

September 2025

University Boulevard Pedestrian/Cyclist Safety Study

Semoran Boulevard to Goldenrod Road

Study Report - Final



Final Report

University Boulevard Pedestrian/Cyclist Safety Study

Orange County, FL

Orange County Contract Y23-813

Prepared for:



Prepared by:



Vanasse Hangen Brustlin, Inc.
Orlando, FL

September 2025

University Boulevard Pedestrian/Cyclist Safety Study Report

Project Name: University Boulevard Pedestrian/Cyclist Safety Study
Project Limits: Semoran Boulevard to Goldenrod Road
County/State: Orange County, Florida
County Contract Y23-813

This Study Report is submitted to Orange County for review and approval.

Submitted by: *Babuji Ambikapathy*
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Date: September 19, 2025

Approved by: Orange County Board of County Commissioners

Date: August 26, 2025

PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Vanasse Hangen Brustlin, Inc., and that I have supervised the preparation of and approved the analysis, findings, opinions, conclusions, and technical advice reported in:

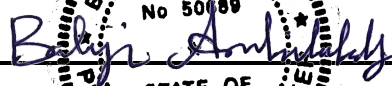
REPORT: University Boulevard Pedestrian/Cyclist Safety Study Report
PROJECT LOCATION: University Boulevard from Semoran Boulevard to Goldenrod Road
CLIENT: Orange County, Florida

The following duly authorized engineering business performed the engineering work represented by this report:

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This report includes a summary of data collection efforts, corridor analysis, and conceptual design analysis for University Boulevard Pedestrian/Cyclist Safety Study from Semoran Boulevard to Goldenrod Road in Orange County, Florida.

I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through design standards and criteria set forth by the federal, state, and local regulatory agencies as well as professional judgement and experience.

Signature:  _____

Name: Babuji Ambikapathy
FL PE 50689

Date: September 19, 2025

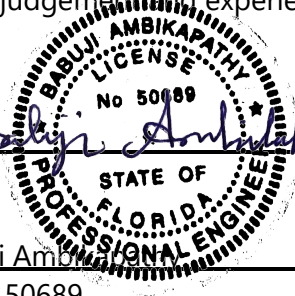


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ES Executive Summary

ES-1 Introduction

Orange County conducted a Pedestrian/Cyclist Safety Study for the University Boulevard corridor from N Semoran Boulevard to N Goldenrod Road in northeast Orange County. The project location is shown in **Figure ES-1**. The objective of the project is to identify a preferred improvement alternative that improves the safety of pedestrians, cyclists, transit patrons, motorists and freight handlers of all ages and abilities, and addresses 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 corridor improvements. This report summarizes the essential components of the study, including public involvement, data collection, traffic analysis, roadway design, and community and environmental impacts.

ES-2 Purpose and Need for Project

Purpose:

The primary purpose of the pedestrian and cyclist safety study on University Boulevard, between Semoran Boulevard and Goldenrod Road, is to enhance safety, accessibility, and multimodal transportation facilities along a key 1.25-mile arterial corridor. University Boulevard serves as a vital link connecting the University of Central Florida and Full Sail University to major north-south roadways and growing residential and commercial areas. By applying an interdisciplinary approach that integrates engineering and transportation planning, the study aims to develop comprehensive strategies for improving bicycle, pedestrian, and transit infrastructure, facilitating safe and efficient crossing options, and supporting the corridor's continued healthy growth.

Need:

Under existing conditions, both pedestrians and bicyclists experience a Level of Traffic Stress (LTS) of 4 along the University Boulevard study corridor, representing the lowest level of comfort and highest level of perceived risk. Key contributing factors to this high-stress environment include sidewalk widths of five feet or less on the south side, limited or absent separation between sidewalks and vehicular travel lanes in several areas, high Annual Average Daily Traffic (AADT), and elevated posted speed limits.

A review of crash data from 2018 to 2023 revealed 813 reported incidents along the corridor, including 24 bicycle-related crashes, 10 involving pedestrians, and one involving a scooter. Reflecting these safety concerns, the recently adopted Orange County Vision Zero

Action Plan has identified this segment of University Boulevard as part of the High Injury Network.

Without necessary multimodal improvements, the anticipated growth in population and surrounding commercial, retail, and institutional development is expected to further degrade conditions—intensifying traffic stress and exacerbating safety risks for all road users, particularly pedestrians and cyclists.

Accordingly, there is a critical need to evaluate and enhance existing infrastructure to support safe, multimodal access along the corridor. Improvements such as intersection upgrades, access management strategies, and dedicated multimodal facilities are essential to accommodate current and projected increases in both motorized and non-motorized traffic, while ensuring the safety of pedestrians, cyclists, transit users, and drivers alike.

This imperative is strongly aligned with the Multimodal and Vision Zero objectives and policies established in the Orange County Comprehensive Plan: Vision 2050, reinforcing the need for a proactive and comprehensive approach to transportation planning in this area.

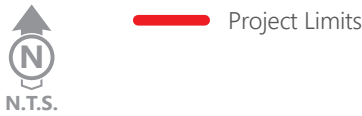
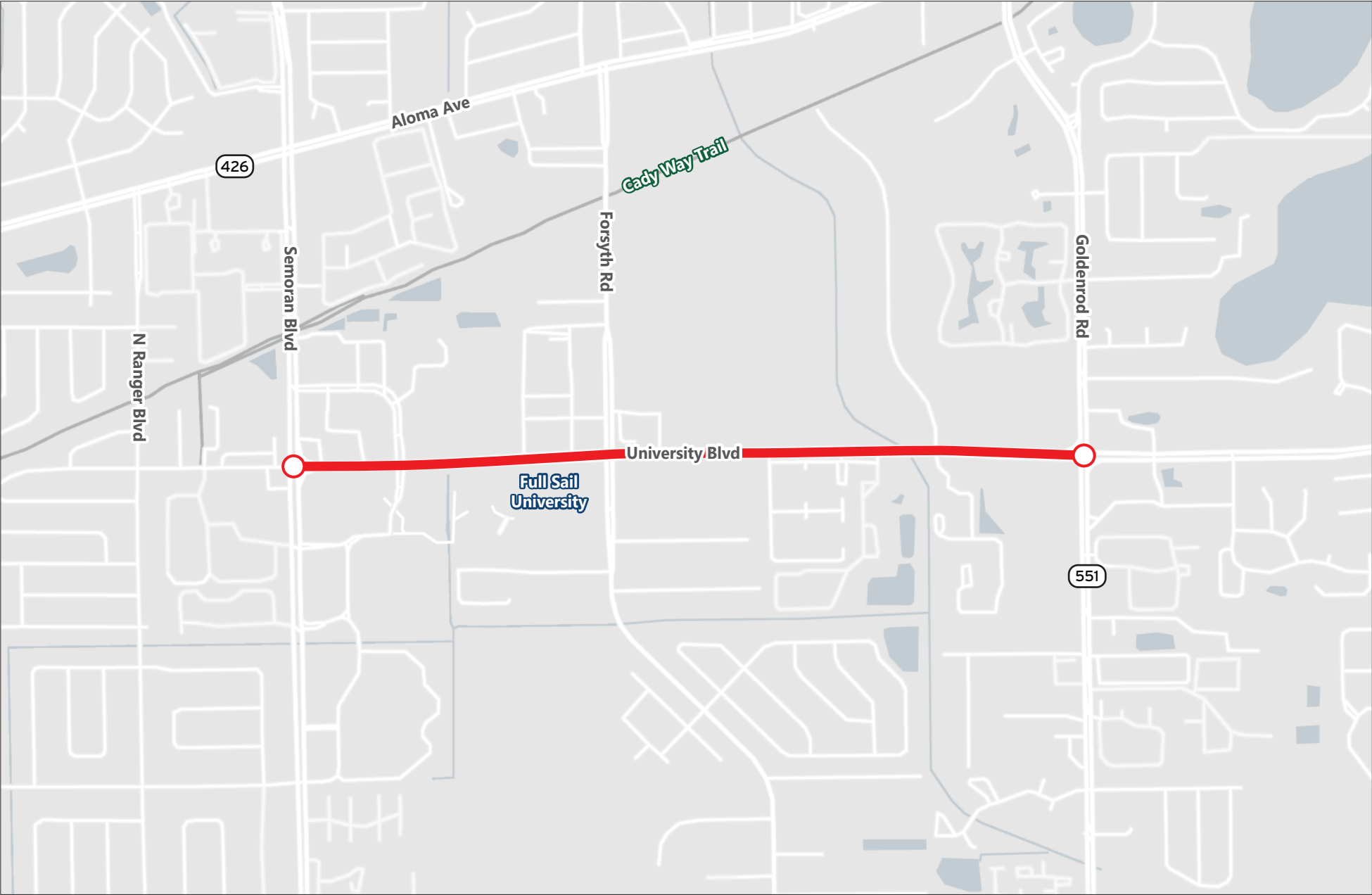


Figure ES-1
Project Location Map
University Boulevard
Pedestrian/Cyclist Safety Study

The study will address deficiencies in multimodal facilities including sidewalks and bicycle lanes, traffic signal operations, crossing accommodations, and other relevant improvements to mitigate risks and enhance connectivity.

ES-3 Existing Conditions

University Boulevard, within the project limits, is a six-lane divided roadway. University Boulevard is classified as a minor arterial and is owned and maintained by Orange County. University Boulevard has a posted speed limit of 45 miles per hour (mph).

A seven-foot-wide sidewalk exists on the north side of University Boulevard, while a five-foot-wide sidewalk exists on the south side of University Boulevard. No on-road bicycle lanes or paved shoulders are provided within the study limits. There are crosswalks at all four legs of each of the signalized intersections, except for the west leg of the intersection of University Boulevard and Metric Drive.

The existing right-of-way (ROW) along University Boulevard varies throughout the project corridor from 128 feet to 162 feet in width.

There are five intersections in total that were evaluated during this study within the project limits, all of which are signalized. These intersections are Semoran Boulevard, Driggs Drive/University Park Drive, Forsyth Road, Metric Drive/Calibre Bend Trail, and Goldenrod Road.

LYNX Transit route 13 operates east-west service along University Boulevard, while LYNX Transit routes 29 and 436S intersect University Boulevard within the study limits. LYNX has six potential future transit routes and one NeighborLink Zone that are located within or near the University Boulevard study area.

Street lighting (conventional light emitting diodes – LEDs) is provided along both sides of University Boulevard with standard cobra head luminaires mounted on utility poles. Seventeen (17) Utility Agency/Owners (UAOs) have been identified within the project area through a Sunshine 811 Design Ticket and utility coordination efforts.

The University Boulevard project area is located in the Little Econlockhatchee River drainage basin within the jurisdiction of the St. Johns River Water Management District (SJRWMD) and Orange County. Stormwater runoff from the existing roadway is collected in curb and gutter inlets that discharge to three existing stormwater ponds located within the project limits.

ES-4 Design Controls and Standards

The proposed improvements shall follow the latest roadway and drainage design standards during the final design phase. Further details about the current roadway and drainage design standards are described in Section 4 of this report.

ES-5 Traffic Conditions

Detailed project traffic analyses are provided in a separate document, the Design Traffic Engineering Report. This document provides the existing traffic conditions of the area, as well as analysis of the proposed improvements. The proposed improvements to University Boulevard will result in a LTS 2 for pedestrians and LTS 1 for bicyclists, indicating the highest comfort levels.

ES-6 Alternatives

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

The basic elements of the typical section include the full reconstruction of University Boulevard and consist of three 11-foot travel lanes in each direction separated by a raised median. Type E curb and gutter is used along the inside lanes, and Type F curb and gutter is used along the outside lanes. The existing seven-foot-wide sidewalk along the north side of University Boulevard is proposed to remain in place with no changes. Alternative 1 maintains the existing median and widens the sidewalk along the south side of University Boulevard to 10 feet. Alternative 2 widens the existing median and widens the sidewalk along the south side of University Boulevard to 10 feet. Alternative 3 maintains the existing median, adds a five-foot-wide bike lane in each direction of travel, and widens the sidewalk along the south side of University Boulevard to eight feet. Alternative 4 maintains the existing median, adds eight-foot-wide protected bike lane in both directions of travel, and widens the sidewalk along the south side of University Boulevard to a 10-foot-wide shared-use path.

Alternatives 1, 2, and 3 can be constructed within the existing ROW. However, Alternative 4 requires additional ROW along the south side of University Boulevard. Transportation Systems Management and Operations (TSM&O) alternatives were also considered and incorporated into the build alternatives.

Table ES-1: Alternatives Evaluation Matrix

Evaluation Criteria	No-Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Study Objectives					
Potentially Enhances Roadway Safety	No	Yes	Yes	Yes	Yes
Potentially Enhances Pedestrian and Bicyclist Safety	No	Yes	Yes	Yes	Yes
Improves Accessibility for All Users	No	Yes	Yes	Yes	Yes
Provides Comfort and Convenience for All Users	No	Yes	Yes	Yes	Yes
Enhances Transit Accessibility	No	Yes	Yes	Yes	Yes
Potential Community Impacts					
Right-of-Way Potentially Needed (acres)	0	0.00	0.00	0.00	0.79
Total Potential Parcels Impacted (#)	0	0	0	0	22
Removal of Existing Trees (#)	0	43	43	59	65
Existing Bus Stop Shelter Impacts (#)	0	5	5	5	5
Community (Social-Economic) Impact Analysis – Environmental Justice (Low/Med/High)	None	Low	Low	Low	Low
Potential Archaeological & Historical Impacts (Low/Med/High)	None	Low	Low	Low	Low
Potential Roadway Utility Impacts (Low/Med/High)	None	Medium	Medium	High	High
Potential Roadway Drainage Impacts (Low/Med/High)	None	Low	Low	High	High
Potential Environmental Impacts					

Evaluation Criteria	No-Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Potential Wetlands Impacts (acres)	None	None	None	None	None
Potential Floodplain Impacts (acres)	None	None	None	None	None
Potential Contamination Sites Impacts (# of Medium/High Sites)	None	4	4	4	4
Potential Threatened & Endangered Species Impacts (Low/Med/High)	None	Low	Low	Low	Low
Critical and Strategic Habitat Impact (Low/Med/High)	None	Low	Low	Low	Low
Wildlife Corridor Impact (Low/Med/High)	None	Low	Low	Low	Low
Estimated Project Cost					
Estimated Total Cost including Right-of-Way (millions)	\$0	\$6.87	\$7.32	\$14.47	\$21.91

ES-7 Analysis and Comparison of Alternatives

A preliminary evaluation of the No-Build and Build alternatives was performed to evaluate the study objectives, potential community impacts, potential environmental impacts, as well as estimated project cost for comparison. Based on the evaluation matrix and public involvement activities, the preferred alternative is Alternative 1. The preferred alternative meets the study objectives, has minimal community and environmental impacts, the lowest total project costs, and can be constructed within the existing ROW. The preferred alternative is shown on the concept plans contained in **Appendix A** and described in more detail in Section 8.

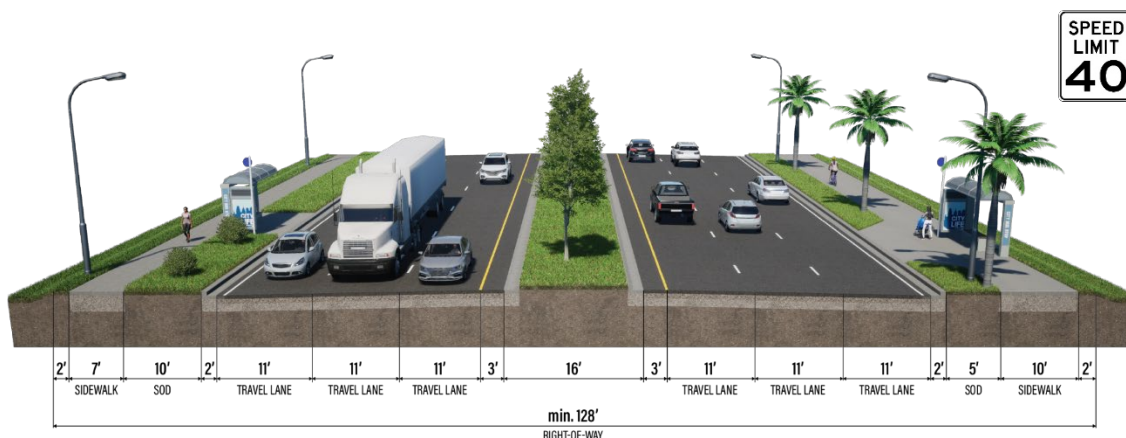
ES-8 Preferred Alternative

The preferred typical section is shown in **Figure ES-2** and contains the following design elements:

- Six 11-foot travel lanes

- A 7-foot sidewalk located along the north side of the roadway
- A 10-foot sidewalk located along the south side of the roadway
- Type E curb and gutter along the inside lanes
- Type F curb and gutter along the outside lanes
- A 3-foot paved shoulder along the inside lanes
- A 16-foot raised median
- A 5-foot utility strip between the Type F curb and gutter and 10-foot sidewalk, and a 10-foot utility strip between the Type F curb and gutter and 7-foot sidewalk
- The existing ROW varies, but is typically 128 feet
- Speed limit of 40 mph

Figure ES-2: Preferred Alternative Typical Section



ES-9 Public Involvement

Critical to the success of this project is the feedback received from the local community. There have been two community meetings held to present project related information to the public and receive input regarding the project. Meeting summaries, along with the Public Involvement Documents are included in **Appendix C**. Small group meetings were held with representatives from Full Sail University, Aloma Elementary School, Orange County Public Schools, Orange County Sheriff's Office, Orange County Parks and Recreation Department, Orange County Environmental Protection Division, LYNX, the Florida Department of Transportation (FDOT), Bike/Walk Central Florida, and University Corporate Center.

ES-10 Conclusions and Recommendations

The objective of the University Boulevard Pedestrian/Cyclist Safety Study is to identify a preferred improvement alternative for University Boulevard between N Semoran Blvd and

N Goldenrod Road that improves the safety of pedestrians, cyclists, transit patrons, motorists and freight handlers of all ages and abilities, and addresses 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 corridor improvements. The process incorporated the insights from planning, engineering, and the public to refine the alternatives and to ultimately advance a preferred alternative. It is recommended that the preferred alternative detailed in Section 8 of this report be advanced to the design phase.

ES-10.1 Interim Measures

This study also includes interim measures that can be constructed prior to design/construction of the preferred alternative improvements. These interim measures are selected for their lack of design and maintenance of traffic requirements, as well as their low cost, providing safety enhancements until the final improvements are implemented along the study corridor.

- Driggs Drive and University Boulevard:
 - Allow protected phase only for the southbound left turn movement when pedestrians are present.
 - Recommend use of a blank out sign for no right-turn-on red (RTOR) when pedestrians are present
- Install a quick curb or flex stakes as an interim between the left turn lane and the travel lane for the directional EB left turn onto Costco Driveway to eliminate illegal NB and SB left turns onto University Boulevard from the side streets.
- Forsyth Road and University Boulevard:
 - Recommend use of a blank out sign for no RTOR when pedestrians are present.
- Metric Drive and University Boulevard:
 - Convert the existing three-section signal display to a four-section signal display for the southbound left turn movement so that permissive phase can be restricted when pedestrians are present.
 - Recommend use of a blank out sign for no RTOR when pedestrians are present.
- University Boulevard Study Corridor:
 - Refresh/install high emphasis crosswalks at driveways.

The estimated cost of the interim measures is \$309,000. A complete cost estimate of the interim measures can be found in **Appendix B**.

1 Introduction

1.1 Introduction and Study Area

Orange County is conducting a pedestrian and cyclist safety study on University Boulevard between State Road (SR) 436 (Semoran Boulevard) and SR 551 (Goldenrod Road), approximately 1.25 miles long. **Figure 1-1** illustrates the project limits for this study.

University Boulevard in the study area is a six-lane minor arterial roadway and a critical east-west roadway that connects the University of Central Florida (UCF) to major north-south roadways such as Semoran Boulevard, Goldenrod Road, and SR 417 (Central Florida GreeneWay), and provides an entrance to Full Sail University. University Boulevard is also surrounded by residential and commercial land uses, which have been growing in the past years and are projected to continue to grow. As such, the provision of multi-modal access for residents, visitors, and workers along University Boulevard is key to the continued healthy growth of this corridor.

1.2 Project Purpose

The purpose of this pedestrian and cyclist safety study project is to apply a comprehensive interdisciplinary approach, combining the strengths of the engineering and transportation planning disciplines in the initial development phases of Orange County's safety and roadway improvement projects. The interdisciplinary approach also seeks to assure early and systematic coordination with all affected County Departments and Divisions, the appropriate state and local entities and the citizenry. The resulting coordination effort is intended to accurately gather and convey information pertinent to the development of the project, thereby identifying viable opportunities to expedite or advance pertinent project phases.

This study will provide a technical evaluation of University Boulevard within the study limits to review the need for additional bicycle, pedestrian, and transit enhancements, and will take into consideration both existing and future development, including Full Sail University's Master Plan. An evaluation of the existing traffic signal operations, signage, and additional accommodations to facilitate the crossing of University Boulevard by bicyclists, pedestrians, and transit users will be conducted.

1.3 Purpose of Report

The purpose of this Study Report is to present an overview of existing conditions, document the findings of the engineering and environmental studies conducted for this

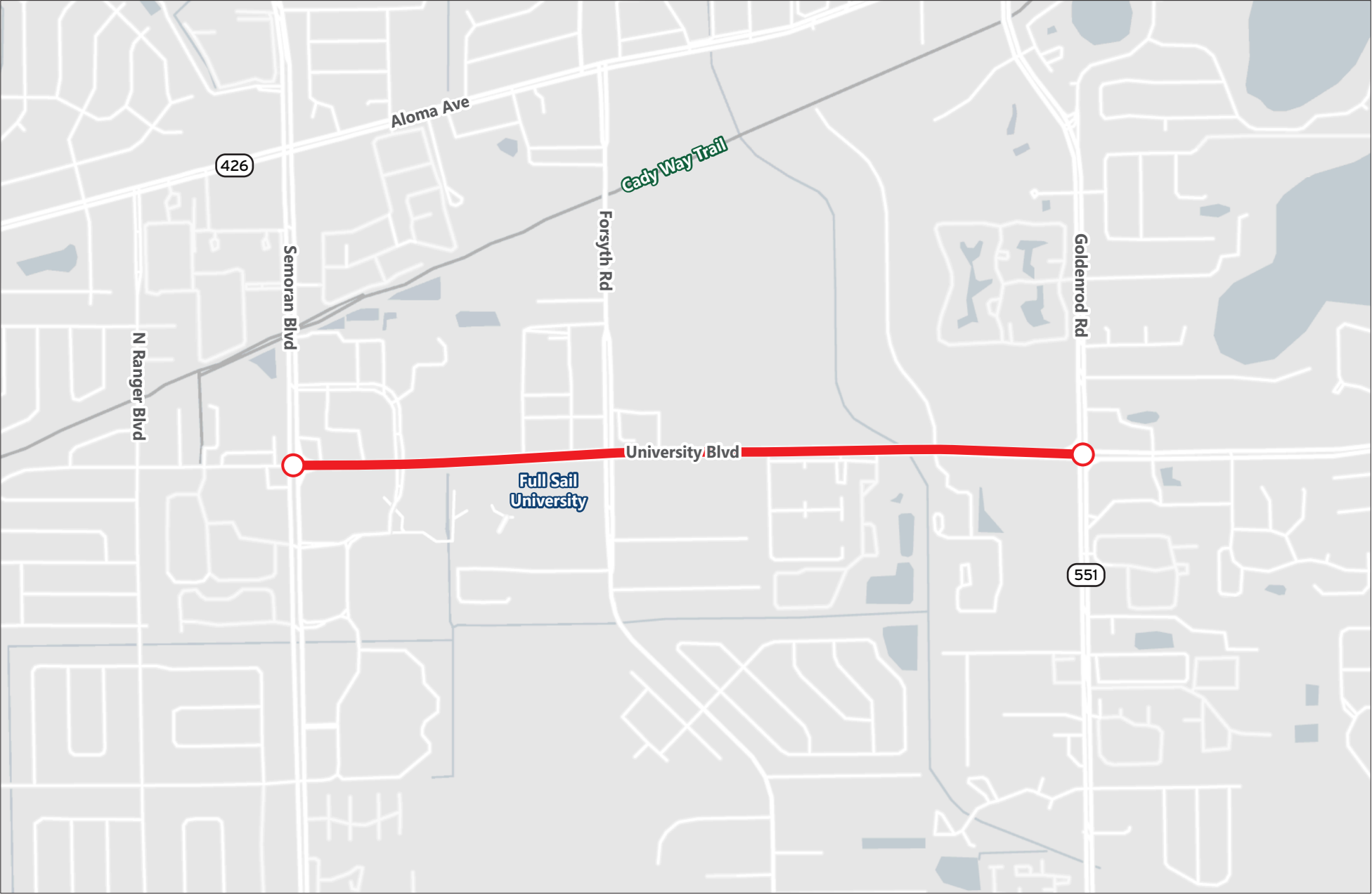
project, describe the results of the alternatives evaluation, and provide the identification of and the justification for the recommended improvements.

This document describes the determinations made regarding a summary of existing and future traffic conditions and the comparative analysis of improvement alternatives that would satisfy existing and future transportation demands for all users.

Potential alternatives were developed based upon the engineering and environmental data collected, a review of Orange County Comprehensive Plan Vision 2050, and the application of current roadway design standards. The alternatives were evaluated based on the impacts resulting from the alignment locations and configurations. Each alternative was assessed using evaluation criteria developed for that purpose.

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

The recommended improvement conceptual plans, included in **Appendix A**, is an integral part of this document and should be reviewed in concert with this document. The plans reflect specific details concerning each area of the project and will supplement the information that is contained in this report.



Project Limits



Figure 1-1
Project Location Map
University Boulevard
Pedestrian/Cyclist Safety Study

2 Purpose and Need for Project

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

2.1 Social/Economic Demands

The study corridor is located in the Aloma area of Orange County. Existing land use along University Boulevard is primarily commercial, including retail and commercial subdivisions, but there are also residential land uses present. Full Sail University is situated at the southeast corner of the intersection of University Boulevard and Semoran Boulevard. Most of the land surrounding University Boulevard in the study area is developed, with a few vacant parcels that are expected to be developed by Full Sail University. The existing zoning along the study corridor is predominantly classified as Industrial, followed by Planned Development and Retail Commercial.

Demographics data within one (1) mile of the University Boulevard study area were compiled from the US Census Bureau American Community Survey (ACS) Five-Year Estimates. Data regarding the block groups within the study area can be seen in **Table 2-1**.

Table 2-1: U.S. Census Data – 2022 ACS Estimates

Category	Measure	Percent
Total Population	50,760	-
Median Age	36.2	-
Median Income	\$75,953	-
Persons below poverty level	7,534	15.0%

Future land use data was obtained from Orange County's Geographic Information System (GIS) Data Hub, InfoMap, and Orange County's Comprehensive Plan 2010-2030. Future land use along the project corridor is mostly classified as Commercial, followed by Industrial and Medium Density Residential. Transportation improvements are needed to provide enhanced connectivity, safety, and accessibility for all users, ensuring the corridor meets the evolving demands of the community.

2.2 Consistency with Transportation Plans

The MetroPlan Orlando 2045 Metropolitan Transportation Plan (MTP) includes several projects relevant to the University Boulevard corridor. Among them is the widening of Goldenrod Road between SR 50 and University Boulevard (MTP ID#2201), and unfunded operational/safety improvements for Semoran Boulevard between Colonial Drive and

University Boulevard (MTP ID#2035) and between University Boulevard and SR 426 (Aloma Avenue) (MTP ID#2046). Additional operational/safety improvements are planned for Forsyth Road, both between Colonial Drive and University Boulevard (MTP ID#3249) and between Hanging Moss Road and University Boulevard (MTP ID#7214). University Boulevard itself will see operational enhancements between Forsyth Road and Goldenrod Road (MTP ID#7256).

The MetroPlan Orlando Transportation Improvement Program (TIP) also includes critical safety and infrastructure projects within the study area, such as the signal and visibility improvements at the intersection of University Boulevard and Semoran Boulevard (FPN 451256-1), and a bike lane/sidewalk enhancement on Semoran Boulevard, which involves several safety measures and infrastructure upgrades (FPN 445303-1).

Improvements to University Boulevard are consistent with the goals, objectives, and policies of the Orange County's Comprehensive Plan: Vision 2050, which underscore the importance of sustainable transportation systems, emphasizing multimodal infrastructure, transit support, next-generation corridors, system integration, and Vision Zero objectives. In addition, MetroPlan Orlando's Complete Streets Policy, adopted in March 2020, reinforces the commitment to planning, designing, constructing, operating, and maintaining streets, emphasizing connectivity, safety, and access to transit through walking and bicycling.

Public transit services are set to expand significantly along the corridor, with the LYNX Transit Development Plan (TDP) identifying Semoran Boulevard as a high-capacity corridor, necessitating increased frequency on Route 201. The LYNX SR 436 Transit Corridor Study also recommends long-term solutions such as bus rapid transit (BRT) to enhance service along Semoran Boulevard.

3 Existing Conditions

This section presents an overview of the existing physical characteristics and conditions of the University Boulevard study corridor.

3.1 Existing Roadway Conditions

3.1.1 Functional Classification, Jurisdiction, and Posted Speed

University Boulevard from Semoran Boulevard to Goldenrod Road is classified as a minor arterial and is owned and maintained by Orange County. The posted speed is 45 miles per hour (mph) along the entire length of the study corridor. Based on the 1986 As-Built for the Improvements to University Boulevard between Semoran Boulevard and Goldenrod Road project, the design speed for University Boulevard between Semoran Boulevard and Goldenrod Road is 50 mph.

3.1.2 Context Classification

University Boulevard does not have an official FDOT designated context classification as it is not a state roadway. However, as discussed in section 4.6.5, based on the recent classification effort by Orange County, a C3C context classification was recommended for the entire University Boulevard study corridor from Semoran Boulevard to Goldenrod Road.

3.1.3 Right-of-Way

The roadway ROW was collected utilizing the Orange County Property Appraiser's website. The ROW along University Boulevard along the study corridor ranges between 128 and 162 feet. See **Table 3-1** below for the existing ROW between each segment along the study corridor.

Table 3-1: Existing Right-of-Way

Begin Location	End Location	Existing ROW Width (feet)
Semoran Boulevard	Driggs Drive / University Park Drive	128'
Driggs Drive / University Park Drive	Forsyth Road	128'-162'
Forsyth Road	Metric Drive / Calibre Bend Trail	128'-152'
Metric Drive / Calibre Bend Trail	Goldenrod Road	131'-159'

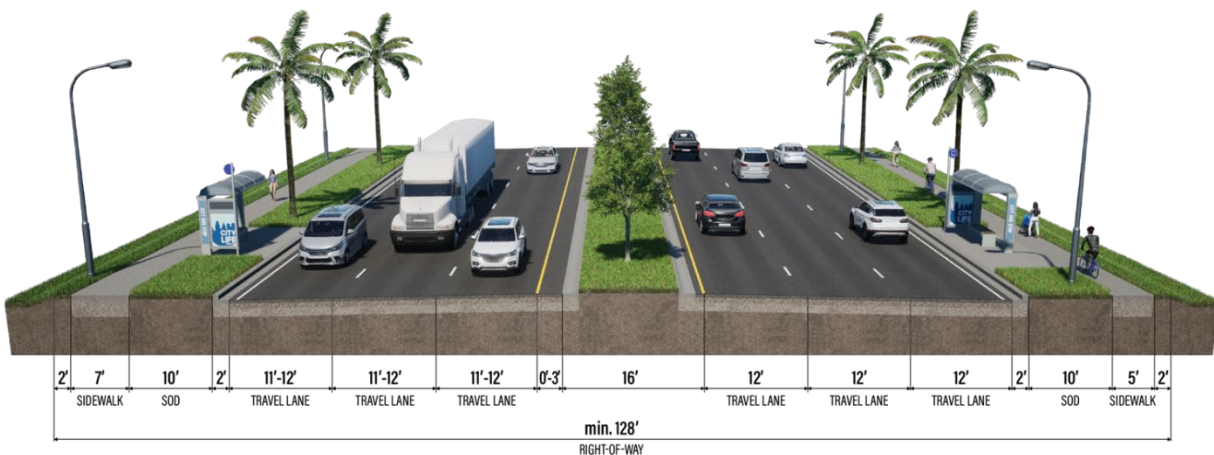
3.1.4 Typical Section(s)

Throughout the study limits, University Boulevard is a 6-lane facility providing 3 travel lanes in each direction with a variable 11-foot to 12-foot lane width in the westbound direction, 12-foot lane width in the eastbound direction, a variable 0-foot to 3-foot inside paved shoulder, a 7-foot-wide sidewalk along the north side of the road, and a 5-foot-

wide sidewalk along the south side of the road. For the entire length of the corridor except for the 800 feet west of Goldenrod Road, the sidewalk on the south side of the roadway is separated from the roadway by a sodded strip up to approximately 10 feet wide. For the entire length of the corridor besides a 1,350-foot-long segment between 700 feet west of Forsyth Road and 650 feet east of Forsyth Road, the sidewalk on the north side of the roadway is separated from the roadway by a sodded strip up to approximately 10 feet wide.

