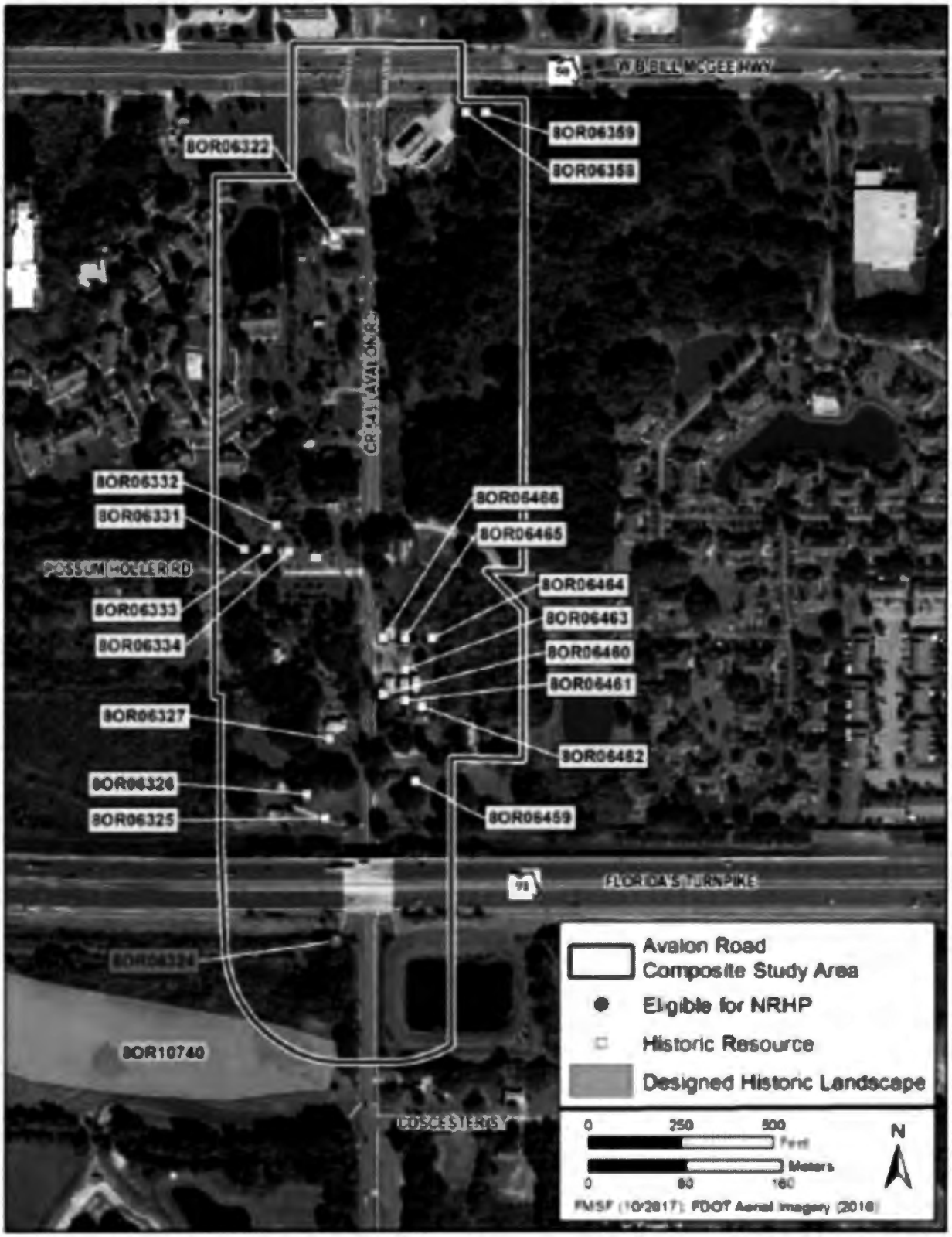


Figure 3.8: USGS Quadrangle Map

Figure 3.9: Existing Hydraulic and Natural Features Map

3.11.2 Special Basin Criteria

Chapter 40C-41 of the Florida Administrative Code (F.A.C.) establishes additional criteria to ensure water quality within certain hydrologic basins. SJRWMD requires projects within those specific basins to meet the additional criteria to acquire any necessary Environmental Resource Permits (ERP) for the project. The Avalon Road improvements must meet special basin criteria for the Ocklawaha River Hydrologic Basin, Wekiva Recharge Protection Basin, and the Lake Apopka Hydrologic Basin. Criteria for these three special basins are summarized in **Table 3.5**.

Table 3.5: Special Basin Criteria

PIM Section	Basin	Requirements
13.2	Ocklawaha River Hydrologic Basin	Drainage system must meet applicable discharge criteria for 10-year and 25-year design storms.
13.3	Wekiva Recharge Protection Basin	Provide retention storage for 3 inches of runoff from all impervious areas to be constructed on Type "A" Soils. No net reduction in the 100-year floodplain.
13.7	Lake Apopka Hydrologic Basin	The Total Phosphorus (TP) loading in the post-development condition must not exceed the pre-development TP loading based on the 2003 land use.

Source: SJRWMD Permit Information Manual (PIM), Volume III (October 2013)

3.11.3 Permits

Additional drainage and environmental information was obtained through a review of the existing permits from recently constructed projects in the vicinity of the corridor. **Table 3.6** provides a summary of the permits that were used in the development of the proposed stormwater management design for the Avalon Road RCA.

Table 3.6: Existing Permits near Avalon Road Corridor

Project Name	Permit Type	Permit Number	Date Issued	Description
Florida's Turnpike Widening from Beulah Road to SR 50 FPID 406146-1	SJRWMD ERP Individual Permit Mod	20358-17	2/12/2008	Widen and reconstruct Florida's Turnpike from four lanes to eight lanes from Beulah Road (MP 269.5) to SR 50 (MP 274.2). Included bridge replacement over Avalon Road.
City of Winter Garden Tucker Ranch Heritage Park Phase 1	SJRWMD ERP Individual	134021-1	11/26/2013	Construct a surface water management system to serve a 6.41-acre recreational park. Includes paved entrance road, paved parking, trails, and other amenities.
Avalon Road Sidewalk Improvements	SJRWMD ERP Standard General	80298-1	11/19/2001	Construct a 5-foot sidewalk along the east side of Avalon Road from Siplin Road to Coscester Street.
SR 50 from Avalon Road to SR 429 FPID 410983-1	SJRWMD ERP Standard General	94790-1	8/20/2004	Widen 3.1 miles of SR 50 from a five-lane rural facility to a six-lane urban divided section. Improvements include the construction of five new stormwater ponds.
The Shoppes at Avalon	SJRWMD ERP Standard General Letter Mod	117678-2	None	Future 1.84-acre site with one commercial building, parking, and a dry pond. Underdrain will be needed to ensure pond recovery.
Country Gardens Apartments	SJRWMD ERP Standard General	27384-1	2/13/1992	Construct three retention ponds for stormwater management for the apartment complex named Country Gardens.
SR 50 from Tubbs Street to Avalon Road	SJRWMD ERP Standard General	108657-1	5/9/2007	Widen 1.27 miles of a rural facility to an urban facility including construction of a new storm sewer system and two wet ponds.

3.11.4 Cross Drains

One existing cross drain is located on Avalon Road approximately 230 feet south of the study area. The 24-inch culvert conveys flows from east to west to an outfall ditch that discharges to a series of wetlands and ditches within Tucker Ranch Heritage Park before ultimately discharging west to Johns Lake. **Table 3.7** provides a summary of information for the existing cross drain.

Table 3.7: Existing Cross Drain

Culvert	Existing Condition			
	Barrels	Description	Flow Line	Length
CD-1	1	24" Reinforced Concrete Pipe (RCP)	94.48 (E) 94.86 (W)	---

3.11.5 Floodplains

The current Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) show that most of the corridor lies in Zone X which is classified as areas located outside the 100-year floodplain. The portion of Avalon Road located south of Florida's Turnpike is located within the 100-year floodplain for Johns Lake. This area is designated as Flood Zone AE with a base flood elevation of 99.7 feet (North American Vertical Datum (NAVD)). No floodways are located within the project corridor. **Figure 3.10** illustrates the floodplain map for the study area.

Minor floodplain impacts will be anticipated if the project improvements encroach upon the floodplain located south of the Florida's Turnpike overpass. Mitigation for potential floodplain impacts can be achieved by expanding the proposed stormwater pond to provide additional volume to compensate for the floodplain impacts. If the project improvements extend north of the floodplain boundaries, floodplain impacts can be avoided for the project.

Figure 3.10: FEMA Floodplain Map

3.11.6 Drainage Basin Characteristics

The entire project corridor is located within one existing drainage basin that extends from Florida's Turnpike to SR 50, incorporating approximately 5.99 acres. One-foot contours based on Light Detection and Ranging (LiDAR) imaging show that Avalon Road slopes south from an approximate elevation of 110 feet near SR 50 to an approximate elevation of 99 feet at the southern end of the project. The area is comprised of Type A/D soils with a Seasonal High Water Table (SHWT) typically located within one foot of the existing ground elevation. No formal treatment or attenuation is currently provided within the roadway corridor.

Along the existing southbound lane of Avalon Road, a series of shallow roadside ditches and ditch bottom inlets (DBIs) capture roadway runoff and convey flows south toward the Florida's Turnpike overpass (**Figure 3.11** and **Figure 3.12**). Flows exit a side drain near Florida's Turnpike and flow along the southbound edge of pavement under the Florida's Turnpike overpass. South of the Florida's Turnpike, there is an existing ditch to the west that carries drainage to Johns Lake.

Throughout most of the corridor, no defined drainage conveyance features are located along the existing northbound lane of Avalon Road. Roadway runoff flows south between the edge of pavement and the existing sidewalk before emptying to a DBI that discharges south under the Florida's Turnpike overpass via a 30-inch pipe to the eastern roadside ditch. The 30-inch pipe also collects offsite flows from the east via an existing 15-inch pipe. An existing 24-inch cross drain (CD-1) located approximately 230 feet south of the beginning of the project conveys flows west to an outfall ditch that traverses Tucker Ranch Heritage Park before discharging to Johns Lake.

Florida's Turnpike Enterprise (FTE) owns and maintains an existing wet detention pond located directly southeast of the Florida's Turnpike overpass at Avalon Road. This facility was permitted in 2008 under SJRWMD permit number 20358-17 to meet stormwater management requirements during the eight-laning of Florida's Turnpike. This pond discharges to the eastern roadside ditch for Avalon Road via a control structure.

Figure 3.11: Drainage Features Along Southbound Roadside Ditch

Figure 3.12: Drainage Features Along Southbound Roadside Ditch

3.12 Wetlands and Species

3.12.1 Wetlands

Wetlands are defined jointly by the U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (EPA) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under natural circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE 1987). Wetlands within the study corridor were identified through a review of available site-specific data and field verification.

Using the information from the reviewed literature and data sources as a guide, field surveys were conducted in October and November 2017 to verify wetland locations and to characterize wetland habitat within the study corridor. Community composition was noted for each wetland including type, plant composition, vegetative stratification, and hydric characteristics. The jurisdictional extent of wetlands and/or other surface water systems were identified in accordance with the 1987 USACE Wetlands Delineation Manual (Technical Report Y-87-1), the November 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic Gulf Coastal Plain Region and the State of Florida's Delineation of the Landward Extent of Wetlands and Surface Waters (Chapter 62-340, Florida Administrative Code).

Habitat types within the study corridor were reviewed through SJRWMD's land use classification system, and revised based on current conditions following field surveys. Land use codes were determined to Level III classification for specific identification of wetlands, other surface waters, and upland habitats within the study corridor.

Three wetland systems and four surface water systems are present within the study area (**Figure 3.13**). The character, condition, and quality of wetland systems within and adjacent to the study area vary in response to drainage pattern alterations, intensity of recent human activity, development and natural succession. The jurisdictional limits of these wetland systems were not delineated in the field, nor have they been approved by the regulatory agencies.

Figure 3.13: Wetlands Map

Table 3.8 identifies the wetland and/or other surface waters within the study area and provides specific land use codes for each location.

Table 3.8: Wetlands and Other Surface Waters within the Study Area with Land Use Codes

Wetland ID	Land Use Code	Description
Wetland 1	6460	Mixed Scrub-Shrub Wetland
Wetland 2	6460	Mixed Scrub-Shrub Wetland
Wetland 3	6410/6460	Freshwater Marsh/Mixed Scrub-Shrub Wetland
Surface Waters 1-4	5300	Reservoir

3.12.2 Threatened and Endangered Species

The study area and adjacent areas consist of single-family and multi-family residential dwellings along Avalon Road, and commercial development adjacent to SR 50. Undisturbed forested uplands and wetland systems are present within the study area. Existing development within the study area, and limited natural habitat will likely result in smaller wildlife species accessing and crossing the study corridor. The presence of protected species and the potential for occurrence within the study area was evaluated through the review of state (Florida Fish and Wildlife Conservation Commission, FWC) and federal (United States Fish and Wildlife Service, FWS) databases, available literature, and field reviews conducted in October and November 2017.

The probability of each wildlife and vegetative species occurrence within the study area was ranked using the following scale: 1) Low, 2) Moderate, and 3) High based on presence of suitable habitat. Ranking of "Low" indicates that marginally suitable habitat may exist within the study area, but species was not observed during field survey. The ranking of "Moderate" indicates that suitable habitat exists within the study area; however, the species was not observed during field surveys. The ranking of "High" indicates that suitable habitat exists within the study area and the species of interest was observed during field survey. **Table 3.9** identifies federal and/or state-listed wildlife known to occur within Orange County that, due to the availability of suitable habitat have a potential for occurrence within the study area.

The FWC database for known bald eagle (*Haliaeetus leucocephalus*) nest sites was queried within one-mile of the study area and preliminary pond locations. Two nest sites were identified within one-mile of the study area. Nest ID OR052 is located south of Florida's Turnpike and east of Avalon Road. Nest ID OR052 was last surveyed in 2014 and was last identified as active in 2011. Nest ID OR018 is located south of Florida's Turnpike and west of Avalon Road. Nest ID OR018 was last surveyed and identified as active in 2014.

Table 3.9: Federal and/or State-Listed Wildlife Species with Potential for Occurrence

Scientific Name	Common Name	FWS Status	FWC Status	Occurrence Potential
Reptiles				
Drymarchon corais couperi	Eastern Indigo Snake	T	T	Low
Gopherus polyphemus	Gopher Tortoise	-	T	Low
Pituophis melanoleucus	Pine Snake	-	SSC	Low
Stilosoma extenuatum	Short-Tailed Snake	-	T	Low
Birds				
Haliaeetus leucocephalus	Bald Eagle	--	--	Low
Egretta caerulea	Little Blue Heron	--	T	Low
Egretta tricolor	Tricolored Heron	--	T	Low
Falco sparverius paulus	Southeastern American Kestrel	--	T	Low
Grus canadensis pratensis	Florida Sandhill Crane	--	T	Low
Mycteria americana	Wood Stork	T	T	Low
Polyborus plancus audubinii	Audubon's Crested Caracara	T	T	Low
Pandion haliaetus	Osprey	--	SSC	Moderate
Mammals				
Sciurus niger shermani	Sherman's Fox Squirrel	--	SSC	Low

Occurrence Potential = Low, Moderate. Code Key, T = Threatened, SSC= Species of Special Concern. Source: http://myfwc.com/media/1515251/threatened_endangered_species.pdf and Florida Natural Areas Inventory (FNAI) Tracking List Orange County Updated July 2017

The study corridor is located within the core foraging areas of two known wood stork (*Mycteria americana*) colonies. The core foraging area consists of a 15-mile radius around each colony.

Federal and/or state-listed flora that have the potential for occurrence within the study area are listed in **Table 3.10**. No federal and/or state-listed flora were observed within or adjacent to the Avalon Road study area.

Table 3.10: Federal and/or State-Listed Flora with Potential for Occurrence

Scientific Name	Common Name	Habitat	FWS Status	FWC Status	Occurrence Potential
Illicium parviflorum	Star Anise	Banks of spring-run or seepage streams, bottomland forest, hydric hammock, baygall dominated by red maple and sweet bay	-	E	Low
Matelea floridana	Florida Spiny-Pod	Mesic hammock	-	E	Low
Monotropa hypopithys	Pinesap	Moist, shaded, temperate forests	-	E	Low
Ophioglossum palmatum	Hand Fern	Old leaf bases of cabbage palms in maritime hammocks and wet hammocks	-	E	Low
Pecluma plumula	Plume Polypody	Tree branches, limestone in hammocks, wet woods, and limesinks	-	E	Low
Zephyranthes simpsonii	Redmargin Zephyrlily	Wet pinelands, pastures and roadsides	-	T	Low

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

3.12.3 Wildlife Corridors

No federal and/or state-listed wildlife species were identified in the study corridor during field surveys and there is no evidence of significant movement of these wildlife species throughout or across the study corridor. General wildlife species (e.g., raccoons, opossums, armadillo, and deer) may utilize the existing vegetative communities along the residential corridor; however, no wildlife species were observed. Existing conditions (residential and commercial development and existing roadways) within the study corridor have fragmented natural vegetative communities, which restricts wildlife movement across Avalon Road. The lack of existing or proposed conservation lands immediately adjacent to the study area limit the effectiveness of a wildlife crossing. **Figure 3.14, Figure 3.15,** and **Figure 3.16** illustrate Florida Natural Areas Inventory (FNAI) critical lands and water identification, biodiversity, and natural communities within the study area.