Curb and gutter is present along the entire corridor, along with a 16-foot-wide raised sod median. **Figure 3-1** depicts the existing typical section.

Figure 3-1: University Boulevard Existing Typical Section



3.1.5 Pavement Conditions

In 2014, University Boulevard had a Pavement Condition Index (PCI) of 74 (Fair condition). Since then, it has further deteriorated due to heavy traffic. In 2013, there was some base repair work that was completed. The road was recently repaved in Fiscal Year (FY) 2024.

3.1.6 Utilities

Seventeen (17) Utility Agency/Owners (UAOs) have been identified within the study area through the Sunshine 811 Design Ticket and utility coordination efforts. The utility providers listed in **Table 3-2** were contacted on December 4, 2023, regarding the proposed improvements and were requested to identify any easements and the location of their existing/planned utilities within the study area. **Table 3-2** identifies the UAO's contacted, and a description of their facilities located on the project.

Table 3-2: Existing Utilities in the Study Area

Utility Owner	Facility	Description
AT&T Distribution Dino Farruggio 888-357-1922 (Utilityquest) G27896@att.com	Telephone Comm. Lines	- AT&T Distribution has 12 CT, 24 CT, 144 CT, 216 CT, and 360 CT Buried Fiber along the project area. 8 Handholes along the project area. 12 CT, 48 CT, and 72 CT Overhead Fiber along the project area.
Centurylink-Lumen Local Bill McCloud 850-875-3144	Fiber, Telephone	- Centurylink-Lumen Local has underground fiber along the project area. - Aerial copper along the project area.
Centurylink-Lumen National Lumen Centurylink 877-366-8344 x2	Fiber	Centurylink-Lumen National has aerial facilities along the project area.
Charter Communications Gary Bleving 813-302-0800	CATV, Fiber, Telephone	- Charter has underground fiber along the project area. - Aerial copper along the project area.
City of Winter Park – Water & Wastewater Miguel Cruz 407-599-3483	Water, Wastewater	- City of Winter Park has an 8" AC FM primarily located on the north side of University Boulevard, with 4-6" FM lines tying into the main running line. - City has a 12-16" water main running along the south side of University Boulevard, with 4-12" WM lines tying into the main running line. Materials of existing WM include PVC, CI, DIP, and AC.
City of Winter Park – Electric Mourad Belfak 407-691-7801 Benjamin Wells 407-599-3491	Electric	Received no response from UAO.
Comcast Communications Andrew Sweeney 904-738-6898	CATV	Comcast has UG FOC along the south side of the project area.
Crown Castle Fiber Dig Team 800-654-3110 Crown Castle Fiber NOC 855-933-4237 x1	Fiber	- Crown Castle has Aerial 216 CT and 228 CT along the south side of University Boulevard. - Aerial 432 CT & 216 CT fiber at the west side of the intersection of Goldenrod Road and University Boulevard. 1.5" HDPE Ducts with 72 CT and 228 CT buried fiber along the south side of the project area. 7 Handholes along the south side of the project area.

Utility Owner	Facility	Description
Duke Energy – Distribution Duke's Customer Service Center 407-629-1010 USIC Dispatch 800-788-9140	Electric	- Duke Energy – Distribution has underground cable located on the north side of University Boulevard. - Overhead electric and poles located on the south side of University Boulevard. - De-energized wire located at the intersection of N Forsyth Road and University Blvd, and Metric Drive and University Boulevard.
Duke Energy – Fiber	Fiber	No Facilities, letter received.
Full Sail University Chris Johnson 407-629-0100 x 8290	Fiber	No Facilities, letter received.
MCI/Verizon Michael Krol (813) 410-4803 Michael.krol@verizon.com	Comm. Lines, Fiber	- Verizon has 2" HDPE buried fiber cable starting at Driggs Drive to Goldenrod Road, located on the south side of University Boulevard. - Aerial Fiber located at the east side of the intersection of Goldenrod and University Boulevard.
Orange County Public Works Mathew Shipley 407-836-7814 Michael Colon Rodriguez 407-836-7987	Fiber, Traffic Signals	Orange County Public Works provided traffic signal and interconnect facilities within the project limits.
S Seminole & N Orange Wastewater Transmission Authority Stefano Ceriana 407-679-5358 Cam Staubas 407-679-5358	Sewer	S Seminole & N Orange Wastewater Transmission Authority has 14" DIP Sanitary FM located on the eastern side of the intersection of University Boulevard and Goldenrod Road.
Seminole County-Engineering Paul Zimmerman 407-665-2024 Chris Graybosch 407-840-4058	Reclaim Water, Sewer, Water	No Facilities, letter received.
Smart City Telecom Guy Bower 407-828-6744 Ken Cabrera 407-828-6672	Fiber, Telephone	Received no response from UAO.

Utility Owner	Facility	Description
Summit Broadband Michael Daniel 407-996-1183 Orenza Merrit 727-501-3709	Fiber, Telephone	- Summit Broadband has Buried 48 CT FOC in 1.25" Conduits on the north side of University Boulevard and Driggs Drive. - Buried 12 CT FOC in 1.25" Conduits on the south side of University Boulevard. - Buried 144 CT FOC in 1.25" Conduits on the south side of University Boulevard. - Buried 288 CT FOC in 1.25" Conduits on the south side of University Boulevard. - Buried 24 CT FOC in 1.25" Conduits crossing north near the intersection of Goldenrod Road and University Boulevard.
TECO Peoples Gas Cheyenne Thompson 813-743-7164 Cthompson2@tecoenergy.com Sharon Beck 813-853-9337	Gas	TECO Peoples Gas has 2" Coated Steel and 6" Coated Steel Gas Mains along the project area.
Uniti Fiber Charlie Croft 251-214-7059	Fiber	Uniti Fiber has underground 1.5" Ducs with ¾" Fiber cable along the project area, near the intersection of University Boulevard and Driggs Drive.
Zayo Group Henry Klobucar 406-496-6510 Louis Simone 772-579-8956	Fiber	Zayo Group has underground facilities located on the south side of University Boulevard.

3.1.7 Lighting

Conventional light emitting diode (LED) street lighting is present along both sides of University Boulevard throughout the study corridor, from Semoran Boulevard to Goldenrod Road. A field review was conducted to determine the location of light poles, stop signs, pedestrian signs, and transit stops, and used to create a web-based GIS map. **Table 3-3** summarizes the existing lighting along the corridor. Using the existing lighting data, luminosity collection points were developed that would provide the best representation of the lighting along the corridor, shown in **Figure 3-2**.

Table 3-3: Existing Lighting along the Study Area

Corridor Inventory	North Side	South Side	Total
Light Poles	50	37	87
Stop Signs	9	4	13
Pedestrian Signs	6	5	11
Transit Stops	6	6	12

3.1.7.1 Luminosity Measurements – Signalized Intersections

At each signalized intersection, the standard illumination level average initial horizontal foot candle (H.F.C.) value is 3.0. The lighting at all the signalized intersection crosswalks is below standard, with the brightest areas being the north leg (6.66 H.F.C.) of Goldenrod Road and west leg (5.65 H.F.C.) of University Park Drive. The east and north legs of Forsyth Road and east and west legs of Goldenrod Road have a lumen reading higher than the standard H.F.C., but the average of the crossing leg was below average. See **Table 3-4** for further details of the Luminosity measurements at signalized intersections.

Table 3-4: Summary of Luminosity Measurements at Signalized Intersections

Signalized Intersections	Measured H.F.C.				Standard H.F.C.
	North Leg	South Leg	East Leg	West Leg	
Semoran Boulevard	0.58 – 2.68	0.25 – 2.37	1.23 – 2.68	0.24 – 1.88	3.0
University Park Drive	0.13 – 1.94	0.20 – 2.81	0.13 – 2.13	0.23 – 5.65	3.0
Forsyth Road	0.25 – 3.51	0.15 – 0.87	0.80 – 3.19	0.25 – 1.08	3.0
Metric Drive / Calibre Bend Trail	0.15 – 0.69	0.04 – 1.93	0.26 – 1.93	0.04 – 1.45	3.0
Goldenrod Road	0.44 – 6.66	0.92 – 2.88	0.62 – 3.45	1.03 – 4.39	3.0

Note: Standard H.F.C. is obtained from 2024 FDOT FDM.



Figure 3-2
Existing Lighting
University Boulevard
Pedestrian/Cyclist Safety Study

3.1.7.2 Luminosity Measurements – Transit Stops

In terms of transit, the Florida Department of Transportation (FDOT) Design Manual (FDM) does not provide minimum standards for lighting; therefore, a standard H.F.C. value of 2.0 was assumed. There are six transit stops on eastbound and westbound University Boulevard, respectively. None of the six transit stops on both eastbound and westbound University Boulevard were found to have sufficient lighting conditions. See **Table 3-5** for further details of the Luminosity measurements at transit stops.

Table 3-5: Summary of Luminosity Measurements at Transit Stops

Eastbound (South Side of the Corridor)				
Transit Stop #	Transit Name	Location	Measured H.F.C.	Standard H.F.C.
3789	LYNX 13	at University Park Drive	0.43	2.0
6538	LYNX 13	at Forsyth Road	0.44	2.0
3363	LYNX 13	at Forsyth Road	0.83	2.0
3364	LYNX 13	at Summerwalk Square	1.20	2.0
3365	LYNX 13	at Sutton Place Boulevard	0.93	2.0
3366	LYNX 13	at Metric Drive	1.57	2.0
Westbound (North Side of the Corridor)				
Transit Stop #	Transit Name	Location	Measured H.F.C.	Standard H.F.C.
3355	LYNX 13	at Driggs Drive	1.95	2.0
6539	LYNX 13	at Forsyth Road	0.44	2.0
3354	LYNX 13	at Forsyth Road	0.69	2.0
3353	LYNX 13	at Summerwalk Square	0.61	2.0
3352	LYNX 13	at Summerwalk Square	0.07	2.0
3351	LYNX 13	at Calibre Bend Trail	0.14	2.0

Note: Standard H.F.C. is obtained from 2024 FDOT FDM.

3.1.7.3 Luminosity Measurements – Segments

In terms of the lighting along the corridor, the FDM illustrates that the average H.F.C. for a major arterial should be 1.5. Based on the illumination collected along the corridor, Semoran Boulevard to University Park Drive, Full Sail University Campus Entrance to Forsyth Road, and Calibre Bend Trail to Goldenrod Road had an average H.F.C. value greater than the standard on the north side of the corridor. On the south side of the corridor, Calibre Bend Trail to Goldenrod Road was the only section that had a H.F.C., greater than the standard. See **Table 3-6** for further details on the summary of Luminosity measurements.

Table 3-6: Summary of Luminosity Measurements

Street Name Segment	Measured H.F.C.	Average H.F.C.	Standard H.F.C.
Westbound (North Side of the Corridor)			
Semoran Boulevard to University Park Drive	1.09 – 5.41	3.30	1.5
University Park Drive to Full Sail Campus Entrance	0.02 – 1.94	0.75	1.5
Full Sail Campus Entrance to Forsyth Road	0.25 – 2.65	1.54	1.5
Forsyth Road to Summerwalk Square	0.10 – 2.54	0.83	1.5
Summerwalk Square to Calibre Bend Trail	0.56 – 2.65	1.16	1.5
Calibre Bend Trail to Goldenrod Road	0.25 – 5.21	2.26	1.5
Eastbound (South Side of the Corridor)			
Semoran Boulevard to University Park Drive	0.21 – 3.65	1.48	1.5
University Park Drive to Full Sail Campus Entrance	0.06 – 6.80	1.43	1.5
Full Sail Campus Entrance to Forsyth Road	0.03 – 0.97	0.49	1.5
Forsyth Road to Summerwalk Square	0.00 – 2.35	0.50	1.5
Summerwalk Square to Calibre Bend Trail	0.00 – 3.41	0.93	1.5
Calibre Bend Trail to Goldenrod Road	0.01 – 4.46	1.64	1.5

Note: Standard H.F.C. is obtained from 2024 FDOT FDM.

3.1.8 Parking

No on-street parking or public parking facilities exist on University Boulevard within the study corridor. Multiple private parking lots exist immediately off the corridor, owned by the businesses located along University Boulevard.

3.1.9 Bridges, Structures, and Pedestrian Overpasses

One structure exists on University Boulevard within the study corridor. Bridge and structure information was obtained from the Federal Highway Administration (FHWA) National Bridge Inventory (NBI) and FDOT's Bridge Information Report. The structure is a 74.1-foot-long culvert located approximately 300 feet west of the intersection of University Boulevard and Metric Drive, located above Canal E-13. It is registered as structure #754081 in the NBI.

The culvert was built in 1987. According to the latest available inspection from the FHWA NBI, dated November 2021, the culvert was evaluated and found to be in good condition. The culvert is 74.1 feet long (along roadway) and consists of three 12-foot by 8-foot concrete boxes with each barrel of the box, 245 feet in length. The culvert provides for six 11-foot-wide traffic lanes, two 6-foot-wide sidewalks, and a raised median. The culvert is located on a tangent section of University Boulevard. See **Figure 3-3** for an image of structure #754081.

Figure 3-3: Existing Structure



Drainage is accommodated by sheet flow off the roadway into the curb inlets before discharging into Canal E-13.

The bridge sufficiency rating is used by FDOT and is derived by evaluating factors indicative of the structure's ability to remain in service. A rating of 100 percent would represent an entirely sufficient bridge, and a rating of zero percent would represent an entirely deficient bridge. FDOT standards indicate structures with a sufficiency rating of 80 percent or less require some rehabilitation and those less than 60 percent require replacement. According to the latest available Florida Bridge Information Report, dated July 11, 2023, the latest above water bridge inspection was completed on November 12, 2021. The bridge inspection reports indicate the bridge is in good condition with a sufficiency rating of 77.3 and health index of 63.71. The existing load rating was performed via Load Test. The Minimum Inventory Rating Factor calculated is 0.85. No load posting is required. Based on the existing bridge inspection reports, sufficiency rating, health index, and Load Factor Road (LFR), widening or reuse of the existing culvert are both viable options.

3.1.10 Transit

3.1.10.1 LYNX

LYNX Link 13 operates east-west service along University Boulevard for the entire length of the study corridor. Service for this route runs Monday through Sunday. The following is a list of the 12 stops, along with accommodations:

- LYNX stop #3789 (eastbound) – University Boulevard and University Park Drive – sign, bench, trash receptacle, and shelter
- LYNX stop #6538 (eastbound) – University Boulevard and Forsyth Road – sign only
- LYNX stop #3363 (eastbound) – University Boulevard and Forsyth Road – sign and bench
- LYNX stop #3364 (eastbound) – University Boulevard and Summerwalk Square – sign, bench, and trash receptacle
- LYNX stop #3365 (eastbound) – University Boulevard and Sutton Place Boulevard – sign, bench, trash receptacle, and shelter
- LYNX stop #3366 (eastbound) – University Boulevard and Metric Drive – sign and bench
- LYNX stop #3355 (westbound) – University Boulevard and Driggs Drive – sign, bench, trash receptacle, and shelter
- LYNX stop #6539 (westbound) – University Boulevard and Forsyth Road – sign and bench
- LYNX stop #3354 (westbound) – University Boulevard and Forsyth Road – sign and bench
- LYNX stop #3353 (westbound) – University Boulevard and Summerwalk Square – sign, bench, trash receptacle, and shelter
- LYNX stop #3352 (westbound) – University Boulevard and Summerwalk Square – sign and bench
- LYNX stop #3351 (westbound) – University Boulevard and Calibre Bend Trail – sign, bench, trash receptacle, and shelter

Additionally, LYNX Link 29 operates north-south service along Forsyth Road (northbound only) and Goldenrod Road (southbound only), with several stops close to the University Boulevard study corridor. Service for this route runs Monday through Sunday. The following is a list of the four stops close to the study corridor, along with accommodations:

- LYNX stop #3566 (northbound) – Forsyth Road and Easter Street – sign and trash receptacle
- LYNX stop #3567 (northbound) – Forsyth Road and University Boulevard – sign and bench

- LYNX stop #3350 (southbound) – Goldenrod Road and Georgeann Street – sign and bench
- LYNX stop #3571 (southbound) – Goldenrod Road and University Boulevard – sign, bench, trash receptacle, and shelter

Additionally, LYNX Link 436S operates north-south service along Semoran Road, with several stops close to the University Boulevard study corridor. Service for this route runs Monday through Sunday. The following is a list of the two stops close to the study corridor, along with accommodations:

- LYNX stop #3553 (northbound) – Semoran Boulevard and Driggs Drive – sign and bench
- LYNX stop #3420 (southbound) – Semoran Boulevard and University Center Drive – sign, bench, trash receptacle, and shelter

See **Figure 3-4** for a map of the existing LYNX service in the study area.

Ridership data for FY 2022 (October 2021 to September 2022) was obtained from LYNX. The total annual ridership recorded for LYNX Link 13 is 149,254.

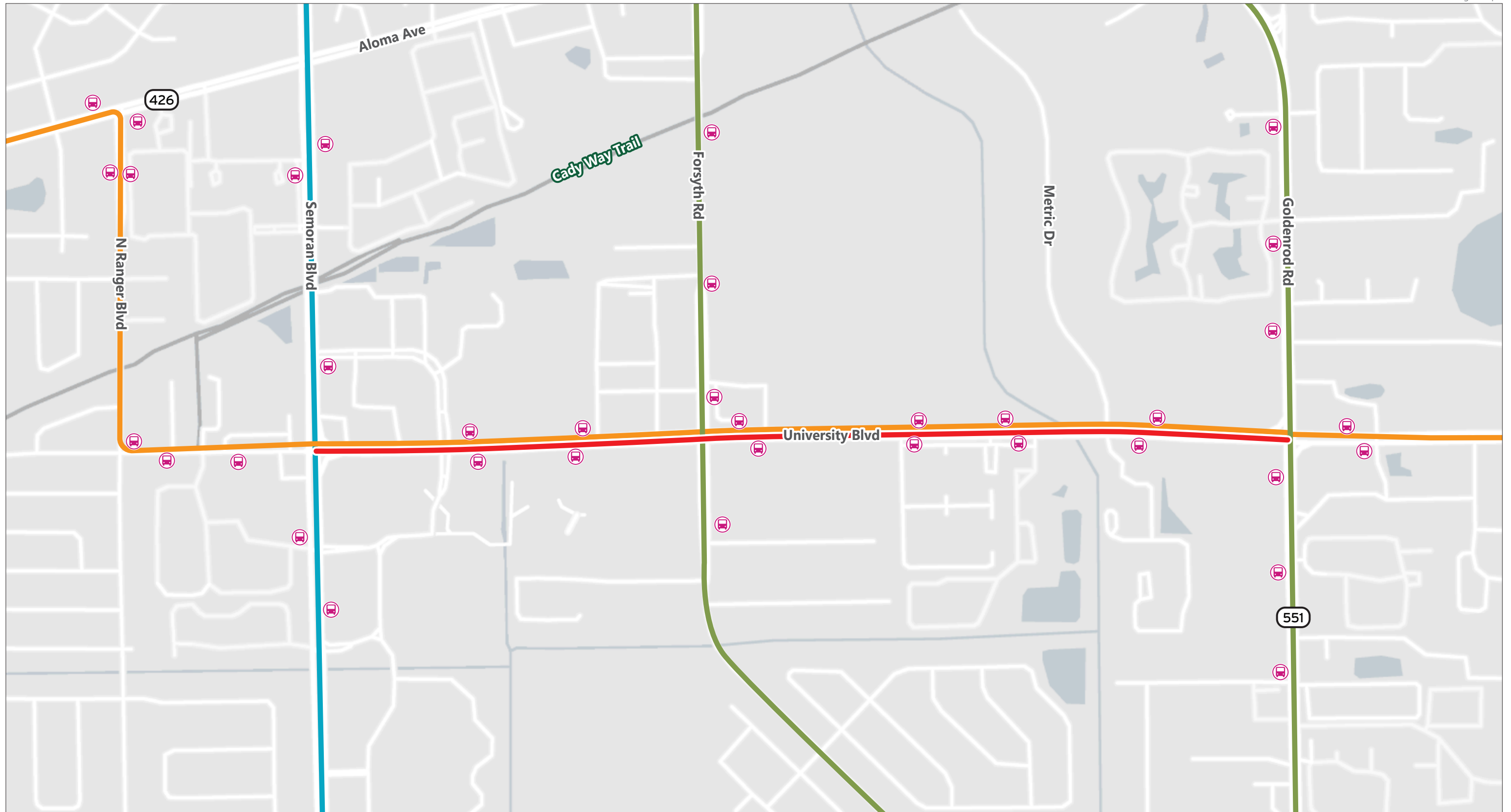
Table 3-7 shows a breakdown of ridership by month for each of the three LYNX Links. Note that FY 2022 data was not available for Link 436S, so FY 2021 data was used for this route.

Table 3-7: LYNX Ridership by Month

Month	LYNX Link 13	LYNX Link 29	LYNX Link 436S ¹
October 2021	11,997	21,175	49,782
November 2021	10,960	19,386	45,105
December 2021	10,904	21,011	48,877
January 2022	11,885	20,626	48,530
February 2022	12,105	19,661	45,746
March 2022	13,498	22,021	54,009
April 2022	12,452	20,751	52,120
May 2022	12,691	19,720	51,778
June 2022	12,471	19,001	50,086
July 2022	12,366	20,027	52,095
August 2022	14,569	20,420	53,403
September 2022	13,356	17,495	52,878
Total FY 2022 Ridership	149,254	241,294	604,410

Notes:

1. FY 2021 Ridership Data used for LYNX Link 436S
2. Data obtained between 2021 and 2022 was collected during a national pandemic, and may not represent typical ridership values



-  Study Corridor
-  LYNX Link 13
-  LYNX Link 29
-  LYNX Link 436S

 LYNX Bus Stops



Figure 3-4

Existing Transit Service
University Boulevard
Pedestrian/Cyclist Safety Study

3.1.11 Pedestrian and Bicycle Features

3.1.11.1 Bicycle Facilities

There are no existing bicycle lanes or separate paths for bicycles along University Boulevard within the study corridor. Additionally, there are no designated bicycle parking areas or separated pedestrian signals (other than those located at traffic signals) along University Boulevard. Adjacent to the study corridor, bicycle lanes are present along Goldenrod Road. The Goldenrod Road bicycle lanes are five feet wide delineated with white pavement markings, as depicted in **Figure 3-5**. There are no bicycle lanes along Semoran Boulevard, Driggs Drive, Forsyth Road, or Metric Drive.

Figure 3-5: Existing Bicycle Facilities on Goldenrod Road north of University Boulevard



3.1.11.2 Pedestrian Facilities

An Americans with Disabilities Act (ADA) Compliance field review was conducted on February 7, 2024, in order to observe the existing pedestrian facilities, and to verify that the existing pedestrian and bicycle facilities met ADA minimum standards. This involved items such as measuring the width of curb ramps, the cross slope of cross walks, the presence of detectable warnings, and the height and reach of pedestrian push buttons. **Appendix D** includes a writeup and annotated base map from this field review.

Sidewalks are present along both the south and north side of University Boulevard along the entire length of the study corridor. The sidewalk along the north side of the road is

seven feet wide, while the sidewalk along the south side of the road is five feet wide. The sidewalk is generally separated from the roadway with a 10-foot-wide sodded strip. Mast arm columns are located within the sidewalk at the southeast and southwest corners of the intersection of University Boulevard and Driggs Drive, along with the southeast and northeast corners of the intersection of University Boulevard and Goldenrod Road. These mast arm columns reduce the effective width of the sidewalk at these locations.

Crosswalks exist along the corridor at all four legs of each of the signalized intersections, except for the west leg of the intersection of University Boulevard and Metric Drive. Right-turn channelization islands exist at the southeast and northeast corners of the intersection of University Boulevard and Semoran Boulevard, along with southeast and northwest corners of the intersection of University Boulevard and Goldenrod Road. These channelization islands are not under signal control and provide refuge for pedestrians, along with reducing the length of the crosswalk. The pedestrian features at the intersection of University Boulevard and Goldenrod Road are shown in **Figure 3-6**. Additionally, the crosswalk at the west leg of the intersection of University Boulevard and SR 436 is worn, making it difficult to see, and needs to be restriped.

All the curb ramps at all the signalized intersections within the study corridor are equipped with detectable warning strips, with the exception of the northwest, northeast, and southeast corners of the intersection of University Boulevard and Metric Drive. However, the vast majority of the unsignalized intersections along the corridor lack detectable warning strips.

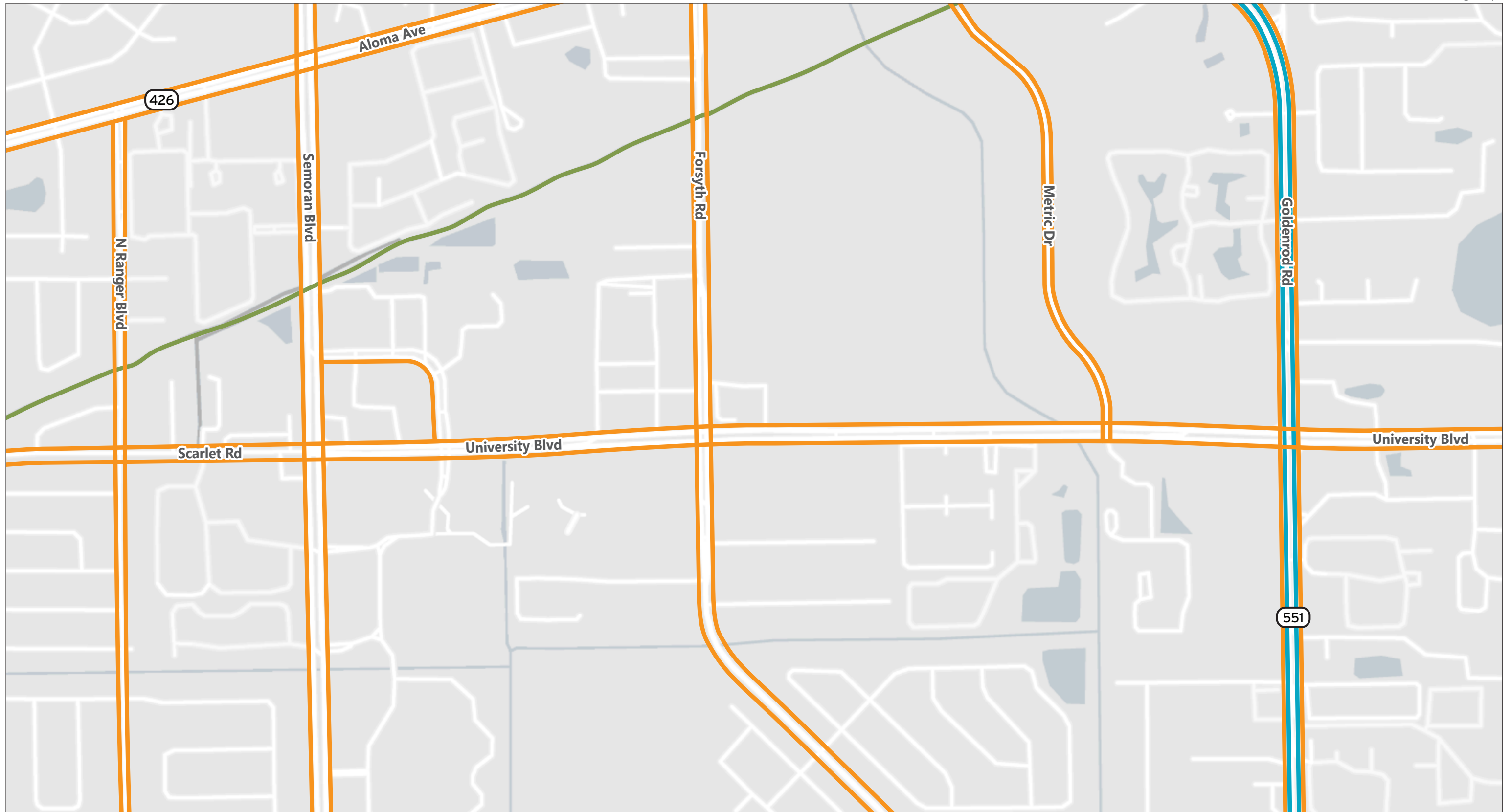
Sidewalks are present along both the north and south side of Scarlet Road west of the study corridor. Sidewalks continue along the north and south sides of University Boulevard east of Goldenrod Road. Additionally, sidewalks are present along both sides of Semoran Boulevard, Forsyth Road, Metric Drive, and Goldenrod Road leading into the study corridor, along with the west side of Driggs Drive.

Figure 3-6: Existing Pedestrian Facilities at Goldenrod Road



3.1.11.3 Cady Way Trail

Cady Way Trail is a 12-foot-wide urban trail that connects Fashion Square Mall to the Cross Seminole Trail and includes a trail loop around Lake Baldwin in addition to a trail spur around Lake Susannah. Cady Way Trail is one section of a larger regional trail network throughout Orange and Seminole Counties. Cady Way Trail connects various restaurants, retail, and employment centers, such as Fashion Square Mall, Downtown Baldwin Park, and the Executive Drive offices. At its closest point to the corridor, it is located approximately 1,000 feet north of the intersection of University Boulevard and Semoran Boulevard. Approximately 3,000 feet west of the intersection of University Boulevard and South Semoran Boulevard, Cady Way Trail leads to Ward Park, which contains baseball fields, a football stadium, tennis courts, pickleball courts, a playground, a pool, and several general-purpose fields. See **Figure 3-7** for a figure of the location of the bicycle and pedestrian facilities adjacent to the University Boulevard study corridor.



-  Sidewalks
-  Bike Lanes
-  Cady Way Trail



Figure 3-7
Existing Bicycle/Pedestrian Facilities
University Boulevard
Pedestrian/Cyclist Safety Study

3.1.12 Truck, Freight, Strategic Intermodal System (SIS), and Evacuation Routes

Semoran Boulevard (Truck Annual Average Daily Traffic (AADT) of 2,320) is a designated freight mobility corridor, and University Boulevard (Truck AADT of 1,587) and Forsyth Road (Truck AADT of 1,034) are designated freight distribution routes by MetroPlan Orlando. No roadways within the immediate vicinity of the University Boulevard study corridor are considered Strategic Intermodal System (SIS) or Evacuation Routes by FDOT. The nearest SIS and Evacuation Routes to the study corridor are SR 408 (Truck AADT of 4,690) and SR 417 (Truck AADT of 7,004).

3.1.13 Intelligent Transportation Systems (ITS) Features

Traffic signals within the study area are managed by Orange County's central Traffic Management Center (TMC) that provides video monitoring, signal timing control, and emergency monitoring and coordination throughout Orange County. **Table 3-8** summarizes the Intelligent Transportation Systems (ITS) features within the immediate study area. Fiber optic cable, which enables improved connection with the TMC and increased data transmission, is present along University Boulevard from Semoran Boulevard to SR 434 (Alafaya Trail). Nearby Semoran Boulevard and Alafaya Trail are also outfitted with fiber, as well as Dean Road south of University Boulevard.

Orange County operates its own Advanced Traffic Management System (ATMS), which provides improved control, operation, and awareness of the transportation network and the ITS equipment deployed within Orange County.

Interconnected and Monitored Traffic Signals (IMTS) are traffic signals that are connected to and accessible through Orange County's ATMS. These IMTS systems are located at the signalized intersections along University Boulevard at Semoran Boulevard and Goldenrod Road. IMTS intersections are also located at nearby intersections along Semoran Boulevard, Goldenrod Road, and Aloma Avenue. Travel-time devices are available along University Boulevard at Semoran Boulevard and at Goldenrod Road. There are no blank out signs (LED signs that minimize undesirable motorist movements during only a portion of the intersection cycle, such as "No-Right Turns") along University Boulevard, but there are several along Aloma Avenue and Semoran Boulevard. There are no leading pedestrian phases along the University Boulevard corridor.

Existing conditions for ITS infrastructure were determined using FDOT's *Internal eTraffic* and *Normalized Operational Equipment Management Initiative* websites.