Figure 3.14: Florida Critical Lands and Water Identification Project Priority Map

Figure 3.15: FNAI Biodiversity Map

Figure 3.16: FNAI Natural Communities Map

4. Design Controls and Standards

4.1 Roadway Design Criteria

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

- Design Speed: 45 mph (Posted: 45 mph)
- Functional Classification: Major Collector Urban
- Level of Service: LOS of "C" or better
- Lane Widths: 12 feet
- Sidewalk Width (east side): 5 feet
- Multi-Purpose Path (west side): 10 feet
- Median Width: 22 feet, raised
- Curb Type: Type F (outside)
- Border Width: 14 feet from outside edge of pavement
- Lateral Offset: 2 feet from face of curb
- Pavement Design: (to be determined)

4.2 Drainage Design Criteria

The study area is located within the St. John's River Water Management District (SJRWMD). The stormwater management systems should be designed to meet or exceed the drainage criteria established by the SJRWMD and Orange County. These design criteria include requirements for providing treatment for water quality protection and attenuation of discharge rates. The following is a summary of the drainage design criteria required by each of the governing agencies.

4.2.1 Orange County

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

The Orange County criteria require that pollution abatement detention volume for wet detention areas be provided for the greater of the first one inch of runoff from the total developed project or the runoff from 2.5 inches over the net new impervious area. Orange County criteria for pollution abatement volume for a dry retention system is 1/2 inch of runoff from the developed site or the runoff generated from the first one inch of rainfall on the developed site, whichever is greater. Compensation will be required for all flood water displaced by development below the 100-year flood elevation. Compensating storage is to be accomplished between the normal seasonal high-water elevation and the 100-year flood elevation.

4.2.2 SJRWMD

SJRWMD requires that the discharge rate is limited to rates that do not cause adverse impacts to existing off-site properties and either historic discharge rates, rates determined in previous District permit actions, or rates specified in District criteria. The SJRWMD criteria state that the design

storm event to be used is the 25-year/72-hour storm; however, local (Orange County - 25 year/24-hour storm) discharge criteria are deferred to for this project. For the purposes of this corridor analysis, SJRWMD has verified that the roadway ponds will defer to the local criteria and meet the standard 25 year/24-hour discharge criteria.

SJRWMD also requires that pollution abatement volume for wet detention areas be provided for the greater of the first one inch of runoff from the total developed project or the runoff from 2.5 inches over the net new impervious area. The required pollution abatement detention volume for dry retention areas shall be equal to 50 percent of the required pollution abatement volume for wet detention.

5. Traffic Conditions

This chapter summarizes existing and future traffic volumes along the Avalon Road corridor, using daily and hourly traffic volume data for vehicular traffic, bicycle traffic, and pedestrian traffic. These are also detailed in the *Design Traffic Engineering Report* in **Appendix F**.

5.1 Existing Traffic Volumes

Weekday daily and hourly traffic volumes along the Avalon Road corridor were collected during October 2017. A detailed list of each count location, by type, is provided in **Table 5.1**.

Table 5.1: Traffic Count Locations and Reference Numbers – Avalon Road

Count #	Count Type	Location along Avalon Road
1	72-Hour Bi-Directional	Florida's Turnpike – Possum Holler Road
2	8-Hour Turning Movement	Possum Holler Road
3	72-Hour Bi-Directional	Possum Holler Road – Rolling Rock Way
4	8-Hour Turning Movement	Rolling Rock Way
5	8-Hour Turning Movement	Country Gardens Apartments
6	72-Hour Bi-Directional	Country Gardens Apartments – SR 50
7	8-Hour Turning Movement	SR 50

All traffic count data collected were seasonally adjusted utilizing the latest (2016) FDOT axle and seasonal adjustment factors for Orange County to provide 2017 annual average conditions. Based on the 72-hour volume counts, the annual average daily traffic (AADT) along the Avalon Road study corridor ranges from a low of 15,000 daily trips south of SR 50 to a high of 15,400 in between Rolling Rock Way and Country Gardens Apartments. Traffic volumes are summarized in **Table 5.2** and illustrated in **Figure 5.1**.

The existing posted speed limit is 45 mph for the entire study corridor. The 85th percentile speed data revealed that vehicles travel above the posted speed limit between Florida's Turnpike and Rolling Rock Way at approximately 49 mph under free flow conditions. Overall, the speed data indicate that the majority of the traffic along this segment of Avalon Road is traveling at or just above the posted speed limit. Within the study area, truck volumes average 393 per day and bus volumes average 76 per day (**Table 5.3**). Since there are no transit routes along the corridor, the bus volumes are assumed to be school buses.

Table 5.2: Existing Daily Traffic Volumes – Avalon Road

Avalon Road Segment		Type	Typical Weekday Measured Characteristics					Seasonal Adj.[1]	Adjusted AADT[2]
From	To		ADT	Peak Hour Total	NB Volume	SB Volume	85th Percentile Speed		
Florida's Turnpike	Rolling Rock Way	72-Hour	15,390	1,371	739	632	49.39	0.98	15,100
Rolling Rock Way	Country Gardens	72-Hour	15,709	1,377	695	682	N/A	0.98	15,400
Country Gardens	W. Colonial Drive	72-Hour	15,300	1,309	615	694	N/A	0.98	15,000

1. *Seasonal adjustment factors for study roadway was obtained from Florida Traffic Online (2016).*
2. *Measured ADT * Axle Adjustment * Seasonal Adjustment = Adjusted AADT (adjusted to nearest hundred).*

Figure 5.1: Existing Annual Average Daily Traffic (AADT) Volumes

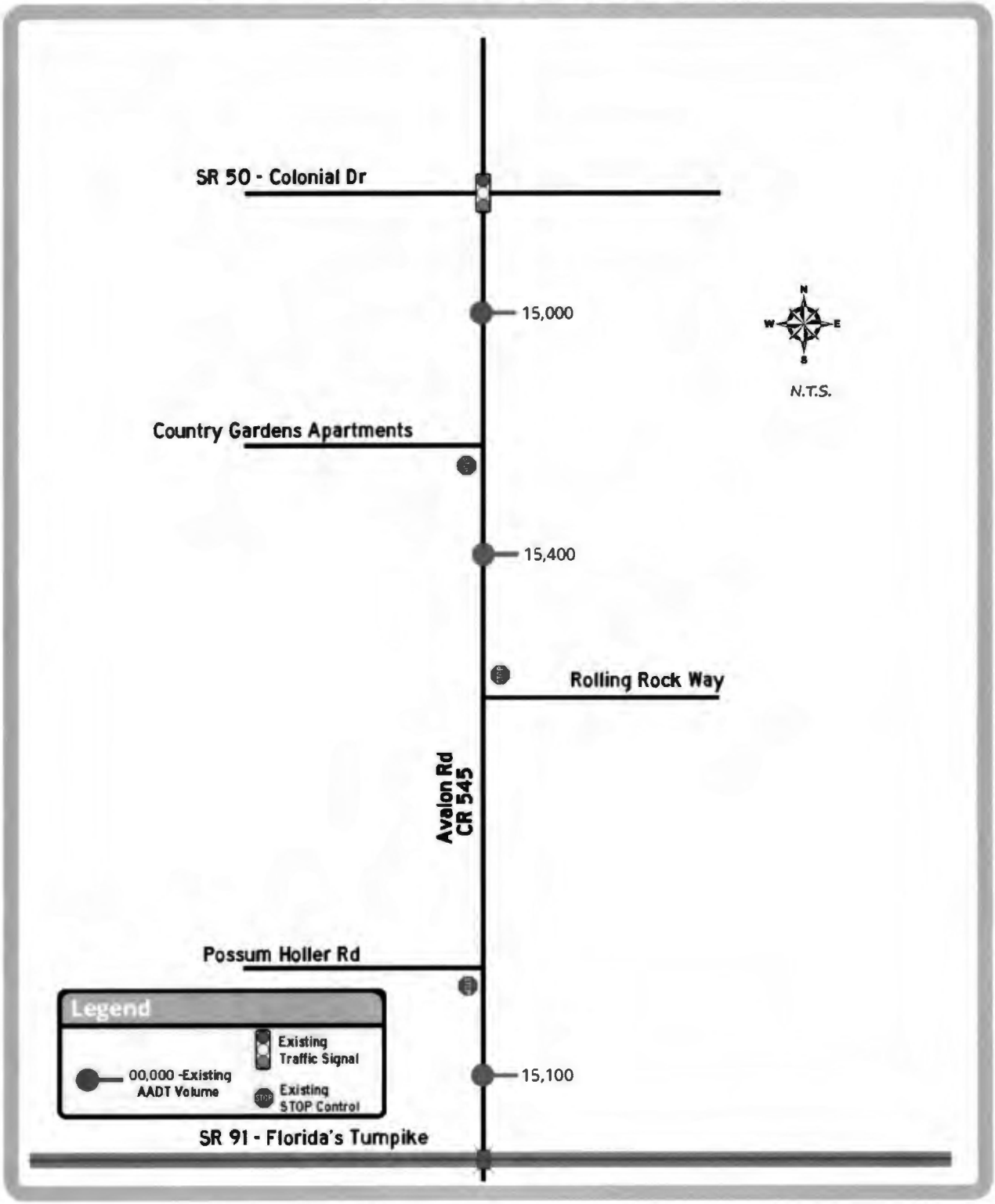


Table 5.3: Existing Daily Truck and Bus Volumes – Avalon Road

From	To	Truck	Bus
Florida's Turnpike	Rolling Rock Way	412 (2.73%)	118 (0.78%)
Rolling Rock Way	Country Gardens	333 (2.16%)	54 (0.35%)
Country Gardens	SR 50	435 (2.90%)	57 (0.38%)

Existing turning movement volumes and intersection LOS are provided in **Figure 5.2** (for weekday AM peak hour) and **Figure 5.3** (for weekday PM peak hour). During these peak hours, the heaviest turning movements to/from Avalon Road occur at the SR 50 intersection, with 428 right-turns from northbound Avalon Road onto eastbound SR 50 in the AM peak hour and 356 right-turns in the PM peak hour. The left-turns from westbound SR 50 onto southbound Avalon Road remains consistently high, with 288 in the AM peak hour and 390 in the PM peak hour.

Existing intersection LOS is provided in **Table 5.4**, which indicates that all intersections are operating above the County LOS standard ("D" or better).

Table 5.4: Existing Intersection LOS – Avalon Road

#	Intersection	Control Type	AM LOS	PM LOS
1	SR 50	Signal	D	D
2	Country Gardens	Stop	A/C*	A/D*
3	Rolling Rock Way	Stop	A/E*	A/D*
4	Possum Holler Road	Stop	A/A*	A/B*

** Unsignalized Intersection LOS are reported for "Major Street Left Turn Movement / Minor Street Movement."*

5.2 Existing Pedestrian/Bicycle Volumes

Existing pedestrian and bicycle volumes along the Avalon Road corridor were collected during October 2017, for the weekday AM (7:00 – 10:00 am), Mid-Day (2:00 – 4:00 pm), and PM (4:00 – 7:00 pm) peak hours (**Table 5.5**). The highest levels of pedestrian activity are located at the Country Gardens and Rolling Rock Way intersections. The highest levels of bicyclist activity are located at the SR 50 and the Rolling Rock Way intersections.

Table 5.5: Existing Pedestrian and Bicycle Volumes – Avalon Road

Intersection	Pedestrian Crossing	Pedestrian			Bicycle		
		AM	Mid-Day	PM	AM	Mid-Day	PM
SR 50	Yes	8	3	3	27	14	3
Country Gardens	No	9	4	4	9	7	6
Rolling Rock Way	Yes	8	7	9	4	10	7
Possum Holler Road	No	2	0	7	2	0	4

Figure 5.2: Existing Weekday AM Peak Hour Traffic Volumes & LOS

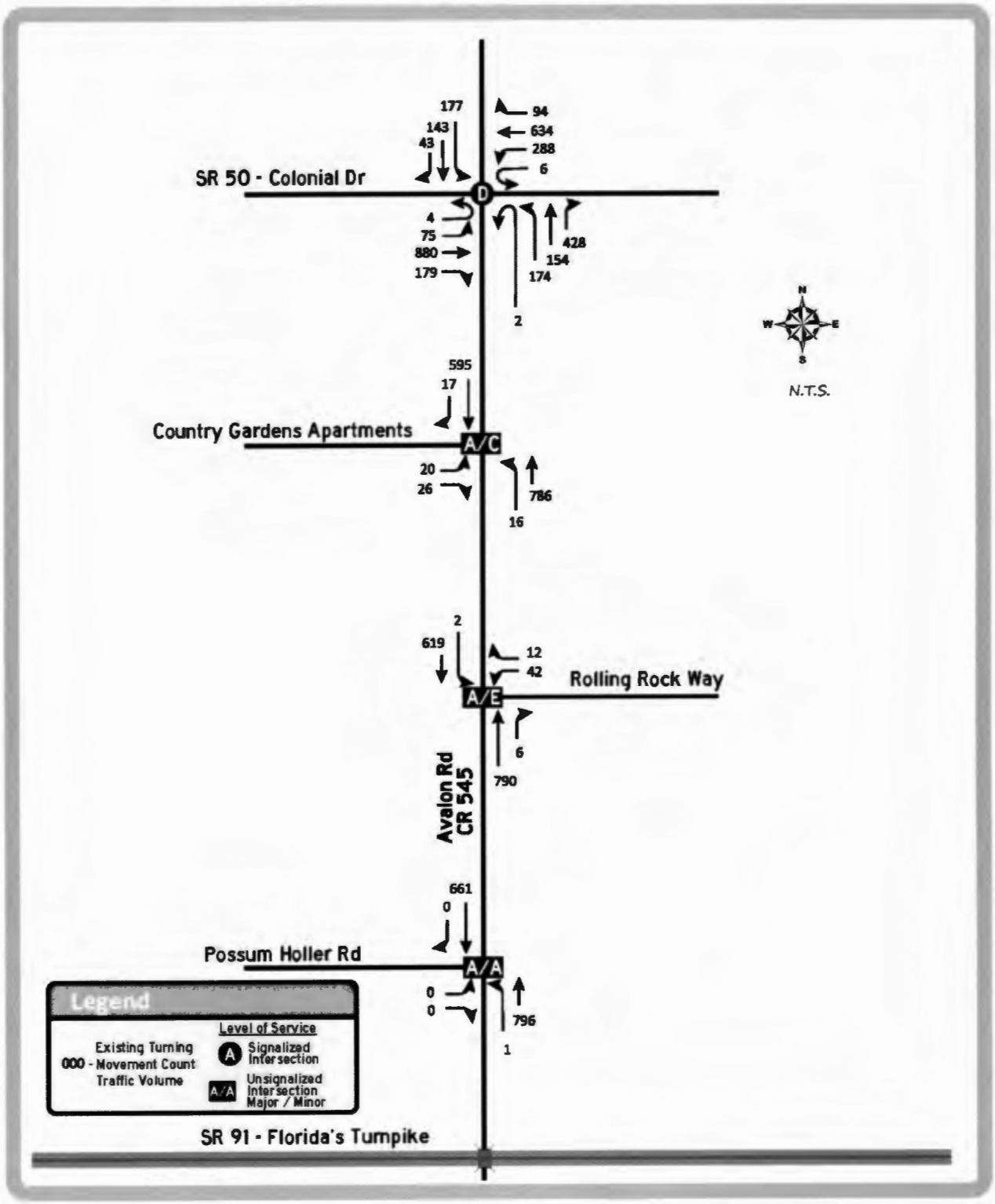
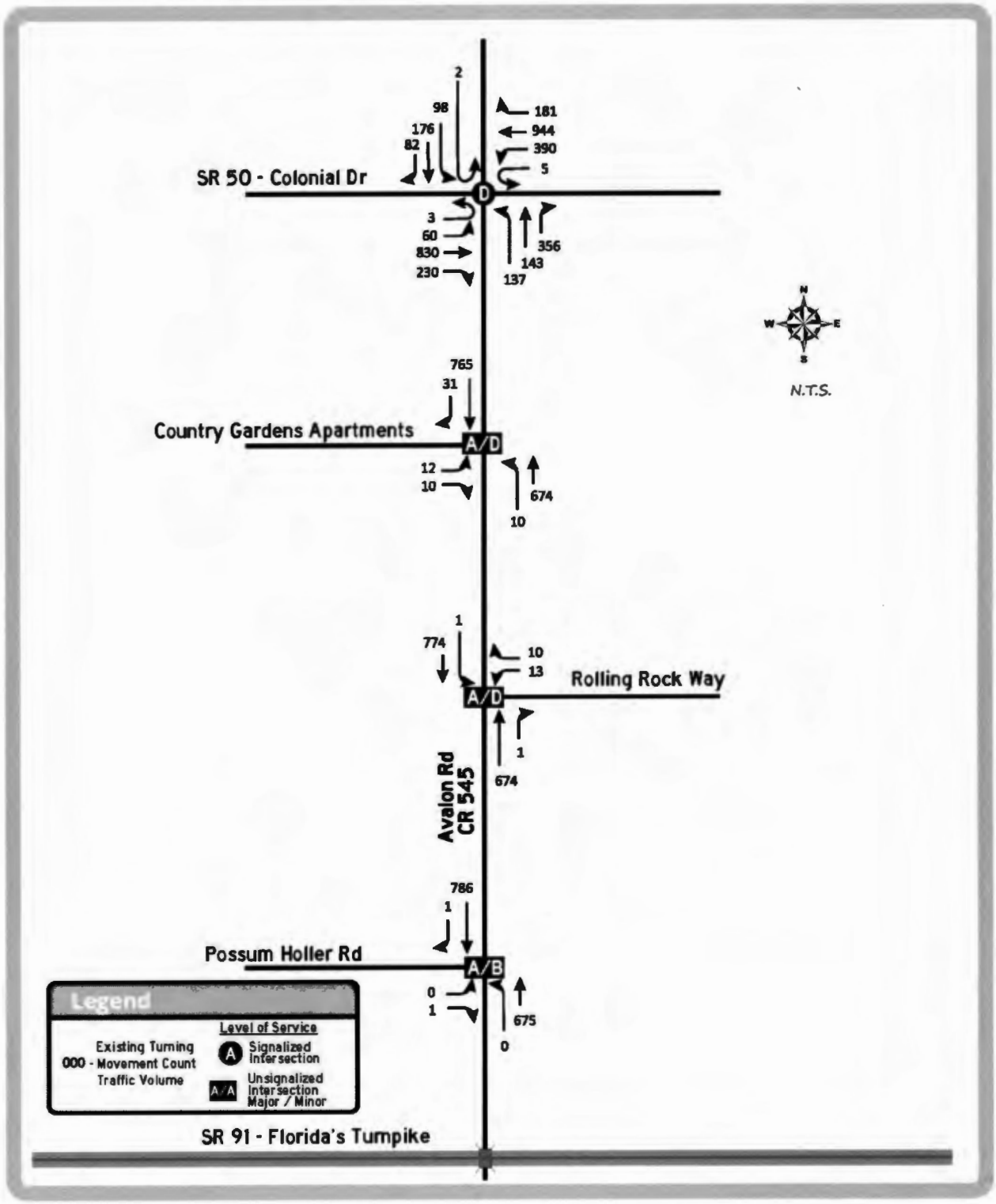