Table 3-8: ITS Equipment near Study Area

ITS Equipment	Roadway	From	To
Fiber Optic Cable	University Boulevard	Semoran Boulevard	Alafaya Trail
Fiber Optic Cable	Semoran Boulevard	Seminole County Line	Colonial Drive
Fiber Optic Cable	Dean Road	University Boulevard	Colonial Drive
Fiber Optic Cable	Alafaya Trail	University Boulevard	Colonial Drive
IMTS	University Boulevard	at Semoran Boulevard	
IMTS	University Boulevard	at Goldenrod Road	
IMTS	Semoran Boulevard	at Aloma Avenue	
IMTS	Semoran Boulevard	at Banchory Road	
IMTS	Goldenrod Road	at Palmetto Avenue	
IMTS	Goldenrod Road	at Bates Road	
IMTS	Aloma Avenue	at Semoran Boulevard	
IMTS	Aloma Avenue	at Forsyth Road	
Travel-Time Device	University Boulevard	at Semoran Boulevard	
Travel-Time Device	University Boulevard	at Goldenrod Road	
Travel-Time Device	Aloma Avenue	at Semoran Boulevard	
Travel-Time Device	Aloma Avenue	at Forsyth Road	
Wrong-Way Beacon	University Boulevard	at SR 417 SB Off-Ramp	
Blank Out Sign	Aloma Avenue	at Semoran Boulevard	
Blank Out Sign	Aloma Avenue	at Goldenrod Road	
Blank Out Sign	Aloma Avenue	at Hall Road	

3.2 Crash Data

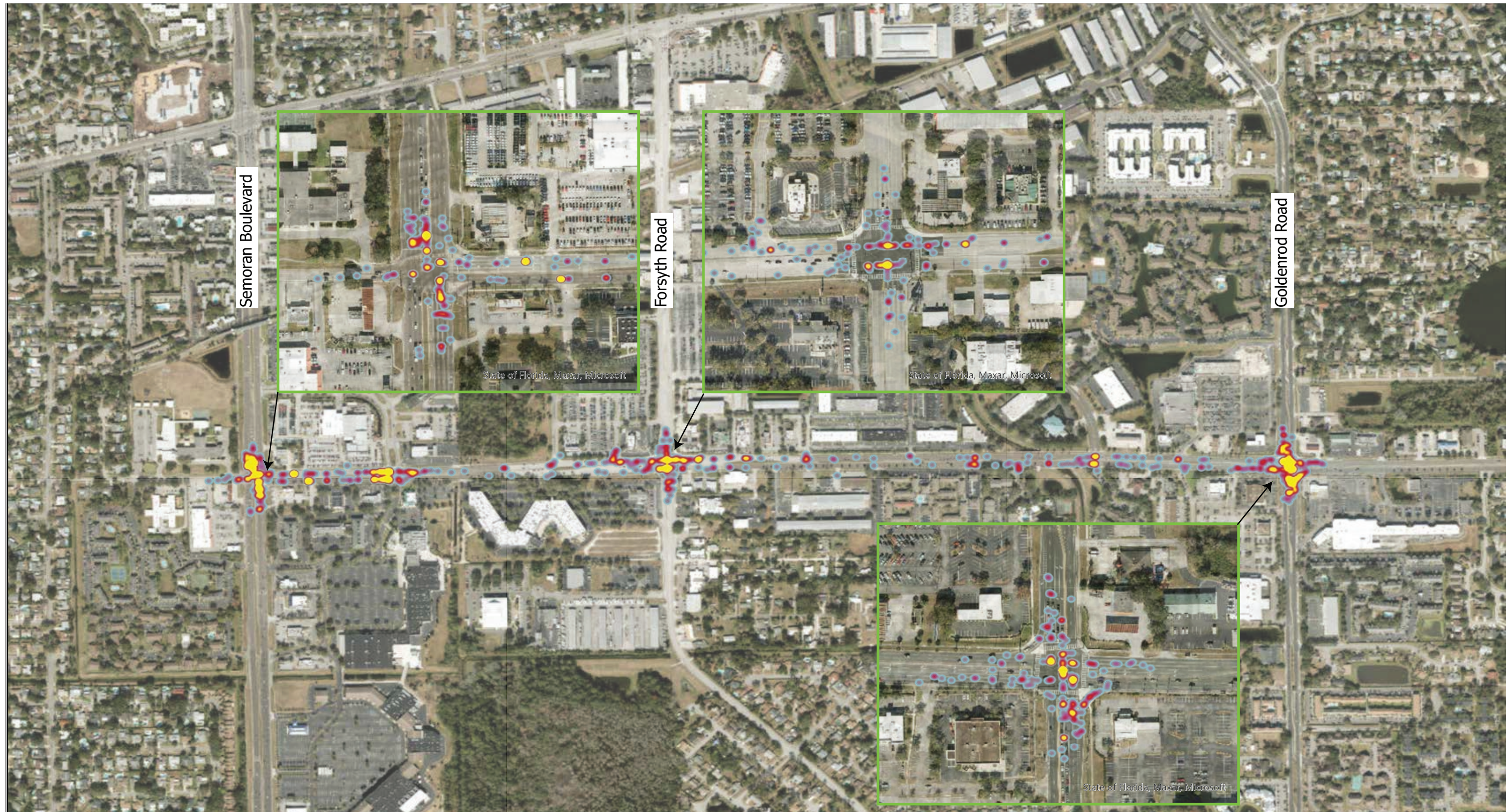
The latest available five-year period of crash data in the study area was collected between August 27, 2018 and August 27, 2023. Crash data including tabulated crash details and Florida Traffic Crash Report (FTCR) long and short-form data were obtained from FDOT's Signal4 Analytics database. The study area encompassed five signalized intersections and three roadway segments. Please note that the crashes along the University Boulevard from Semoran Boulevard to Driggs Drive were already considered under corresponding signalized intersections. A total of 813 crashes were reported within the study area. Raw crash data is included in **Appendix D**. The crashes were analyzed to identify any particular patterns within the study area. Historical crashes were evaluated at the following five intersections:

- University Boulevard at Semoran Boulevard
- University Boulevard at Driggs Drive
- University Boulevard at Forsyth Road
- University Boulevard at Metric Drive
- University Boulevard at Goldenrod Road

As well as the following three roadway segments:

- University Boulevard from Driggs Drive to Forsyth Road
- University Boulevard from Forsyth Road to Metric Drive
- University Boulevard from Metric Drive to Goldenrod Road

Out of the 813 total crashes, 741 occurred within the area of influence of the 5 intersections, with the remaining 72 crashes occurring along the 3 roadway segments. A heat map presenting all crashes by location density can be seen in **Figure 3-8**. Within this period, there was one fatality, 256 injury crashes, and 556 property damage only crashes. There were 24 bicycle-, 10 pedestrian-, and 1 scooter-related crashes recorded during the study period. The predominant crash types include rear ends accounting for 55.6% of crashes, sideswipes for 12.4% of crashes, and left turns for 8.6% of crashes. There were 11 crashes involving alcohol and 3 involving drugs. **Figure 3-9** describes all 813 crashes by type and severity. The following sections describe the crash characteristics by intersection and segment and detail the fatal and pedestrian/cyclist/scooter crash circumstances.



Collision Occurance Density

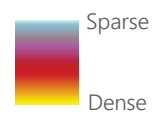
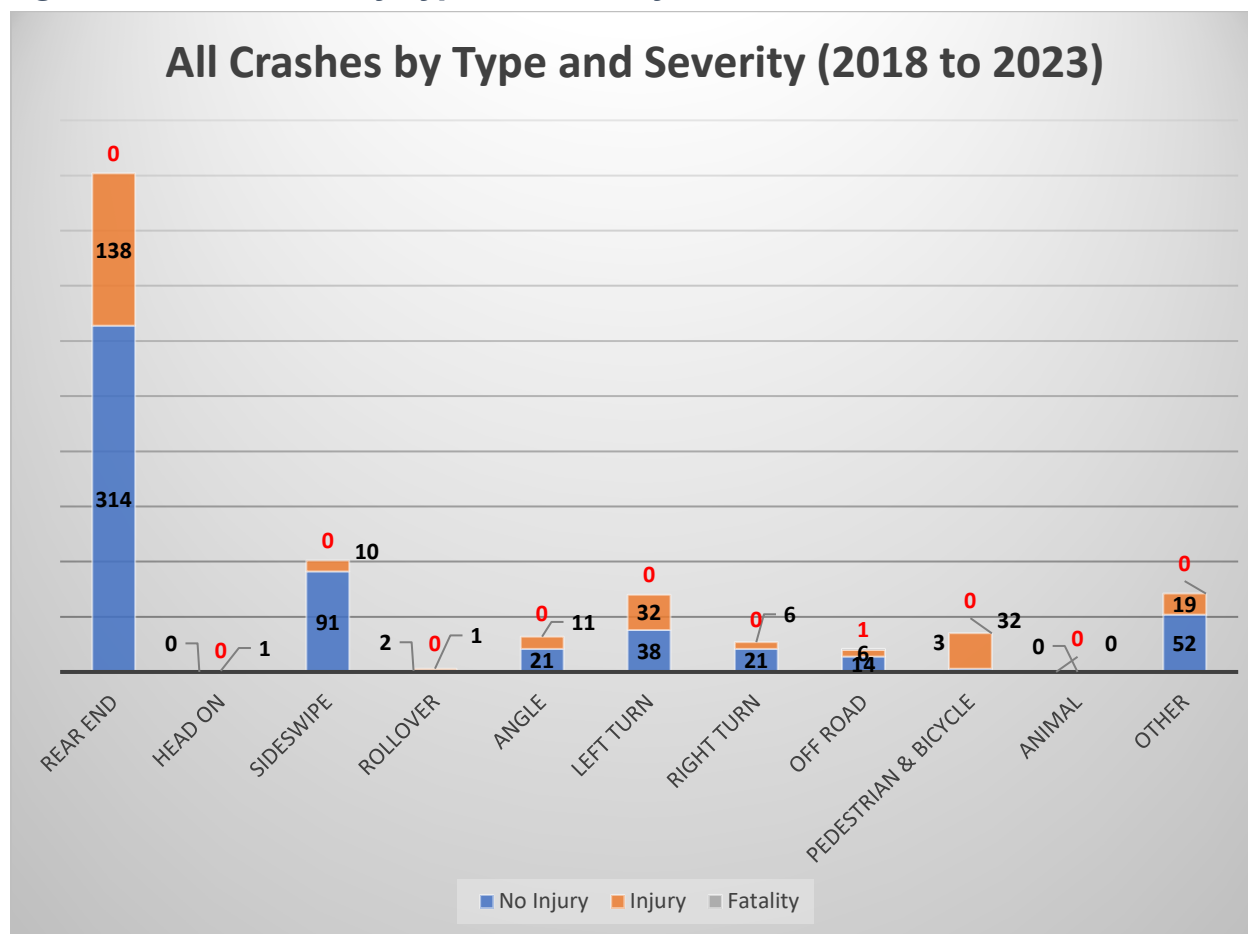


Figure 3-8

Heat Map
University Boulevard
Pedestrian/Cyclist Safety Study

Figure 3-9: All Crashes By Type And Severity



3.2.1 Crash Summary by Intersection

University Boulevard at Semoran Boulevard

A total of 202 crashes were reported within the study intersection - consisting mainly of rear end (60.9%), sideswipe (10.5%), and other (14.5%) crashes. Dark, dusk, or dawn light conditions accounted for 21.4% of crashes, while wet road conditions were present in 9.1%. There was one fatal crash at this intersection, while injury crashes account for 17.0% of crashes, and the remaining crashes resulting in property damage only. Five alcohol related crashes and one drug related crash occurred at this intersection. The following **Table 3-9** describes the circumstances by year.

Table 3-9: University Boulevard at Semoran Boulevard – Crash Summary

Crash Type	2018	2019	2020	2021	2022	2023	Total	Proportion
Rear End	6	34	23	22	22	18	125	60.9%
Head On	0	0	1	0	0	0	1	1.1%
Sideswipe	2	4	7	2	2	2	19	10.5%
Rollover	0	0	0	0	1	0	1	1.8%
Angle	0	2	3	0	0	0	5	3.3%
Left Turn	0	2	13	6	2	1	24	4.3%
Right Turn	0	2	0	0	0	2	4	1.1%
Off Road	0	2	1	2	2	0	7	2.2%
Pedestrian, Bicycle, & Scooter	1	1	1	0	1	0	4	0.4%
Animal	0	0	0	0	0	0	0	0.0%
Other	0	3	3	5	0	1	12	14.5%
Total	9	50	52	37	30	24	202	100.0%
Crash Severity	2018	2019	2020	2021	2022	2023	Total	Proportion
Fatality	0	0	1	0	0	0	1	0.0%
Injury	5	16	17	14	10	8	70	17.0%
Property Damage Only	4	34	34	23	20	16	131	83.0%
Total	9	50	52	37	30	24	202	100.0%
Pavement Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Wet	0	7	12	6	4	3	32	9.1%
Dry	9	43	40	31	26	21	170	90.9%
Slippery	0	0	0	0	0	0	0	0.0%
Total	9	50	52	37	30	24	202	100.0%
Light Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Daylight	5	37	40	29	22	15	148	78.6%
Dusk	0	2	4	0	0	0	6	2.2%
Dawn	0	0	0	0	2	1	3	2.2%
Dark	4	11	8	8	6	8	45	17.0%
Total	9	50	52	37	30	24	202	100.0%
Under the Influence	2018	2019	2020	2021	2022	2023	Total	Proportion
Alcohol	0	0	1	1	2	1	5	2.5%
Drugs	0	0	0	0	1	0	1	0.5%
Total	0	0	1	1	3	1	6	3.0%

University Boulevard at Driggs Drive

A total of 104 crashes were reported within the study intersection consisting of rear end (56.7%), sideswipe (18.3%), and left turn (9.6%) crashes. Dark, dusk, or dawn light conditions accounted for 26.0% of incidents while wet road conditions were present in 17.3%. Injury crashes account for 29.8% of crashes while the remaining crashes resulted in property damage only. No alcohol or drug related incidents occurred at this intersection. The following **Table 3-10** describes the circumstances by year.

Table 3-10: University Boulevard at Driggs Drive – Crash Summary

Crash Type	2018	2019	2020	2021	2022	2023	Total	Proportion
Rear End	3	7	23	20	1	5	59	56.7%
Head On	0	0	0	0	0	0	0	0.0%
Sideswipe	0	4	4	8	2	1	19	18.3%
Rollover	0	0	0	0	0	0	0	0.0%
Angle	0	1	0	1	1	1	4	3.8%
Left Turn	0	3	1	2	4	0	10	9.6%
Right Turn	0	0	1	0	0	1	2	1.9%
Off Road	0	0	0	2	0	0	2	1.9%
Pedestrian, Bicycle, & Scooter	2	2	0	0	0	0	4	3.8%
Animal	0	0	0	0	0	0	0	0.0%
Other	0	1	3	0	0	0	4	3.8%
Total	5	18	32	33	8	8	104	100.0%
Crash Severity	2018	2019	2020	2021	2022	2023	Total	Proportion
Fatality	0	0	0	0	0	0	0	0.0%
Injury	2	4	7	13	3	2	31	29.8%
Property Damage Only	3	14	25	20	5	6	73	70.2%
Total	5	18	32	33	8	8	104	100.0%
Pavement Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Wet	1	2	8	6	1	0	18	17.3%
Dry	4	16	24	27	7	8	86	82.7%
Slippery	0	0	0	0	0	0	0	0.0%
Total	5	18	32	33	8	8	104	100.0%
Light Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Daylight	3	13	29	19	6	7	77	74.0%
Dusk	0	0	0	3	0	0	3	2.9%
Dawn	0	1	1	0	0	0	2	1.9%
Dark	2	4	2	11	2	1	22	21.2%
Total	5	18	32	33	8	8	104	100.0%
Under the Influence	2018	2019	2020	2021	2022	2023	Total	Proportion
Alcohol	0	0	0	0	0	0	0	0.0%
Drugs	0	0	0	0	0	0	0	0.0%
Total	0	0	0	0	0	0	0	0.0%

University Boulevard at Forsyth Road

A total of 166 crashes were reported within the study intersection - consisting mainly of rear end (54.8%), sideswipe (13.9%), and other (7.8%) crashes. Dark or dusk light conditions accounted for 11.4% of crashes, while wet road conditions were present in 14.5%. Injury crashes account for 31.9% of crashes while the remaining crashes resulted in property damage only. Two alcohol related crashes and one drug related crash occurred at this intersection. The following **Table 3-11** describes the circumstances by year.

Table 3-11: University Boulevard at Forsyth Road – Crash Summary

Crash Type	2018	2019	2020	2021	2022	2023	Total	Proportion
Rear End	8	31	13	21	9	9	91	54.8%
Head On	0	0	0	0	0	0	0	0.0%
Sideswipe	2	6	4	3	3	5	23	13.9%
Rollover	0	1	0	0	0	0	1	0.6%
Angle	2	1	2	1	3	1	10	6.0%
Left Turn	0	3	1	0	2	0	6	3.6%
Right Turn	1	3	1	1	5	0	11	6.6%
Off Road	0	0	0	1	0	1	2	1.2%
Pedestrian, Bicycle, & Scooter	0	3	1	0	2	3	9	5.4%
Animal	0	0	0	0	0	0	0	0.0%
Other	0	3	2	4	3	1	13	7.8%
Total	13	51	24	31	27	20	166	100.0%
Crash Severity	2018	2019	2020	2021	2022	2023	Total	Proportion
Fatality	0	0	0	0	0	0	0	0.0%
Injury	1	16	7	10	12	7	53	31.9%
Property Damage Only	12	35	17	21	15	13	113	68.1%
Total	13	51	24	31	27	20	166	100.0%
Pavement Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Wet	1	10	4	4	3	2	24	14.5%
Dry	12	41	20	27	24	18	142	85.5%
Slippery	0	0	0	0	0	0	0	0.0%
Total	13	51	24	31	27	20	166	100.0%
Light Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Daylight	11	48	17	29	25	17	147	88.6%
Dusk	0	1	2	0	0	1	4	2.4%
Dawn	0	0	0	0	0	0	0	0.0%
Dark	2	2	5	2	2	2	15	9.0%
Total	13	51	24	31	27	20	166	100.0%
Under the Influence	2018	2019	2020	2021	2022	2023	Total	Proportion
Alcohol	0	0	0	0	0	2	2	1.2%
Drugs	0	0	0	0	1	0	1	0.6%
Total	0	0	0	0	1	2	3	1.8%

University Boulevard at Metric Drive

A total of 38 crashes were reported within the study intersection - consisting mainly of rear end (39.5%), sideswipe (18.4%), and other (18.4%) crashes. Dark or dusk light conditions accounted for 31.6% of crashes, while wet road conditions were present in 15.8%. Injury crashes account for 34.2% of crashes while the remaining crashes resulted in property damage only. No alcohol or drug related crashes occurred at this intersection. The following **Table 3-12** describes the circumstances by year.

Table 3-12: University Boulevard at Metric Drive – Crash Summary

Crash Type	2018	2019	2020	2021	2022	2023	Total	Proportion
Rear End	3	7	2	0	2	1	15	39.5%
Head On	0	0	0	0	0	0	0	0.0%
Sideswipe	0	2	2	1	1	1	7	18.4%
Rollover	0	0	0	0	0	0	0	0.0%
Angle	0	0	0	0	0	0	0	0.0%
Left Turn	0	1	1	1	0	0	3	7.9%
Right Turn	0	0	0	0	0	0	0	0.0%
Off Road	0	3	0	0	0	1	4	10.5%
Pedestrian, Bicycle, & Scooter	0	1	0	0	0	1	2	5.3%
Animal	0	0	0	0	0	0	0	0.0%
Other	1	2	3	0	1	0	7	18.4%
Total	4	16	8	2	4	4	38	100.0%
Crash Severity	2018	2019	2020	2021	2022	2023	Total	Proportion
Fatality	0	0	0	0	0	0	0	0.0%
Injury	0	6	1	1	3	2	13	34.2%
Property Damage Only	4	10	7	1	1	2	25	65.8%
Total	4	16	8	2	4	4	38	100.0%
Pavement Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Wet	2	3	0	0	1	0	6	15.8%
Dry	2	13	8	2	3	4	32	84.2%
Slippery	0	0	0	0	0	0	0	0.0%
Total	4	16	8	2	4	4	38	100.0%
Light Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Daylight	4	10	5	1	2	4	26	68.4%
Dusk	0	1	1	0	0	0	2	5.3%
Dawn	0	0	0	0	0	0	0	0.0%
Dark	0	5	2	1	2	0	10	26.3%
Total	4	16	8	2	4	4	38	100.0%
Under the Influence	2018	2019	2020	2021	2022	2023	Total	Proportion
Alcohol	0	0	0	0	0	0	0	0.0%
Drugs	0	0	0	0	0	0	0	0.0%
Total	0	0	0	0	0	0	0	0.0%

University Boulevard at Goldenrod Road

A total of 231 crashes were reported within the study intersection - consisting mainly of rear end (57.1%), sideswipe (12.1%), and other (10.8%) crashes. Dark, dusk, or dawn light conditions accounted for 22.9% of crashes, while wet road conditions were present in 9.1%. Injury crashes account for 27.7% of crashes while the remaining crashes resulted in property damage only. Three alcohol related crashes and one drug related crash occurred at this intersection. The following **Table 3-13** describes the circumstances by year.

Table 3-13: University Boulevard at Goldenrod Road – Crash Summary

Crash Type	2018	2019	2020	2021	2022	2023	Total	Proportion
Rear End	10	42	28	27	16	9	132	57.1%
Head On	0	0	0	0	0	0	0	0.0%
Sideswipe	4	6	4	6	4	4	28	12.1%
Rollover	0	0	0	0	0	0	0	0.0%
Angle	1	3	1	3	0	3	11	4.8%
Left Turn	3	5	2	0	4	0	14	6.1%
Right Turn	1	2	2	0	1	3	9	3.9%
Off Road	1	0	1	1	1	0	4	1.7%
Pedestrian, Bicycle, & Scooter	1	3	0	0	3	1	8	3.5%
Animal	0	0	0	0	0	0	0	0.0%
Other	3	8	7	1	1	5	25	10.8%
Total	24	69	45	38	30	25	231	100.0%
Crash Severity	2018	2019	2020	2021	2022	2023	Total	Proportion
Fatality	0	0	0	0	0	0	0	0.0%
Injury	6	16	13	10	11	8	64	27.7%
Property Damage Only	18	53	32	28	19	17	167	72.3%
Total	24	69	45	38	30	25	231	100.0%
Pavement Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Wet	1	8	3	5	3	1	21	9.1%
Dry	23	61	42	33	27	24	210	90.9%
Slippery	0	0	0	0	0	0	0	0.0%
Total	24	69	45	38	30	25	231	100.0%
Light Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Daylight	17	52	36	34	20	19	178	77.1%
Dusk	3	2	2	2	0	1	10	4.3%
Dawn	0	1	0	1	2	0	4	1.7%
Dark	4	14	7	1	8	5	39	16.9%
Total	24	69	45	38	30	25	231	100.0%
Under the Influence	2018	2019	2020	2021	2022	2023	Total	Proportion
Alcohol	1	2	0	0	0	0	3	1.3%
Drugs	0	1	0	0	0	0	1	0.4%
Total	1	3	0	0	0	0	4	1.7%

3.2.2 Crash Summary by Segment

University Boulevard from Driggs Drive to Forsyth Road

As shown in the following **Table 3-14**, a total of 12 crashes were recorded at this segment and consists mainly of rear end (41.7%), other (25.0%), and bicycle (16.7%) crashes. Dark light conditions accounted for 8.3% of crashes, while wet road conditions were present in 25.0%. Injury crashes account for 58.3% of crashes, with the remaining crashes resulting in

property damage only. One alcohol related crash occurred along this segment, while no drug related crashes occurred.

Table 3-14: University Boulevard from Driggs Drive to Forsyth Road

Crash Type	2018	2019	2020	2021	2022	2023	Total	Proportion
Rear End	2	2	1	0	0	0	5	41.7%
Rollover	0	0	0	0	0	1	1	8.3%
Angle	0	0	0	0	0	0	0	0.0%
Left Turn	0	1	0	0	0	0	1	8.3%
Right Turn	0	0	0	0	0	0	0	0.0%
Off Road	0	0	0	0	0	0	0	0.0%
Pedestrian, Bicycle, & Scooter	0	1	0	0	1	0	2	16.7%
Animal	0	0	0	0	0	0	0	0.0%
Other	0	0	0	0	0	3	3	25.0%
Total	2	4	1	0	1	4	12	100.0%
Crash Severity	2018	2019	2020	2021	2022	2023	Total	Proportion
Fatality	0	0	0	0	0	0	0	0.0%
Injury	1	3	1	0	1	1	7	58.3%
Property Damage Only	1	1	0	0	0	3	5	41.7%
Total	2	4	1	0	1	4	12	100.0%
Pavement Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Wet	0	3	0	0	0	0	3	25.0%
Dry	2	1	1	0	1	4	9	75.0%
Slippery	0	0	0	0	0	0	0	0.0%
Total	2	4	1	0	1	4	12	100.0%
Light Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Daylight	2	3	1	0	1	4	11	91.7%
Dusk	0	0	0	0	0	0	0	0.0%
Dawn	0	0	0	0	0	0	0	0.0%
Dark	0	1	0	0	0	0	1	8.3%
Total	2	4	1	0	1	4	12	100.0%
Under the Influence	2018	2019	2020	2021	2022	2023	Total	Proportion
Alcohol	1	0	0	0	0	0	1	8.3%
Drugs	0	0	0	0	0	0	0	0.0%
Total	1	0	0	0	0	0	1	8.3%

University Boulevard from Forsyth Road to Metric Drive

A total of 50 crashes were recorded at this segment and consists mainly of rear end (50.0%) and left turn (22.0%) crashes. Dark or dusk light conditions accounted for 22.0% of crashes, while wet road conditions were present in 18.0%. Injury crashes account for 24.0% of crashes and the remaining crashes resulted in property damage only. There were no alcohol or drug related crashes along this segment. The following **Table 3-15** describes the circumstances by year.

Table 3-15: University Boulevard from Forsyth Road to Metric Drive

Crash Type	2018	2019	2020	2021	2022	2023	Total	Proportion
Rear End	2	9	2	5	5	2	25	50.0%
Sideswipe	0	1	0	1	3	0	5	10.0%
Rollover	0	0	0	0	0	0	0	0.0%
Angle	0	1	0	0	0	0	1	2.0%
Left Turn	0	3	0	2	3	3	11	22.0%
Right Turn	0	0	0	0	0	0	0	0.0%
Off Road	0	1	0	0	0	0	1	2.0%
Pedestrian, Bicycle, & Scooter	0	1	0	0	1	0	2	4.0%
Animal	0	0	0	0	0	0	0	0.0%
Other	1	1	0	1	1	1	5	10.0%
Total	3	17	2	9	13	6	50	100.0%
Crash Severity	2018	2019	2020	2021	2022	2023	Total	Proportion
Fatality	0	0	0	0	0	0	0	0.0%
Injury	0	4	2	1	3	2	12	24.0%
Property Damage Only	3	13	0	8	10	4	38	76.0%
Total	3	17	2	9	13	6	50	100.0%
Pavement Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Wet	1	6	0	0	1	1	9	18.0%
Dry	2	11	2	9	12	5	41	82.0%
Slippery	0	0	0	0	0	0	0	0.0%
Total	3	17	2	9	13	6	50	100.0%
Light Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Daylight	3	12	2	9	7	6	39	78.0%
Dusk	0	1	0	0	2	0	3	6.0%
Dawn	0	0	0	0	0	0	0	0.0%
Dark	0	4	0	0	4	0	8	16.0%
Total	3	17	2	9	13	6	50	100.0%
Under the Influence	2018	2019	2020	2021	2022	2023	Total	Proportion
Alcohol	0	0	0	0	0	0	0	0.0%
Drugs	0	0	0	0	0	0	0	0.0%
Total	0	0	0	0	0	0	0	0.0%

University Boulevard from Metric Drive to Goldenrod Road

A total of 10 crashes were recorded at this segment and consists mainly of bicycle, pedestrian, and scooter (40.0%) and other (20.0%) crashes. Dark or dusk light conditions accounted for 20.0% of crashes, while wet road conditions were present in 10.0%. Injury crashes account for 60.0% of crashes and the remaining crashes resulted in property damage only. There were no alcohol or drug related crashes along this segment. The following **Table 3-16** describes the circumstances by year.

Table 3-16: University Boulevard from Metric Drive to Goldenrod Road

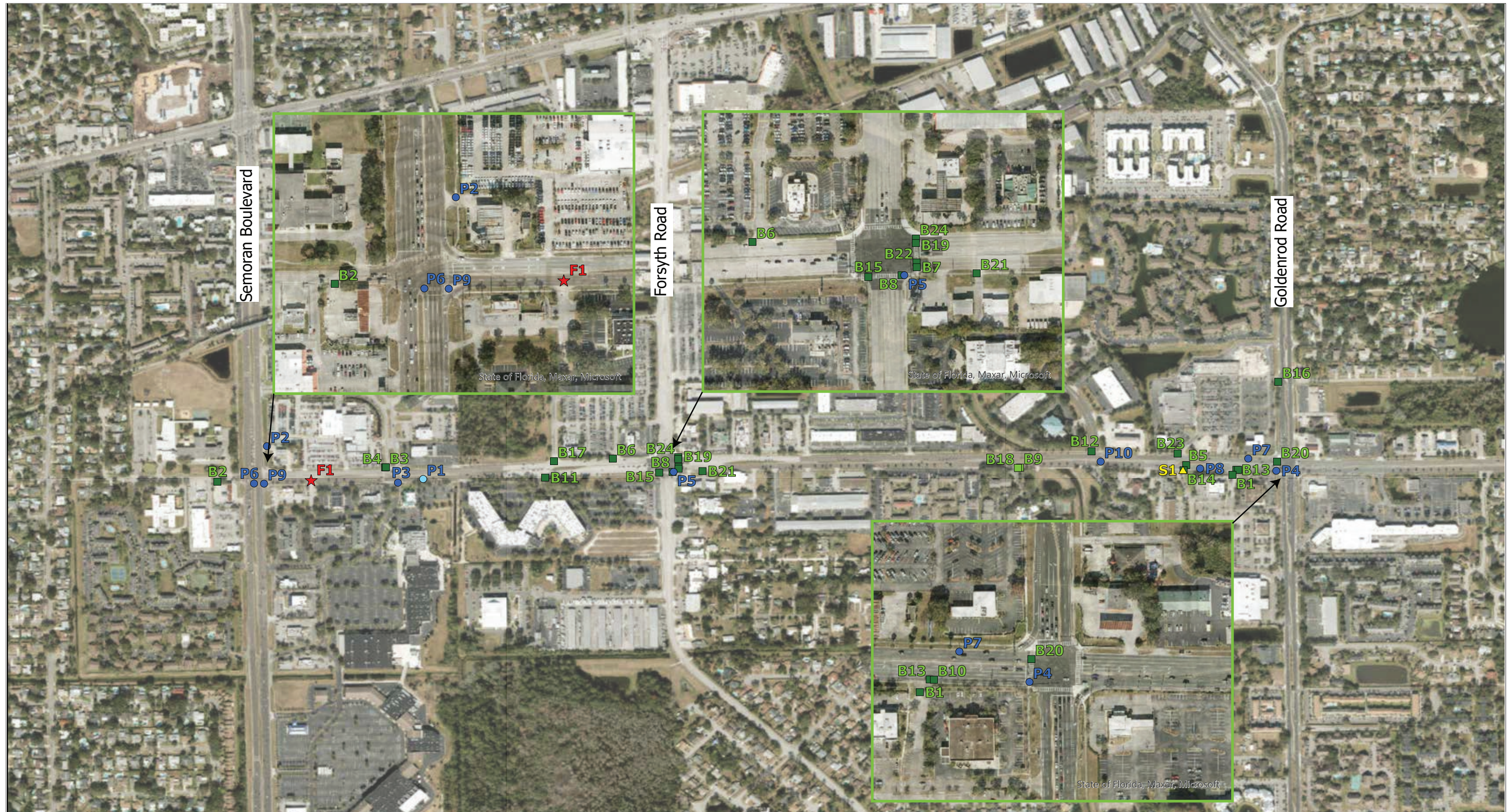
Crash Type	2018	2019	2020	2021	2022	2023	Total	Proportion
Rear End	0	0	0	0	0	0	0	0.0%
Angle	0	0	0	1	0	0	1	10.0%
Left Turn	0	0	1	0	0	0	1	10.0%
Right Turn	0	1	0	0	0	0	1	10.0%
Off Road	0	1	0	0	0	0	1	10.0%
Pedestrian, Bicycle, & Scooter	0	1	0	1	0	2	4	40.0%
Animal	0	0	0	0	0	0	0	0.0%
Other	0	0	0	2	0	0	2	20.0%
Total	0	3	1	4	0	2	10	100.0%
Crash Severity	2018	2019	2020	2021	2022	2023	Total	Proportion
Fatality	0	0	0	0	0	0	0	0.0%
Injury	0	1	0	3	0	2	6	60.0%
Property Damage Only	0	2	1	1	0	0	4	40.0%
Total	0	3	1	4	0	2	10	100.0%
Pavement Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Wet	0	0	0	1	0	0	1	10.0%
Dry	0	3	1	3	0	2	9	90.0%
Slippery	0	0	0	0	0	0	0	0.0%
Total	0	3	1	4	0	2	10	100.0%
Light Condition	2018	2019	2020	2021	2022	2023	Total	Proportion
Daylight	0	1	1	4	0	2	8	80.0%
Dusk	0	1	0	0	0	0	1	10.0%
Dawn	0	0	0	0	0	0	0	0.0%
Dark	0	1	0	0	0	0	1	10.0%
Total	0	3	1	4	0	2	10	100.0%
Under the Influence	2018	2019	2020	2021	2022	2023	Total	Proportion
Alcohol	0	0	0	0	0	0	0	0.0%
Drugs	0	0	0	0	0	0	0	0.0%
Total	0	0	0	0	0	0	0	0.0%

3.2.3 Pedestrian, Bicyclist, Scooter, and Fatal Crash Overview

One fatal crash, one scooter crash, 10 pedestrian crashes, and 24 bicycle crashes are summarized in **Table 3-17** below and illustrated/mapped in **Figure 3-10**. See **Appendix D** for detailed information about each of the pedestrian, bicycle, scooter, and fatality collisions.

Table 3-17: Pedestrian, Bicycle, Scooter, and Fatality Collisions

Crash Number	Crash ID	Date	Crash Type	Severity
B1	87293731	9/5/2018	Bicyclist	Injury
B2	88012541	10/31/2018	Bicyclist	Injury
B3	88031421	11/28/2018	Bicyclist	Injury
B4	88051538	12/19/2018	Bicyclist	Injury
P1	88063193	1/3/2019	Pedestrian	No Injuries
B5	88075684	1/13/2019	Bicyclist	Injury
B6	88069210	2/1/2019	Bicyclist	Injury
P2	88910719	2/8/2019	Pedestrian	Injury
P3	88100395	3/5/2019	Pedestrian	Injury
B7	88123726	5/30/2019	Bicyclist	Injury
B8	88145211	7/2/2019	Bicyclist	Injury
B9	88182188	9/21/2019	Bicyclist	No Injuries
B10	88208047	10/4/2019	Bicyclist	Injury
B11	88225545	10/8/2019	Bicyclist	Injury
B12	88201752	10/10/2019	Bicyclist	Injury
P4	88227677	11/14/2019	Pedestrian	Injury
B13	88245067	11/22/2019	Bicyclist	Injury
P5	88304984	3/3/2020	Bicyclist	Injury
F1	88335086	4/10/2020	Vehicular	Fatality
P6	88399593	10/14/2020	Pedestrian	Injury
B14	89590070	12/26/2021	Bicyclist	Injury
P7	24888731	1/12/2022	Pedestrian	Injury
P8	24894047	2/4/2022	Pedestrian	Injury
B15	24894063	2/14/2022	Pedestrian	Injury
B16	24903396	7/16/2022	Pedestrian	Injury
P9	24983846	7/22/2022	Bicyclist	Injury
B17	24975875	8/2/2022	Bicyclist	Injury
B18	25027153	10/8/2022	Bicyclist	No Injuries
B19	88102696	11/14/2022	Bicyclist	Injury
P10	25073184	1/8/2023	Pedestrian	Injury
B20	25061465	1/23/2023	Bicyclist	Injury
B21	25079832	3/2/2023	Bicyclist	Injury
B22	89615919	3/4/2023	Bicyclist	Injury
B23	89623157	3/21/2023	Bicyclist	Injury
B24	89620672	4/7/2023	Bicyclist	Injury
S1	89656846	6/6/2023	Scooter	Injury



Legend

Bicycle Collision

- Injury
- No Injury

Pedestrian Collision

- Injury
- No Injury

Scooter Collision

- ▲ Injury

Vehicle Collision

- ★ Fatality



Figure 3-10

Pedestrian/Bicycle-related and Fatal Crash Location Map
University Boulevard Pedestrian/
Cyclist Safety Study

3.2.4 Summary of Pedestrian, Bicycle, and Scooter Safety Conditions

Based on the historical pedestrian, bicycle, and scooter crashes along the study corridor, as well as observations made during field visits, several crash hazards can be identified and addressed.

- These crashes are concentrated near the signalized study intersections and between Metric Drive and Goldenrod Road. Along the study corridor, 19 out of 35 crashes occurred between Semoran Boulevard and Forsyth Road. The remaining 16 crashes are concentrated between Metric Drive and Goldenrod Road.
- There were more bicycle- than pedestrian-related crashes indicating more conflicts between bicycles and vehicles, especially between turning vehicles at either the study intersections or the several driveways along the study corridor.
- The NB and EB crosswalks at the University Boulevard intersection with Forsyth Road were the locations of a notable quantity of bicycle crashes. During field observations it was noted that the raised Amscot parking lot partially obstructed vision around the southeast quadrant of the intersection.
- The roadway segment along University Boulevard from Metric Drive to Goldenrod Road saw a significant portion of the total pedestrian and bicycle crashes. During field visits it was also observed that pedestrians crossed University Boulevard at places where it is not allowed (no mid-block crossings along the corridor).

3.3 Geotechnical Considerations

This section presents a summary of the preliminary geotechnical evaluation for the University Boulevard study.

3.3.1 Soils

Soil units present within the study area were identified using the Soil Survey Geographic Database (SSURGO) maintained by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). Mapped soil units present within the study area are summarized in **Table 3-18**. Each soil unit was assigned the hydric status designation in accordance with the Hydric Soils of Florida Handbook Fourth Edition (2007). In general, non-hydric soils are typically associated with uplands and hydric soils are associated with wetlands. A map depicting the soil units present within the study area is included in **Figure 3-11**.

Table 3-18: NRCS Soil Survey Map Units in Project Area

Soil Unit No. and Name	Description	Hydric Status
3	Basinger fine sand, frequently ponded, 0 to 1 percent slopes	Hydric
34	Pomello fine sand, 0 to 5 percent slopes	Hydric Inclusions
35	Pomello-urban land complex, 0 to 5 percent slopes	Hydric Inclusions
41	Samsula-Hontoon-Bassinger Association, depressional	Hydric
44	Smyrna-Smyrna, wet, fine sand, 0 to 2 percent slopes	Non-Hydric
45	Smyrna fine sand-urban land complex, 0 to 2 percent slopes	Hydric Inclusions
50	Urban land, 0 to 2 percent slopes	Non-Hydric
54	Zolfo fine sand, 0 to 2 percent slopes	Non-Hydric

Basinger Fine Sand, frequently ponded, 0 to 1 percent slopes (3) – This nearly level and very poorly drained soil is found on shallow depressions and sloughs and along the edges of freshwater marshes and swamps. Slopes range from 0 to 1 percent. Under natural conditions, the water table is above the surface for 6 to 9 months or more each year and is within 12 inches of the surface for the rest of the year. Permeability is rapid throughout. The available water capacity is low in the surface and subsurface layers and in the substratum and is medium in the subsoil. This is considered a hydric soil associated with wetlands.

Pomello Fine Sand, 0 to 5 percent slopes (34) – This nearly level to gently sloping and moderately well drained soil is typically located on low ridges and knolls on the flatwoods. Slopes are smooth to convex. The seasonal high-water table (SHWT) is at a depth of 24 to 40 inches for 1 month to 4 months and recedes to a depth of 40 to 60 inches during dry periods. The permeability is very rapid in surface layer and subsurface layers, moderately rapid in the subsoil, and rapid in the substratum. The available water capacity is very low in the surface and subsurface layers and in the substratum, and it is medium in the subsoil. This is considered a soil with hydric inclusions and can be indicative of uplands or wetlands depending on where it lies in the landscape.

Pomello-Urban Land Complex, 0 to 5 percent slopes (35) – This nearly level to gently sloping and moderately well drained soil is associated with urban areas but can be located on low ridges and knolls on the flatwoods. The urban land part of this complex is covered by concrete, asphalt, buildings, or another impervious surface. Slopes are smooth to convex. The SHWT is at a depth of 24 to 40 inches for 1 month to 4 months and recedes to a depth of 40 to 60 inches during dry periods. The permeability is very rapid in surface layer and subsurface layers, moderately rapid in the subsoil, and rapid in the substratum. The available water capacity is very low in the surface and subsurface layers and in the

substratum, and it is medium in the subsoil. This is considered a soil with hydric inclusions and can be indicative of uplands or wetlands depending on where it lies in the landscape.

Samsula-Hontoon-Basinger Association, Depressional (41) – This nearly level and very poorly drained soil is typically located in freshwater swamps, depressions, slough, and broad, poorly defined drainageways. Slopes are smooth to concave and range from 0 to 2 percent. The SHWT fluctuates between depths of about 10 inches and the surface. The permeability is rapid throughout. The available water capacity is very high in organic matter and is very low in the underlying sandy material. This is considered a hydric soil typically indicative of wetlands.

Smyrna-Smyrna, Wet, Fine Sand 0 to 2 percent slopes (44) – This nearly level and poorly drained soil is typically located on broad flatwoods. Slopes are smooth to concave and range from 0 to 2 percent. The SHWT is within 10 inches of the surface for 1 month to 4 months and recedes to a depth of 10 to 40 inches for more than 6 months. The permeability is rapid in the surface and subsurface layers and in the substratum, and it is moderate to moderately rapid in the subsoil. The available water capacity is low to very low in the surface and subsurface layers and in the substratum, and it is medium in the subsoil. This is considered soil with hydric inclusions and can be indicative of uplands or wetlands depending on where it lies in the landscape.

Smyrna Fine Sand-Urban Land Complex, 0 to 2 percent slopes (45) – This complex contains nearly level and poorly drained soil and area of urban lands. It is typically located on the flatwoods. Slopes are smooth to concave and range from 0 to 2 percent. The SHWT is within 10 inches of the surface for 1 month to 4 months. The permeability is rapid in the surface and subsurface layers and in the substratum, and it is moderate to moderately rapid in the subsoil. The available water capacity is low to very low in the surface and subsurface layers and in the substratum, and it is medium in the subsoil. This is considered a soil with hydric inclusions and can be indicative of uplands or wetlands depending on where it lies in the landscape.

Urban Land, 0 to 2 percent slopes (50) – This soil designation is a result of natural soils that cannot be observed or identified because it is covered by urban facilities such as shopping centers, parking lots, industrial buildings, houses, streets, airports, and other structures. Soils in unoccupied areas such as lawns, vacant lots, playgrounds, and parks, mostly consist of Candler, Florahome, Millhopper, Ona, Pomello, St. Lucie, Smyrna, Tavares, and Wabasso soils. These soils have been altered by grading and shaping, or a fill material has been used to cover the natural soils to a depth of 12 inches. Drainage systems have been established in most areas and the SHWT is highly variable. This

disturbed soil designation is considered a non-hydric soil associated with uplands and developed land.

Zolfo Fine Sand, 0 to 2 percent slopes (54) – This nearly level and somewhat poorly drained soil is typically located on broad, slightly higher positions adjacent to the flatwoods. Slopes are smooth to convex and range from 0 to 5 percent. The SHWT is at a depth of 24 to 40 inches for 2 to 6 months, and it is a depth of 10 to 24 inches during periods of heavy rains. It recedes to a depth of about 60 inches during extended dry periods. The permeability is rapid in the surface and subsurface layers, and it is moderate in the subsoil. The available water capacity is low in the surface and subsurface layers and is medium in the subsoil. This is considered a non-hydric soil indicative of uplands.



- Study Area (98.76 ac)
- NRCS Soil Boundary



Figure 3-11
NRCS Soils Map
University Boulevard
Pedestrian/Cyclist Safety Study

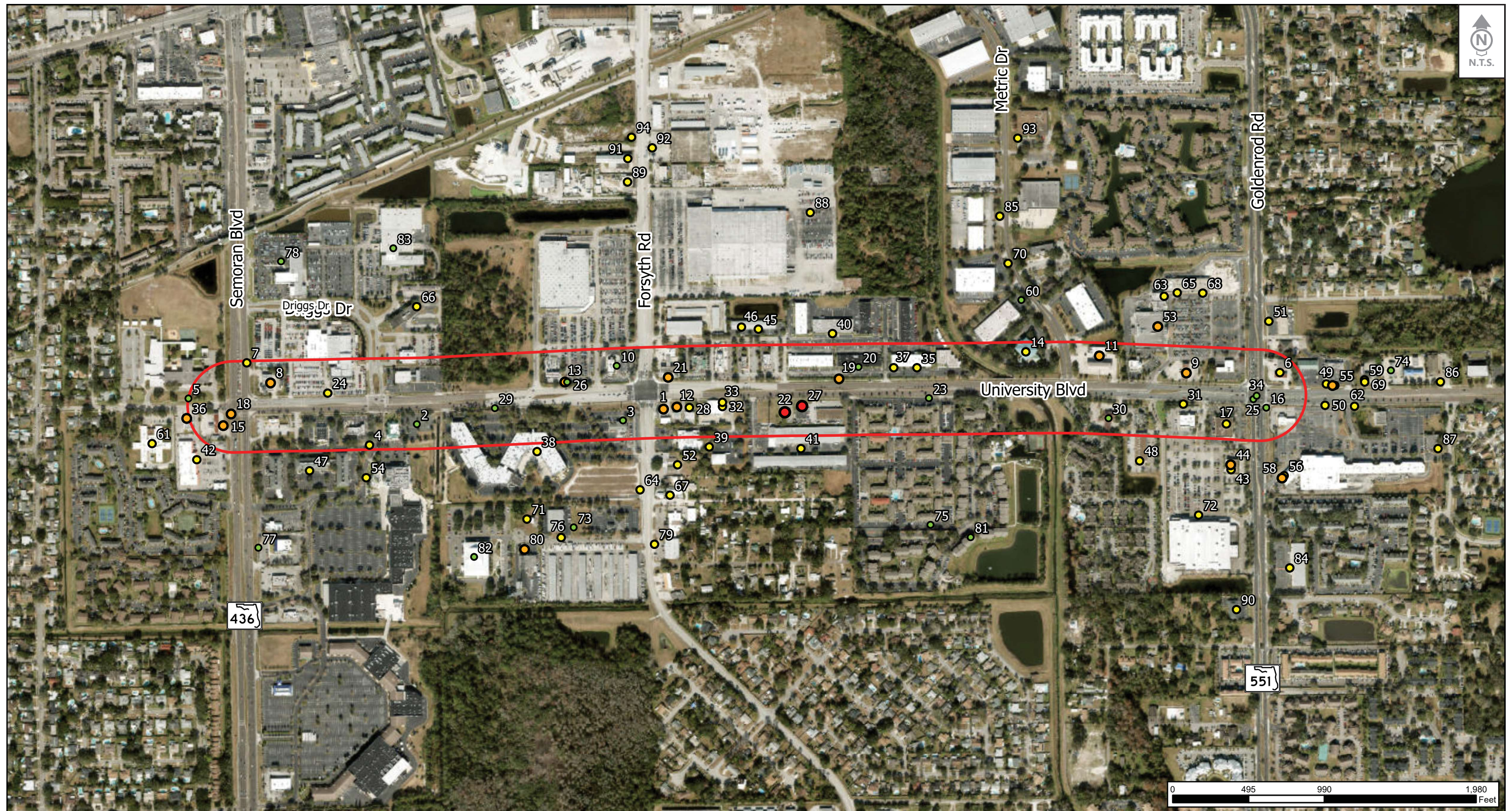
3.4 Potential Contamination

A Level I Contamination Screening Evaluation was performed to identify potentially contaminated sites that are within or adjacent to the study area which may affect project implementation. Based on the desktop and field reviews, 38 facilities within the study area and 56 offsite facilities were identified that may present a hazardous material liability to the proposed study area (see **Figure 3-12**). A total of 16 facilities received a Medium contamination risk rating (CRR) rating. Facilities that pose a medium risk to the study area include existing and historic gas stations, historic and existing dry cleaners, an oil change facility, and local governmental facilities. One historic chemical management company poses a high risk to the study area. Two High risk facilities (22 and 27) were identified during the contamination screening. Twelve onsite facilities and five offsite facilities were identified with Medium or High risk. **Table 3-19** provides information related to the Medium and High rated sites. **Figure 3-12** shows the locations of the Medium and High rated sites. The results of the Contamination Screening Evaluation can be found in the *Contamination Screening Evaluation Report (CSER)*, under separate cover.

Table 3-19: Medium and High Rated Contamination Sites within the Project Area

Site Number	Site Name	Risk Rating
1	Circle K #7428, Sunrise Food Mart #27, Amoco-University Sup 6320 University Blvd	Medium
8	Mobil RIs #46659, Sunshine Food Mart #302, Exxon #6659-John's, Exxon Mobil Corporation, Johns Exxon Service, Exxon Ras #46659, Exxon #6659 John's 203 N Semoran Blvd	Medium
9	Shell #100721, Circle K #2709742, Star Enterprise, Circle K #2709742, Texaco #24-025-0083-Majik Market, Motiva Enterprises LLC 7373 University Blvd	Medium
11	Racetrac Petroleum Inc, Racetrac #2440 7235 University Blvd	Medium
12	Lube Master Inc, Take 5 Oil Change 30381, Texaco Xpress Lube #1081, Take 5 Oil Change #381 6334 University Blvd	Medium
13	Costco Wholesale #185, Costco Gasoline (Loc 185) 3333 University Blvd	Medium
15	Citgo-Rahal #2, Mobil #02-J5h, Mobil Oil Corporation, Winslows 100 S Semoran Blvd	Medium

Site Number	Site Name	Risk Rating
18	Americlean 114 S Semoran Blvd	Medium
19	Streamline Technologies Inc 6961 University Blvd	Medium
21	7-Eleven Store #32360, 7-Eleven Food Store 32360 6305 University Blvd	Medium
22	City Chemical University Blvd-Gw Remediation Treat 6504/6586 University Blvd	High
27	Executive Automotive 6562 University Blvd	High
36	7-Eleven Food Store #15101 2990 Scarlet Rd	Medium
44	Touch of Class Dry Cleaners, Moe's Southwest Grill 7484 University Blvd	Medium
53	Publix Super Market #1387, K Mart - Store 7520, Penske Auto Center, Harrison Cleaners, K Mart #7520 Auto Service 4000 & 4008 N Goldenrod Rd	Medium
57	Elite Dry Cleaners 7591 University Blvd	Medium
58	DCI Management Group Inc 7530 University Blvd	Medium
80	East District Facilities Maint. Warehouse, Orange Cnty-Communications Ctr 6600 Amory Court	Medium

**Legend**

Study Area (98.76 ac)

Contamination Risk Rating

- No - No potential contamination impact to the project.
- Low - It is not likely that there would be any contamination impacts to the project.
- Medium - A potential contamination impact to the project has been identified.
- High - A substantial impact to construction activities, ROW acquisition, or liability for Orange County has been identified.



Figure 3-12
Potential Contaminated Sites
 University Boulevard Pedestrian/
 Cyclist Safety Study

3.5 Land Use and Development Patterns

Land use data was collected and analyzed within the project study area to determine the nature and intensity of development. To compile this data, a variety of sources were used, including Orange County's InfoMap GIS application, Orange County's GIS Data Hub, the FastTrack Online system, Comprehensive Plan 2010-2030, Florida Land Use and Cover Classification System (FLUCCS), proposed development plans, and desktop reviews.

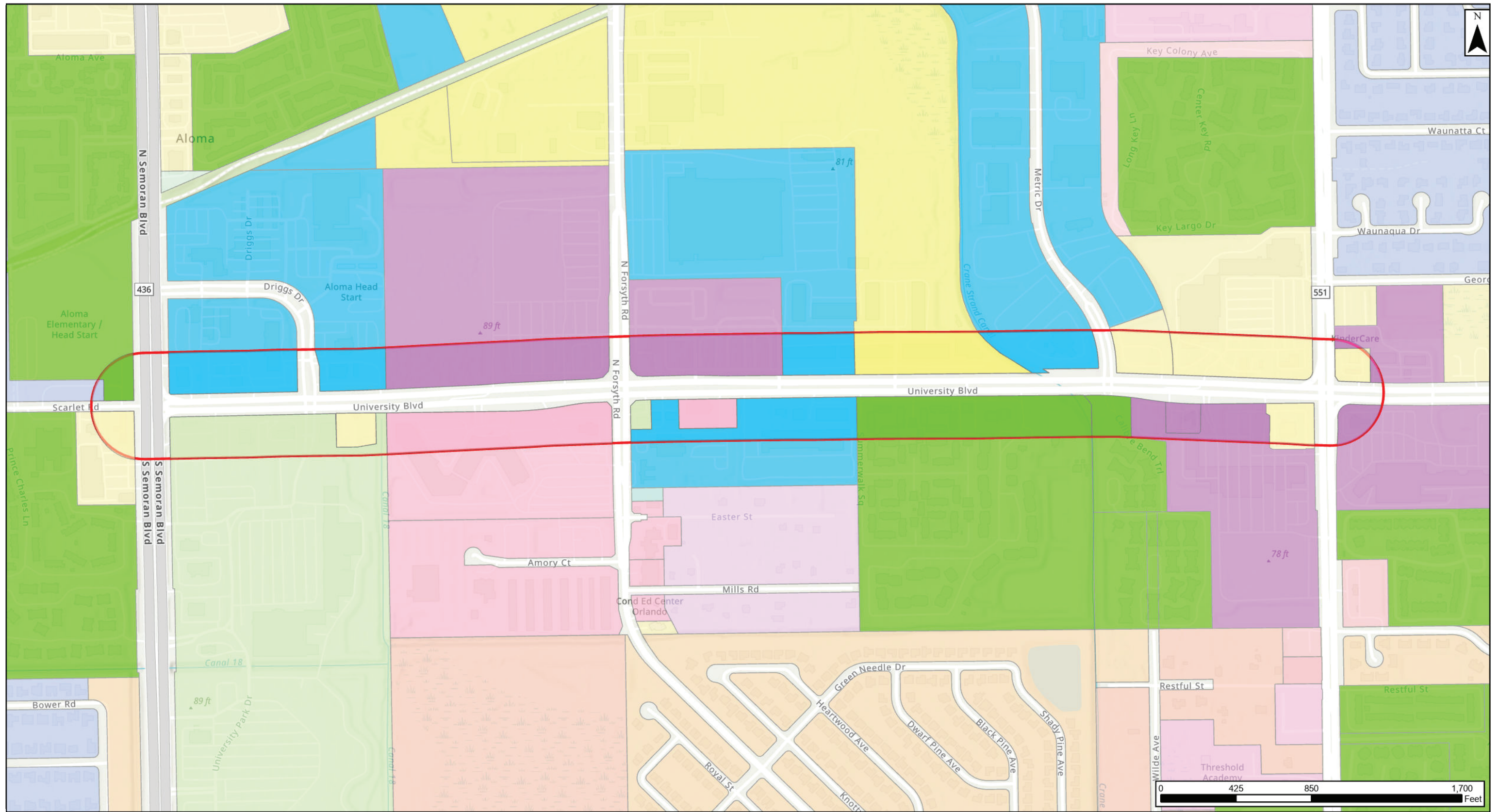
3.5.1 Zoning

Orange County's GIS Data Hub and InfoMap were used to determine the zoning districts located within the study area. **Table 3-20** provides a breakdown of the different zoning districts found along the project corridor. The predominant zoning district within the project area is Industrial (IND-2/IND-3), followed by Planned Development (P-D) and Retail Commercial (C-1).

Table 3-20: Zoning Districts in the Project Area

Map Unit Symbol	Zoning Description	Acres	Percent
C-1	Retail Commercial District	10.31	11%
C-2	General Commercial District	6.03	6%
C-3	Wholesale Commercial District	7.66	8%
IND-2/IND-3	Industrial District (General)	16.26	17%
IND-4	Industrial District (Heavy)	4.51	5%
P-D	Planned Development (PD-RP and PD-UNP)	16.00	16%
R-1A	Single Family Dwelling District	0.05	0%
R-3	Multiple Family Dwelling District	9.16	9%
RW	Roads and Highways	27.94	28%
Total of Project Area		97.92	100%

Figure 3-13, the zoning district map, illustrates the location of each zoning district within the study area boundary.



- | | | |
|--|--|--|
| Study Area (98.76 ac) | C-3 - Wholesale Commercial District | P-D - Planned Development District |
| Zoning | C-1 - Retail Commercial | IND-2/IND-3 - Industrial District (General) |
| C-2 - General Commercial District | IND-4 - Industrial District (Heavy) | R-1A - Single-Family Dwelling Districts |
| | | R-3 - Multiple-Family Dwelling Districts |



Figure 3-13
Zoning Map
 University Boulevard
 Pedestrian/Cyclist Safety Study

3.5.2 Existing and Proposed Land Uses

Land use data was collected and analyzed within the project study area to determine the nature and intensity of development. To compile this data, a variety of sources were used, including Orange County's InfoMap GIS application, Orange County's GIS Data Hub, the FastTrack Online system, Comprehensive Plan 2010-2030, the FLUCCS, proposed development plans, and desktop reviews.

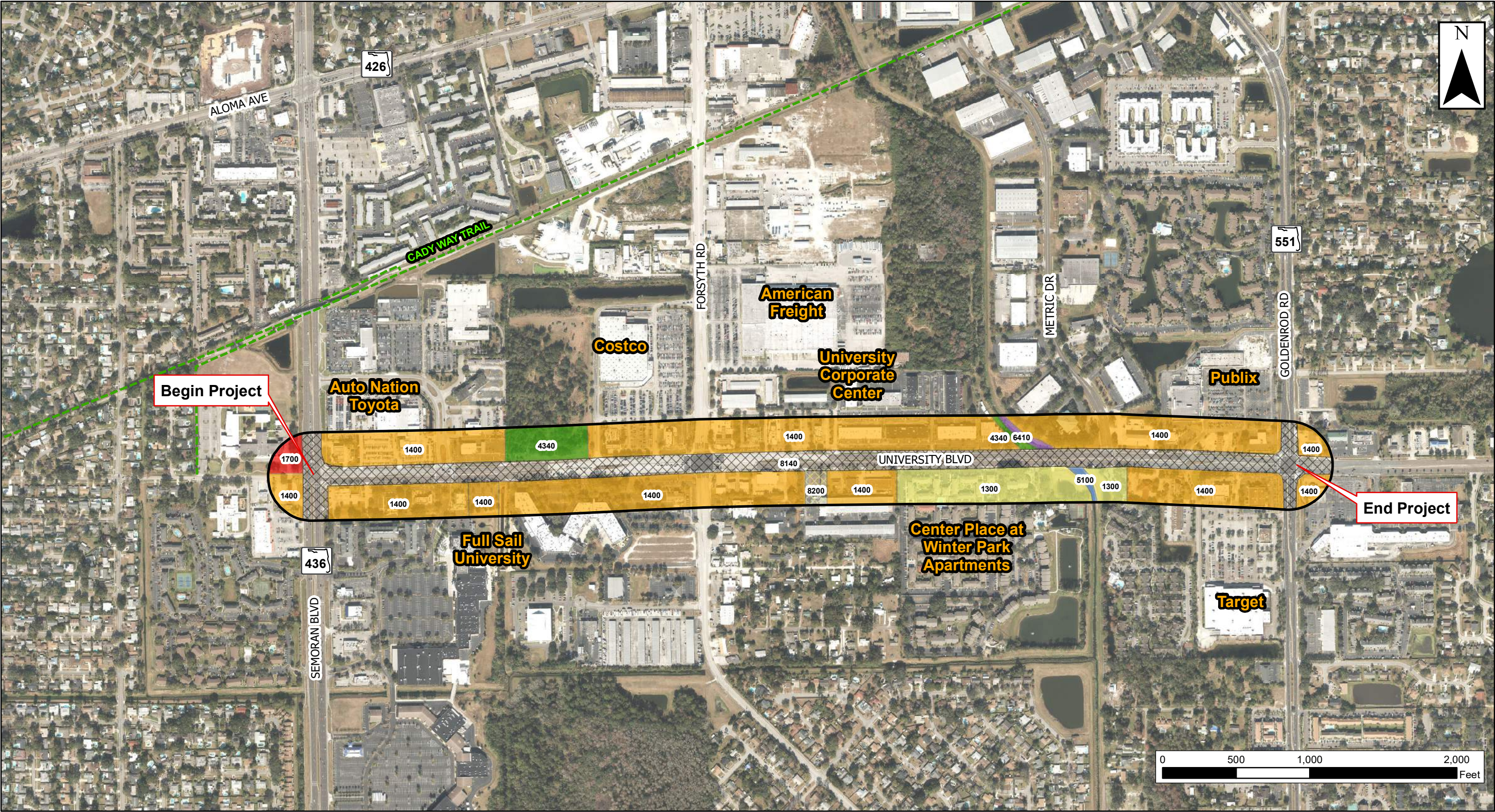
The FLUCCS was used to ascertain existing land uses within the project area. **Table 3-21** provides a summary of the different land use classifications found along the project corridor. Commercial and Services make up a majority of the existing land uses, followed by High-Density Residential and Upland Mixed. Notably, the remaining vacant parcel along the corridor with an Upland Mixed classification is expected to be developed by Full Sail University.

It is worth noting that parcel ID #10-22-30-0000-00-081 was originally classified as land use 8830 (Water Supply Plants) on FLUCCS and was manually changed to 1400 (Commercial and Services) as field verification confirmed it exists as a parking lot to the adjacent Miller's Ale House.

Table 3-21: Existing Land Use in the Project Area

Map Unit Symbol	Land Use Description	Acres	Percent
1300	High Density, 6 or more dwelling units/acre	8.18	8%
1400	Commercial and Services	60.19	61%
1700	Institutional	1.05	1%
4340	Upland Mixed - Coniferous / Hardwood	3.20	3%
5100	Streams and Waterways	0.81	1%
6410	Freshwater Marshes	0.62	1%
8200	Communications	0.79	1%
8140	Roads and Highways	23.08	24%
Total of Project Area		97.92	100%

Figure 3-14, the existing land use map, shows the layout of each land use classification within the study area boundary.



Legend

- Project Buffer 300 ft
- Cady Way Trail

LAND USE

- 1300: High Density, 6 or more dwelling units/acre
- 1400: Commercial and Services
- 1700: Institutional
- 4340: Upland Mixed - Coniferous / Hardwood

- 5100: Streams and Waterways
- 6410: Freshwater Marshes
- 8140: Roads and Highways
- 8200: Communications



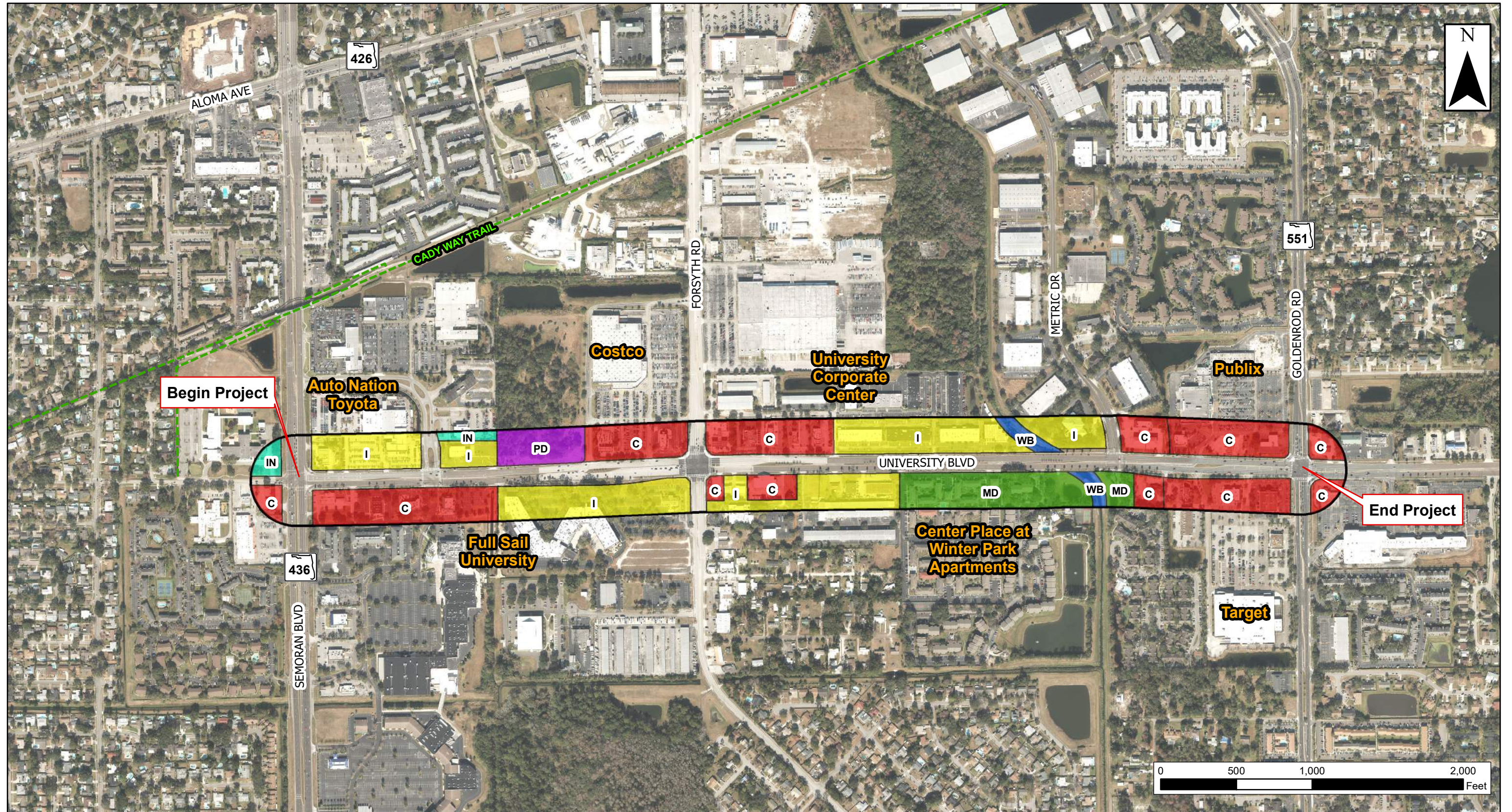
Figure 3-14
Existing Land Use Map
University Boulevard
Pedestrian/Cyclist Safety Study

The County's GIS Data Hub, InfoMap, and Orange County's Comprehensive Plan 2010-2030 were used to determine the planned future land uses found within the study area. **Table 3-22** provides a breakdown of the various future land use designations found along the project corridor. The project area is primarily made up of Commercial (C), followed by Industrial (I) and Medium Density Residential (MD).