Figure 5.3: Existing Weekday PM Peak Hour Traffic Volumes & LOS



5.3 Future Traffic Volumes

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

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

Design traffic volumes were developed for two traffic conditions, No-Build and Build. The No-Build condition for Avalon Road, between Florida's Turnpike and SR 50, assumes that the subject facilities will maintain existing lane geometry and intersection configurations. The PM peak hour design hour volumes (DHV's) for the intersections were developed using the Orange County approved No-Build annual traffic growth rate for Avalon Road (6.2 percent for 2025 and 2.2 percent for 2035 / 2045) to project AADT's for the opening year, mid-design year and design year to calculate DHV's based on the approved K and D factors, as well as the observed existing turning movements. **Figure 5.4** presents the No-Build AADT for the study roadway segments.

Figures 5.5 – 5.7 show the weekday AM and PM peak hour opening year, mid-design year, and design year design hour turning movement volumes for the No-Build Scenario for the intersections along the Avalon Road project corridor. **Table 5.6** presents the projected level of service for the No-Build study intersections. Both AM and PM peak hour intersection analysis were performed. The AM peak hour traffic volumes were assumed to be the inverse of the PM peak hour traffic volumes and adjusted based on the existing AM to PM peak hour ratio of the existing traffic counts.

Table 5.6: Future No-Build Weekday Intersection LOS – Avalon Road

#	Intersection	Control Type	AM LOS	PM LOS
Opening Year 2025				
1	SR 50	Signal	E	F
2	Country Gardens	Stop	B/F	B/E
3	Rolling Rock Way	Stop	B/F	B/F
4	Possum Holler Road	Stop	B/E	B/E
Mid-Year 2035				
1	SR 50	Signal	F	F
2	Country Gardens	Stop	B/F	B/F
3	Rolling Rock Way	Stop	B/F	B/F
4	Possum Holler Road	Stop	B/E	B/F
Design Year 2045				
1	SR 50	Signal	F	F
2	Country Gardens	Stop	B/F	C/F
3	Rolling Rock Way	Stop	C/F	B/F
4	Possum Holler Road	Stop	B/F	B/F

** Unsignalized Intersection LOS are reported for "Major Street Left Turn Movement / Minor Street Movement."*

5.3.1 Opening Year 2025

As shown in **Figure 5.5**, the SR 50 signalized intersection is projected to operate at LOS E during the weekday AM peak hour and LOS F during the weekday PM peak hour. The full access unsignalized intersections south of SR 50 are projected to operate at LOS F for the minor street movements, except for Possum Holler Road (LOS E).

5.3.2 Mid-Design Year 2035

As shown in **Figure 5.6,** the SR 50 signalized intersection is projected to operate at LOS F during the weekday AM and PM peak hours. The full access unsignalized intersections are projected to operate at LOS F for the minor street movements, except for Possum Holler Road (LOS E) during the weekday AM peak hour. Left turns from Avalon Road onto the minor streets where applicable would operate at LOS B.

5.3.3 Design Year 2045

As shown in **Figure 5.7,** the SR 50 signalized intersection is projected to operate at LOS F during the weekday AM and PM peak hours. The full access unsignalized intersections are projected to operate at LOS F for the minor street movements and LOS B/C for Avalon Road left turns onto the minor streets where applicable.

Figure 5.4: Future No-Build AADT Volumes

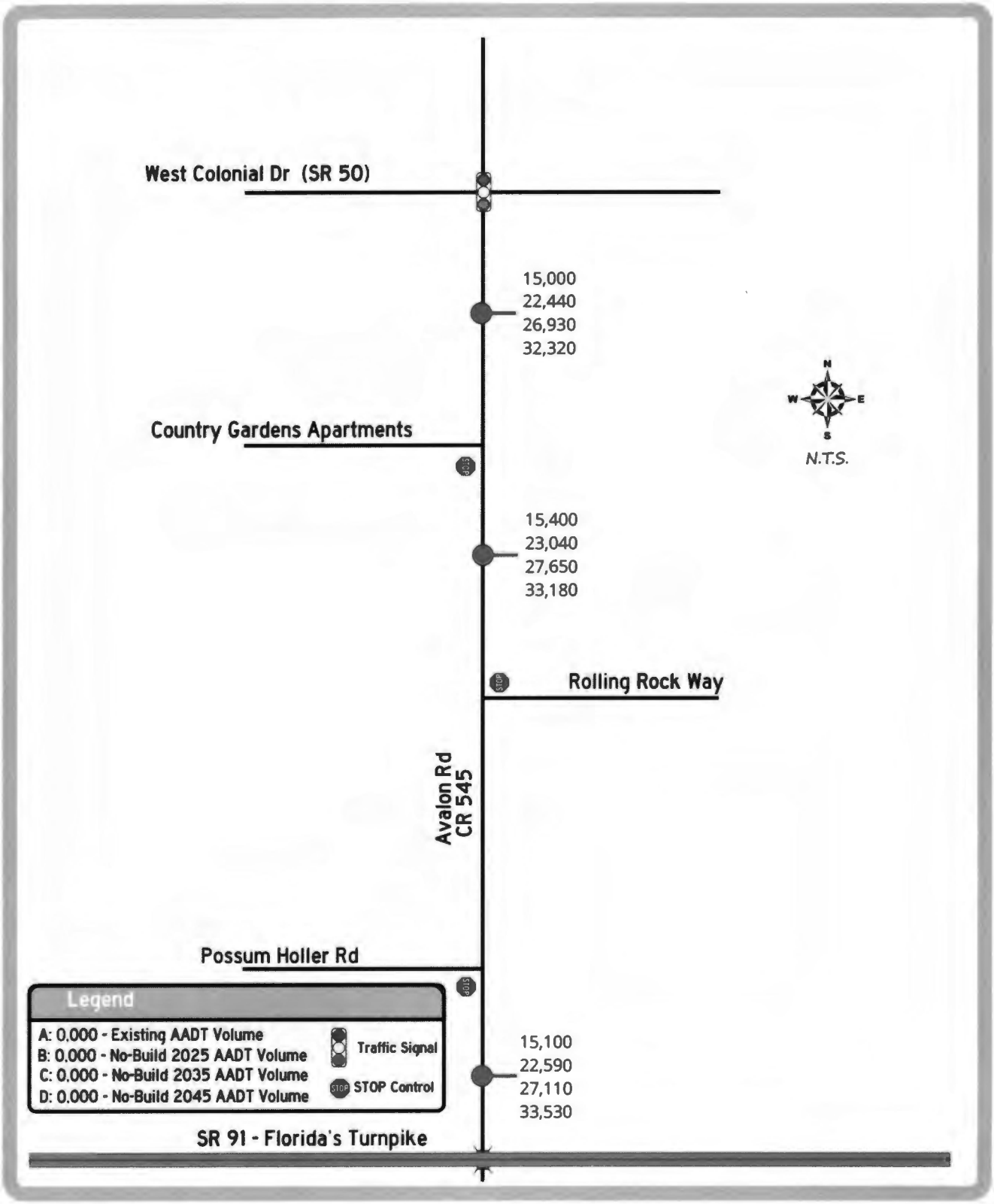


Figure 5.5: Future No-Build 2025 Turning Movement Volumes & LOS: Weekday Peak Hour

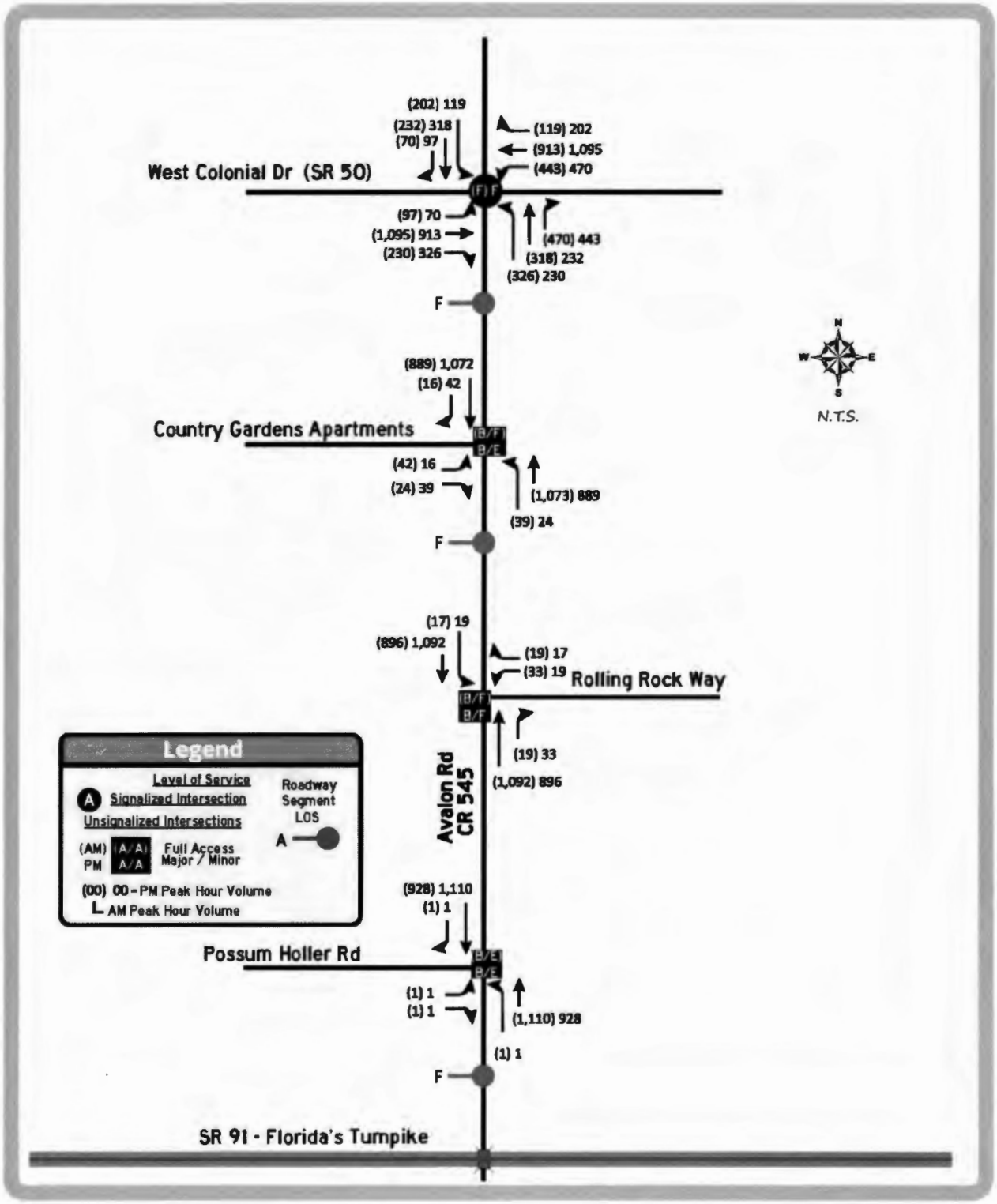


Figure 5.6: Future No-Build 2035 Turning Movement Volumes & LOS: Weekday Peak Hour

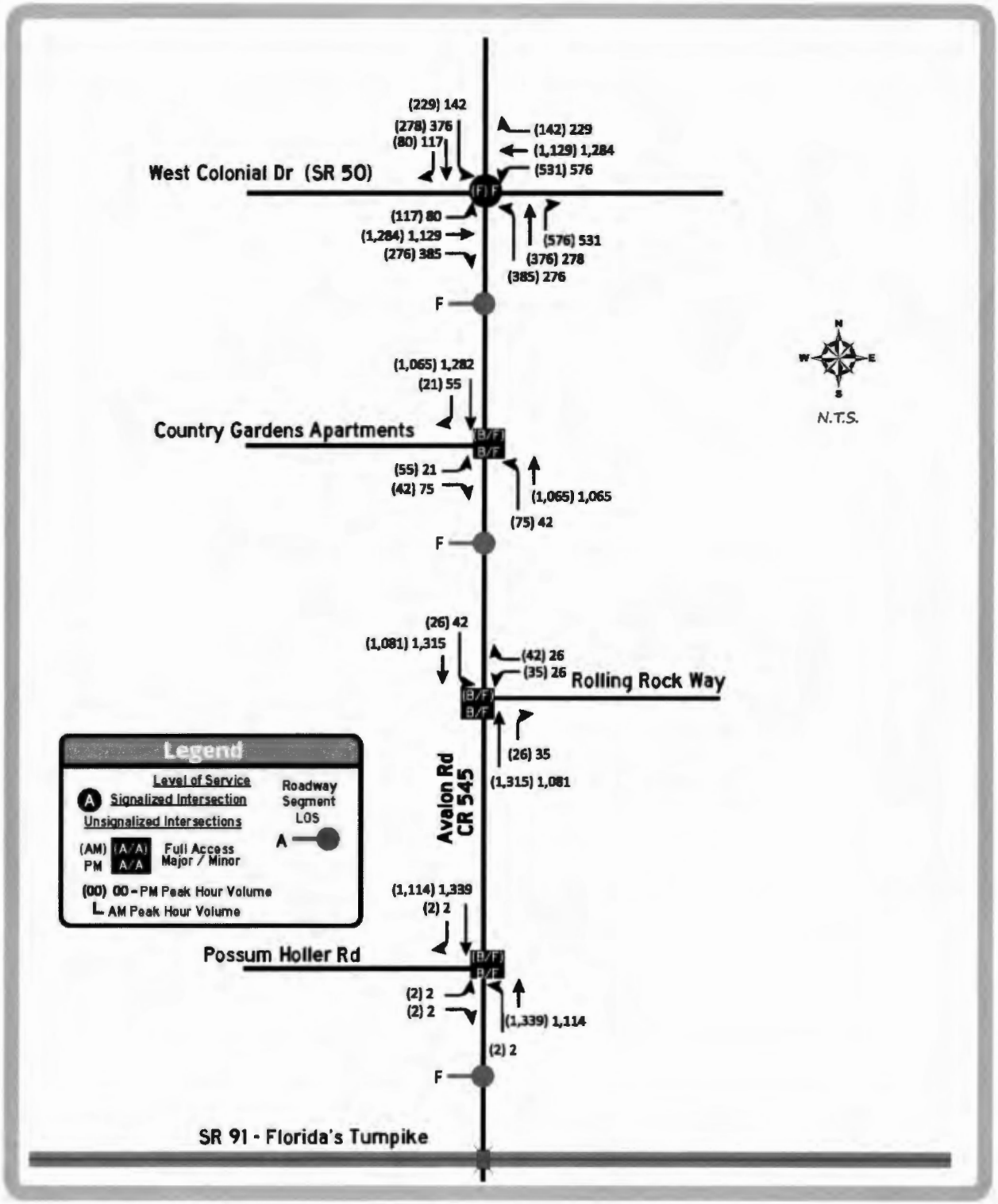
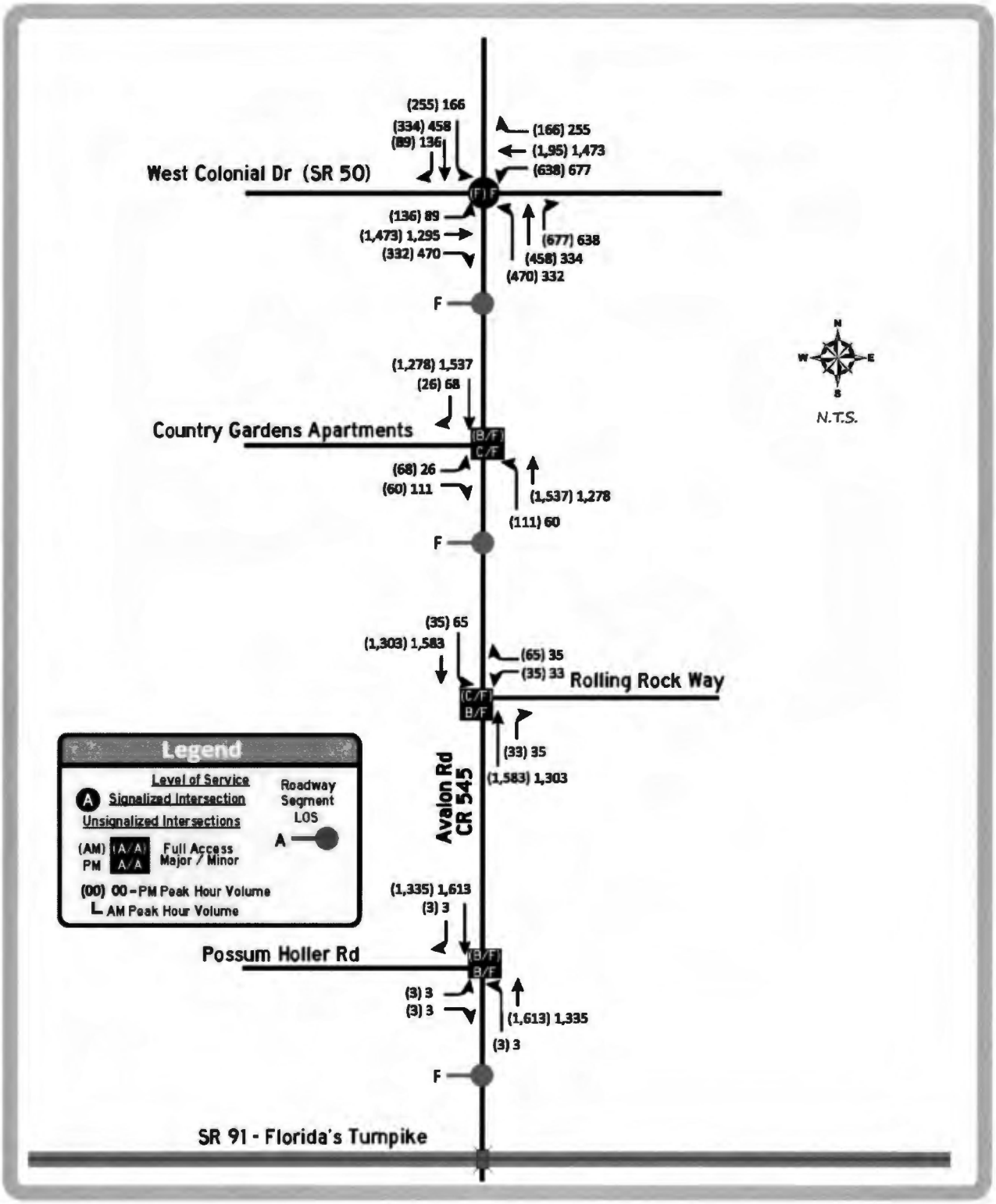


Figure 5.7: Future No-Build 2045 Turning Movement Volumes & LOS: Weekday Peak Hour



6. Alternatives Analysis

This section analyzes the No-Build Alternative and the four Build Alternatives considered for the Avalon Road corridor as described below:

- **No-Build Alternative** – A "do nothing" approach where no changes will be made to the existing roadway section. Under this alternative, the current crash history can be expected to continue.
- **Build Alternative** – Widening of Avalon Road to four through lanes, including various safety measures such as a raised median consistent with access management changes, dedicated left turn lanes, multi-purpose path, landscaping and other improvements. The Build Alternatives have a similar typical section with different horizontal alignments.

6.1 Opportunities and Constraints

6.1.1 Right-of-Way

The Avalon Road right-of-way, when originally constructed, was 47 feet in width. FDOT previously owned the Avalon Road right-of-way up until 1951, when it was given to Orange County. Around the same time, David Zook, the owner of the parcel on the east side of Avalon Road subdivided the former grove into several lots, holding to the right-of-way line set by the County. In 2018, upon detailed investigation, it was discovered that at the time of subdivision, a total of 8 feet of right-of-way that has been thought of as owned by the private residents along the east side of Avalon Road still belongs to David Zook. As part of a new, widened right-of-way of 120 feet to accommodate the Avalon Road improvements, the County will have to obtain the 8-foot strip of land from David Zook along the east side of Avalon Road. This is in addition to acquisition of property from other owners on the east side, plus some acquisition of property on the west side of the existing roadway. In addition, two parcels (one from the W.H. Benton Estate and one from Willie Rich) will need to be acquired for a pond on the east side of the roadway along Florida's Turnpike.

6.1.2 Raised Medians

Raised medians improve safety by reducing the number of potential conflict points at driveways and intersections. In addition, raised medians provide the opportunity for refuge at mid-block crossings or intersections, thereby giving pedestrians and bicyclists a safe place to rest as they cross the street and wait for gaps in traffic. The raised median included in all four Build Alternatives allows for all existing movements except for the northbound left onto Possum Holler Road and the northbound left onto Country Gardens Apartment Drive, which will now have to be accessed through U-turns.

6.1.3 Multi-Purpose Path

Multi-purpose paths can improve mobility and safety by providing an opportunity for safe pedestrian or bicycle travel in a separate area away from vehicular traffic. Multi-purpose paths are particularly beneficial when bicycle lanes are not present on the roadway and can also accommodate children or some bicyclists that may not be comfortable riding on the roadway. All four Build Alternatives include a 10-foot multi-purpose path on the west side of the roadway.

6.2 Alternatives Analysis

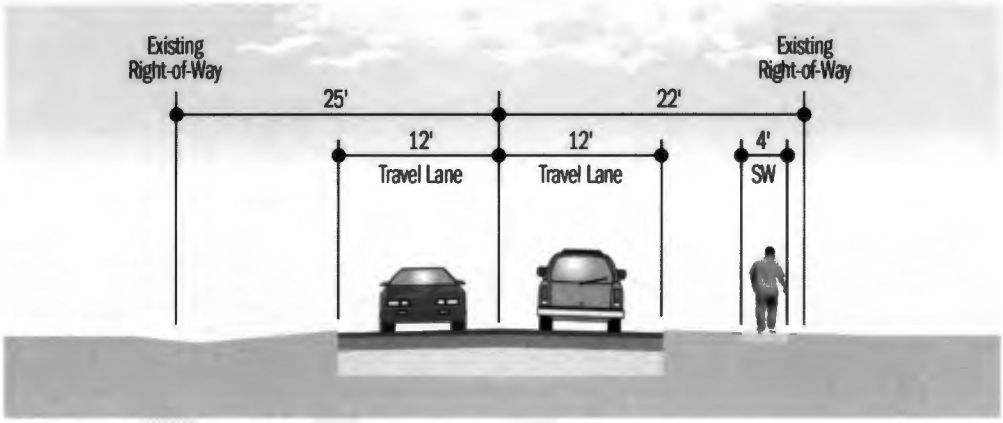
Various alternatives were evaluated to determine if they can meet the purpose and need of this project. These alternatives include the following, and are in **Appendix G**:

- No-Build Alternative
- Transportation Systems Management & Operations
- Four Build Alternatives
  - Build Alternative 1 – West Alignment Widening
  - Build Alternative 2 – East Alignment Widening
  - Build Alternative 3 – Center Alignment Widening
  - Build Alternative 4 – Center/Hybrid Alignment Widening

6.2.1 No-Build Alternative

The No-Build Alternative reflects the continuation of existing pedestrian, bicycle, and traffic operations along Avalon Road through 2045 with no changes. For the No-Build Alternative, Avalon Road was found to operate at LOS F for all roadway segments, for all design years 2025, 2035 and 2045, during the weekday PM peak hour. The No-Build Alternative reflects the existing physical configuration of Avalon Road, as illustrated in the typical section displayed in **Figure 6.1**.

Figure 6.1: No-Build Alternative Typical Section



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

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

However, the potential disadvantages of the No-Build Alternative include:

- Does not improve multimodal mobility
- Results in reduced LOS and increased traffic congestion
- Motor vehicle crashes, property damage, injuries, and fatalities will increase due to increased congestion
- Emergency vehicle access is degraded
- User costs are increased due to congestion

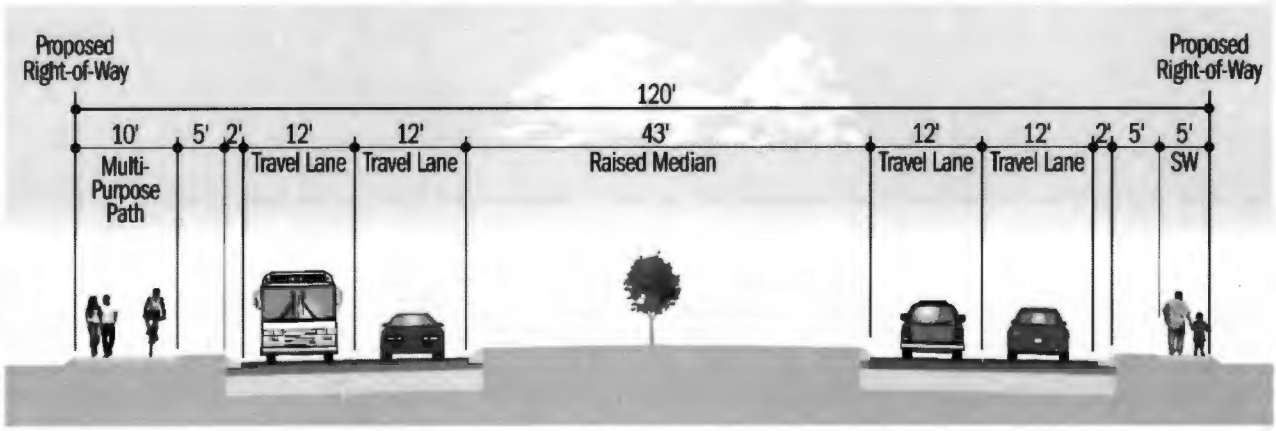
6.2.2 Transportation Systems Management & Operations (TSM&O)

Alternatives that use TSM&O rely upon maximizing the utilization and efficiency of the existing facility through improved system and demand management, and generally include traffic signal and intersection improvements, access management, and transit improvements. Since the additional capacity required to meet the projected traffic volumes along Avalon Road in the design year cannot be provided solely through the implementation of TSM&O improvements, there are elements of TSM&O that have been incorporated into the Build Alternatives, in particular access management with introduction of a raised median, and added auxiliary lanes at the SR 50 intersection.

6.2.3 Build Alternatives

Four Build Alternatives – the West Alignment, East Alignment, Center Alignment, and Center/Hybrid Alignment – were developed for evaluation, all stemming from the same Initial Build Alternative (displayed in **Figure 6.2**), which included a four-lane section with 12-foot travel lanes on either side, a 43-foot median, a 10-foot multi-purpose path to the west, and a 5-foot sidewalk to the east.

Figure 6.2: Build Alternative: Initial Alignment

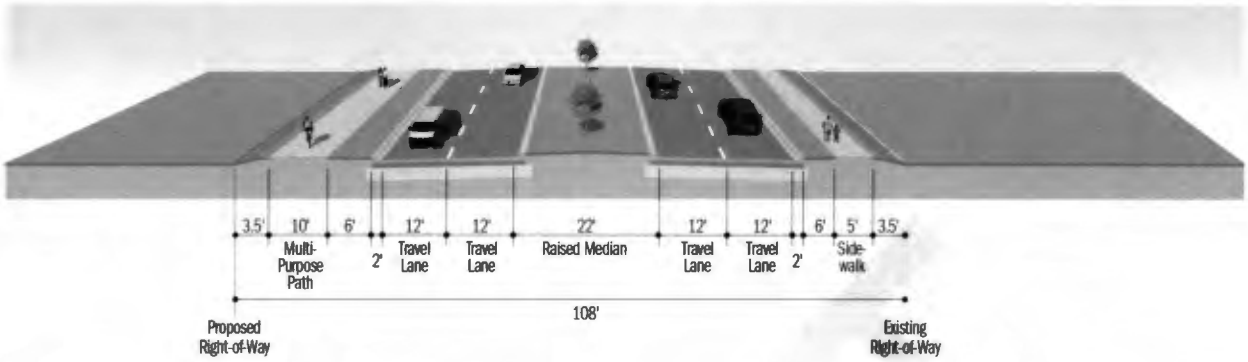


To minimize impacts to existing residences along Avalon Road, the median width in the Initial Build Alternative was reduced from 43 feet to 22 feet (the minimum median width to provide for U-turn movements). Using a narrower right-of-way of 120 feet, four horizontal alignments were developed that modify right-of-way by widening to different sides. These Build Alternatives were developed with consideration of future traffic needs, input from the public, input from the City of Winter Garden, and standard engineering practice, including compliance with the Americans with Disabilities Act (ADA).

West Alignment

The West Alignment, illustrated in **Figure 6.3**, would hold the east side of Avalon Road on the existing right-of-way and widens to the west. This alignment would have a 22-foot median, 10-foot multi-purpose path on the west side, and a 5-foot sidewalk on the east side. The West Alignment would impact 25 parcels, require 5.41 acres of right-of-way, and require nine residential acquisitions.

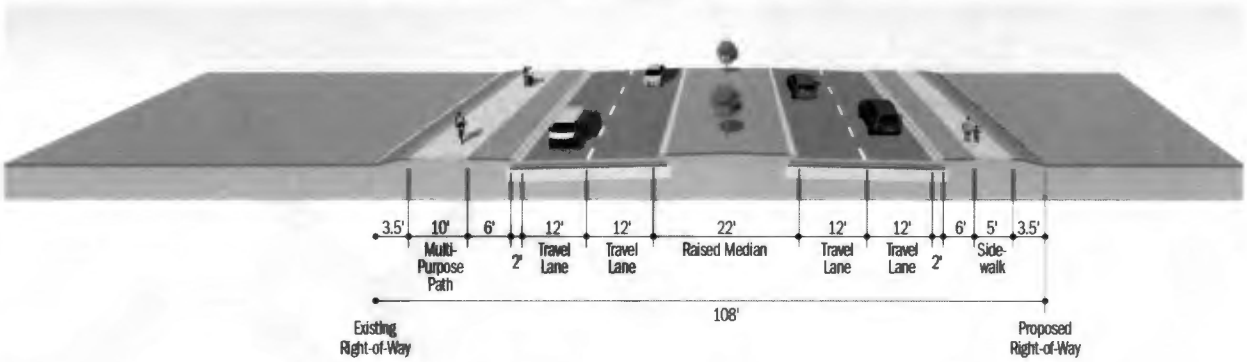
Figure 6.3: Build Alternative: West Alignment



East Alignment

The East Alignment, illustrated in **Figure 6.4**, would hold the west side of Avalon Road on the existing right-of-way and widen to the east. This alignment would have a 22-foot median, 10-foot multi-purpose path on the west side, and a 5-foot sidewalk on the east side. The East Alignment would impact 23 parcels, require 5.64 acres of right-of-way, and require six residential acquisitions.