Table 3-22: Future Land Use in the Project Area

Map Unit Symbol	Future Land Use Description	Acres	Percent
C	Commercial	30.11	31%
I	Industrial	25.43	26%
IN	Institutional	1.48	1%
MD	Medium Density Residential	7.76	8%
PD	Planned Development	3.35	3%
WB	Water Body	1.51	2%
RW	Roads & Highways	28.28	29%
Total of Project Area		97.92	100%

Figure 3-15, the future land use map, shows the location of each future land use within the study area boundary.



Legend

- | | | |
|-----------------------|------------------------|---------------------------------|
| Project Buffer 300 ft | Future Land Use | MD - Medium Density Residential |
| Cady Way Trail | C - Commercial | PD - Planned Development |
| | I - Industrial | WB - Water Body |
| | IN - Institutional | |



Figure 3-15

Future Land Use Map
University Boulevard
Pedestrian/Cyclist Safety Study

Individual land uses and developments within the study area were identified and are displayed in **Figure 3-16**. Although not within the study area, the future industrial center called University Crossing at Winter Park located north of the study area on Forsyth Road was also included due to the increase in expected truck traffic the development will generate within the study area.

Some of the more noteworthy developments are further described below (**Table 3-23**) and correspond to the numbered parcels in the figure.

Table 3-23: Major Corridor Development in the Project Area

Map Unit Symbol	Development Name	Acres	Acres within Study Area
1	ALOMA ELEMENTARY SCHOOL	13.91	0.85
2	MOBIL GAS STATION/CHIPOTLE	0.87	0.87
6	FUTURE FULL SAIL STUDENT HOUSING	13.14	3.16
25	UNIVERSITY SHOPPES	4.00	0.12
37	UNIVERSITY BUSINESS PARK	6.84	2.01
41	CENTRAL PLACE AT WINTER PARK APARTMENTS	13.90	3.69
42	ALVISTA WINTER PARK APARTMENT HOMES	26.50	2.57
43	CALIBRE BEND APARTMENT HOMES	14.75	0.82
46	UNIVERSITY SQUARE SHOPPING CENTER	19.55	1.03
50	UNIGOLD SHOPPING CENTER	14.30	0.46
51	UNIVERSITY CROSSING AT WINTER PARK	43.43	0.00
Total		171.19	15.58

Aloma Elementary School (1)

At the northwest corner of the Semoran Boulevard and University Boulevard intersection is Aloma Elementary School, with a student population of 499 students as of January 2024. The school is located on 13.91 acres and includes 76,805 square feet of institutional space.

Mobil Gas Station/Chipotle (2)

There are plans to demolish the Mobil gas station (already demolished) and convenience store on the 0.87-acre parcel in the northeast corner of the Semoran Boulevard and University Boulevard intersection and replace it with a Chipotle restaurant and drive-thru (currently under construction). The permit (B22906433) associated with this development was issued on 12/03/24.

Future Full Sail Student Housing (6)

The parcel located west of the Costco (parcel ID# 03-22-30-0000-00-029) was initially proposed to be included as Phase 2 of the Silver City subdivision. Currently, this parcel is undeveloped and not platted but does include three on-site billboards. This 13.14-acre

parcel is planned for future student housing (Phase 1 - 580 beds and 1,800 beds at buildout) and a clubhouse, along with 6,103 square feet of retail, per Orange County Case #DP-24-10-242. Development plans (#DP-24-10-261) were also submitted for a pedestrian bridge across University Boulevard.

University Shoppes (25)

University Shoppes was a shopping center located southwest of the Semoran Boulevard and University Boulevard intersection that was recently demolished. It consisted of 173,825 square feet of combined retail building space on 4.00 acres. Plans for the shopping center to be demolished and rebuilt to accommodate new restaurants and retailers were announced on GrowthSpotter in 2022. County records indicated that plans for the new University Hill development included a 3,850 square foot City BBQ Restaurant (Building Permit #B23905394), a 950 square foot Dutch Bros Coffee shop with drive-thru (Building Permit #B23903383), and a 3,444 square foot Raising Cane's Restaurant with outdoor seating patio, and drive-thru (Building Permit #B23905116). Construction of the University Hill development has been completed and the restaurants and coffee shop are open for business.

University Business Park (37)

University Business Park is located along the south side of University Boulevard on a 6.84-acre parcel. This business park includes a combined total of 83,996 square feet of industrial warehouse space.

Central Place at Winter Park Apartments (41)

Located along the south side of University Boulevard between the Forsyth Road and Goldenrod Road intersections, the Central Place at Winter Park Apartments is a multifamily residential complex with a total acreage of 13.90 acres and 304 dwelling units. It was originally constructed in 1974.

Alvista Winter Park Apartment Homes (42)

Alvista Winter Park Apartment homes is a multifamily residential complex constructed in 1986 with 288 dwelling units and a total acreage of 26.50 acres. It is located along the south side of University Boulevard between the Forsyth Road and Metric Drive intersections.

Calibre Bend Apartment Homes (43)

Calibre Bend Apartment Homes is a multifamily residential complex with 212 dwelling units located along the south side of University Boulevard between the Metric Drive and Goldenrod Road intersections. Originally constructed in 1987, the property has a total acreage of 14.75 acres.

University Square Shopping Center (46)

Located in the southwest corner of the Goldenrod Road and University Boulevard intersection is the University Square Shopping Center which includes a total acreage of 19.55 acres. The shopping center includes a Target as an anchor store located on a 19.55-acre parcel with a building area of 200,000 square feet for big box retail space and a garden center. Additional outparcels within the shopping center include various retail and restaurants, as well as a CVS and an MD Now Urgent Care medical office.

Unigold Shopping Center (50)

The Unigold Shopping Center is located at the southeast corner of the Goldenrod Road and University Boulevard intersection. The shopping center includes 14.30 acres and 174,231 square feet of combined retail space. Major retailers at the shopping center include a Ross Dress for Less retail clothing store, and a vacant anchor space that was formerly Lucky's Market, a big box supermarket that went out of business.

University Crossing at Winter Park (51)

University Crossing at Winter Park is a 43.43-acre industrial distribution center located on Forsyth Road, north of the Forsyth Road and University Boulevard intersection. The industrial center includes four warehouses with a combined 506,837 square feet (Permit #B20906134). Two buildings (Building 100 and Building 200) are located on the land previously occupied by a Sears warehouse. Buildings 300 and 400 are located east of Buildings 100 and 200, on what was previously undeveloped land. In September 2023, AutoNation Toyota Winter Park submitted a commercial permit application for the interior remodel and build-out of Building 300 for Toyota car-services, including service bays for cars and a carwash. The site and the warehouses received their certificate of completion in May 2024.

The development of University Crossing at Winter Park included a new driveway and the construction of a signalized intersection on Forsyth Road at the north Costco access road and the future industrial center driveway. Plans for the signalized intersection were approved in June 2023, and included median modifications, pavement markings, and curb ramps. The traffic signal is now operational.

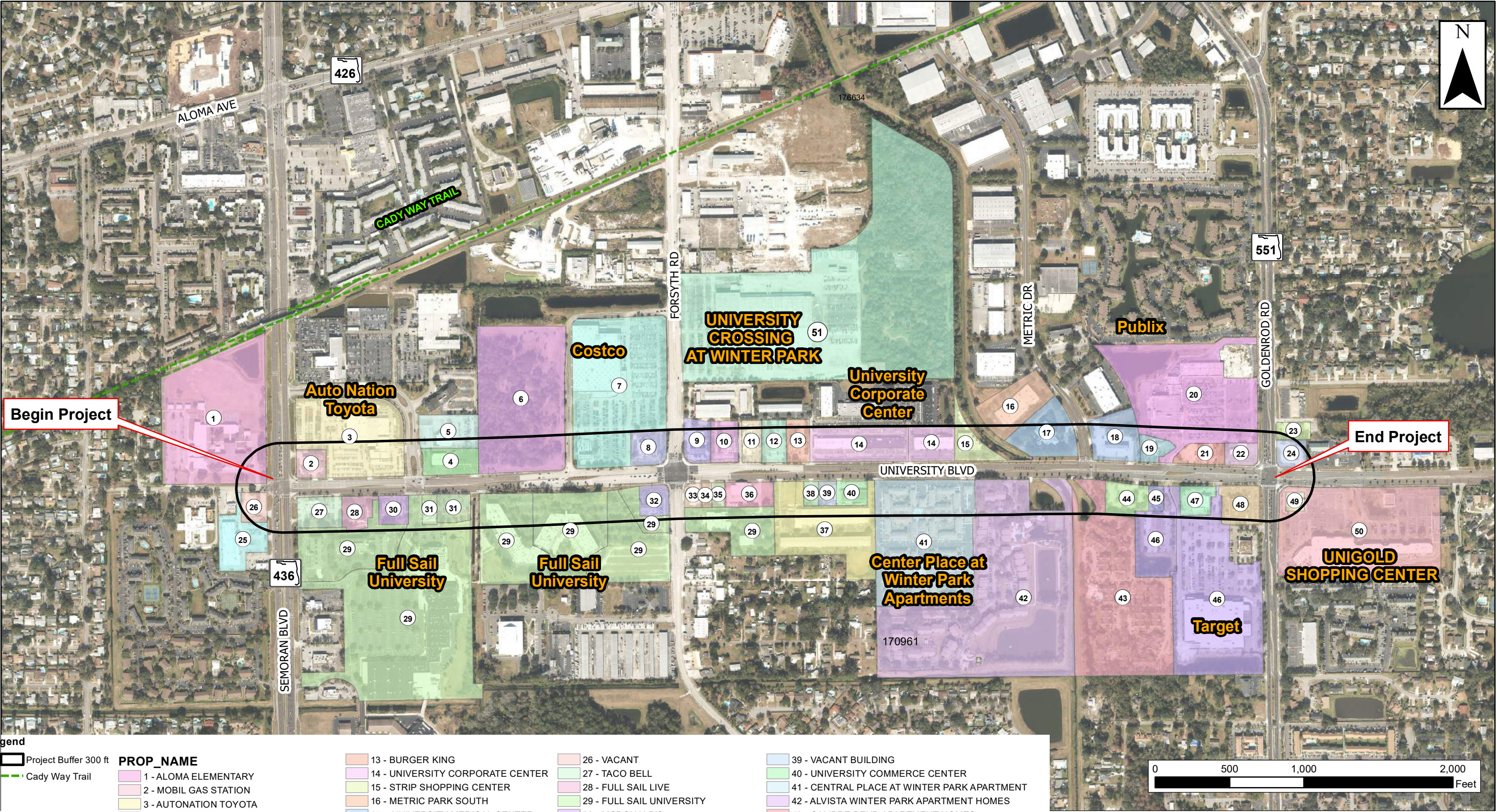


Figure 3-16
Existing and Proposed Developments
University Boulevard Pedestrian/Cyclist
Safety Study

3.5.3 Conformance with Transportation and Long-Range Plans

The below sections describe the local transportation plans and transportation studies close to the University Boulevard study corridor. See **Figure 3-17** for a map of proposed transportation projects adjacent to the study corridor.

3.5.3.1 *MetroPlan Orlando 2045 Metropolitan Transportation Plan*

The MetroPlan Orlando 2045 MTP is the MPO's Long Range Transportation Plan (LRTP). The MTP was adopted on December 9, 2020, and revised on February 14, 2024.

A roadway widening project for Goldenrod Road between SR 50 (Colonial Drive) and University Boulevard (MTP ID#2201) is included in the Cost Feasible Plan. The project is scheduled for Planning Period I (2026-2030) and Planning Period II (2031-2035) with an estimated total project cost of \$25.85 million (includes Project Development & Environment [PD&E]; design; ROW; environmental; construction; and Construction Engineering and Inspection [CEI] costs in 2020 dollars).

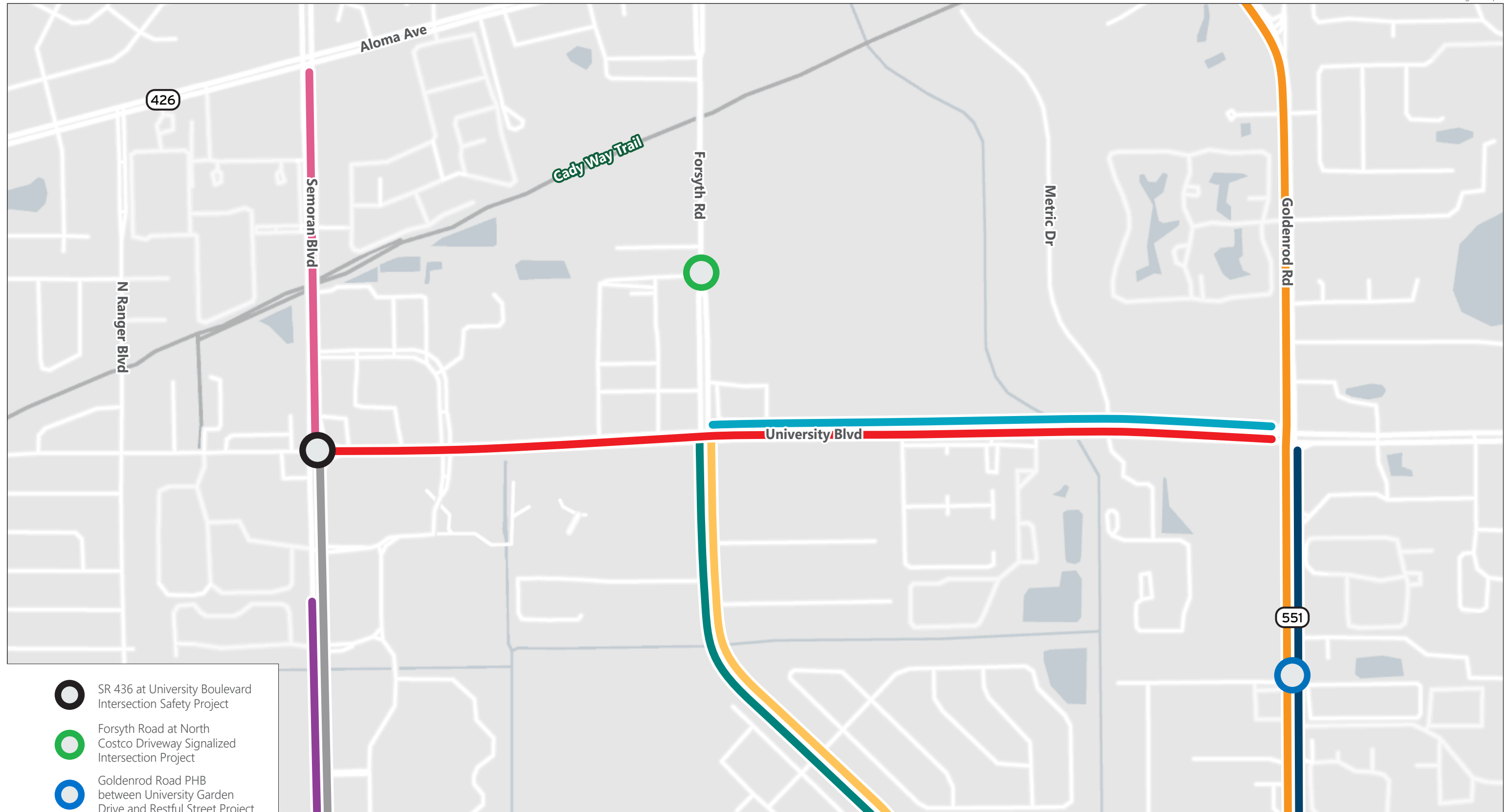
An operational/safety project for Semoran Boulevard between Colonial Drive and University Boulevard (MTP ID#2035) is included in the MTP. The project is currently unfunded. The estimated total project cost is \$13.326 million (includes design, ROW, environmental, construction, and CEI costs in 2020 dollars). An operational/safety project for Semoran Boulevard between University Boulevard and SR 426 (Aloma Avenue) (MTP ID#2046) is included in the MTP. The project is currently unfunded. The estimated total project cost is \$2.39 million (includes design, ROW, environmental, construction, and CEI costs in 2020 dollars).

An operational/safety project for Forsyth Road between Colonial Drive and University Boulevard (MTP ID#3249) is included in the MTP. The project is currently unfunded. The estimated total project cost is \$10.45 million (includes design, ROW, environmental, construction, and CEI costs in 2020 dollars).

An operational project for Forsyth Road between Hanging Moss Road and University Boulevard (MTP ID#7214) is included in the MTP Cost Feasible Plan. The project is scheduled for Planning Period II (2031-2035). The estimated total project cost is \$1.68 million (includes design, ROW, environmental, construction, and CEI costs in 2020 dollars).

An operational project for University Boulevard between Forsyth Road and Goldenrod Road (MTP ID#7256) is included in the MTP Cost Feasible Plan. The project is scheduled for Planning Period III (2036-2045). The estimated total project cost is \$1.51 million (includes design, ROW, environmental, construction, and CEI costs in 2020 dollars).

Relevant pages from the MetroPlan MTP are included in **Appendix G**.



- SR 436 at University Boulevard Intersection Safety Project
- Forsyth Road at North Costco Driveway Signalized Intersection Project
- Goldenrod Road PHB between University Garden Drive and Restful Street Project



- University Boulevard Pedestrian/Cyclist Safety Study
- SR 436 Operational/Safety Project between University Boulevard and SR 426
- SR 436 Operational/Safety Project between SR 50 and University Boulevard
- Goldenrod Road Resurfacing Project between SR 408 and SR 426
- Goldenrod Road Widening Project between SR 50 and University Boulevard

- University Boulevard Operational Project between Forsyth Road and Goldenrod Road
- Forsyth Road Operational/Safety Project between SR 50 and University Boulevard
- Forsyth Road Operational Project between Hanging Moss Road and University Boulevard
- SR 436 Bike Lane/Sidewalk Project between North of Old Cheney Highway and South of University Park Drive



Figure 3-17

Adjacent Projects
University Boulevard
Pedestrian/Cyclist Safety Study

3.5.3.2 MetroPlan Orlando Transportation Improvement Program

The purpose of MetroPlan Orlando's TIP is to identify all federal and state funded transportation projects that have been scheduled for implementation in the Orlando Urban Area (Orange, Seminole and Osceola Counties) during the FY 2023/24- 2027/28 time period. The TIP was adopted on July 12, 2023, and amended on March 13, 2024.

A safety project (FPN 451256-1) is proposed at the intersection of University Boulevard and Semoran Boulevard and is included in the TIP. The project involves improving signal head visibility, reconstructing the diagonal span traffic signal with a box span and concrete strain pole supports, improving the visibility of the crosswalk pavement markings, and potential signalization of the free flow right turn lanes and the addition of blank-out signs. The TIP indicates that the preliminary engineering will be completed in FY 2024/2025, with the construction phase to be completed in FY 2026/2027. The project is fully funded, with the preliminary engineering phase costing \$460,000, and the construction phase costing \$785,000, for a total project cost of \$1,245,000. FDOT is identified as the responsible agency.

A bike lane/sidewalk project (FPN 445303-1) is proposed on Semoran Boulevard between north of Old Cheney Highway and north of University Park Drive/Antique Oaks Circle and is included in the TIP. This project involves repaving the roadway and implementing strategies to increase safety for all users along the project corridor. This includes narrowing lane widths, placing a barrier curb, changing right turn movements in some areas, modifying driveways, installing traffic calming landscaping, and signing and pavement marking improvements. A midblock crossing with a Pedestrian Hybrid Beacon (PHB) will also be installed at University Park Drive as part of this project. The TIP indicates that the preliminary engineering and construction phases will be completed in FY 2023/2024. The project is fully funded for a total project cost (including construction phase) of \$624,000. The project is estimated to be completed in Spring 2025 (majority of the construction has already taken place) and will not impact the study intersection of University Boulevard and Semoran Boulevard. FDOT is identified as the responsible agency.

The development of University Crossing at Winter Park includes a new driveway and the construction of a signalized intersection on Forsyth Road at the north Costco access road and the future industrial center driveway. Plans for the signalized intersection were approved in June 2023 and include median modifications, pavement markings, and curb ramps. The traffic signal is now operational.

A PHB along Goldenrod Road south of University Boulevard between Restful Street and University Garden Drive is currently under design and is programmed for construction in FY 2026.

The relevant pages from the MetroPlan TIP are included in **Appendix G**.

3.5.3.3 MetroPlan Orlando Complete Streets Policy

The MetroPlan Orlando Complete Streets Policy was adopted in March 2020. The policy states that MetroPlan Orlando shall fund and support the planning, design, and construction of Complete Streets that consider the needs of everyone within the MetroPlan Orlando planning area and authority. Complete Streets are planned, designed, constructed, operated, and maintained to safely and comfortably accommodate people of all ages and abilities. This includes but is not limited to pedestrians, bicyclists, transit users, motorists, micromobility users, rideshare users and freight and service operators. The Complete Streets program recognizes that depending on context, streets may serve diverse activities, functions, and intensity of uses.

The goals of the MetroPlan Orlando Complete Streets Policy are:

1. Create a complete, connected network of streets, roads, and trails that safely and comfortably serves every type of system user;
2. Provide safe and comfortable transportation options for vulnerable users of all ages and abilities;
3. Support redevelopment of and connectivity to activity centers; and
4. Provide safe, comfortable, and effective access to transit through walking and bicycling.

The relevant pages from the MetroPlan Complete Streets Policy are included in **Appendix G**.

3.5.3.4 FDOT Five-Year Work Program

Each year, FDOT develops the Five-Year Work Program in accordance with Section 339.135, Florida Statutes. The Five-Year Work Program is an ongoing process that is used to forecast the funds needed for upcoming transportation system improvements scheduled for the next five years. The development of this Work Program involves extensive coordination with local governments, including Metropolitan Planning Organizations (MPOs) and other city and county officials. The current FDOT Five-Year Work Program is from FY 2024-2028.

The FDOT Five-Year Work Program includes two projects near the study corridor including, the safety project at Semoran Boulevard and University Boulevard/Scarlet Road

(FM #451256-1) and the bike lane/sidewalk project (FPN 445303-1) proposed on Semoran Boulevard between north of Old Cheney Highway and north of University Park Drive/Antique Oaks Circle. The majority of the bike lane/sidewalk project (FPN 445303-1) has already been completed. The details of these two projects are included in above section 3.5.3.2.

See **Appendix G** for the signing and pavement marking plans from this project.

The relevant pages from the FDOT Five-Year Work Program are included in **Appendix G**.

3.5.3.5 Orange County Comprehensive Plan: Vision 2050

The Orange County Comprehensive Plan serves as a means to guide and direct development within Orange County. In the latest update to the Comprehensive Plan, Orange County initiated a major overhaul of the plan, titled Vision 2050, with more focus on sustainable transportation systems and development planning. Vision 2050 is currently in draft form and is subject to change until adoption by Orange County Board of County Commissioners (BCC), with the draft document most recently amended in August 2023. The following transportation policies, based on Vision 2050 Chapter 7: Transportation, support the objectives of this Pedestrian and Cyclist Safety study:

Vision 2050 Chapter 7: Transportation – Relevant Policy Objectives:

OBJ T 1.4: MULTIMODAL INFRASTRUCTURE; The County will support the infrastructure and service improvements necessary to increase mobility options for all users, address costs associated with usage, promote safety for all modes of the transportation system, and promote the use of transit, bicycle, and pedestrian facilities, including multi-use trails. (Amended 11/16, Ord. 2016-28) (OBJ T3.3)

OBJ T 1.5: TRANSIT; The County will partner with LYNX, SunRail and other established transit providers to implement a comprehensive multimodal transit system that offers efficient, convenient, and reliable travel options to residents, employees, and visitors throughout Orange County.

OBJ T 3.2: MULTIMODAL CORRIDORS; The County will coordinate infrastructure planning for next-generation transportation corridors that include multiple transportation modes and emerging technologies with all appropriate local, regional, and state agencies.

OBJ T 3.3: MULTIMODAL SYSTEM; The County will coordinate land use and infrastructure planning to support multiple modes and emerging technologies, in order to facilitate the safe and efficient movement of goods and people.

OBJ T 4.1: VISION ZERO; The County shall continue to develop policies, construct multimodal improvements, and implement safety countermeasures on the transportation network to achieve its Vision Zero goal of preventing serious injuries and all traffic-related fatalities while ensuring the safety of all roadway users.

OBJ T 4.2: SAFETY AND EQUITY; Orange County shall continue to provide and promote a safe integrated network of transportation options for all roadway users, including roadway and transit users, pedestrians, and bicyclists, underserved populations and the transportation disadvantaged, with adjacent municipalities and other transportation providers to enhance transportation equity and environmental justice.

Note, there are numerous sub-policies which fall under each of the above, which further details the specific methods, technologies, and measures-of-effectiveness (MOEs) to achieve each objective, and also how the objectives tie in with other Orange County plans. The relevant pages from the Draft Vision 2050 Document are included in **Appendix G**.

3.5.3.6 Orange County Pedestrian & Bicycle Safety Action Plan

Orange County's Walk-Ride-Thrive! Pedestrian safety program includes Orange County's first Pedestrian and Bicycle Safety Action Plan (PBSAP). The first phase of the PBSAP, completed in 2018, accomplished the following:

- Documented the County's extensive pedestrian and bicycle safety efforts to date.
- Analyzed crash data and crash typing to identify location and behavioral factors that contribute to crashes.
- Reviewed the engineering design features that Orange County currently uses or could adopt to decrease crashes on County roadways.
- Coordinated with regional partners, including MetroPlan Orlando, Bike/Walk Central Florida (BWCF), Orange County Public Schools, and LYNX.

The next phase of the PBSAP includes public outreach to Orange County residents and organizations to present findings and obtain their input and recommendations on improving bicycle and pedestrian safety in Orange County.

3.5.3.7 Orange County Trails Master Plan

Orange County adopted their Trails Master Plan in July 2022. The Orange County Trails Master Plan focuses on the County's mainline trails, a network of wide, paved, multi-purposed trails that form the primary network of Orange County's bikeways and trails system.

The Orange County Trails Master Plan reviews the existing conditions and recent changes to the trail network. Additionally, the Master Plan provides conceptual plans for eight

mainline trails. None of the proposed eight trails intersect or approach the University Boulevard study corridor. While Cady Way Trail is identified as an existing trail within the plan, no proposed improvements or concepts are proposed for Cady Way Trail within the Orange County Trails Master Plan. This study will evaluate ways to provide pedestrian and bicycle connections to Cady Way Trail.

The relevant pages from the Master Plan are included in **Appendix G**.

3.5.3.8 LYNX Transit Development Plan

The LYNX TDP documents future transit improvements throughout the LYNX service area on a ten-year planning horizon. Transit improvements may include new routes, expanded hours of operation, or increased frequencies. The LYNX TDP identifies Semoran Boulevard between Orlando International Airport and University Boulevard as a high-capacity corridor. The LYNX TDP states the need to increase high frequency service on Semoran Boulevard on proposed Route 201 to a headway between 15-20 minutes with an increase in average stop spacing. Additionally potential infrastructure improvements on proposed Route 201 include walk-up stations, community stations, enhanced facilities connections and access, signal timing and coordination, transit signal priority, dedicated lanes, and park and ride facilities. Additionally, the LYNX TDP identifies Full Sail University as a needed transfer center that is required to support the 10-year TDP service plan.

3.5.3.9 LYNX SR 436 Transit Corridor Study

The LYNX SR 436 Transit Corridor Study was completed in 2019. The study was conducted to identify and advance solutions to improve transit service along the Semoran Boulevard corridor between Orlando International Airport and SR 434. This transit route would intersect University Boulevard at the western intersection of the study area. As a short-term solution, the study recommended limited-stop bus service from Orlando International Airport to the Altamonte Springs SunRail station. As a long-term solution, the study recommends the implementation of BRT between Orlando International Airport and the Altamonte Springs SunRail station. This would involve using dedicated bus stations (as opposed to bus stops), decreased headway, and dedicated BRT and/or business access and transit (BAT) lanes. The relevant pages from the Transit Corridor Study are included in **Appendix G**.

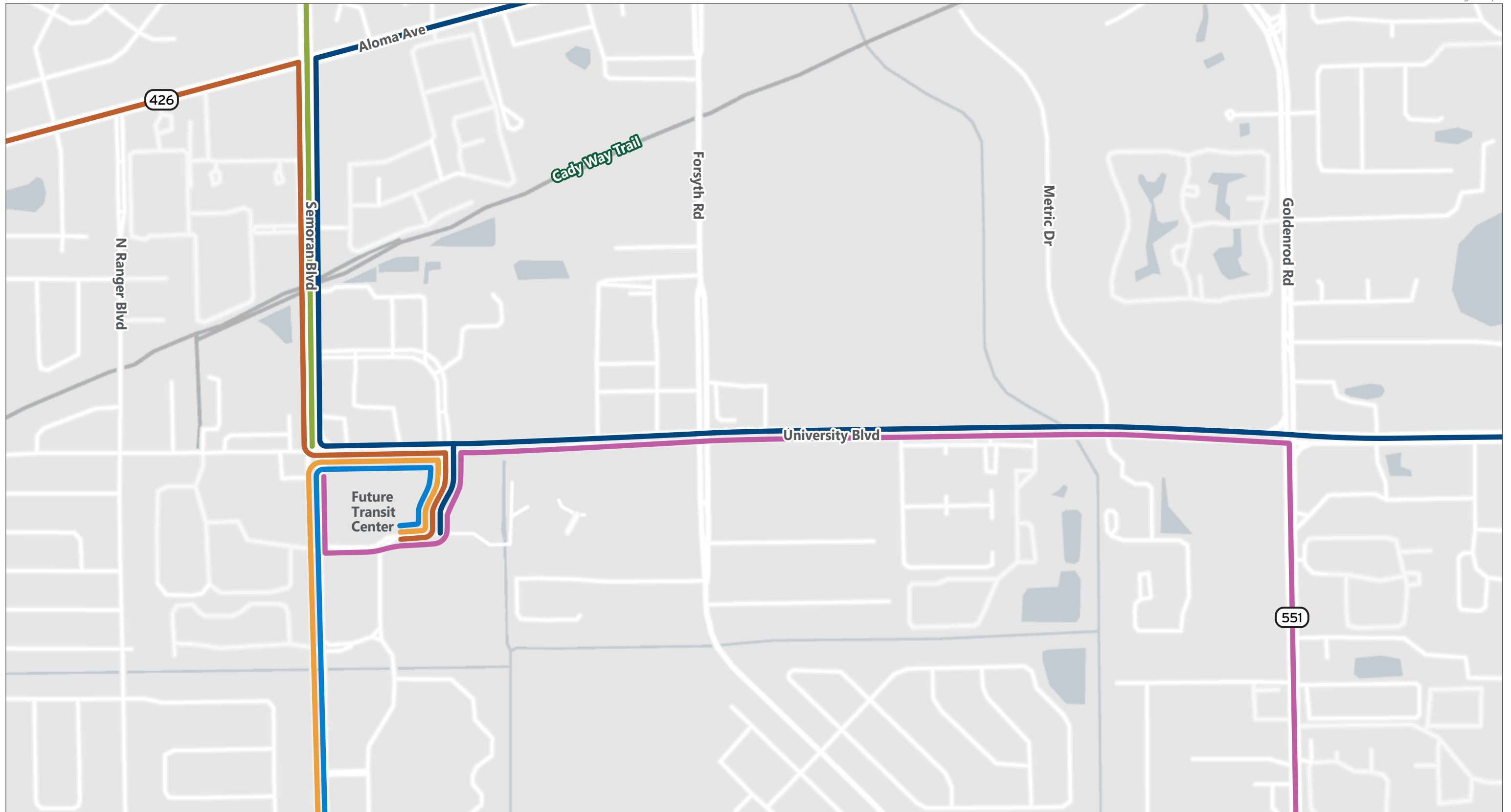
3.5.3.10 Potential LYNX Transit Routes

Based on coordination with LYNX, it was determined that there are 85 potential LYNX routes and five phased NeighborLink Zones within Orange County. Six of these potential transit routes, one NeighborLink Zone, and future transit center (located in the southeast

corner of University Boulevard and Semoran Boulevard) are near the University Boulevard study area.

LYNX Link 101A is a future potential transit route that is proposed to operate north-south service along Semoran Boulevard between Full Sail University and Orlando International Airport Terminal C. The route would intersect the study corridor at the intersection of University Boulevard and Semoran Boulevard. Service for this route would run Monday through Sunday. LYNX Link 201 is a future potential transit route that is proposed to operate north-south service along Semoran Boulevard between Full Sail University and Nemours Children's Hospital. The route would intersect the study corridor at the intersection of University Boulevard and Semoran Boulevard. Service for this route would run Monday through Sunday. LYNX Link 436N Extended is a future potential transit route that is proposed to operate north-south service along Semoran Boulevard between University Boulevard and the Apopka SuperStop. The route would intersect the study corridor at the intersection of University Boulevard and Semoran Boulevard. Service for this route would run Monday through Sunday. LYNX Links 501 and 503 are proposed to run along the entire study corridor with a connection to the future transit center. LYNX Link 522 is a future potential transit route that is proposed to operate east-west service primarily along Aloma Avenue and University Boulevard between Clayton Crossing Way and UCF Campus Superstop. The route would operate along the entire length of the study corridor. Service for this route would run Monday through Sunday. See **Figure 3-18** for a map of the future LYNX transit service.