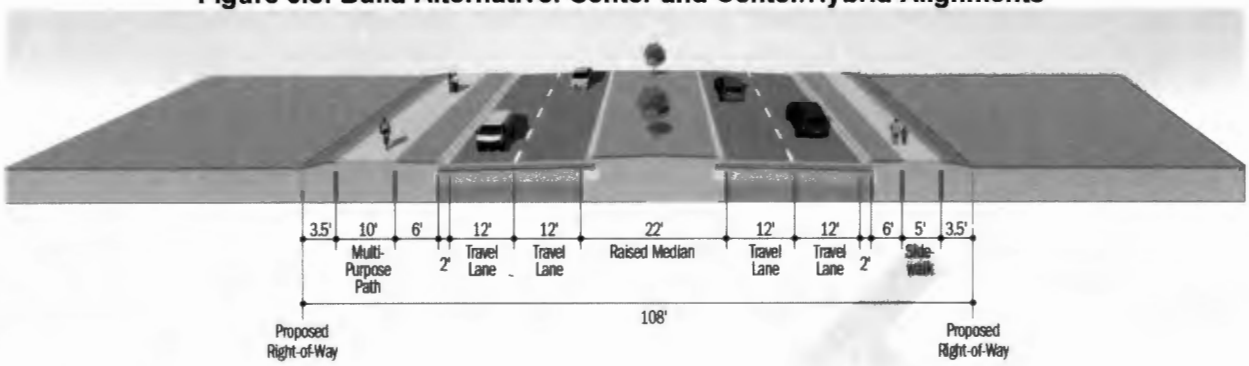
Figure 6.4: Build Alternative: East Alignment



Center Alignment

The Center Alignment, illustrated in **Figure 6.5**, generally would follow the existing centerline of Avalon Road. This alignment would have a 22-foot median, 10-foot multi-purpose path on the west side, and a 5-foot sidewalk on the east side. The Center Alignment would impact 30 parcels, require 5.13 acres of right-of-way, and require five residential acquisitions.

Figure 6.5: Build Alternative: Center and Center/Hybrid Alignments



Center/Hybrid Alignment

The Center/Hybrid Alignment, illustrated in **Figure 6.5**, is a hybrid between the West, East, and Center Alignments, and was developed to minimize the impacts to existing residences along Avalon Road and optimize utilization of existing County right-of-way. The Center/Hybrid Alignment would generally follow the existing centerline of Avalon Road, but would require added right-of-way strategically from both sides to minimize residential impacts. This Alignment would have a 22-foot median, 10-foot multi-purpose path on the west side, and a 5-foot sidewalk on the east side. The Center/Hybrid Alignment would impact 30 parcels, require 5.55 acres of right-of-way, and require four residential acquisitions (the least of all of the Build Alternatives).

6.3 Evaluation of Build Alternatives

This chapter screens the No-Build and Build Alternatives on how well they meet the project purpose and objectives – "to improve mobility for all users on Avalon Road." The screening of the No-Build and Build Alternatives is summarized in **Table 6.1** which indicates how well these alternatives subjectively meet the project purpose and objectives. This project has the following objectives:

- Create a roadway environment for users of all ages and abilities
- Provide safe access for pedestrians/bicyclists to and from schools, religious institutions, businesses, and residential areas – for all modes of travel

6.3.1 Evaluation Measures: Right-of-Way Impacts

This section screens the No-Build and Build Alternatives using three different measures to indicate the extent of right-of-way impacts. The preferred alignment should minimize the impact to neighboring residents and businesses along Avalon Road. Listed below are brief descriptions of each of the measures:

- **Number of Residential Acquisitions** reflects how many residential structures are anticipated to be potentially fully impacted by the proposed right-of-way.
- **Right-of-Way Needed (acres)** reflects how much right-of-way is anticipated to be required by the County.
- **Number of Parcels Impacted** reflects how many parcels (residential, business, or otherwise) are anticipated to be affected by the project, through right-of-way acquisition.

6.3.2 Evaluation Measures: Social, Natural, and Physical Impacts

This section screens the No-Build and Build Alternatives using eight measures to indicate the extent of social, natural, and physical impacts. The preferred alignment should minimize the social, natural, and physical impacts to neighboring residents and businesses along Avalon Road. Listed below are brief descriptions of each of the measures:

- **Social & Neighborhood** reflects anticipated social and neighborhood impacts on mobility, such as effects on parks, schools, or community resources.
- **National Register Archaeological/Historic Sites** reflects anticipated impacts on archaeological/historic sites that are listed in the National Register of Historic Places.
- **Threatened/Endangered Species** reflects anticipated impacts to threatened/endangered species, such as wildlife habitat impact or species relocation.
- **Acres of Wetlands** reflects anticipated acreage of wetlands impacted by the proposed right-of-way.
- **Acres of Floodplains** reflects anticipated acreage of floodplains impacted by the proposed right-of-way.
- **Potential Contamination Sites** reflects how many potential contamination sites are anticipated to be impacted by the proposed right-of-way and how that contamination may affect construction.
- **Southbound Deflection Impacts at SR 50 Intersection** reflects if the horizontal alignment is able to meet County and FDOT deflection criteria (the angle between two roadways across an intersection).
- **Meets County Level of Service Standard** reflects if the lane capacity is able to meet the County Level of Service current standard of LOS D or better.

6.3.3 Evaluation Measures: Estimated Costs

This section screens the No-Build and Build Alternatives using estimated capital cost, as a sum of Design, Right-of-Way Acquisition, Roadway Construction, and Construction Engineering and Inspection (CEI). The preferred alignment should minimize the estimated costs to neighboring residents and businesses along Avalon Road. Listed below are brief descriptions of each of the cost components:

- **Roadway Construction:** The roadway construction costs were developed based on unit prices from construction bid costs from Orange County for recent projects on Dean Road, Avalon Park Blvd and Boggy Creek Road. These projects were deemed similar in size and scope to the Avalon Road RCA, so the unit prices of each of the three projects and for Avalon Road improvements were assumed to be similar. For each pay item, a maximum, minimum and an average were calculated for all three of the projects. After comparing the quantities for each of the three projects to the quantity needed for Avalon Road, a new unit price was assumed based off the unit prices. Mobilization and maintenance of traffic were calculated as 10 percent of the cost of construction and a 25 percent contingency was also added. The contingency was added to cover any changes that may be made in final design and all necessary underground utility relocations. The detailed construction cost estimates are presented in **Appendix H.**
    - **Design:** The design cost was calculated as 15 percent of the estimated roadway construction cost.
    - **CEI:** The CEI cost was calculated as 15 percent of the estimated roadway construction cost.

- **Right-of-Way Acquisition:** A preliminary cost estimate for acquiring the necessary right-of-way for the proposed alternatives was developed using the Orange County Property Appraiser website (http://www.ocpafl.org/). For each parcel that Orange County is assumed to be acquiring for added right-of-way, the 2017 land value and parcel area was obtained from the property records. Once the land value and parcel area was obtained, a unit price for each individual parcel was developed. With the unit price for each parcel and the proposed acquisition area, a proposed acquisition cost was calculated for each parcel. In all the alternatives, except the No-Build Alternative, there would be residential property acquisition. In the case of a residential acquisition with one building on the parcel, the entire parcel was assumed to be acquired. In the case of multiple houses on a parcel, the necessary land was assumed to be acquired. Just like the right-of-way acquisition, for residential acquisition, the value of the house was determined by the 2017 tax year values. The right-of-way acquisition costs reflect the land and building acquisition and does not include any residential relocation costs. It is recognized that right-of-way acquisition costs will be adjusted during a formal appraisal process associated with final design.

Table 6.1: Alternatives Comparison Matrix

Evaluation Criteria	No-Build Alternative	West Alignment	East Alignment	Center Alignment	Center/Hybrid Alignment (Preferred)
Right-of-Way Impacts					
Number of Residential Acquisitions	None	9	6	5	4
Right-of-Way Needed (acres)	None	5.41	5.64	5.13	5.55
Number of Parcels Impacted	None	25	23	30	30
Social, Natural, & Physical Impacts					
Social & Neighborhood	None	Moderate	Moderate	Moderate	Moderate
National Register Archaeological/Historical Sites	None	None	None	None	None
Threatened/Endangered Species	None	None	None	None	None
Acres of Wetlands	None	None	None	None	None
Acres of Floodplains	None	None	None	None	None
Potential Contamination Sites	None	1	1	1	1
Southbound Deflection Impacts at SR 50 Intersection	Yes	Yes	Yes	Yes	Yes
Meets County Level of Service Standard	No	Yes	Yes	Yes	Yes
Estimated Costs (Present Day Costs)					
Design (15% of Construction)	No Cost	$499,000	$501,000	$506,000	$495,000
Right-of-Way Acquisition*	No Cost	$529,000	$402,000	$316,000	$321,000
Roadway Construction	No Cost	$3,329,000	$3,341,000	$3,374,000	$3,302,000
CEI (15% of Construction)	No Cost	$499,000	$501,000	$506,000	$495,000
Total Cost **		**$4,856,000**	**$4,745,000**	**$4,702,000**	**$4,613,000**

** Right-of-way acquisition estimate does not include relocations or business damages, and is subject to change.*
*** Roadway construction cost estimate (in 2018 dollars) assumes underground utility relocation included in contingency within the cost, pending further engineering analysis during design.*
Shaded column represents the preferred alternative.

6.3.4 Evaluation Summary

This section provides a comparative analysis of the Build Alternatives using the Evaluation Comparison Matrix (**Table 6.1**), and presents a summary of the results:

- The Center/Hybrid Alignment would require the least number of residential acquisitions (4), though it would impact thirty (30) parcels.
- The East Alignment would impact the least number of parcels (23), but would require two more residential acquisitions than the Center/Hybrid Alignment (6).
- Each of the Build Alternatives score the exact same as opposed to the No-Build Alternative under the Social, Natural. & Physical Impact measures.
- All Build Alternatives meet southbound deflection criteria at the SR 50 intersection, and all Build Alternatives meet the 2040 County LOS standard.
- The Center/Hybrid Alignment would require the least amount of roadway construction cost (at $3.3 million), design cost ($495,000), and CEI ($495,000).
- However, the Center Alignment would require the lowest right-of-way acquisition cost ($316,000) as compared to the Center/Hybrid Alignment ($321,000).

In summary, the Center/Hybrid Alignment is preferred to advance to the Design phase, primarily because the Center/Hybrid Alignment would require the least number of residential acquisitions and would require the least amount of roadway construction cost. The Center/Hybrid Alignment Alternative is detailed in the next Chapter.

7. Preferred Alternative

This section presents the preferred alternative, the Center/Hybrid Alignment.

7.1 Design Traffic Volumes

The *Avalon Road RCA Design Traffic Technical Memorandum* (June 2018) documents the existing traffic conditions and the analysis of the No-Build and Build Scenarios. The existing and future traffic conditions and the analysis are summarized in Chapter 5.

The proposed Build Scenario geometry and traffic control for Avalon Road from Florida's Turnpike to SR 50 (**Figure 7.1)** includes an additional through lane in each direction for Avalon Road through movements, converting the Country Gardens Apartments intersection and the Possum Holler Road intersection to right-in/right-out only intersections, and the addition of turn lanes on the south approach to SR 50. Based on the programmed and planned improvements, Avalon Road between Florida's Turnpike and SR 50 is proposed to be widened to four lanes by the opening year 2025. The PM peak hour DHV's for the intersections were developed using the approved Avalon Road Build annual growth rate (6.2 percent for 2025 and 2.2 percent for 2035 / 2045) to project AADT's for the opening year, mid-design year and design year to calculate DHV's based on the approved K and D factors, as well as the observed existing turning movements. **Figure 7.2** presents the Build Scenario AADT for the study roadway segments.

Figures 7.3, 7.4, and 7.5 show the opening year, mid-design year, and design year volumes for the Build Scenario for the intersections along the Avalon Road project corridor. **Table 7.1** presents the projected level of service for the Build Scenario study intersections. Both a weekday AM and PM peak hour intersection analysis were performed to determine the maximum turn lane queue length. The AM peak hour traffic volumes were assumed to be the inverse of the PM peak hour traffic volumes (which are based on actual counts) and adjusted based on the existing AM to PM peak hour ratio of the existing traffic counts.

Table 7.1: Future Build Weekday Intersection LOS

#	Intersection	Control Type	AM LOS	PM LOS
Opening Year 2025				
1	SR 50	Signal	D	D
2	Country Gardens	Stop	B	C
3	Rolling Rock Way	Stop	B	C
4	Possum Holler Road	Stop	B	B
Mid-Year 2035				
1	SR 50	Signal	D	F
2	Country Gardens	Stop	B	C
3	Rolling Rock Way	Stop	C	D
4	Possum Holler Road	Stop	B	B
Design Year 2045				
1	SR 50	Signal	F	F
2	Country Gardens	Stop	D	D
3	Rolling Rock Way	Stop	C	E
4	Possum Holler Road	Stop	C	C

** Unsignalized Intersection LOS are reported for "Major Street Left Turn Movement / Minor Street Movement."*

7.1.1 Opening Year 2025

As shown in **Figure 7.3** and **Figure 7.4**, the SR 50 signalized intersection is projected to operate at LOS D during the weekday PM peak hour. The Rolling Rock Way intersection is projected to operate at LOS C for the minor street movements. The two right-in/right-out intersections (Country Gardens Apartments and Possum Holler Road) are projected to operate at LOS C or better for the minor street movements.

Under weekday AM peak hour conditions, the SR 50 signalized intersection is projected to operate at LOS D. The Rolling Rock Way intersection is projected to operate at LOS C for the minor street movements. The two right-in/right-out intersections (Country Gardens Apartments and Possum Holler Road) are projected to operate at LOS B for the minor street movements.

7.1.2 Mid-Design Year 2035

As shown in **Figure 7.5** and **Figure 7.6**, the SR 50 signalized intersection is projected to operate at LOS F during the weekday PM peak hour. The Rolling Rock Way intersection is projected to operate at LOS C for the minor street movements. The two right-in/right-out intersections (Country Gardens Apartments and Possum Holler Road) are projected to operate at LOS C or better for the minor street movements.

Under weekday AM peak hour conditions, the SR 50 signalized intersection is projected to operate at LOS D. The full access unsignalized intersection is projected to operate at LOS E for the minor street movements. The two right-in/right-out intersections (Country Gardens Apartments and Possum Holler Road) are projected to operate at LOS B for the minor street movements.

7.1.3 Design Year 2045

As shown in **Figure 7.7** and **Figure 7.8,** the SR 50 signalized intersection is projected to operate at LOS F during the weekday PM peak hour. The Rolling Rock Way intersection is projected to operate at LOS E for the minor street movements. The two right-in/right-out intersections (Country Gardens Apartments and Possum Holler Road) are projected to operate at LOS D or better for the minor street movements.

Under weekday AM peak hour conditions, the SR 50 signalized intersection is projected to operate at LOS F. The Rolling Rock Way intersection is projected to operate at LOS F for the minor street movements. The protected minor street volumes would not support a warrant for a traffic signal and adding auxiliary westbound turn lanes would not improve the level of service beyond LOS F. Converting the intersection to a roundabout would provide an acceptable LOS. The two right-in/right-out intersections (Country Gardens Apartments and Possum Holler Road) are projected to operate at LOS D or better for the minor street movements.

Based on the intersection level of service analyses, the Build Scenario would result in a significant reduction in delay and better LOS. The Synchro printouts for the intersection LOS for the opening year, the mid-design year, and design year for design hour for the No-Build and Build Scenarios are in **Appendix F**.

Figure 7.1: Future Build Roadway Lane Configuration and Traffic Control

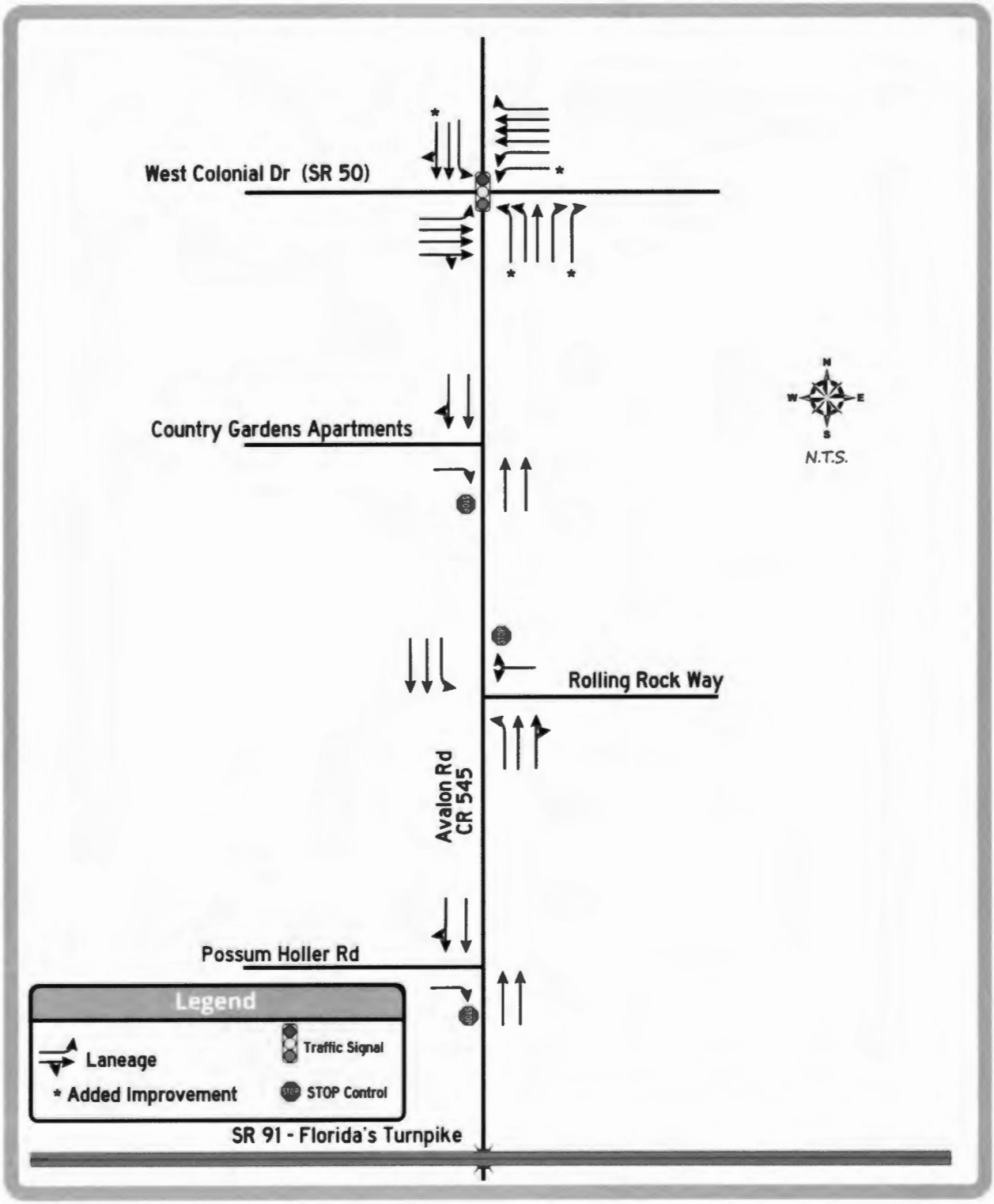


Figure 7.2: Future Build Volumes AADT

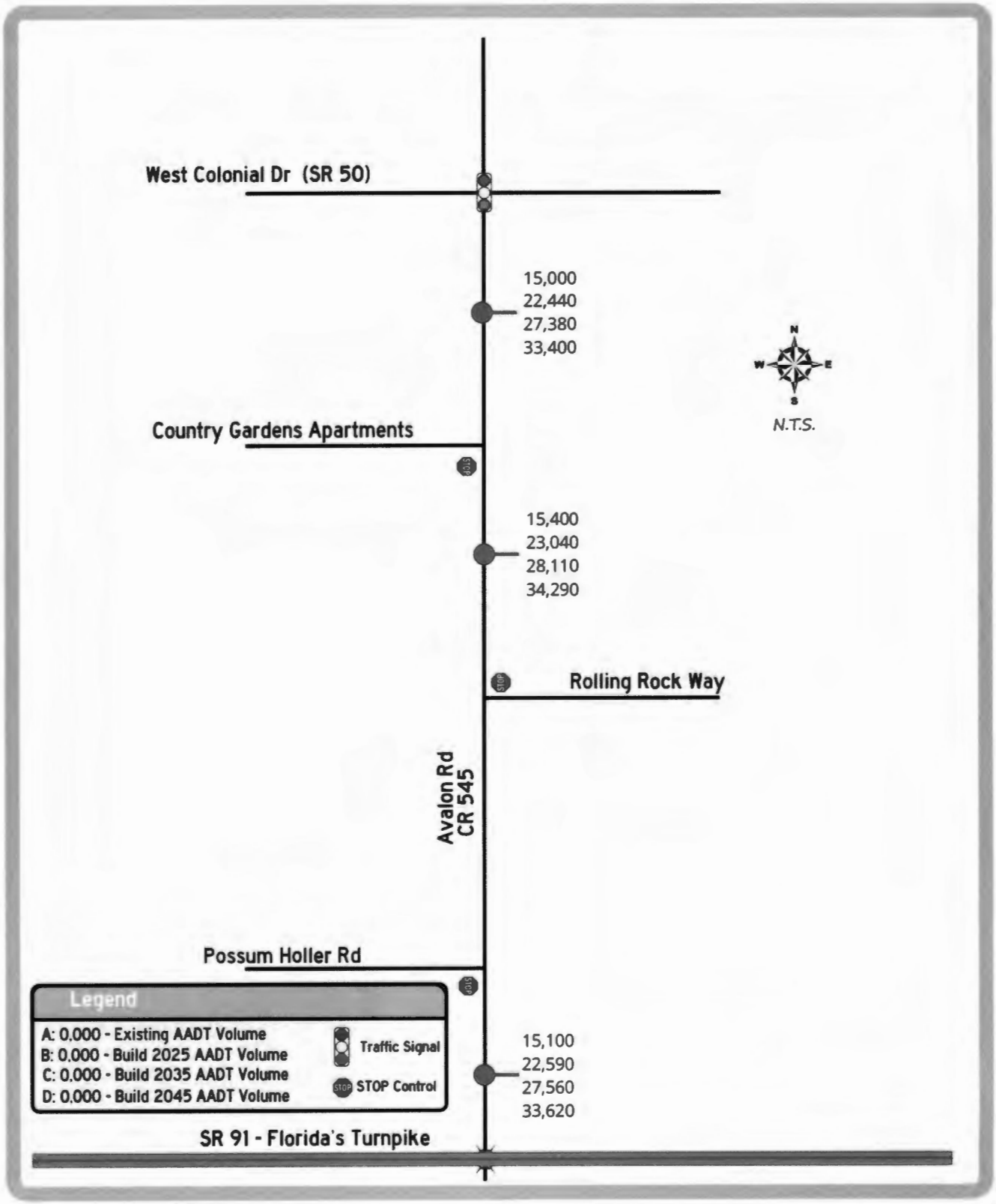


Figure 7.3: Future Build 2025 Turning Movement Volumes & LOS: Weekday AM Peak Hour

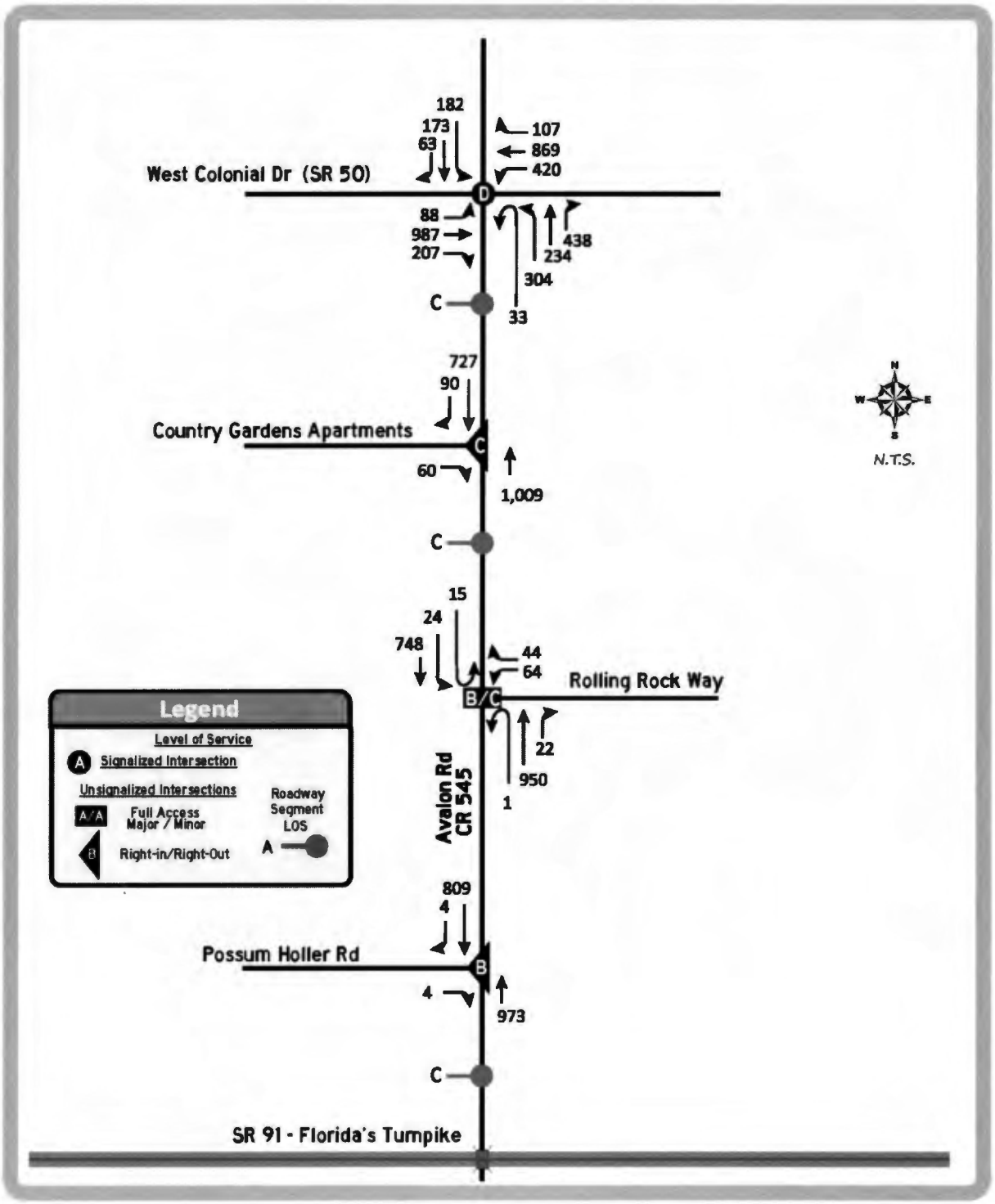


Figure 7.4: Future Build 2025 Turning Movement Volumes & LOS: Weekday PM Peak Hour

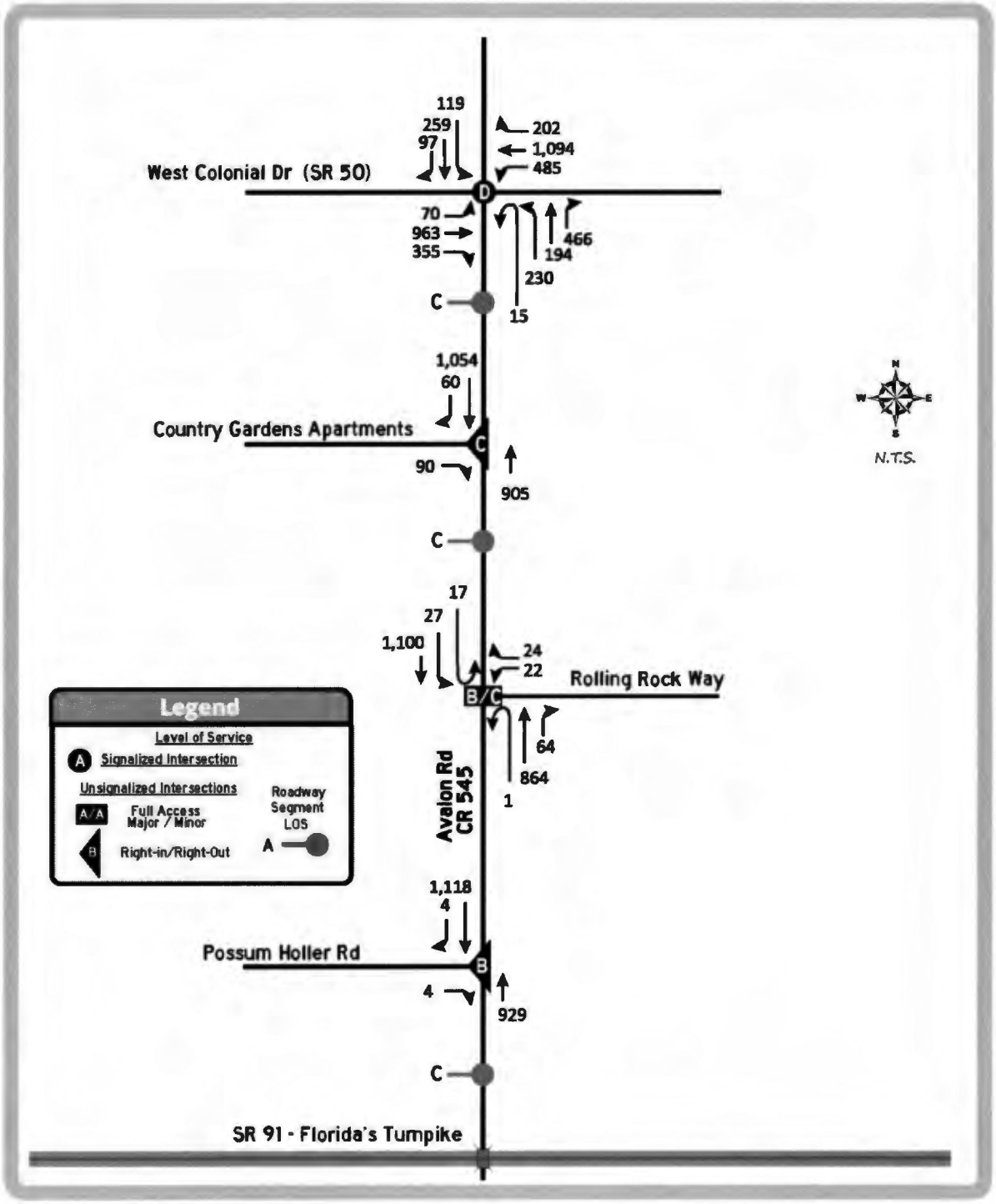


Figure 7.5: Future Build 2035 Turning Movement Volumes & LOS: Weekday AM Peak Hour

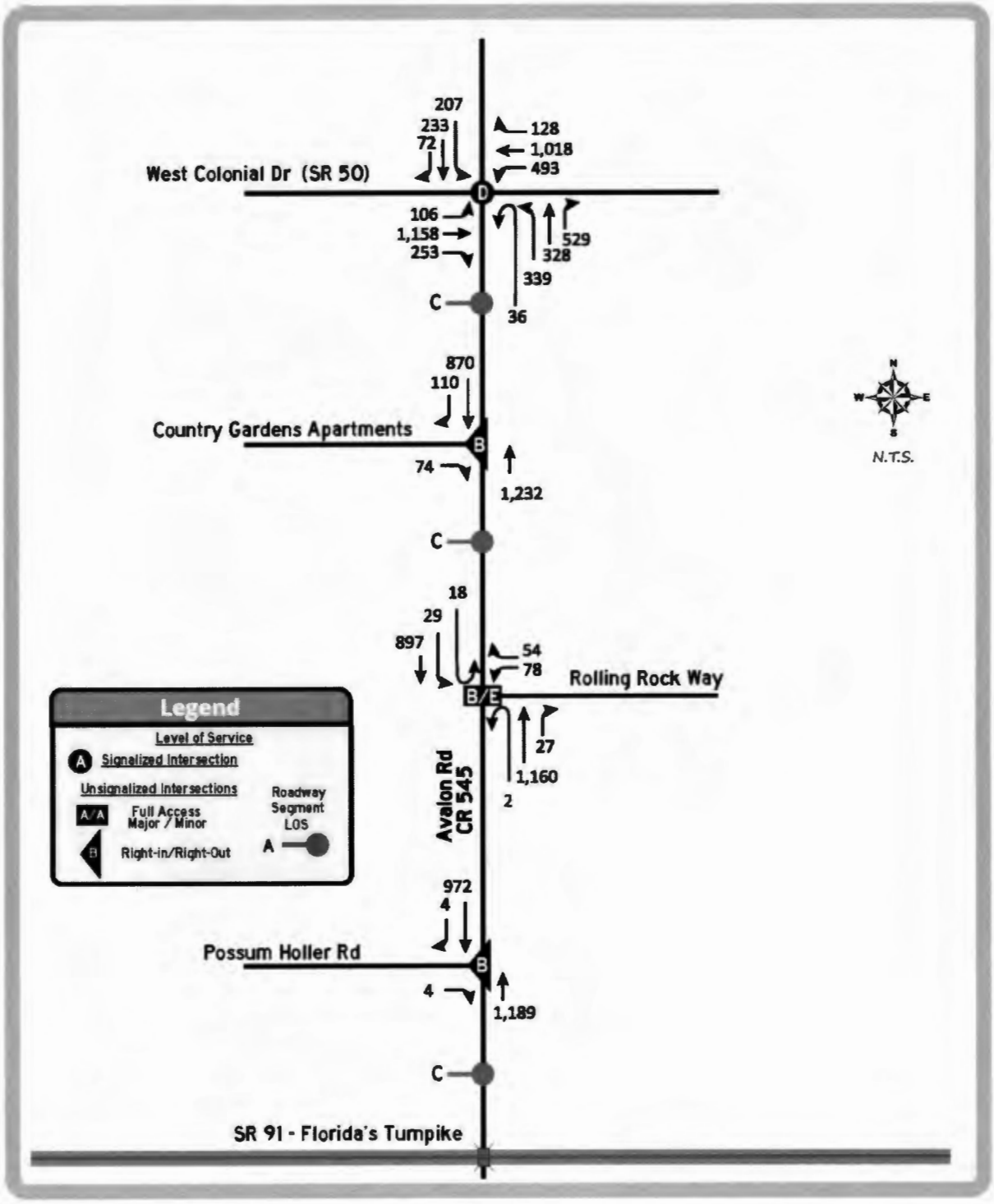


Figure 7.6: Future Build 2035 Turning Movement Volumes & LOS: Weekday PM Peak Hour