In addition to the fixed transit routes listed above, the Orange County Transit Plan includes several phased NeighborLink Zones. NeighborLink Zone Phase 3 intersects the western half of the study area, and includes the areas surrounding Full Sail University, Baldwin Park, Orlando Fashion Square, Colonial Plaza, Winter Park High School, and Ward Park.



- LYNX 101A
- LYNX 201
- LYNX Link 436N Extended

- LYNX 501
- LYNX 503
- LYNX 522



Figure 3-18
Future Transit Service
University Boulevard
Pedestrian/Cyclist Safety Study

3.6 Cultural Features

3.6.1 Trails

There are no existing trails along University Boulevard within the study corridor. The Cady Way Trail is located just north of the study corridor, which provides a 12-foot-wide urban trail connecting Fashion Square Mall to the Cross Seminole Trail. More information on Cady Way Trail is included in Section 3.1.11.3.

3.6.2 Business/Commercial Activity Centers

AutoNation Toyota Winter Park is located on the north side of University Boulevard at the western end of the project corridor. Across the street from AutoNation Toyota Winter Park are restaurant establishments including Taco Bell, McDonald's, and Miller's Ale House.

Costco is located at the northwest quadrant of the intersection of University Boulevard and Forsyth Road. At the southwest corner of this intersection is Full Sail University, one of the largest employers in Orange County. Near the northeast corner of this intersection is American Freight, which is a large warehouse owned by Costco. Currently, the site is undergoing redevelopment and under construction to include four warehouses. Just east of this intersection is University Corporate Center, which contains multiple small businesses and shops. Additionally, near this intersection are restaurant establishments including Chick-fil-A, Sonny's BBQ, Perkin's Restaurant, and Zaxby's.

At the northwest quadrant of the intersection of University Boulevard and Goldenrod Road is a shopping center with a Publix (one of the largest employers in Orange County) along with several restaurants and businesses. At the southeast corner of this intersection is a shopping center which includes Ross, Regions Bank, several restaurants, and small businesses. At the southwest corner of this intersection is a shopping center with a Target and CVS.

Other notable businesses located on or near the project corridor include Lexus of Winter Park, CubeSmart Self Storage, United States Postal Service, Orange County Fire HQ, and several medical offices.

3.6.3 Residential

The largest residential complex along the study corridor is Central Place at Winter Park Apartments, a 304-unit apartment complex. Central Place at Winter Park Apartments has its only two access points on University Boulevard, approximately halfway between Forsyth Road and Metric Drive.

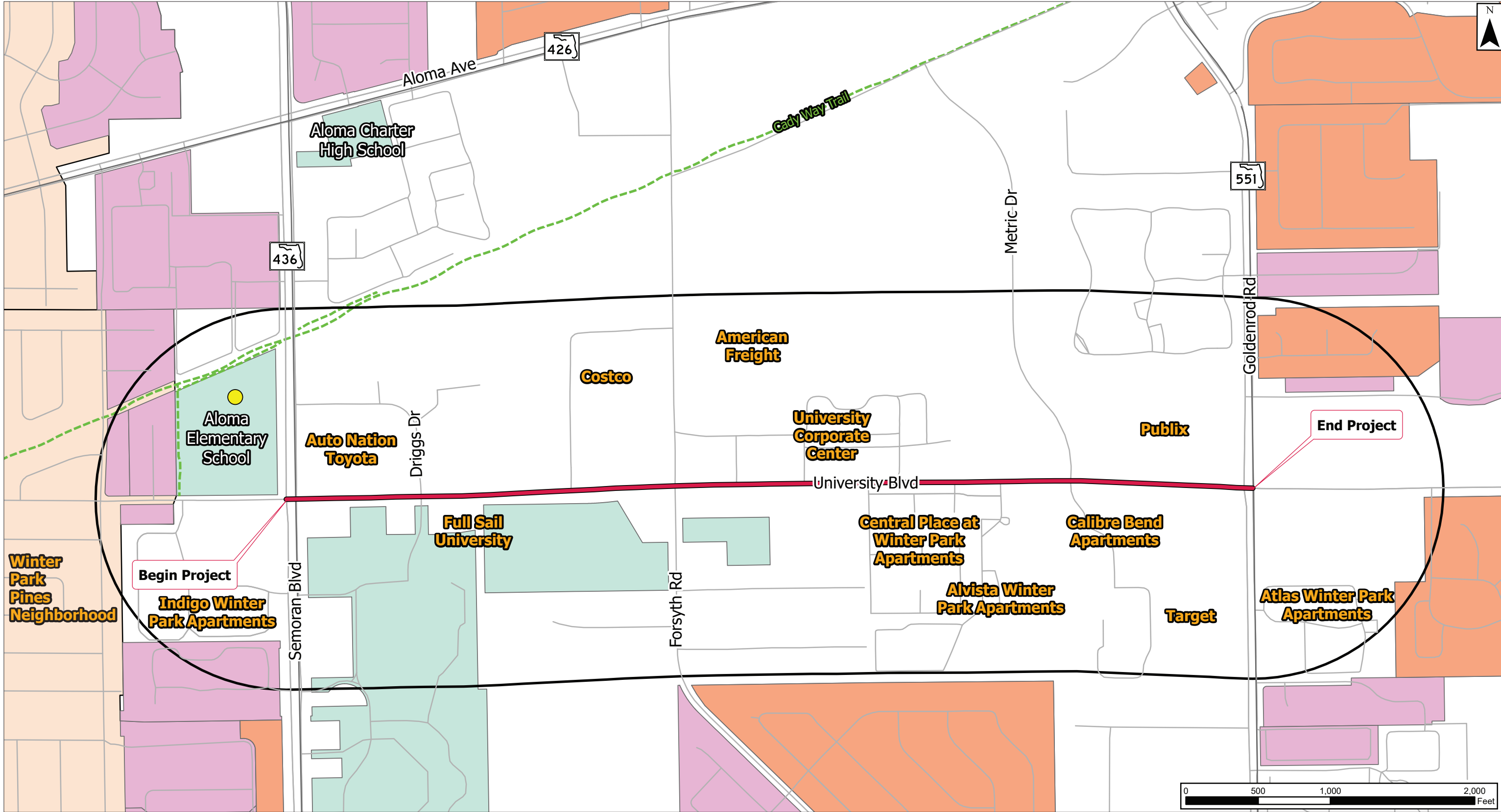
Additionally, just east of Central Place at Winter Park Apartments is Alvista Winter Park, a 288-unit apartment complex. Alvista Winter Park has its only access point on University Boulevard and is located just east of Central Place at Winter Park Apartments.

Just east of Alvista Winter Park is Calibre Bend Apartments, a 212-unit apartment complex. Calibre Bend Apartments has its only access point on University Boulevard, located at the intersection of University Boulevard and Metric Drive.

Just west of the study corridor, at the southwest corner of the intersection between University Boulevard and Semoran Boulevard, is Indigo Winter Park, a 319-unit apartment complex. Indigo Winter Park has an access point along Semoran Boulevard and on Scarlet Road.

Just east of the study corridor, near the southeast corner of the intersection between University Boulevard and Goldenrod Road, is Atlas Winter Park, a 319-unit apartment complex. Atlas Winter Park has its only access point along Goldenrod Road, just south of Unigold Shopping Center.

The study corridor also serves as the eastern access point for the Winter Park Pines Neighborhood subdivision at the intersection of University Boulevard and Semoran Boulevard. See **Figure 3-19** for the Sociocultural Resources Map of the study corridor.



- Head Start Center
- Schools (2023)
- Community Organizations
- Neighborhood Organizations
- Residential Subdivisions
- Cady Way Trail
- Study Corridor
- University Boulevard Safety Study - 1/4 Mile Buffer



Figure 3-19
Sociocultural Resources Map
University Boulevard
Pedestrian/Cyclist Safety Study

3.7 Environmental

3.7.1 Archeological and Historic Features

A cultural resource assessment was performed for the study, including all known ROW for the length of the project. This assessment presents information on archaeological and historic resources, which has been compiled via background research and desktop review of previously recorded environmental, archaeological, and historic structures data; no field survey or reconnaissance was conducted as part of this planning effort. Historical and archaeological background research was conducted primarily through a database review of Florida Master Site File (FMSF) records, as well as a review of available Orange County Property Appraiser information.

The study area includes an urban and significantly developed portion of roadway with limited grassy areas in the corridor. Low lying wet areas are present to the north, northeast, and southeast, with Lake Waunatta and Lake Nan lying further to the east, but outside the study area. A drainage canal extends through the study area between the intersections of Sutton Place Boulevard and Metric Drive/Calibre Bend Trail.

Based on physiographic site characteristics and disturbance due to historic farming activities and residential development, precontact site probability within the study area is believed to be low. Land within the corridor has experienced modern growth within its rural environment, with a review of historic aerial photographs suggesting the area remained mostly undeveloped prior to the start of the twenty-first century. The probability of encountering historic period archaeological sites is considered moderate due to redevelopment efforts that have resulted in the destruction of the previously existing farmsteads along the corridor since the 1960s. There have been no previously identified archaeological sites within the study area or within a 1-mile buffer of the study corridor. An archaeology records search did not identify any previous surveys conducted within the study area.

The study area was also scanned for historic resources, which started with a FMSF search. No previously identified historic resources were identified. Orange County tax assessor records indicate the presence of approximately seven newly identified historic resources within the study area that were constructed in 1974 or earlier. These would require survey from a Secretary of the Interior qualified historian. **Appendix F** contains the results of the Cultural Resource Assessment Desktop Analysis.

3.7.2 Hydrologic and Natural Features

Hydraulic and natural features include natural features such as wetlands, surface waters (man-made or natural) as well as designated Federal Emergency Management Agency (FEMA) floodplains and floodways. These features were identified using available spatial databases and verified during field reviews. A summary of our findings as well as a qualitative assessment of wetland and/or surface waters present within the study area is presented in subsequent sections of the report.

3.7.2.1 Wetlands and Other Surface Waters

The extent of wetlands and surface waters within the study area was determined via a desktop GIS analysis using a combination of the St. Johns River Water Management District (SJRWMD) Land Use/Land Cover data, U.S. Fish and Wildlife Service National Wetlands Inventory (USFWS NWI) data, and USDA NRCS soils data. The information obtained from these resources was field verified by VHB scientists following applicable state and federal delineation methodologies.

The NWI dataset depicts a Freshwater Palustrine, Emergent, Persistent, Seasonally Flooded, Partly Drained/ditched wetland (PEM1Cd) present along the western margin of the Crane Strand Canal north of University Boulevard (SW13). The field review indicated that the mapping of a wetland feature in this area was not accurate. No wetlands were identified within the project area.

The GIS desktop review and subsequent field visits identified 16 surface water features within the study area (listed in **Table 3-24**). Most of these features are man-made, stormwater features including swales, ditches, and ponds. However, two of the surface waters are larger drainage canals. The Crane Strand Canal (SW7, SW13) is a man-made canal that crosses University Boulevard west of the intersection of University Boulevard and Metric Drive/Calibre Bend Trail, near the western terminus of the study area. The bank slopes are steep and regularly maintained. This feature is classified by the NWI as Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded, Excavated System (R2UBHx) (Cowardin et al. 1979).

SW4 is a man-made canal located adjacent to University Boulevard just east of the Driggs Drive intersection. This surface water is classified by the NWI as Riverine Unknown Perennial Unconsolidated Bottom Perennially Flooded, Excavated, (R5UBFx) (Cowardin et al. 1979). The canal is approximately 40-ft wide (top of bank). Slopes have been armored with concrete revetment mats.

Table 3-24: Surface Waters Within the Study Area

Surface Water ID	FLUCCS CODE	FLUCCS Description	Wetland and Deepwater Habitat Classification Code	Acres
SW 1	510	Stormwater Ditch	-	0.01
SW 2	510	Stormwater Ditch	-	0.02
SW 3	531	Artificial Impoundment/Reservoir	-	0.05
SW 4	510	Canal	R5UBFx	0.23
SW 5	510	Stormwater Ditch	-	0.05
SW 6	531	Artificial Impoundment/Reservoir	-	0.31
SW 7	510	Canal	R2UBHx	0.51
SW 8	531	Artificial Impoundment/Reservoir	-	0.12
SW 9	510	Stormwater Ditch	-	0.07
SW 10	510	Stormwater Ditch	-	0.05
SW 11	510	Stormwater Ditch	-	0.14
SW 12	510	Stormwater Ditch	-	0.03
SW 13	510	Canal	R2UBHx, PEM1Cd	0.58
SW 14	531	Artificial Impoundment/Reservoir	-	0.01
SW 15	510	Stormwater Ditch	-	0.01
SW 16	510	Stormwater Ditch	-	0.05
Total				2.24

3.7.2.2 Wetland and Surface Water Qualitative Assessment

As previously discussed, the surface water features within the study area are man-made features (canals, ditches, swales, and ponds) ranging from 0.01 ac to 0.58 ac in size. Most of the surface waters are part of permitted stormwater management systems (SWMS) and are not hydrologically connected to natural systems. SW4, SW7 and SW13 are not part of a permitted SWMS and appear to be hydrologically connected to the Little Econlockhatchee River. State and Federal rules and regulations may require permits and mitigation for any work in, on, or over these features. Mitigation requirements to wetlands or surface waters are determined based on the loss of ecological function associated with the proposed activity.

In Florida both state and federal agencies determine the ecological function of wetlands and potential loss due to permitted activities using the Uniform Mitigation Assessment Methodology (UMAM) as provided in Chapter 62-345 of the Florida Administrative Code (F.A.C.). UMAM assessments include two parts: a qualitative description (Part I) and a quantification (Part II) for each assessment area. Part I provides a description of the native community type and current condition of the assessment area, including details such as anticipated wildlife usage; potential listed species usage; significant nearby features; uniqueness or rarity of the habitat; and geographic relationship and hydrologic connection with wetlands, other surface waters and uplands. Part II provides

quantification of the current (or without mitigation) and anticipated condition (after project) using numerical scoring of the location and landscape support, water environment, and the community structure. Scoring ranges from 0 to 10 per category, where each point represents a 10% change in perceived function of the assessment area compared to the optimal reference habitat. The scores are then applied to the Assessment Area (AA).

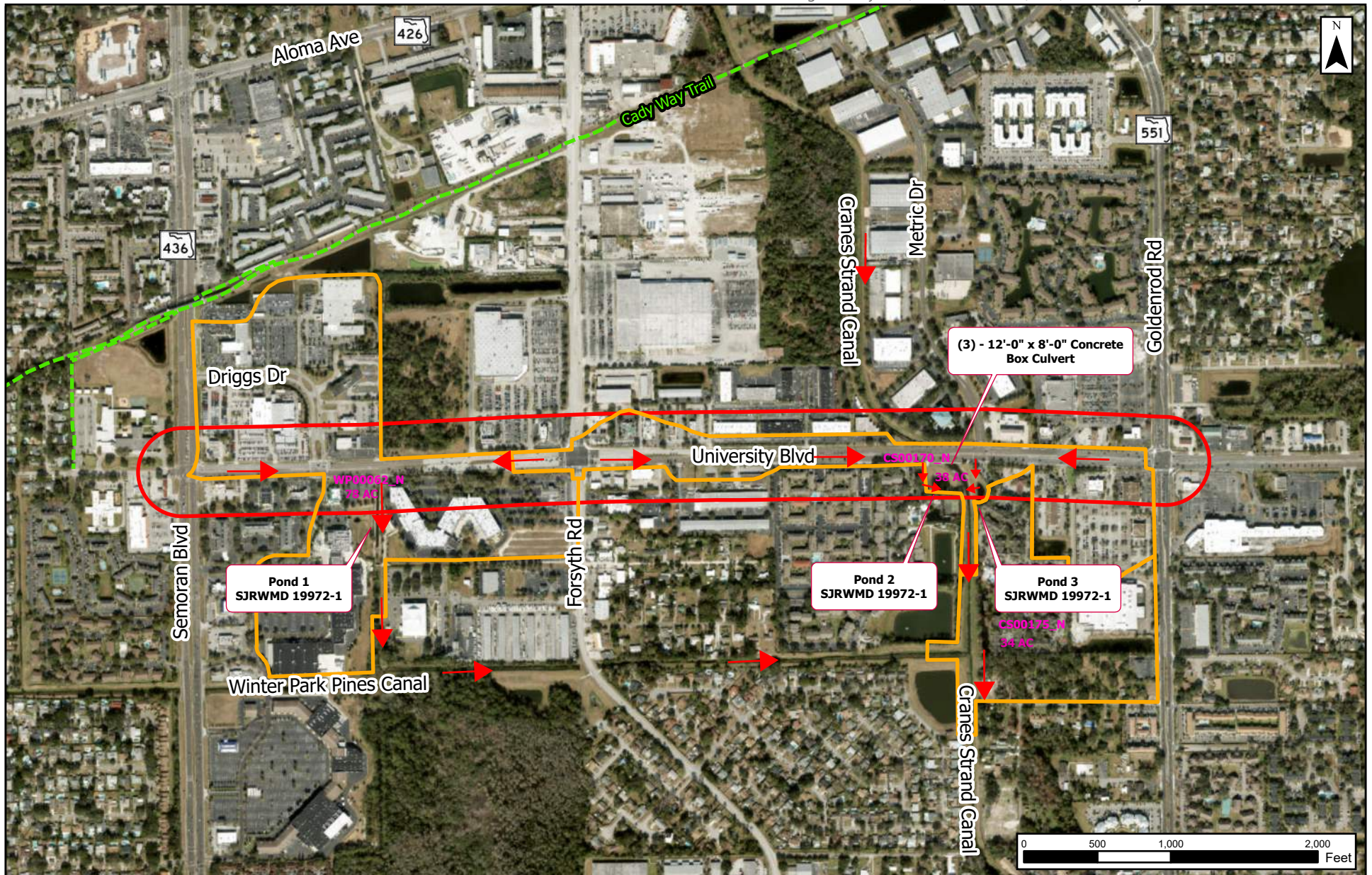
When conducting a qualitative assessment of wetlands and surface waters within the project study area, a full UMAM assessment, without a specific development or restoration project, is premature. However, the identification of regionally significant wetland and surface water features within the project study area is critical to understanding the local ecology as well as potential regulatory requirements that would likely be associated with development. It is anticipated that impacts to the canals may not require wetland mitigation. Whether mitigation is required by the regulatory agencies will be determined during the design and permitting of the project, and the UMAM assessment will be completed at that time.

3.7.2.3 Floodplains and Floodways

The extent of floodplains and floodways within the project study area was determined via a desktop GIS analysis using the FEMA Flood Hazard data from October 2020. A FEMA floodway is defined as the channel of the river or stream and any adjacent land area that will allow floodwaters to pass without increasing the water surface elevation by more than one foot. A floodplain is defined as any land area susceptible to being inundated by floodwaters from any source. FEMA Flood Zone type A indicates areas that are subject to a one percent annual chance flood event or a 100-Year floodplain, using approximations, resulting in a lack of provided base flood depths. FEMA Flood Zone AE indicates areas that are subject to a one percent annual chance flood event or a 100-Year floodplain, using detailed methods, providing base flood elevations. FEMA Flood Zone X indicates areas that are not within the Special Flood Hazard Zone. Type X is between the limits of the base flood and the 0.2 percent annual chance for flood, or 500-Year floodplain.

The study area is primarily located within 500-year Flood Zone X (96.57 acre), while a small portion is located within 100-year Flood Zone AE (0.58 acre). The remainder of the study area is not located within a floodplain (1.61 acre). There are no designated FEMA floodways within the study area.

Hydrologic and natural features can be found in **Figure 3-20**.



- Study Area (98.76 ac)
- - - Cady Way Trail
- Basins
- ➔ Drainage Flow



Figure 3-20

**Hydrologic and Natural
Features Map**
University Boulevard
Pedestrian/Cycle Safety Study

3.7.3 Critical and Strategic Habitats

Critical Habitat

No Critical Habitat designated for listed species occurs within the project area. No destruction or adverse modification of USFWS designated Critical Habitat will occur.

Strategic Habitat Conservation Areas

Strategic Habitat Conservation Areas (SHCA) are lands in need of protection to maintain natural communities and viable populations of many species that are indicators of the state's biological diversity. In 1994, the Florida Fish and Wildlife Conservation Commission (FWC) biologists completed a project entitled Closing the Gaps in Florida's Wildlife Habitat Conservation System which assessed the security of rare and imperiled species on existing conservation lands in Florida. This research identified important habitat areas in Florida with no conservation protection. These SHCA serve as a foundation for conservation planning for species protection through habitat conservation. No SHCA occurs within the study area.

3.7.4 Wildlife Corridor

Roads can have an adverse effect on wildlife, most notably through habitat fragmentation and genetic isolation. Vehicle traffic on roads can lead to wildlife-vehicle collisions and roadkill, which may imperil local wildlife populations.

The study area is highly developed with very limited natural areas that are not contiguous with other habitats; therefore, wildlife mobility is limited within the corridor in the existing condition.

3.7.5 Threatened and Endangered Species

The study team reviewed the most recent, publicly available information and GIS data regarding environmental resources documented in or with the potential to occur in the project area. This information and data included topography, floodplains, wetlands, documented wildlife observations, management plans, and other historical records. Other sources of information reviewed included:

- Historic and recent aerial photography;
- U.S. Geological Survey (USGS) Topographic Maps;
- Natural Resource Conservation Service (NRCS) Soil Maps;
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Maps;
- USFWS Wood Stork Colony Core Foraging Area Maps;
- USFWS Consultation Areas;
- Florida Fish and Wildlife Conservation Commission (FWC) Bald Eagle Nests;
- Audubon Florida EagleWatch Nest Website;

- FWC Imperiled and Managed Species Lists and Occurrence Data;
- Florida Land Use, Cover and Forms Classification System (FLUCFCS) Maps;
- USFWS IPaC Information for Planning and Consultation;
- St. Johns River Water Management District (SJRWMD) Conservation/Regulatory Easements;
- SJRWMD existing Environmental Resource Permits;
- U.S. Army Corps of Engineers Clean Water Act (CWA) 404 retained waters Map;
- Florida Natural Areas Inventory (FNAI).

Following the desktop data review, project ecologists conducted a field review, November 15, 2023, to verify conditions within the study area to potentially support state or federally protected species. The term “protected species” refers to those protected by law, regulation, or rule. Species included in the assessment include those identified in the Endangered Species Act (ESA) of 1973, as amended; the Florida Endangered and Threatened Species Act, Section 379.2291, Florida Statutes; and the Florida Regulated Plant Index (58-40.0055, F.A.C.).

A total of 30 protected species have the potential to occur within the project study area. These include eight (8) avian, one (1) amphibian, one (1) mammal, two (2) reptile, and 18 plant species, all of which are included below in **Table 3-25** and **Table 3-26**.

Ecologists determined a species’ potential occurrence in the study area based on its habitat preferences and distributions, existing site conditions, and historical data, when available. The likelihood of occurrence was rated as low, medium, or high. A low rating indicates that the species occurs in Orange County, but suitable habitat is not present within the study area and the species has not been observed or documented in the study area. A moderate rating indicates that the species occurs in Orange County, suboptimal habitat or limited suitable habitat occurs within the study area, but the species has not been documented within the study area. A high rating indicates that the species occurs within Orange County, suitable habitat is present within the study area, and the species is suspected to occur or has been previously documented within the study area.

Table 3-25: Federal and State Listed Plant Species

Scientific Name	Common Name	Habitat	FWS Status	FWC Status	FDACS	Occurrence Potential
<i>Calopogon multiflorus</i>	Many-flowered grass-pink				T	Low
<i>Carex chapmannii</i>	Chapman’s sedge				T	Low
<i>Centrosema arenicola</i>	Sand butterfly pea				E	Low
<i>Clitoria frangrans</i>	Pigeon wings		T			Low
<i>Coleataenia abscissa</i>	Cutthroatgrass				E	Low
<i>Deeringothamnus pulchellus</i>	Beautiful pawpaw		E			Low

Scientific Name	Common Name	Habitat	FWS Status	FWC Status	FDACS	Occurrence Potential
<i>Hartwrightia floridana</i>	Hartwrightia				T	Low
<i>Illicium parviflorum</i>	Star anise				E	Low
<i>Lechea cernua</i>	Nodding pinweed				T	Low
<i>Matelea floridana</i>	Florida spiny-pod				E	Low
<i>Nemastylis floridana</i>	Celestial lily				E	Low
<i>Nolina atopocarpa</i>	Florida beargrass				T	Low
<i>Paronchia chartacea</i>	Papery Whitlow-wort		T			Low
<i>Polygonella myriophylla</i>	Sandlace		E			Low
<i>Pteroglossaspis ecristata</i>	Giant orchid				T	Low
<i>Salix floridana</i>	Florida willow				E	Low
<i>Warea amplexifolia</i>	Clasping warea		E			Low
<i>Warea carteri</i>	Carter's warea		E			Low
E = Endangered T = Threatened C = Candidate M = Managed BGEPA = Bald and Golden Eagle Protection Act MBTA = Migratory Bird Treaty Act FDACS = Florida Department of Agriculture and Consumer Services FWC = Florida Fish and Wildlife Conservation Commission USFWS = United States Fish and Wildlife Service						

Table 3-26: Federal and State Listed Wildlife Species

Scientific Name	Common Name	FWS Status	FWC Status	Occurrence Potential
Amphibian				
<i>Notophthalmus perstriatus</i>	Striped newt		T	Low
Avian				
<i>Athene cunicularia</i>	Florida burrowing owl		T	Low
<i>Egretta caerulea</i>	Little blue heron		T	Medium
<i>Egretta tricolor</i>	Tricolored heron		T	Medium
<i>Grus canadensis</i>	Florida sandhill crane		T	Medium
<i>Haliaeetus leucocephalus</i>	Bald eagle	BGEPA/MBTA		Medium
<i>Mycteria americana</i>	Wood stork	T		Medium
<i>Platalea ajaja</i>	Roseate spoonbill		T	Low
<i>Rostrhamus sociabilis plumbeus</i>	Everglade snail kite	E		Low
Mammal				
<i>Ursus americanus floridanus</i>	Florida black bear		M	Low
Reptile				
<i>Drymarchon couperi</i>	Eastern indigo snake	T		Low
<i>Gopherus polyphemus</i>	Gopher tortoise		T	Medium
E = Endangered T = Threatened C = Candidate M = Managed BGEPA = Bald and Golden Eagle Protection Act MBTA = Migratory Bird Treaty Act FDACS = Florida Department of Agriculture and Consumer Services FWC = Florida Fish and Wildlife Conservation Commission USFWS = United States Fish and Wildlife Service				

4 Design Controls and Standards

4.1 Roadway Design Criteria

University Boulevard is not a state road. Therefore, the road does not have an officially designated context classification. As of the writing of this report (Q1 2025), Orange County is working on updating the Concurrency Management System (CMS) roadway database based on the latest context-based service volumes outlined in the 2023 FDOT Multimodal Quality/Level of Service (QLOS) Handbook Generalized Service Volumes (GSV) Tables. As part of this effort, Orange County is working to assign Context Classifications for all CMS roadways based on FDOT's Context Classification Guide (July 2020).

Based on the recent classification effort by Orange County, a C3C – Suburban Commercial context classification was recommended for the study corridor of University Boulevard from Semoran Boulevard to Goldenrod Road.

The design criteria determined by the assigned context classification are provided in **Table 4-1**, as defined in the 2018 Florida Greenbook. All criteria are subject to change, and only the most current criteria should be used during the final design phase.

Table 4-1: 2018 Florida Greenbook Design Criteria by Context Classification

Design Control	University Boulevard	Source
Context Classification	C3C	Orange County CMS roadway database
Functional Classification	Minor Urban Arterial	FDOT Functional Classification Maps
Design Speed	40 mph	Selected by Study
Lane Widths (Travel and Auxiliary)	11 feet	Florida Greenbook Table 3-20
Minimum Median Width for Divided Roadways	15.5 feet (with constrained ROW and design speed ≤ 40 mph)	Florida Greenbook Table 3-23
Standard Sidewalk Width	5 feet	Florida Greenbook Chapter 8 Section B.1
Shared-Use Path Width	10 feet	Selected by Study / Florida Greenbook Chapter 9 Section C.1
Curb & Gutter Type	Median – Type E Outside – Type F	Florida Greenbook Chapter 3 Section C.7.g

Table 4-2 provides additional design criteria not controlled by the context classification for the corridor.

Table 4-2: 2018 Florida Greenbook Design Criteria Additional Standards

Design Control	University Boulevard	Source
Typical Section Type	Urban	Selected by Study
Access Management Classification	Access Class 5	Selected by Study
Access Class – Connection Spacing	245 feet	Multimodal Access Management Guidebook Table 12
Access Class – Signal Spacing	1,320 feet	Access Management Guidebook Table 3
Pavement Cross Slope	0.02	Florida Greenbook Chapter 3 Section C.7.b.2
Roadside Front Slopes	1:4 (minimum) 1:6 (recommended)	Florida Greenbook Chapter 4 Section B.1.a
Maximum Deflection without a curve	2°00'	Florida Greenbook Chapter 3 Section C.4.b
Maximum Deflection for through lanes through intersections	5°00'	Florida Greenbook Table 3-7
Maximum Curvature	10°45'	Florida Greenbook Table 3-11
Minimum Length of Curve	Desired: 600 feet Minimum: 400 feet	Florida Greenbook Table 3-8
Maximum Profile Grade	7%	Florida Greenbook Table 3-16
Maximum Change in Grade without Vertical Curve	0.80	Florida Greenbook Table 3-17
Minimum Sight Distance	305 feet	Florida Greenbook Table 3-4
Minimum Crest Curve Length	120 feet	Florida Greenbook Table 3-18
Minimum Sag Curve Length	120 feet	Florida Greenbook Table 3-18
Minimum Crest Vertical Curve (K)	44	Florida Greenbook Table 3-18
Minimum Sag Vertical Curve (K)	64	Florida Greenbook Table 3-18

The design criteria for the shared-use path are provided in **Table 4-3**, as defined in the 2018 Florida Greenbook. Unlike design criteria for roadways, design criteria for shared-use paths are not dependent on context classification or functional classification. All criteria are subject to change, and only the most current criteria should be used during the final design phase.

Table 4-3: Shared-Use Path Design Criteria

Design Control	Shared-Use Path	Source
Design Speed	18 mph	Florida Greenbook Chapter 9, Section C.3
Shared-Use Path Width	10 feet	Florida Greenbook Chapter 9 Section C.1 / Selected by Study
Back of Shared-Use Path Graded Area Width	2 feet	Florida Greenbook Chapter 9 Section C.1
Maximum Cross Slope	0.02	Florida Greenbook Chapter 9 Section C.5
Front Slope	1:6	Florida Greenbook Chapter 9 Section C.1
Separation between Shared-Use Path and Roadway	5 feet between path and face of curb	Florida Greenbook Chapter 9 Section C.2
Minimum Radius	60 feet	2012 AASHTO Guide for the Development of Bicycle Facilities Table 5-2
Max Profile Grade	5%	Florida Greenbook Chapter 9 Section C.5
Minimum Stopping Sight Distance	130 feet	2012 AASHTO Guide for the Development of Bicycle Facilities Figure 5-6
Minimum Crest Curve Length	0 feet (<3% grade) 0 feet (3% grade) 55 feet (4% grade) 100 feet (5% grade)	2012 AASHTO Guide for the Development of Bicycle Facilities Figure 5-8

The design criteria for bicycle lanes are provided in **Table 4-4**, as defined in the 2018 Florida Greenbook and the National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide. Unlike design criteria for roadways, design criteria for bicycle lanes are not dependent on context classification or functional classification. All criteria are subject to change, and only the most current criteria should be used during the final design phase.

Table 4-4: Bicycle Lane Design Criteria

Design Control	Bicycle Lane	Source
Minimum Bicycle Lane Functional Width	4-foot paved bicycle lane, 5 feet to face of curb	Florida Greenbook Chapter 9 Section B.1 / Figure 9-1
Maximum Bicycle Lane Marking Spacing	1,320 feet	Florida Greenbook Chapter 9 Section B.1.b
Desired Protected, Buffered Bicycle Lane Width (Not including Buffer Width)	5 feet	NACTO Urban Bikeway Design Guide Section Page 61
Desired Protected, Buffered Bicycle Lane Buffer Width	3 feet	NACTO Urban Bikeway Design Guide Section Page 61

4.2 Drainage Design Criteria

The University Boulevard study corridor is in the Little Econlockhatchee (Econ) River drainage basin within the jurisdiction of SJRWMD and Orange County. The project is subject to criteria that are current at the time of the improvements.

The stormwater flows off the roadway and is collected in curb and gutter inlets that discharge to three existing stormwater ponds located within the project limits. The existing ponds have been designed, permitted, and constructed to accommodate the required treatment volume of a typical six-lane section of University Boulevard.