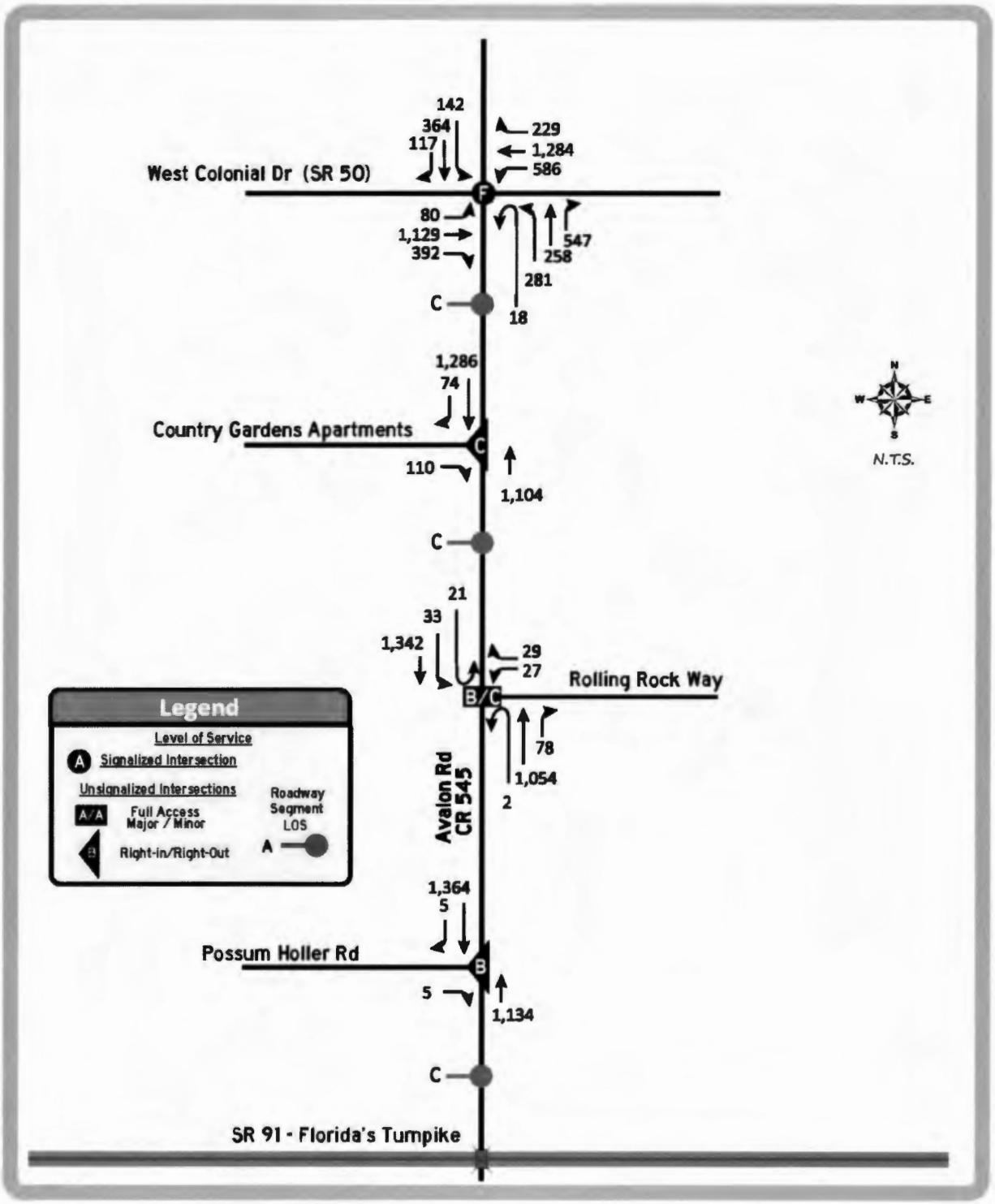


Figure 7.7: Future Build 2045 Turning Movement Volumes & LOS: Weekday AM Peak Hour

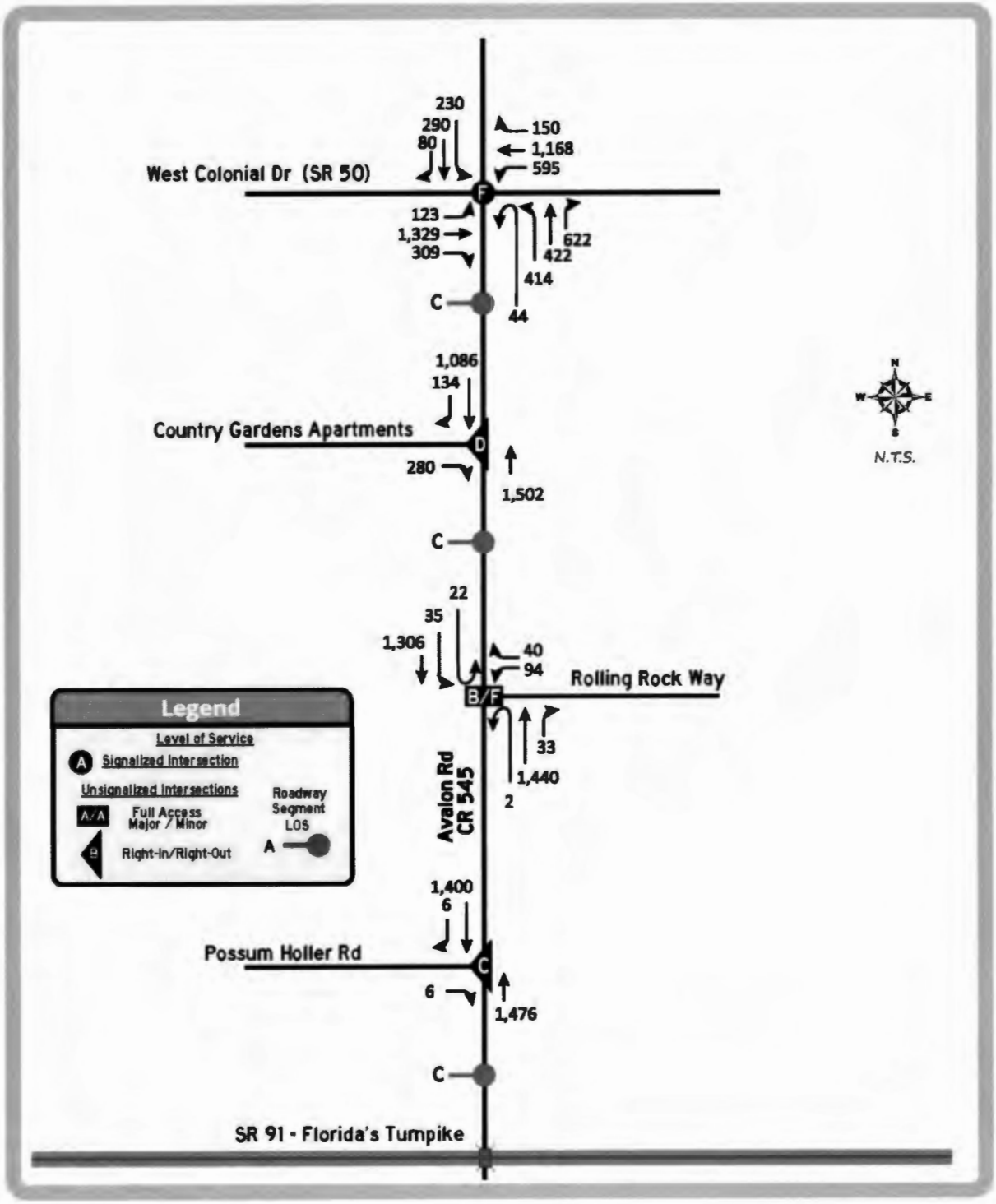
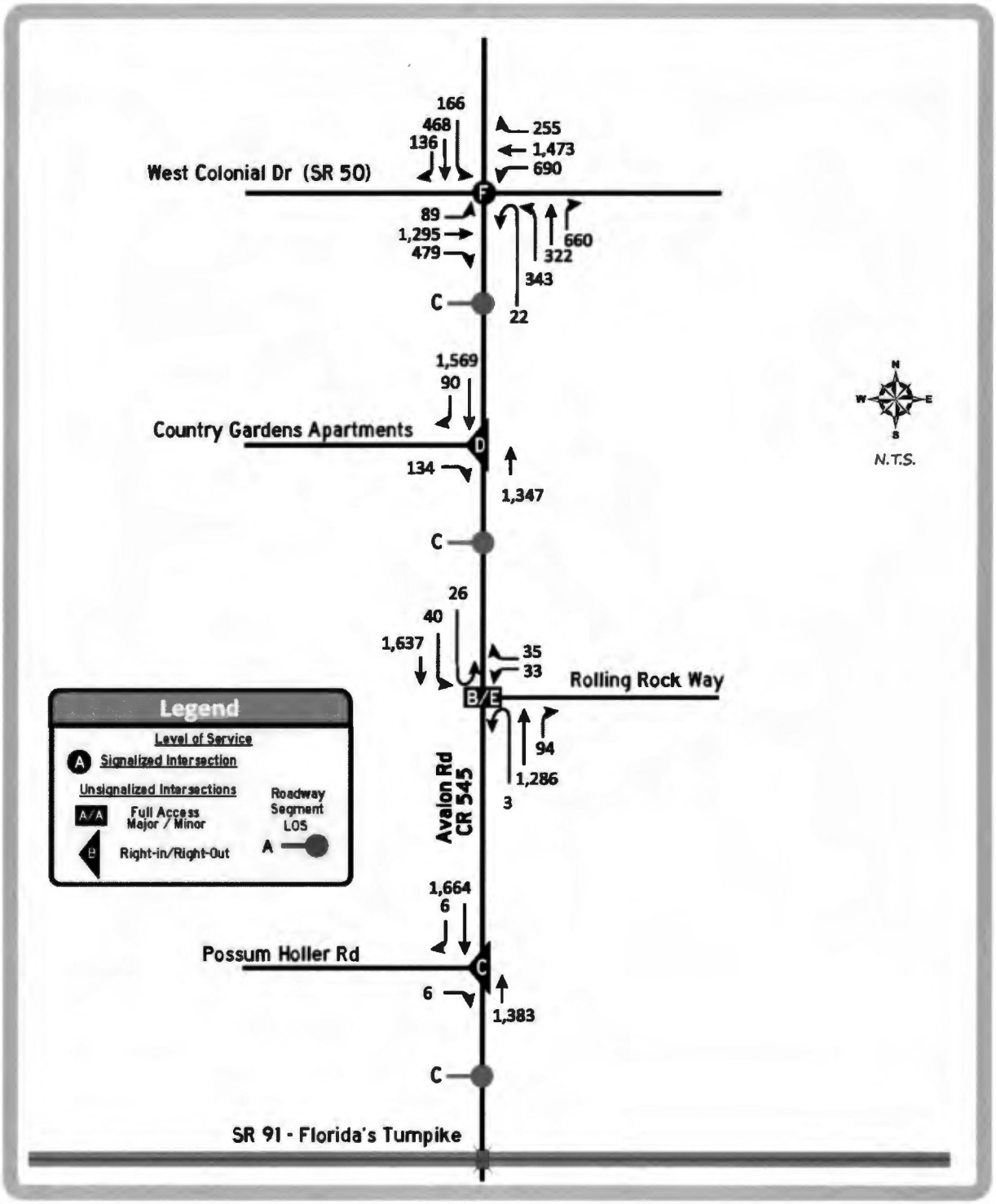


Figure 7.8: Future Build 2045 Turning Movement Volumes & LOS: Weekday PM Peak Hour



7.2 Typical Section and Alignment

The preferred typical section and alignment is the Center/Hybrid Alignment. The preferred typical section is shown in **Figure 7.9** and the preferred horizontal alignment is shown on the concept plans in **Figure 7.10**. The roadway design elements incorporated into the preferred alternative include the following:

- Four 12-foot travel lanes
- A 5-foot sidewalk located on the east side of the roadway
- A 10-foot multi-purpose path located on the west side of the roadway
- Type E curb & gutter along the inside lanes
- Type F curb & gutter along the outside lanes
- A 22-foot raised median
- Two 6-foot utility strips between Type F curb & gutter and the sidewalk/multi-purpose path
- A grass strip between the sidewalk/multi-purpose path and right-of-way of varying width
- Right-of-way of 108 feet