The following criteria will be applicable if structures, and modifications to the existing structures are proposed. The criteria were collected from applicable portions of:

1. Orange County and FDOT Drainage Design Guide and Drainage Manual
2. SJRWMD Permit Information Manual

4.2.1 Orange County

Since the improvements might consider new structures or modifications of the existing ones, per the Orange County Subdivision Regulations, the following criteria applies:

Roadway Drainage Design

Curbs and gutters:

All roadway drainage not considered suitable for swale and/or ditch type drainage shall be designed as one of the following:

- Median: Type E Curb per FDOT Index 502-001, current edition.
- Outer travel lane: Type F Curb per FDOT Index 502-001, current edition.

Runoff determination:

The peak rates of runoff for which the pavement drainage system must be designed shall be determined by the Rational Method. The time of concentration, individual drainage areas and rainfall intensity amounts shall be submitted as part of the drainage plans. A separate Rational Runoff Coefficient (C) shall be determined for the specific contributing area to each inlet/catch basin within the proposed storm sewer system. A composite C value shall be computed for each contributing area based on an individual C value of 0.9 for the estimated impervious portion of the actual area and an individual C value of 0.2 for the remaining pervious (grassed) portion of the actual area.

Stormwater Spread into Traveled Lane:

Inlets shall be located at all low points, intersections, and along continuous grades to prevent the spread of water from exceeding tolerable limits. The acceptable tolerable spread for a roadway with a design speed of 45 mph or less, includes keeping one-half the traveled lane width clear.

Inlet Types:

The curb inlet types to be used shall be the latest version of the FDOT inlet Types 1 and 2. Ditch bottom inlets shall be FDOT inlet Types C, D, E and H. All ditch bottom inlets located within the ROW shall have traffic-bearing grates.

Low Point Inlets:

The following criteria are applicable to the low point inlets:

- Inlets shall be placed at all low points in the gutter grade and/or ditch, and as appropriate at intersections, median breaks, and on side streets where drainage would adversely flow onto the roadway pavement.
- Inlets shall also be placed ten to twenty feet prior to the level section in superelevation transitions, to avoid concentrated flows across the pavement.
- Curb inlets, including inlet transitions shall not be located within handicap drop curb locations or on curb returns.
- Inlets in sag vertical curves that have no overflow outlet other than the storm drain system, (i.e., barrier wall, bridge abutment, cut sections) must have flanking inlets on one or both sides. The flanking inlets shall be located to satisfy spread criteria when the sag inlet is blocked.

Storm Sewer Design**Design Storm Drain Frequency:**

The design storm frequency to be utilized for the design of pavement drainage shall set the hydraulic gradient line at 12 inches below gutter for a 10-year frequency storm.

Hydraulic Gradient Line Computations:

The hydraulic gradient line for the storm sewer system shall be computed taking into consideration the design tailwater on the system and the energy losses associated with entrance into and exit from the system, friction through the system, and turbulence in the individual manholes/catch-basins/junction boxes within the system. The energy losses associated with the turbulence in the individual manholes are minor for an open channel or gravity storm sewer system and can typically be overcome by adjusting (increasing) the upstream pipe invert elevations in a manhole by a small amount. However, the energy

losses associated with the turbulence in the individual manholes can be significant for a pressure or surcharged storm sewer system and must be accounted for in establishing a reasonable hydraulic gradient line.

Minimum Pipe Size:

The minimum size of pipe to be used in storm sewer systems is 18 inches. Designs shall be based upon 6-inch increments in sizes above 18 inches.

Pipe Grade:

All storm sewers shall be designed and constructed to produce a minimum velocity of 2.5 feet per second (fps) when flowing full. No storm sewer system or portion thereof will be designed to produce velocities in excess of 20 fps for reinforced concrete pipe or 10 fps for metal pipe, and these maximums shall only be used when these outlet ends have sufficient erosion protection and/or energy dissipators.

Maximum Lengths of Pipe:

The following maximum runs of pipe shall be used when spacing access structures of any type:

18 inches = 300 feet

24 inches to 36 inches = 400 feet

42 inches and larger = 200 feet

Design tailwater:

All storm sewer systems shall be designed taking into consideration the tailwater of the receiving facility. In the case where the detention pond is the receiving facility, the design tailwater level can be estimated from the information generated by routing through the pond the hydrograph resulting from a 10-year frequency storm of duration equal to that used in designing the pond. The design tailwater level can be assumed to be the 10-year pond level corresponding to the time at which peak inflow occurs from the storm sewer into the pond.

Allowable materials:

Storm sewers shall be reinforced concrete pipe (RCP) in accordance with the latest version of the *FDOT Standard Specifications for Road and Bridge Construction*.

4.2.2 St. Johns River Water Management District (SJRWMD)

The project might qualify for an exemption from permitting from SJRWMD, if the proposed improvements adhere to F.A.C. 62-330.051. The applicable exemption criteria below:

62-330.051 Exempt Activities:

- (4)(d) Resurfacing and Repair of Existing Paved Roads, and Grading of Existing Unpaved Roads, provided:
 1. Travel lanes are not paved that are not already paved;
 2. No substantive changes occur to existing road surface elevations, grades, or profiles; and
 3. All work is conducted in compliance with subsection 62-330.050(9), F.A.C.
- (10) The construction, alteration, maintenance, removal or abandonment of recreational paths for pedestrians, bicycles, and golf carts, provided:
 - (a) There is no work in, on, or over wetlands or other surface waters other than those in drainage ditches constructed in uplands;
 - (b) There is no reduction in the capacity of existing swales, ditches, or other stormwater management systems legally in existence under chapter 403 or part IV of chapter 373, F.S.;
 - (c) The paths have a width of 8 feet or less for pedestrian paths, and 14 feet or less for multi-use recreational paths;
 - (d) The paths are not intended for use by motorized vehicles powered by internal combustion engines or electric-powered roadway vehicles, except when needed for maintenance or emergency purposes; and
 - (e) The paths comply with the limitations and restrictions in subsection 62-330.050(9), F.A.C.

If a permit exemption is not granted and a standard general permit is required from SJRWMD, the project shall adhere to the applicable F.A.C. criteria as shown below:

62-330.405 General Conditions for All General Permits

62-330.451 General Permit to Counties, Municipalities, and other Agencies to Conduct Stormwater Retrofit Activities.

- (1) A general permit is granted to counties, municipalities, state agencies and water management districts to construct, operate, and maintain stormwater retrofit activities as authorized below for improving existing surface water and stormwater systems. This general permit may be used in conjunction with exempt activities.
- (2) Types of storm water retrofit activities authorized under this general permit are:

- (a) Construction or alteration that will add additional treatment or attenuation capacity and capability to an existing stormwater management system.
- (b) The modification, reconstruction, or relocation of an existing stormwater management system or stormwater discharge facility.

5 Traffic Conditions

5.1 Existing Conditions

This section describes the analysis of traffic flow operating conditions for the existing year 2023 at the study intersections and roadway segments along the project corridor.

It utilizes field-collected traffic counts and intersection turning movement counts, along with existing roadway geometry. The analysis includes signal timing data from Orange County. The following sub-sections describe the overall process.

5.1.1 Traffic Counts

Traffic counts conducted from September 2023 through December 2023 for this study are shown in **Figure 5-1**. For all study intersections, the AM peak hour starts at 8:00 AM and the PM peak hour starts at 5:00 PM. From the 72-hour tube counts along University Boulevard, it was determined that the peak direction is westbound (WB) in the AM peak and eastbound (EB) in the PM peak.

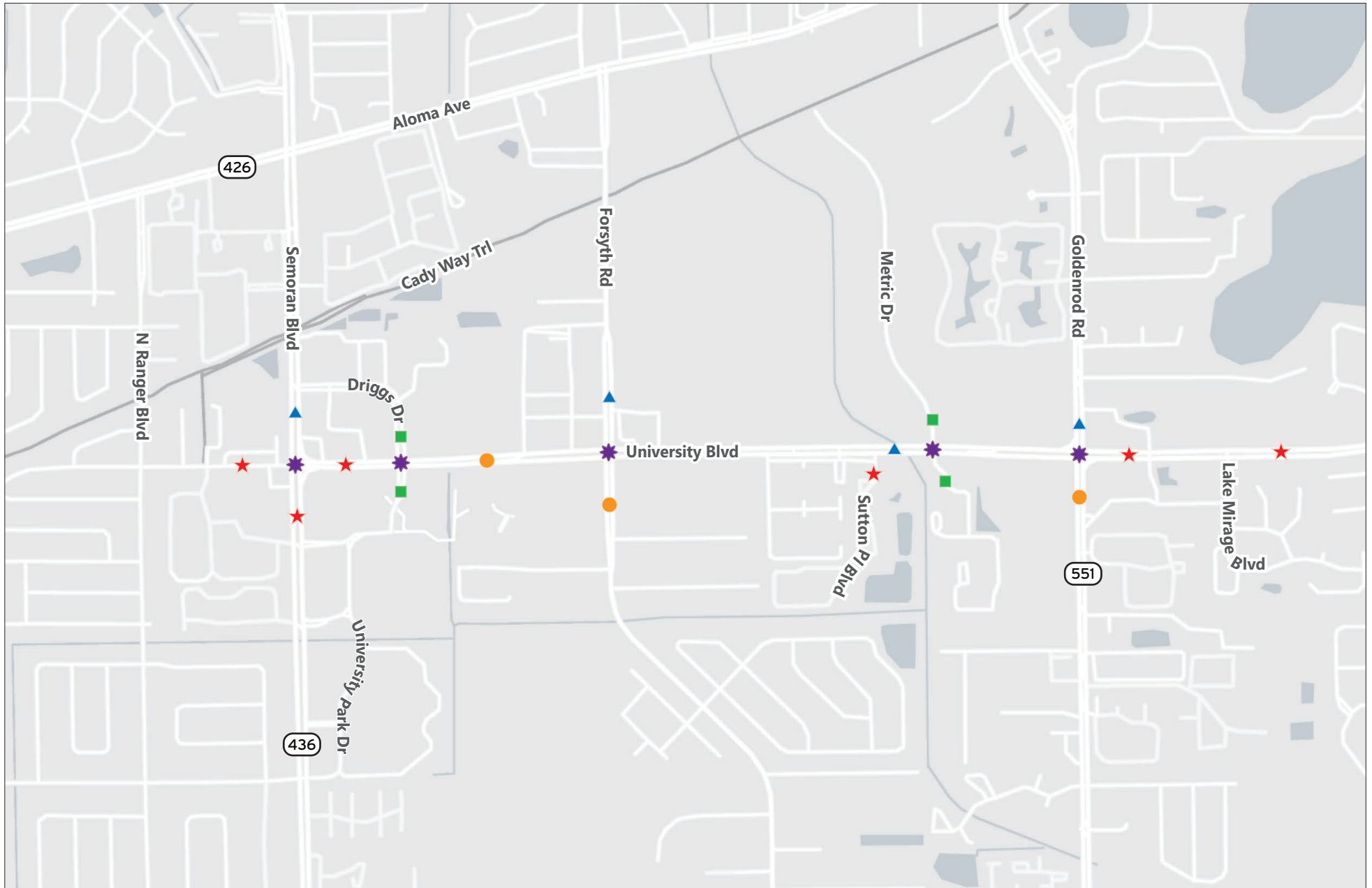
The total eight-hour pedestrian and bicyclist summary is provided in **Table 5-1**.

Table 5-1: Eight Hour Pedestrian and Bicyclists Summary

University Boulevard at	Pedestrian & Bicyclist
Semoran Boulevard	180
Driggs Drive	158
Forsyth Road	527
Metric Drive	306
Goldenrod Road	312

5.1.2 Existing Volume and Geometry

The study area analysis includes derived peak hour flow to daily ratio (K measured) and directional split (D measured) for roadway segments, along with daily truck percentages (Y-daily measured) at classification count locations. Adjusted AADTs are shown in **Figure 5-2**. Turning movement volumes were balanced based on engineering judgment, with 2023 AM and PM peak hour volumes included in **Figure 5-3**. Existing intersection geometry is illustrated in **Figure 5-4**. Pedestrian and bicyclist information is illustrated in **Figure 5-5**.



72-hour Bi-directional Volume Counts



72-hour Bi-directional Classification Counts



72-hour Bi-directional Counts (Orange County Annual Count Program)



24-hour Volume Counts

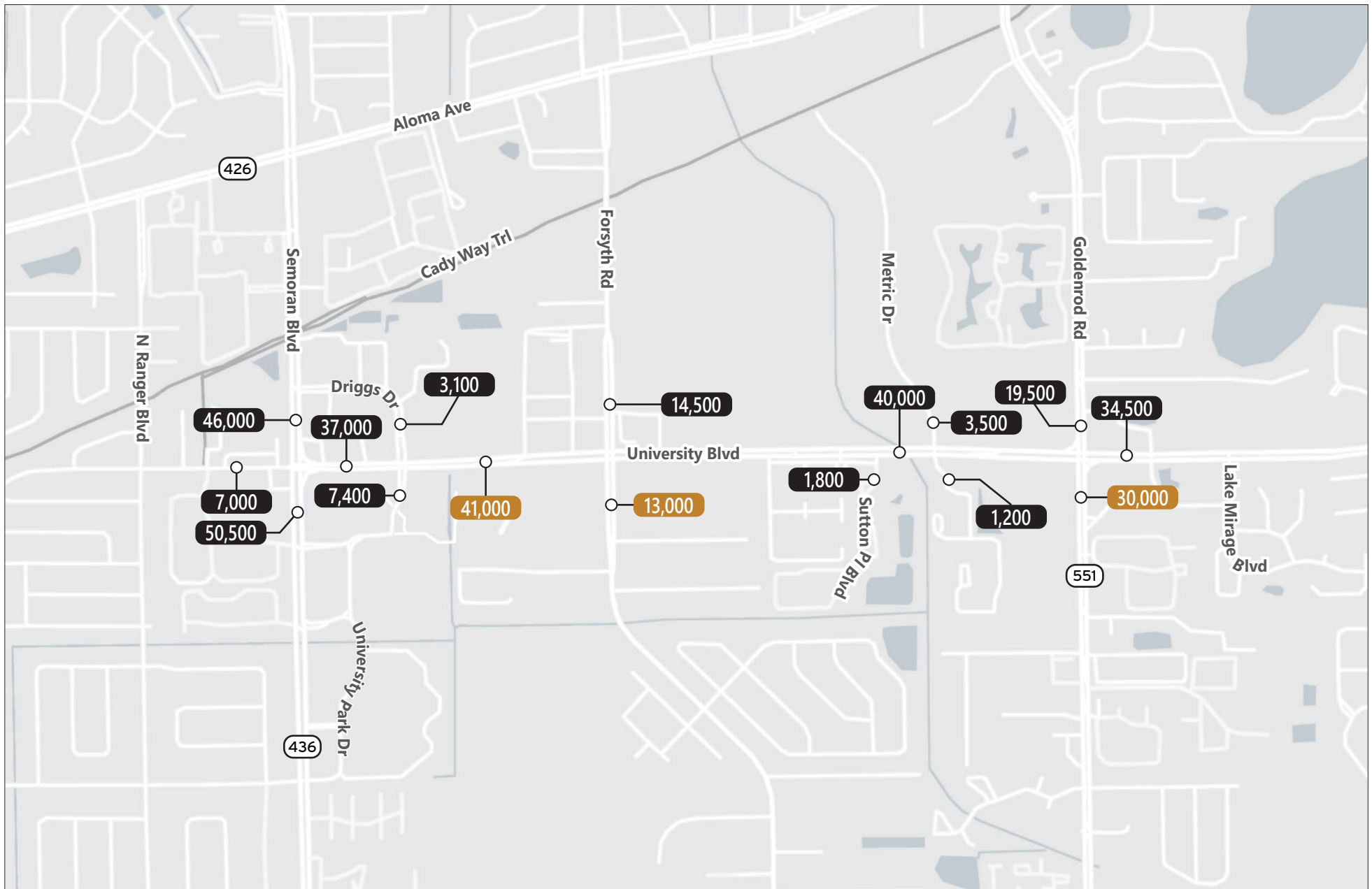


8-hour Turning Movement Counts



Figure 5-1

Data Collection Location Map
University Boulevard
Pedestrian/Cyclist Safety Study



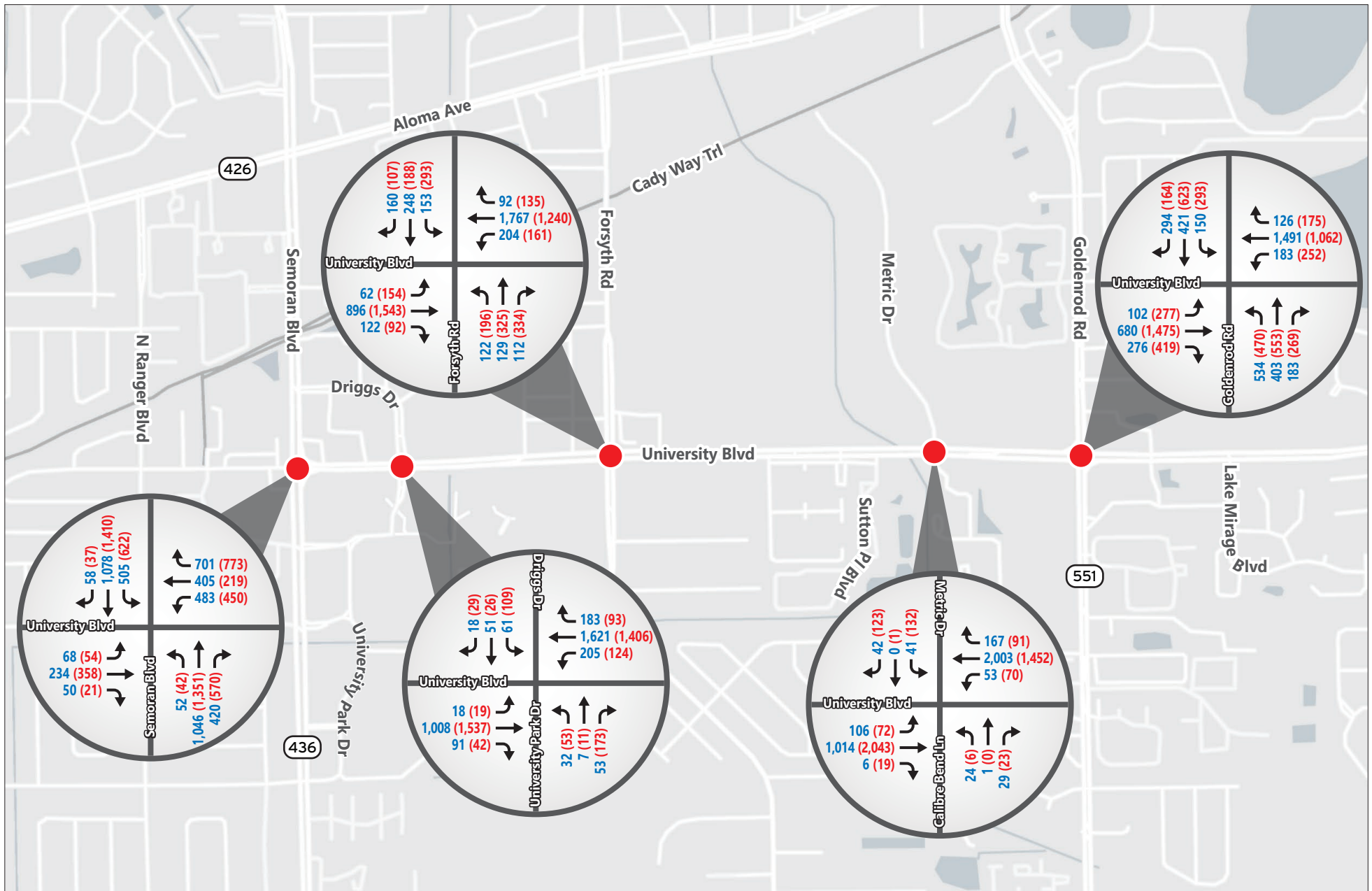
XXXX Field Collected AADT

XXXX 2022/2023 Orange County Count AADT



Figure 5-2

Existing AADT
University Boulevard
Pedestrian/Cyclist Safety Study

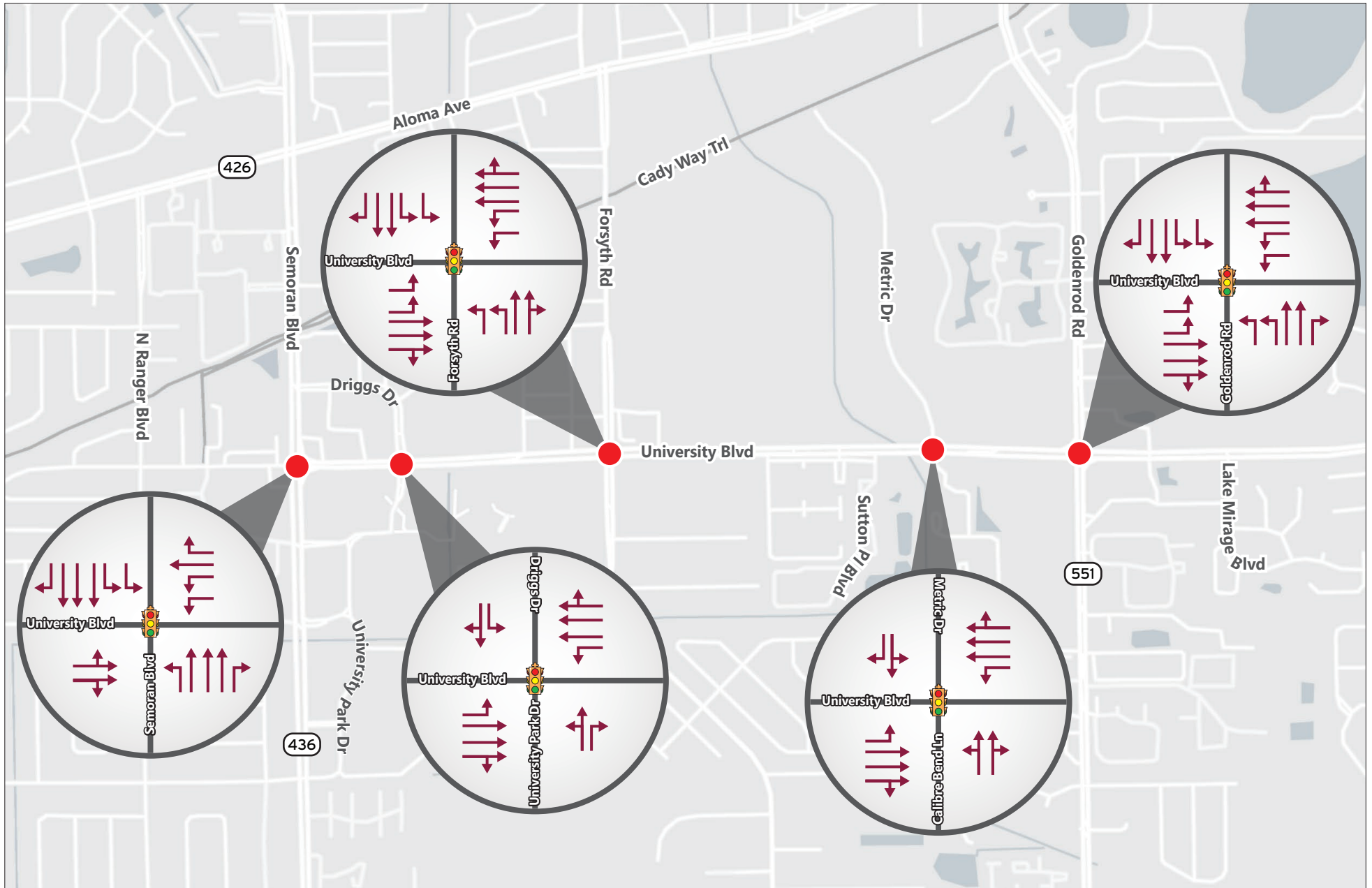


AM (PM) Peak Hour Traffic Volumes

→ Traffic Movement

**Figure 5-3**

Existing Turning Movement Counts
University Boulevard
Pedestrian/Cyclist Safety Study

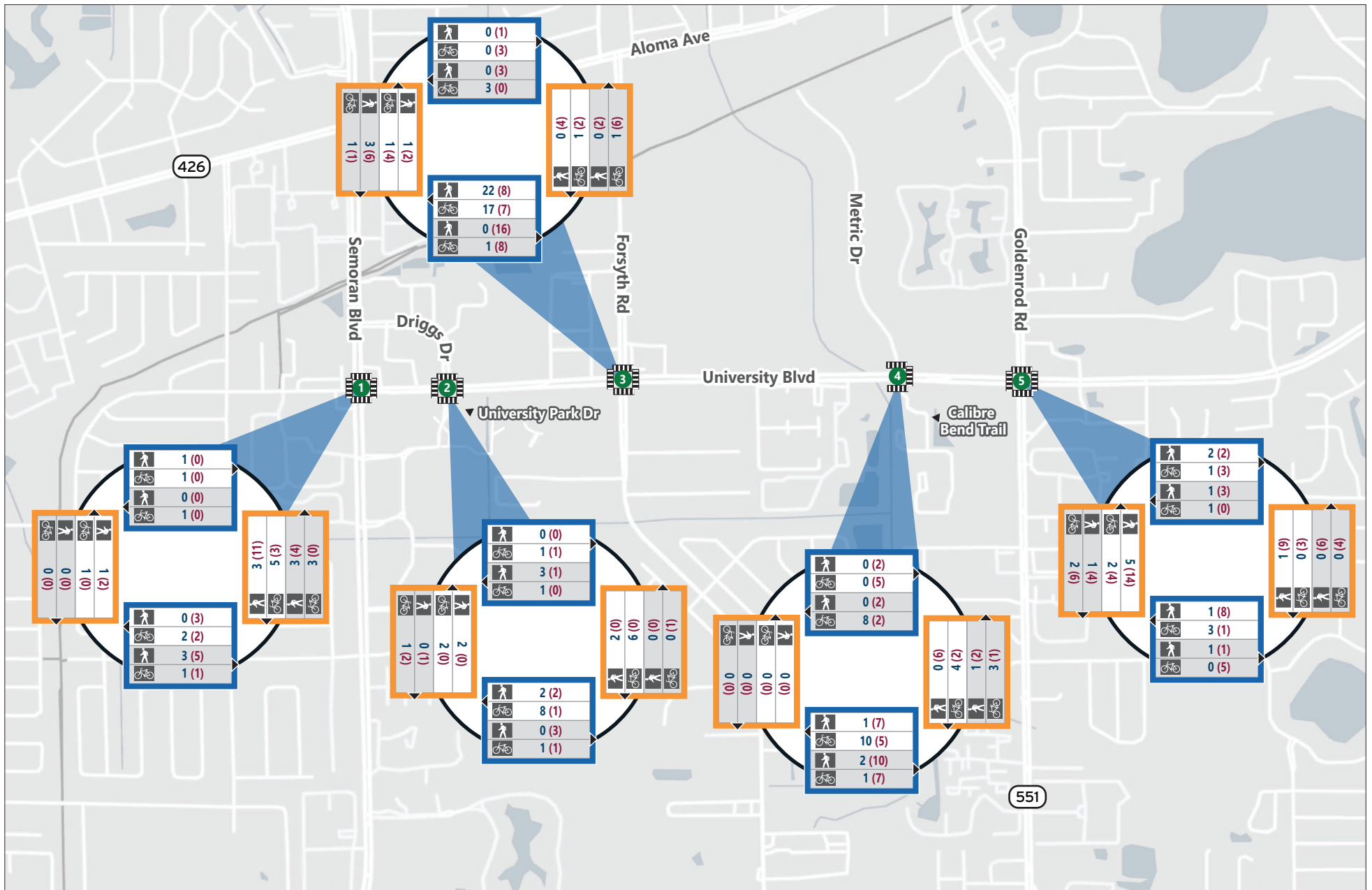


-  Lane Geometry
-  Signalized Intersection



Figure 5-4

Existing Geometry
University Boulevard
Pedestrian/Cyclist Safety Study



Crosswalk
Pedestrian
Bicycle



AM (PM)
8-9 (5-6)
Intersection Counts



Crossing University Blvd.



Crossing Side Street



Figure 5-5

Existing Pedestrian and Bicyclists Counts
University Boulevard
Pedestrian/Cyclist Safety Study

5.2 Existing Condition Level of Service (LOS) Analysis

5.2.1 Intersection LOS

The results below in **Table 5-2** show that all study intersections are found to operate within LOS E overall. Except for Driggs Drive, all other study intersections have some individual approaches that operate at LOS F. The EB and WB approaches at the intersection with Semoran Boulevard operate at LOS F in both the AM and PM peak hours. The WB approach at the intersection with Forsyth Road operates at LOS F in both the AM and PM peak hours while the northbound (NB) approach operates at LOS F in the PM peak hour. At the intersections with Metric Drive and Goldenrod Road, the NB approach operates at LOS F in the AM and PM peak hours, respectively and the southbound (SB) approach operates at LOS F during both the AM and PM peak hours.

Table 5-2: Existing Conditions Intersection Analysis

University Boulevard at	Approach	Existing AM		Existing PM	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Semoran Boulevard	EB	87.1	F	93.5	F
	WB	91.5	F	92.1	F
	NB	59.5	E	75.6	E
	SB	71.9	E	73.3	E
	Overall	74.2	E	78.7	E
Driggs Drive	EB	40.4	D	41.3	D
	WB	5.6	A	4.5	A
	NB	41.1	D	48.6	D
	SB	49.1	D	55.4	E
	Overall	19.8	B	25.9	C
Forsyth Road	EB	7	A	12.7	B
	WB	85.1	F	85.6	F
	NB	72.1	E	117.4	F
	SB	61.2	E	75.6	E
	Overall	59.9	E	62.7	E
Metric Drive	EB	54.3	D	4.3	A
	WB	1.6	A	2.8	A
	NB	85.6	F	76.1	E
	SB	84.6	F	81.8	F
	Overall	21.9	C	9.1	A
Goldenrod Road	EB	26.9	C	36.2	D
	WB	45.8	D	53.5	D
	NB	69.8	E	84.4	F
	SB	97.6	F	90.9	F
	Overall	56.5	E	60.6	E

5.2.2 Roadway LOS

The roadway segment LOS for University Boulevard was analyzed using Synchro. Roadway LOS for EB and WB directions along University Boulevard is summarized in **Table 5-3**: below. The documented MOE in the table below is arterial speed. The existing operational analysis shows that in the EB direction, University Boulevard operates at LOS F between Semoran Boulevard and Driggs Drive during both the AM and PM peak hours (due to closely spaced intersections) and between Metric Drive and Goldenrod Road during the PM peak hour. In the WB direction, University Boulevard operates at LOS F between Driggs Drive and Semoran Boulevard during both the AM and PM peak hours (due to closely spaced intersections).

Table 5-3: Roadway Segment Capacity Analysis Based on Synchro

Segment Along University Boulevard	Existing AM		Existing PM	
	Average Speed (mph)	LOS	Average Speed (mph)	LOS
Eastbound				
Semoran Boulevard to Driggs Drive	10.7	F	10.8	F
Driggs Drive to Forsyth Road	28.4	B	17	E
Forsyth Road to Metric Drive	39.5	A	35.3	A
Metric Drive to Goldenrod Road	18.2	D	11	F
Overall	23.5	C	17.7	D
Westbound				
Goldenrod Road to Metric Drive	26.5	C	27.9	C
Metric Drive to Forsyth Road	22.1	C	18.2	D
Forsyth Road to Driggs Drive	26.7	C	30.4	B
Driggs Drive to Semoran Boulevard	7.5	F	9	F
Overall	17.1	D	17.1	D

5.2.3 Multimodal Segment Level of Traffic Stress (LTS) and LOS

The performance of alternative transportation modes was evaluated based on the 2023 FDOT Multimodal Q/LOS Handbook. The Level of Traffic Stress (LTS) is determined by factors like pedestrian and bicyclist facilities, AADT, and speed limits. The worst side result is reported for each segment. **Table 5-4** and **Table 5-5** demonstrate the LTS determination and criteria for pedestrians and bicyclists with no bike facilities respectively. As shown in the tables, all segments (worst side LTS) operate at LTS 4, indicating the lowest comfort levels. The major contributing factors to the low scores are the sidewalk width less than or equal to five feet, lack of sidewalk separation from vehicular travel lanes, high AADTs, and high posted speed limits.

Table 5-4: Existing Conditions Pedestrian LTS Analysis

Roadway/Segment	Segment Length (mi)	Continuous Sidewalk	Posted Speed	Separation from Vehicular Travel Lane	Vertical Separation	Sidewalk Width > 5 feet	Level of Traffic Stress
Semoran Boulevard to Driggs Drive	0.141	✓	45	✓	X	X	LTS 4
Driggs Drive to Forsyth Road	0.301	✓	45	X	X	X	LTS 4
Forsyth Road to Metric Drive	0.493	✓	45	X	X	X	LTS 4
Metric Drive to Goldenrod Road	0.210	✓	45	X	X	X	LTS 4

Source: 2023 Q/LOS Handbook – Pedestrian Level of Traffic Stress Flow Chart

Note: Though the Pedestrian LTS was calculated to be LTS 3 (based on presence of sidewalk, speed limit of 45 mph and no vertical separation) - as per the field visit experience and the "Notes" under Pedestrian LTS Flow Chart - "If the sidewalk width is less than or equal to 5 feet, reduce the PLTS by 1", the final LTS was determined as LTS 4.