Figure 7.9: Preferred Alternative: Center/Hybrid Alignment

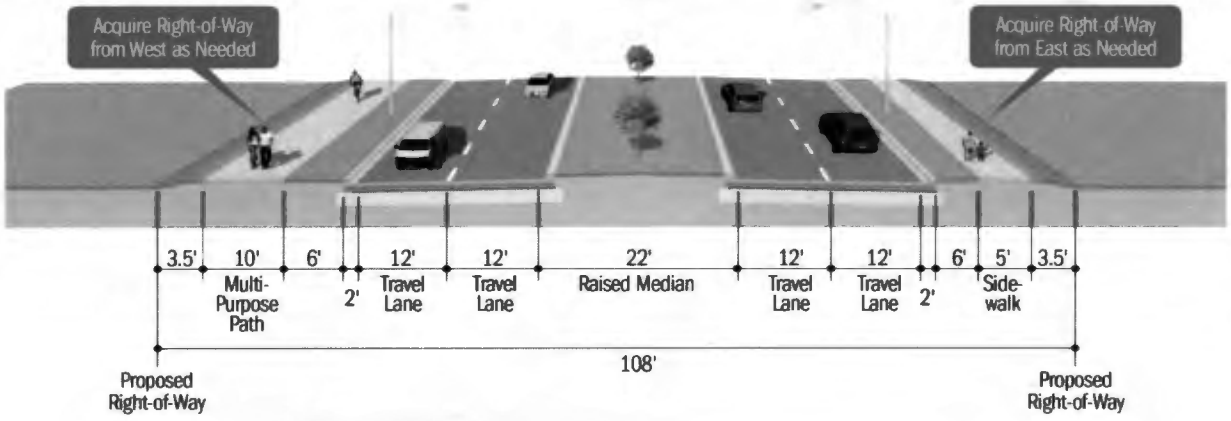
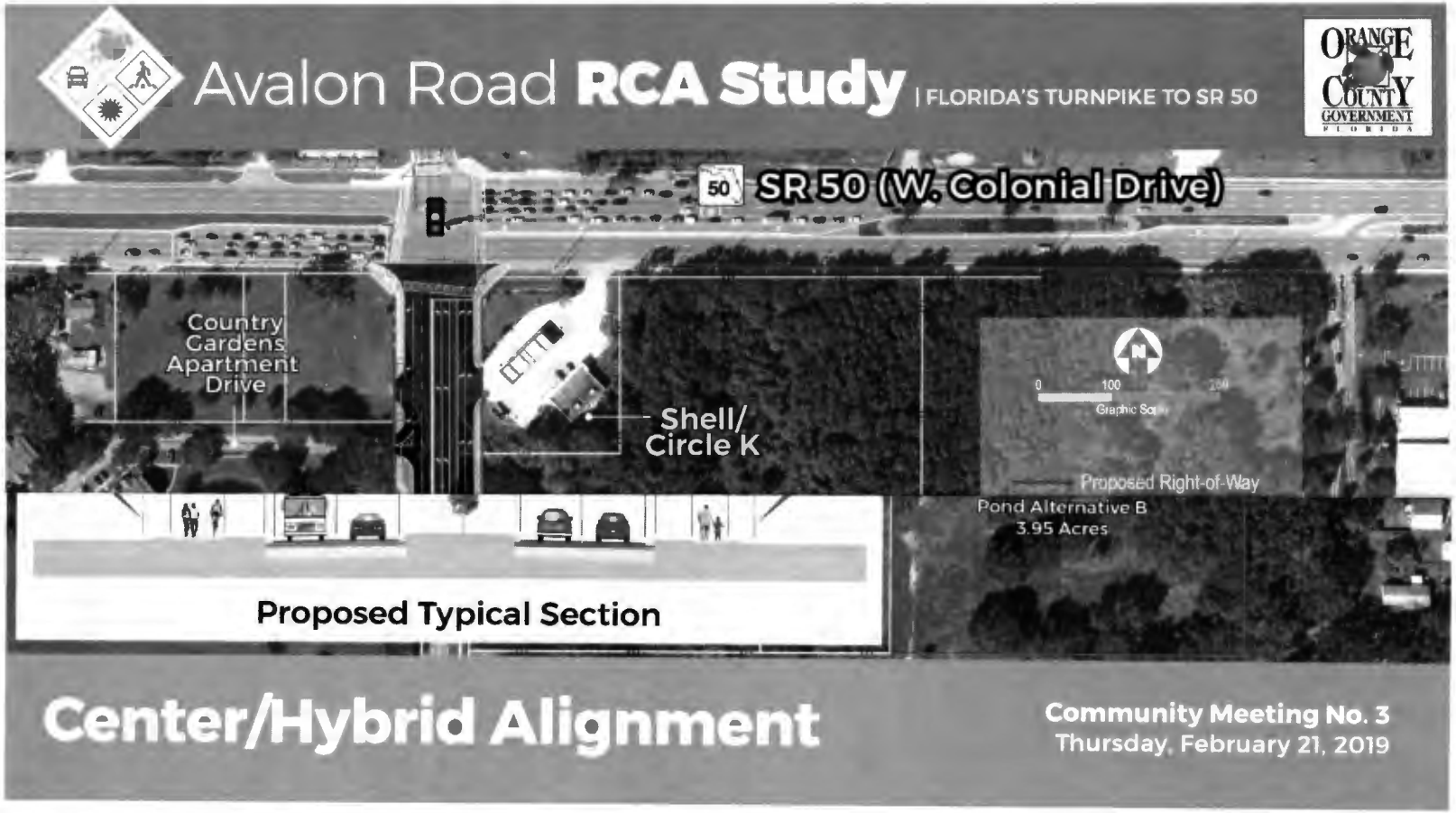


Figure 7.10: Preferred Alternative: Center/Hybrid Alignment



7.3 Intersection Concepts and Signal Analysis

The proposed improvements at the only signalized intersection at Avalon Road/SR 50 are:

- Remove the existing pavement markings to the inside of the existing westbound left-turn lane to provide a dual lane left-turn approach.
- Add second northbound auxiliary left-turn lane to provide a dual lane left-turn approach.
- Add second northbound auxiliary right-turn lane to provide a dual lane right-turn approach.
- The signal pole on the southeast corner will need to be relocated to accommodate the auxiliary lane improvements, as well as new relocated signal heads covering all intersection approaches.

7.4 Alignment and Right-of-Way Needs

The preferred alignment is the Center/Hybrid Alignment. Approximately 5.55 acres of right-of-way will need to be acquired from both sides of Avalon Road as needed. The right-of-way requirements are shown in the concept plans in **Appendix I** and on the right-of-way identification maps in **Appendix J**.

7.5 Drainage

7.5.1 Preliminary Design Analysis

The proposed method of drainage treatment is wet detention due to the relatively high ground water table in the project corridor. The Soil Conservation Service (SCS) runoff methodology was used to determine the runoff volumes and the pre-development and post-development conditions. Composite curve numbers were calculated using soil characteristics and percentage of imperviousness. Runoff volumes were developed from the composite curve numbers for the project area and the 25-year/24-hour design rainfall amount for Orange County of 8.4 inches.

Stormwater management facilities must attenuate stormwater runoff to ensure runoff volumes in the post-development condition do not exceed pre-development runoff volumes. The preliminary pond alternatives for Avalon Road were designed to attenuate for the 25-year / 24-hour design storm event. The preliminary stormwater ponds were sized to have sufficient capacity for the required water quality volume and the peak attenuation volume.

7.5.2 Stormwater Management Facilities

The proposed stormwater management facilities (SMF) are designed to meet all applicable Orange County and SJRWMD criteria. The impervious surface was determined to calculate the required treatment and attenuation volume for the project area. The pond alternatives were sized to accommodate all runoff from the proposed right-of-way within the corridor. Existing land use, right-of-way, drainage easements, topography, roadway parcel impacts, floodplain impacts and wetland impacts are among the various factors that were evaluated during the pond selection process. The peak design stage for the ponds accounted for the roadway profile and the proposed low edge of pavement within the project area. Since the surrounding ground slopes from north to south, the preliminary pond sites are located near the southern end of the project limits. No wetland impacts or floodplain impacts are anticipated at the preliminary ponds.

The seasonal high for the ponds were estimated using information from existing permits, existing ground elevations and soil survey information for Orange County. Control elevations for the ponds

were established based on the estimated seasonal high and compared to the tailwater elevations for the pond outfalls. Berm elevations were determined by adding the required freeboard to the peak design stage. Peak stages for each pond were kept below the low edge of pavement. Pond berms were assumed to have 20-foot widths and to be sloped to the inside at 1:20 slopes. Ponds were assumed to tie down to the existing ground at 1:4 slopes and to have side slopes of 1:4 down to the control elevation. The provided treatment and attenuation for each pond was calculated using these geometric values to ensure the required pond volumes were provided.

- Pond 1A is 2.60 acres, and is located on the east side of Avalon Road near Station XXX+00 and encompasses two parcels, one residential and one vacant. Pond 1A is sized for all required treatment and attenuation for the Avalon Road corridor. The entire 2.60 acres of land within these two parcels is needed. The pond will outfall south into the eastern roadside ditch for Avalon Road before the existing 30-inch cross drain conveys flows west to an outfall ditch that ultimately discharges to Johns Lake.

- Pond 1B is 3.95 acres, and is located along the south border of Florida's Turnpike and directly east of an existing Turnpike wet detention pond. The pond is located entirely within one parcel Pond 1B is sized to accommodate all treatment and attenuation for the Avalon Road corridor. Approximately 2.90 acres of land within this parcel is required for the proposed stormwater management. The pond will outfall west to the existing 30-inch cross drain which conveys flows west to an outfall ditch that ultimately discharges to Johns Lake.

The preferred pond site for the project is shown as Pond 1A (SMF 1A) in **Figure 7.11**. No wetland or floodplain impacts are associated with this alternative, and this site has lower right-of-way costs and construction costs than Pond 1B. During final design, pond sizes, configurations, control elevations and bottom elevations could vary from the preliminary ponds based on final survey and geotechnical analysis.

7.5.3 Cross Drains

One existing cross drain is located on Avalon Road approximately 230 feet south of the study area. The 24-inch culvert conveys flows from east to west to an outfall ditch that discharges to a series of wetlands and ditches within Tucker Ranch Heritage Park before ultimately discharging west to Johns Lake. The pipe crossing appears to be in good condition and will not be impacted by the project improvements. However, the existing sand cement headwalls are failing and should be replaced by straight concrete endwalls. **Table 7.2** provides a summary of information for the existing cross drain and a proposed cross drain.

Table 7.2: Existing and Proposed Cross Drain

Culvert	Station	Existing Condition			Proposed Condition			Comments
		Barrels	Description	Flow Line	Barrels	Description	Flow Line	
CD-1	---	1	24" RCP	94.48 (E) 94.86 (W)	1	24" RCP	94.48 (E) 94.86 (W)	230 ft south of project limits. Replace headwall. Cross drain to remain.

Figure 7.11: Stormwater Management Facility Alternatives Map

7.5.4 Floodplain and Floodways

The current FEMA FIRMs show that the entire project lies in Zone X which is classified as areas located outside the 100-year floodplain. No floodways are present within the study area.

7.5.5 Stormwater Permits

The project is located within the jurisdiction of SJRWMD. The project lies within one drainage basin, and preferred and alternative stormwater management ponds have been identified for this basin.

7.6 Displacements

The preferred Center/Hybrid Alignment will result in the acquisition of four private residences along Avalon Road.

7.7 Estimated Project Costs

The total estimated project costs for the Center/Hybrid Alignment are shown in **Table 7.3**, and the detailed construction cost estimates are located in **Appendix H**.

Table 7.3: Total Estimated Project Costs

Estimated Costs (Present Day Costs)	
Design (15% of Construction)	$495,000
Right-of-Way Acquisition*	$321,000
Roadway Construction	$3,302,000
Construction Engineering and Inspection (15% of Construction)	$495,000
Total Cost **	**$4,613,000**

** Right-of-way acquisition estimate does not include relocations or business damages, and is subject to change.*
*** Roadway construction cost estimate assumes underground utility relocation included in contingency within the cost, pending further appraised work during design.*

7.8 Recycling of Salvageable Materials

The opportunity to recycle any salvageable materials by the contractor is encouraged by Orange County. Such materials may include old asphaltic concrete pavement, base material and drainage structures. The existing pavement on existing roadways, may be milled for recycling during the construction of the project. Any other salvageable materials will be identified during the design of the project. If these materials should be removed from the construction site, it is to be done as specified in the current FDOT *Standard Specifications for Road and Bridge Construction*.

7.9 User Benefits

Highway user costs are defined by the American Association of State Highway and Transportation Officials (AASHTO) *Manual on User Benefit Analysis of Highway and Bus-Transit Improvements* as the sum of (1) motor vehicle running cost, (2) the value of the vehicle user travel time and (3) traffic accident cost. User benefits are the cost reductions and other advantages that occur to highway motor vehicle users through the use of a particular transportation facility as compared with the use of another. Benefits are generally measured in terms of a decrease in user costs. It is anticipated that the Preferred Alternative will provide user benefits due to a reduction in roadway congestion as compared to the No-Build Alternative. In addition, the improved horizontal geometry and access management provided with the project should reduce the occurrence rate of many crash types on the roadway.

7.10 Pedestrian and Bicycle Facilities

A continuous five-foot wide sidewalk is proposed on the east side of Avalon Road and a 10-foot wide multi-purpose path will be provided along the west side of Avalon Road.

The sidewalk and the multi-purpose path would be separated from the roadway by curb and gutter and a six-foot wide grass/utility strip. Pedestrian features, including crosswalks and pedestrian signals, would be provided at each signalized intersection. The pedestrian and bicycle facilities would comply with ADA.

7.11 Utilities

As part of the Avalon Road widening, some existing utilities (listed in **Table 3.4**) could be impacted. In response to outreach in November 2018, AT&T Florida, CenturyLink, Duke Energy Transmission, and Lake Apopka Natural Gas anticipated having to relocate some or all of their facilities within or adjacent to the study area as part of the Avalon Road widening, and have listed their estimated relocation costs in **Table 7.4**. Further assessment of required utility modifications and costs will be determined in greater detail during Preliminary Design.

Table 7.4: Anticipated Utility Relocations within Study Area

	Utility Agency/Owner	Planned Changes	Estimated Relocation Cost*
1	AT&T Corp	*No response from agency.*	
2	AT&T Florida	Relocation of fiber facilities at SR 50 intersection.	$100,000
3	CenturyLink	Relocation of copper and fiber cables.	$100,000
4	Charter/Brighthouse	*No response from agency.*	
5	City of Winter Garden	No relocation anticipated.	N/A
6	Duke Energy Distribution	*No response from agency.*	
7	Duke Energy Transmission	Anticipated relocation of transmission poles.	$400,000
8	Lake Apopka Natural Gas	Anticipated relocation of gas mains.	$113,000
9	Level 3	*Now CenturyLink – see above.*	
10	Smart City Telecom	*No response from agency.*	
11	Verizon	*No response from agency.*	

** Each of these are estimated relocation costs were developed by the related utility agency/owner.*

7.12 Environmental Impacts

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

7.12.1 Land Use

The land use along the corridor is primarily residential. The project is consistent with the existing and future land use along the corridor.

7.12.2 Community Cohesion

The project does not bifurcate any neighborhoods or developments.

7.12.3 Cultural Impacts

Based on the analysis conducted for this study, there are no cultural resources listed, determined eligible, or appear to be potentially eligible for listing in the NRHP.

7.12.4 Wetlands

The project is anticipated to not impact any acres of wetlands (roadway improvement and pond). Federal, state, and local government agencies with regulatory authority over wetland and/or other surface waters generally require mitigation to offset unavoidable impacts as a condition of the permit. Mitigation requirements are based on a compilation of wetland parameters including quality, type, function, and size.

Impacts to wetlands and/or other surface waters will be avoided and minimized to the extent possible while maintaining safe and sound engineering and construction practices. Primarily, avoidance and minimization efforts are related to the proposed stormwater management pond locations. A mitigation plan that adequately offsets adverse impacts will be developed and implemented during the design phase. Adverse wetland impacts that may result from the construction of this project will be mitigated, satisfying the requirements of Part IV. Chapter 373, F.S. and 33 U.S.C. 1344. Compensatory mitigation for this project will be completed through the use of mitigation banks and/or any other mitigation options that satisfy federal and state requirements.

7.12.5 Wildlife and Habitat

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

7.13 Traffic Control Plan

A project construction staging and associated traffic control plan will be developed during the design process.

8. Public Involvement

8.1 Public Involvement Plan

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

8.2 Public Information Distribution

Public information for this project was dispersed through the following methods:

- Five newsletters mailed to property owners and tenants along the study corridor, and other interested persons at the following study time periods:
  - Newsletter #1: February 2018 (Study Overview and Existing Conditions)
  - Newsletter #2: August 2018 (Alternatives Analysis)
  - Newsletter #3: April 2019 (LPA Hearing)
  - Newsletter #4: May 2019 (BCC Hearing)
  - Newsletter #5: June 2019 (Announcement of Adopted Alternatives)
- Public meeting advertisements were placed in the *Orlando Sentinel* and *El Sentinel*
- A project website was provided which contained information such as: project study area map, project schedule, meeting notices, newsletters, and study documents.

8.3 Coordination and Small Group Meetings

Small group meetings were held with private residents along the Avalon Road corridor. Minutes from these meetings are in **Appendix K**.

8.4 Public Meetings

Two community public meetings were held for the project. The meeting format consisted of an open house that allowed informal discussions between the project team and the public, followed by a presentation and an open question and answer forum.

- The Kick-off Alternative Public Information Meeting was held on March 28, 2018 from 6 to 8 p.m. at Winter Garden City Hall.
  - In addition to the project team, 16 stakeholders attended the Kick-off Alternative Public Information Meeting.
  - At the meeting, attendees expressed support for the proposed multi-use path, and had several questions on access management/driveway locations, existing right-of-way limits, and potential property takings. Attendees expressed a desire for the speed limit of Avalon Road to be reduced, and for U-Turn facilities to be incorporated into the conceptual design.
- The Preferred Alternative Public Information Meeting was held on September 12, 2018 from 6 to 8 p.m. at Winter Garden City Hall.
  - In addition to the project team, 40 stakeholders attended the Preferred Alternative Public Information Meeting.

- At the meeting, attendees had questions about the width/nature of the proposed median, anticipated construction and drainage impacts, the location of dedicated turn lanes, and the estimated cost of the project. Attendees expressed a desire for the speed limit of Avalon Road to be reduced, for lighting along the roadway, and for U-Turn facilities to be incorporated in both directions of the roadway.

The public meeting summaries are in **Appendix K**.

8.5 Local Planning Agency

The study's recommendations will be presented to the Orange County Planning and Zoning Commission/Local Planning Agency (LPA) two times: first as a work session agenda item on February 21, 2019 and second as a public hearing agenda item on April 18, 2019. Notifications will be made at least two weeks before the public hearing date and included in the study newsletter (mailings and emails), newspaper advertisements (*Orlando Sentinel* and *El Sentinel*), the study website, and press releases.

8.6 Board of County Commissioners

The study's recommendations will be presented to the Orange County Board of County Commissioners (BCC) two times: first as a work session agenda item on March 26, 2019 and second as a public hearing agenda item on a later date to be determined. Notifications will be made at least two weeks before the public hearing date and included the study newsletter (mailings and emails), newspaper advertisements (*Orlando Sentinel* and *El Sentinel*), the study website, and press releases.

Once the Orange County LPA and BCC approve the study and further project funding is authorized, the project will proceed to the design phase.

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