Table 5-5: Existing Conditions Bicycle LTS Analysis – No Facilities

Roadway/Segment	Segment Length (mi)	Posted Speed	AADT	Vehicular Travel Lanes	Posted Speed ≥ 35 mph	Travel Lanes ≥ 4 lanes	AADT ≥ 3,000	Level of Traffic Stress
Semoran Boulevard to Driggs Drive	0.141	45	37,000	6	✓	✓	✓	LTS 4
Driggs Drive to Forsyth Road	0.301	45	41,000*	6	✓	✓	✓	LTS 4
Forsyth Road to Metric Drive	0.493	45	40,000	6	✓	✓	✓	LTS 4
Metric Drive to Goldenrod Road	0.210	45	40,000	6	✓	✓	✓	LTS 4

Source: 2023 Q/LOS Handbook – Bicycle LTS Flow Chart to use When No Bicycle Facility is Present

* 2022 Orange County Counts

Table 5-6 demonstrates the transit LOS results. Please note that currently the study segment along University Boulevard is serviced in its entirety exclusively by LYNX Bus Route 13.

Table 5-6: Existing Conditions Transit LOS Analysis

Roadway/Segment	Segment Length (mi)	Service Frequency (Vehicles/Hour)	Headway (Minutes)	Level of Service
Semoran Boulevard to Driggs Drive	0.141	1	60	E
Driggs Drive to Forsyth Road	0.301	1	60	E
Forsyth Road to Metric Drive	0.493	1	60	E
Metric Drive to Goldenrod Road	0.210	1	60	E

Source: 2023 Q/LOS Handbook – Table 1

5.2.4 Recommended Design Traffic Characteristics

The design traffic characteristics established in this section will be used in developing design hour volumes (DHVs) at the study intersections for future conditions. These

characteristics are decided based on the procedures outlined in the 2019 FDOT Project Traffic Forecasting (PTF) Handbook and 2023 FDOT Multimodal Q/LOS Handbook.

Table 5-7 provides a summary of the recommended design traffic characteristics within the study corridor to be utilized for this study.

Table 5-7: Recommended Design Characteristics

Roadway	K Factor	D Factor	T Factor	DHT Factor
University Boulevard	8.00%	54.00%	5.00%	2.50%
Semoran Boulevard	7.50%	Measured		
Driggs Drive	9.00%			
Forsyth Road	9.00%			
Metric Drive	9.00%			
Goldenrod Road	8.00%			

5.3 Future Year Traffic Projections

The traffic forecasting methodology follows the 2019 FDOT PTF Handbook and utilizes the Central Florida Regional Planning Model version 7.0 for future traffic projections, as well as the travel demand model from the Northeast Orange County Areawide Transportation Study for forecasts.

5.3.1 Subarea Model Validation

A subarea model was developed for the year 2020, calibrated and validated according to established standards. Its accuracy is assessed through various percent error metrics, with an RMSE of 7.09% for 11 roadway links. The model is deemed acceptable for future travel demand estimation, with adjustments planned for the 2045 NEOCATS build model.

5.3.2 Future Corridor Travel Demand Model

The 2045 NEOCATS build model incorporated model validation changes based on various sources, including the FDOT Five-Year Work Program, committed projects identified by Orange County, MetroPlan Orlando's Adopted FY 2024-2028 TIP, MetroPlan Orlando's Adopted 2045 MTP and Central Florida Expressway Authority (CFX) Masterplan were reviewed for programmed and planned improvements within the study area. The below capacity projects were identified and were already included in the build model:

- Goldenrod Road from Colonial Drive to University Boulevard – widen from 4 to 6 lanes.
- Richard T Crotty Parkway from Semoran Boulevard to Goldenrod Road – New 4 lane Road

Land use data for 2045 was updated in coordination with stakeholders, and a model run was conducted for future conditions. A comparison between CFRPM7.0 and the Orange County 2050 Vision Plan showed identical land use designations.

5.3.3 Future Traffic Growth Rates

The development of traffic projections for the study area involved examining historical growth and local traffic patterns. The following sources were used for future traffic forecasts:

- Population Projections from the Bureau of Economic and Business Research (BEBR), Florida Population Studies, January 2024.
- Historical Traffic Trends Analysis using data from Florida Traffic Online (FTO) and Orange County Traffic Count Program.
- Travel Demand Model: CFRPM7.0 from the NEOCATS study.

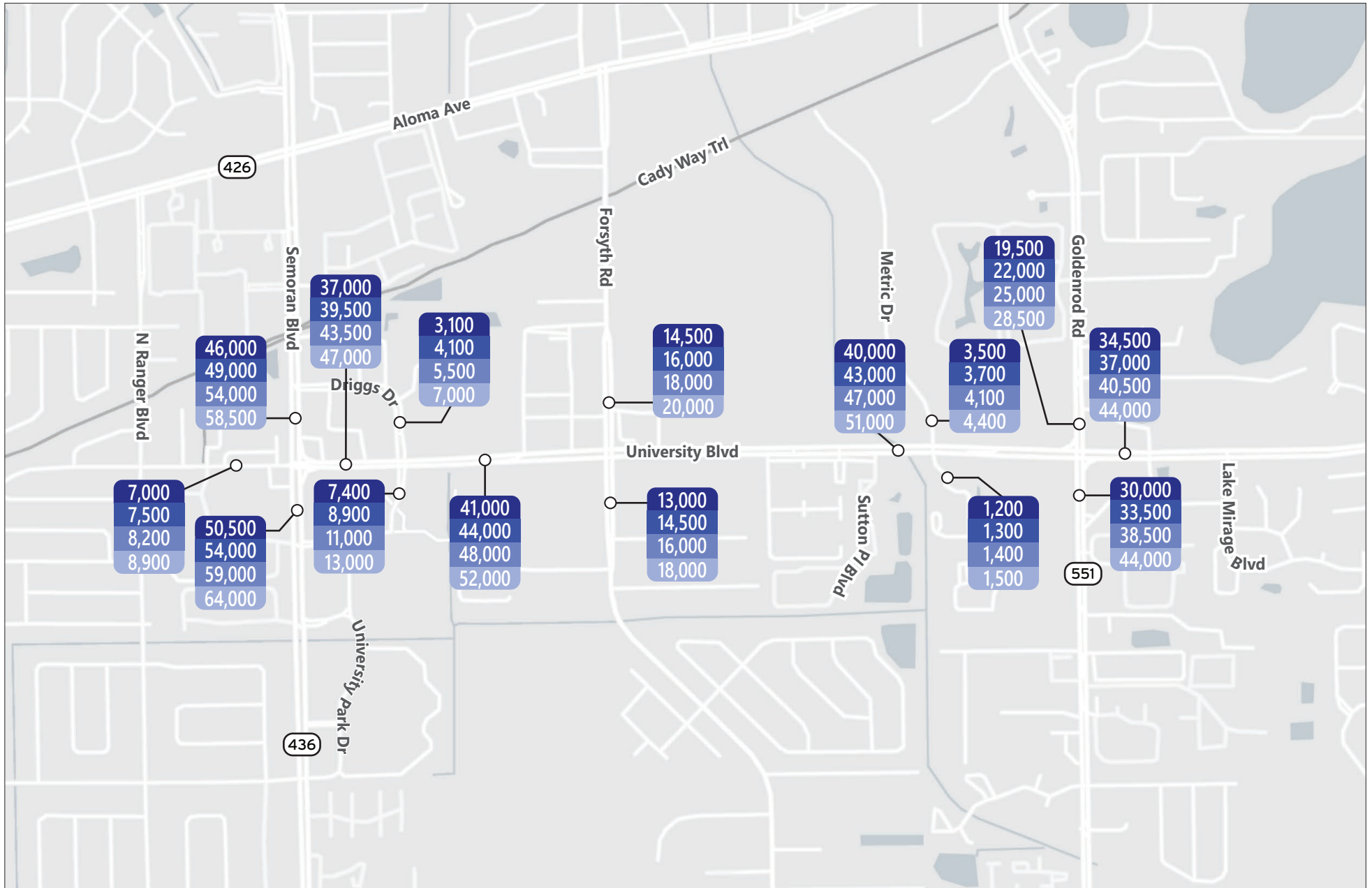
Comparison of growth rates from these sources led to recommended growth rates (shown in **Table 5-8**) and future forecasted AADTs (shown in **Figure 5-6**) for the study segments.

Table 5-8: Recommended Growth Rates

Roadway Segment	Growth Rate	Source
University Boulevard	1.00%	Average of BEBR Med and Model
SR 436	1.00%	Average of BEBR Med and Model
Driggs Drive (north leg)	4.62%	Average of BEBR Med and Model
Driggs Drive (south leg)	2.92%	Average of BEBR Med and Model
Forsyth Road	1.40%	Model based growth rate
Metric Drive	1.00%	Same as University Boulevard
Goldenrod Road	1.70%	Model based growth rate

5.3.4 Intersection Turning Movement Volume Projections

Intersection design hour volumes (DHVs) for traffic at intersections were developed for the years 2030, 2040, and 2050 using FDOT Turns5 tool, existing and future AADT forecasts, and recommended design traffic factors. The year 2050 turning movements volumes are illustrated in **Figure 5-7**. Volumes for the opening year 2030 and interim year 2040 are provided in **Appendix D**.

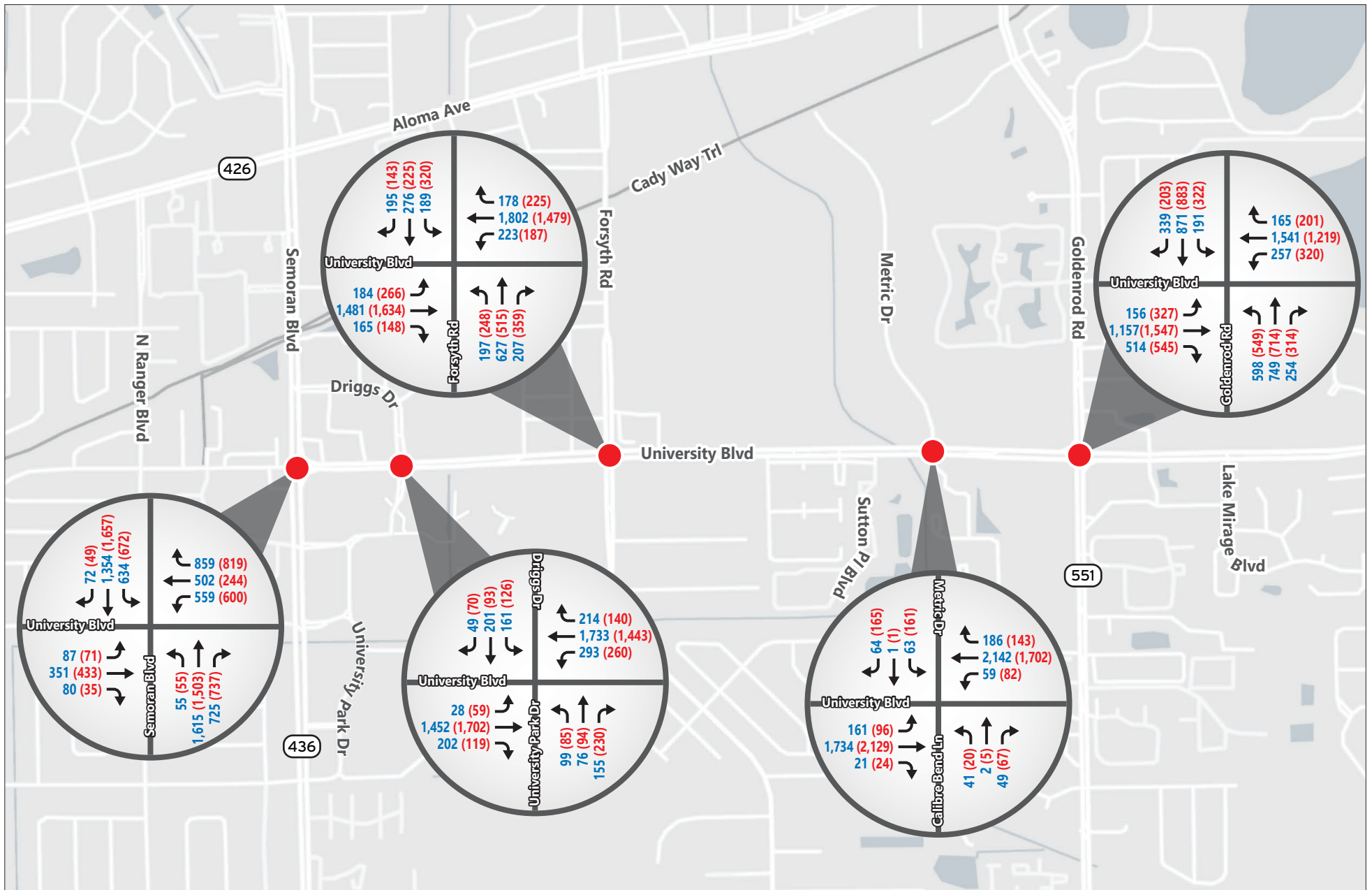


XXX	2023 AADT
XXX	2030 AADT
XXX	2040 AADT
XXX	2050 AADT



Figure 5-6

Future AADT
University Boulevard
Pedestrian/Cyclist Safety Study



AM (PM) Peak Hour Traffic Volumes

→ Traffic Movement



Figure 5-7

Future Year 2050 Turning Movement Volumes
University Boulevard
Pedestrian/Cyclist Safety Study

5.4 Future Operational Analysis

This chapter presents the results of the traffic operations analysis conducted for the future No-Build and Build alternatives for the below planning horizons:

- Opening Year (2030)
- Mid-Design Year (2040)
- Design Year (2050)

The results of this analysis are presented in the following sections.

5.4.1 No-Build Multimodal LOS Analysis

The No-Build operational analysis represents the baseline evaluation of the operational performance of the corridor. Under the No-Build scenario, the corridor operations are evaluated assuming the existing geometry.

5.4.1.1 Multimodal Intersection Analysis

Intersection analysis identified future deficiencies at study intersections. Synchro 11 was utilized for LOS operational analyses, with roadway segment LOS for auto mode based on average speeds. Pedestrian, cyclist, and transit LOS are based on the 2023 FDOT Multimodal Q/LOS Handbook. The results of the No-Build analysis are summarized below in **Table 5-9**. See **Appendix D** for further details of the analysis.

- University Boulevard and Semoran Boulevard: LOS F expected from 2030 PM condition.
- University Boulevard and Driggs Drive: LOS C expected through 2050.
- University Boulevard and Forsyth Road: LOS E expected through mid-2040, LOS F anticipated in 2050 PM condition.
- University Boulevard and Metric Drive: LOS C or better expected through 2050.
- University Boulevard and Goldenrod Road: LOS E expected through mid-2040, LOS F anticipated in 2050 PM condition.

Table 5-9: No-Build Intersection Analysis Summary

Intersection with University Boulevard	2030 AM		2030 PM		2040 AM		2040 PM		2050 AM		2050 PM	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Semoran Boulevard	78.8	E	85.4	F	96.7	F	101	F	135.8	F	121.4	F
Driggs Drive	23.0	C	27.9	C	31.8	C	30.4	C	39.1	D	33.2	C
Forsyth Road	60.0	E	67.7	E	61.4	E	76.5	E	64.8	E	87.9	F
Metric Drive	24.7	C	9.6	A	28.6	C	10.2	B	32.2	C	10.7	B
Goldenrod Road	58.8	E	66.6	E	63	E	78.2	E	78.7	E	93.3	F

5.4.1.2 Roadway Segment LOS

The roadway segment LOS for University Boulevard was analyzed using Synchro. Roadway LOS for EB and WB directions along University Boulevard is summarized in **Table 5-10** below. The No-Build operational analysis shows that in the EB direction, University Boulevard is projected to operate at LOS F between Semoran Boulevard and Driggs Drive during both the AM and PM peak hours during all analysis years 2030, 2040, and 2050, (due to closely spaced intersections) and between Metric Drive and Goldenrod Road during the PM peak hour in 2030, and in the AM and PM peak hours in 2040 and 2050. In the WB direction, University Boulevard is projected to operate at LOS F between Driggs Drive and Semoran Boulevard during both the AM and PM peak hours (due to closely spaced intersections).

5.4.1.3 Multimodal Segment Level of Traffic Stress (LTS) and LOS

In the existing conditions, all roadway segments operated at LTS 4, indicating the lowest comfort levels. Major contributing factors include:

- Sidewalk width less than or equal to five feet
- Lack of sidewalk separation from vehicular travel lanes
- High AADTs
- High posted speed limits

It is noted that the same LTS 4 conditions will prevail for pedestrians and bicyclists under future No-Build conditions. **Table 5-11** demonstrates the transit LOS results based on future transit plans. LYNX routes 101A, 201, 503 and 522 are proposed to operate along University Boulevard between Semoran Boulevard and Driggs Drive, and LYNX routes 501 and 522 are proposed to operate along University Boulevard between Driggs Drive and Goldenrod Road. A headway of 15 to 30 minutes is assumed for the analysis.

Table 5-10: Roadway Segment Capacity Analysis based on Synchro – No-Build

Segment Along University Boulevard	2030 AM		2030 PM		2040 AM		2040 PM		2050 AM		2050 PM	
	Average Speed (mph)	LOS	Average Speed (mph)	LOS	Average Speed (mph)	LOS	Average Speed (mph)	LOS	Average Speed (mph)	LOS	Average Speed (mph)	LOS
Eastbound												
Semoran Boulevard to Driggs Drive	10.8	F	10.8	F	10.8	F	10.9	F	10.4	F	10.8	F
Driggs Drive to Forsyth Road	25.5	C	16.1	E	20.5	D	14.9	E	16.8	E	13.5	E
Forsyth Road to Metric Drive	39.2	A	34.9	B	37.8	A	34.2	B	32.9	B	33.5	B
Metric Drive to Goldenrod Road	15.9	E	9.7	F	12.8	F	8.5	F	11.2	F	7.4	F
Overall	22.2	C	16.7	E	19.7	D	15.6	E	17.2	D	14.4	E
Westbound												
Goldenrod Road to Metric Drive	25.1	C	27.1	C	23.4	C	25.6	C	24.0	C	23.8	C
Metric Drive to Forsyth Road	21.5	D	17.7	D	20.7	D	16.6	E	18.2	D	14.6	E
Forsyth Road to Driggs Drive	25.7	C	29.9	B	23.4	C	29.7	B	22.1	C	29.3	B
Driggs Drive to Semoran Boulevard	6.2	F	9.3	F	5.0	F	9.2	F	3.9	F	9.1	F
Overall	15.6	E	16.8	E	14.0	E	16.2	E	12.4	F	15.2	E

Table 5-11: No-Build Conditions Transit LOS Analysis

Roadway/Segment	Segment Length (mi)	Service Frequency (Vehicles/Hour)	Headway (Minutes)	Level of Service
Semoran Boulevard to Driggs Drive	0.141	4	15	C
Driggs Drive to Forsyth Road	0.301	2	30	D
Forsyth Road to Metric Drive	0.493	2	30	D
Metric Drive to Goldenrod Road	0.210	2	30	D

Source: 2023 Q/LOS Handbook – Table 1

5.4.2 Build Multimodal Level of Service (LOS) Analysis

The operational analysis assesses the study corridor with proposed improvements, emphasizing traffic operations, capacity needs, and intersection access management. It also considers pedestrian/bicycle enhancements, such as leading pedestrian intervals and right-turn-on-red restrictions, for the year 2050, especially in areas with significant pedestrian/bicyclist activity. The intersection LOS for 2050 remains at "E".

Build Alternative Proposed Improvements

Based on the existing and No-Build operational analyses, the following improvements are proposed at the study intersections (also shown in **Figure 5-8**) in the Build alternative:

- At the intersection with **Semoran Boulevard**:
 - Remove channelization of northbound right turn lane.
 - Add third southbound exclusive left turn lane.
 - Remove channelization of westbound right turn lane and add second exclusive right turn lane.
 - LPIs and right-turn-on-red restrictions are not recommended at this location since the year 2050 LOS exceeds LOS E with these modifications.
- At the intersection with **Driggs Drive**:
 - Extend the westbound left turn lane
 - Convert northbound shared left-through lane to left-only, and right-only to a shared through-right lane
 - Convert all permitted phases for the left turn movements to protected phases
 - LPIs and right-turn-on-red restrictions for the eastbound and westbound directions
- At the intersection with **Forsyth Road**:
 - Add northbound exclusive right turn lane
 - LPIs and right-turn-on-red restrictions for the eastbound and westbound directions
- At the intersection with **Metric Drive**:
 - Convert permitted phase to protected phase for the minor left turn movements so that the side street movements will operate under split phases
 - LPIs and right-turn-on-red restrictions for the eastbound and westbound directions
- At the intersection with **Goldenrod Road**:
 - Add eastbound exclusive right turn lane
 - LPIs and right-turn-on-red restrictions are not recommended at this location since the year 2050 LOS is close to LOS F with these modifications.

- **University Boulevard Segment:**
 - A target speed of 40 mph
 - Add a midblock pedestrian crossing supplemented with a PHB just west of Goldenrod Road near the Publix Driveway
 - This study recommends monitoring the area near Central Place at Winter Park Apartments for the need to install a midblock pedestrian crossing with a PHB
 - This study recommends a midblock pedestrian crossing along the frontage of the Full Sail University main entrance that will be designed and constructed by others. A pedestrian bridge is being proposed along with Phase 1 development of the vacant parcel (Silver City Properties) located west of Costco on the north side of University Boulevard.

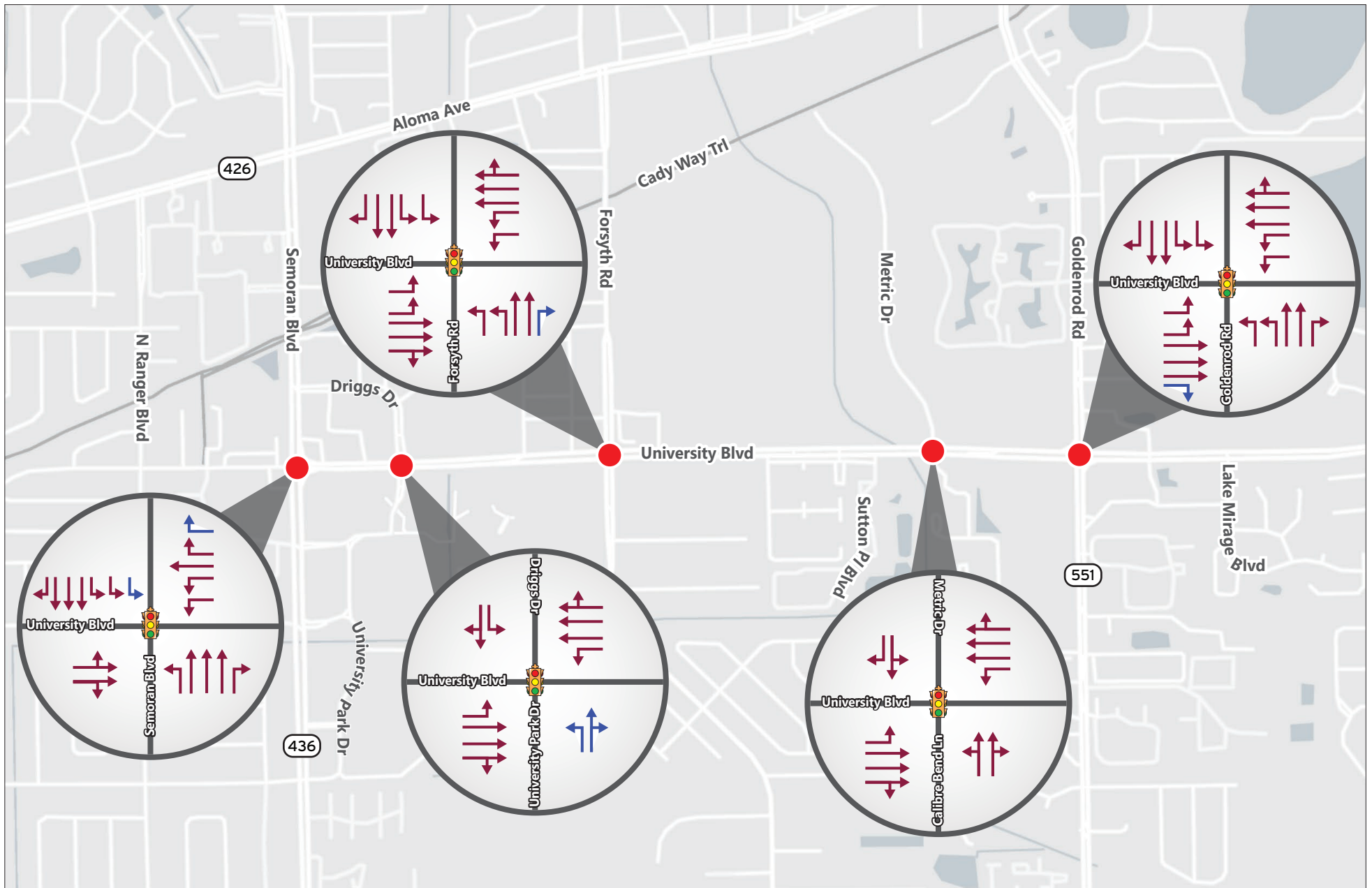
Multimodal Intersection Analysis

Intersection analysis was conducted to identify deficiencies at the study intersections for future years. The Build analysis results are summarized below and referenced in **Table 5-12** and **Table 5-13**, which shows the overall LOS and delays with proposed pedestrian timing improvements at the study intersections except for Semoran Boulevard intersection.

- The intersection of University Boulevard and Semoran Boulevard is expected to operate at LOS E through the design year 2050.
- The intersection of University Boulevard and Driggs Drive is expected to operate at LOS C through the design year 2050.
- The intersection of University Boulevard and Forsyth Road is expected to operate at LOS E or better through the design year 2050.
- The intersection of University Boulevard and Metric Drive is expected to operate at LOS C or better through the design year 2050.
- The intersection of University Boulevard and Goldenrod Road is expected to operate at LOS E through the design year 2050.

5.4.3 Roadway Segment LOS

The roadway segment LOS for University Boulevard is projected to operate at LOS F during peak hours between Semoran Boulevard and Driggs Drive starting from 2030, and between Metric Drive and Goldenrod Road starting from 2040, as referenced in **Table 5-14**. Overall, it is expected to operate at LOS E, except for the 2050 AM period through the design year 2050. Average speeds in the Build condition are lower than in the No-Build condition due to reduced posted and target speeds to 40 mph.



- Existing Lane Geometry
- Build Lane Geometry
- Signalized Intersection



Figure 5-8

Build Geometry
University Boulevard
Pedestrian/Cyclist Safety Study

Table 5-12: Build Intersection Analysis Summary

Intersection with University Boulevard	2030 AM		2030 PM		2040 AM		2040 PM		2050 AM		2050 PM	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Semoran Boulevard	65.7	E	65.7	E	66.8	E	68.5	E	74.3	E	71.1	E
Driggs Drive	26.1	C	22.7	C	31.4	C	26.3	C	32.2	C	30.9	C
Forsyth Road	26.9	C	36.5	D	38.8	D	57.4	E	42.7	D	60.6	E
Metric Drive	8.6	A	19.3	B	9.4	A	27.3	C	10.3	B	27.4	C
Goldenrod Road	63.8	E	60.7	E	64.3	E	65.2	E	69.3	E	67.0	E

Table 5-13: Build Intersection Analysis With LPI and No Right on Red Restrictions – Design Year 2050

University Boulevard at	2050 AM Delay (sec/veh)/LOS	2050 PM Delay (sec/veh)/LOS
Driggs Drive	44.1/D	53.5/D
Forsyth Road	42.8/D	64.4/E
Metric Drive	31.2/C	42.0/D
Goldenrod Road	75.8/E	79.1/E

Table 5-14: Roadway Segment Capacity Analysis Based on Synchro - Build

Segment Along University Boulevard	2030 AM		2030 PM		2040 AM		2040 PM		2050 AM		2050 PM	
	Average Speed (mph)	LOS	Average Speed (mph)	LOS	Average Speed (mph)	LOS	Average Speed (mph)	LOS	Average Speed (mph)	LOS	Average Speed (mph)	LOS
Eastbound												
Semoran Boulevard to Driggs Drive	6.4	F	7.2	F	6.1	F	8.4	F	5.5	F	7.8	F
Driggs Drive to Forsyth Road	25.1	C	29.0	B	20.9	D	25.2	B	14.1	E	24.9	C
Forsyth Road to Metric Drive	22.0	D	24.4	B	21.3	D	23.6	C	26.1	C	24.7	C
Metric Drive to Goldenrod Road	16.3	E	12.7	E	16.3	E	11.5	F	7.9	F	11.5	F
Overall	16.2	E	16.9	D	15.2	E	16.6	E	12.1	F	16.4	E
Westbound												
Goldenrod Road to Metric Drive	22.9	C	17.6	D	18.8	D	15.0	E	20.0	D	12.4	F
Metric Drive to Forsyth Road	30.5	B	31.4	B	22.9	C	23.2	C	15.1	E	22.1	C
Forsyth Road to Driggs Drive	26.1	C	28.8	B	26.2	C	23.5	C	19.6	D	27.8	C
Driggs Drive to Semoran Boulevard	4.4	F	4.6	F	4.1	F	5.3	F	3.6	F	5.3	F
Overall	16.0	E	16.1	E	14.0	E	15.0	E	11.4	F	14.6	E

5.4.4 Multimodal Segment Level of Traffic Stress (LTS) and LOS

As per the Build typical sections described in Section 6, a sidewalk wider than six feet and vertical separation via landscaping on the south side of University Boulevard, with a posted and target speed of 40 mph. **Table 5-15** and **Table 5-16** illustrate the LTS determination and criteria for pedestrians and bicyclists for the 2050 build conditions, showing that all segments operate at LTS 2 for pedestrians and LTS 1 for bicyclists, indicating high comfort levels.

Table 5-17 presents the transit LOS results. The No-Build analysis indicates that LYNX routes 101A, 201, 503, and 522 will run along University Boulevard from Semoran Boulevard to Driggs Drive, while routes 501 and 522 will operate between Driggs Drive and Goldenrod Road. A headway of 15 to 30 minutes is assumed for this analysis.

See **Appendix D** for further details of the No-Build multimodal analysis.

5.5 Recommended Improvements

This study recommends capacity improvements to accommodate projected traffic volumes and enhance mobility and safety within the study corridor, as shown in **Table 5-18** and **Figure 5-8**. These improvements may require additional ROW and differ from the short-term improvements identified in Section 6.3, which typically do not require ROW and can be implemented at lower costs.

The recommended capacity improvements are traditional, maximizing the number of turn lanes at the study intersections based on the design year 2050 traffic demand. However, adding turn lanes will impact pedestrians and bicyclists with longer crossing distances.

Table 5-15: 2050 Build Conditions Pedestrian LTS Analysis

Roadway/Segment	Segment Length (mi)	Continuous Sidewalk	Target Speed	Separation from Vehicular Travel Lane	Vertical Separation	Sidewalk Width > 5 feet	Level of Traffic Stress
Semoran Boulevard to Driggs Drive	0.141	✓	40	✓	✓	✓	LTS 2
Driggs Drive to Forsyth Road	0.301	✓	40	✓	✓	✓	LTS 2
Forsyth Road to Metric Drive	0.493	✓	40	✓	✓	✓	LTS 2
Metric Drive to Goldenrod Road	0.210	✓	40	✓	✓	✓	LTS 2

Source: 2023 Q/LOS Handbook – Pedestrian Level of Traffic Stress Flow Chart

Table 5-16: 2050 Build Conditions Bicycle LTS Analysis – With Facilities

Roadway/Segment	Segment Length (mi)	Facility Type	Target Speed	AADT	Posted Speed ≥ 40 mph	Level of Traffic Stress
Semoran Boulevard to Driggs Drive	0.141	10 ft Sidewalk or 8 ft	40	47,000	✓	LTS 1
Driggs Drive to Forsyth Road	0.301	Sidewalk with 5 ft Bike Lanes or 8 ft	40	52,000	✓	LTS 1
Forsyth Road to Metric Drive	0.493	Protected Bicycle lane with 10 ft	40	51,000	✓	LTS 1
Metric Drive to Goldenrod Road	0.210	Shared Use Path	40	51,000	✓	LTS 1

Source: 2023 Q/LOS Handbook – Bicycle LTS Flow Chart to use When Bicycle Facility is Present

Table 5-17: 2050 Build Conditions Transit LOS Analysis

Roadway/Segment	Segment Length (mi)	Service Frequency (Vehicles/Hour)	Headway (Minutes) assumed	Level of Service
Semoran Boulevard to Driggs Drive	0.141	4	15	C
Driggs Drive to Forsyth Road	0.301	2	30	D
Forsyth Road to Metric Drive	0.493	2	30	D
Metric Drive to Goldenrod Road	0.210	2	30	D

Source: 2023 Q/LOS Handbook – Table 1

Table 5-18: Recommended Improvements

Study Section/ Intersection	Improvement
Semoran Boulevard	- Remove channelization of northbound right turn lane - Add third southbound exclusive left turn lane - Remove channelization of westbound right turn lane and add second exclusive right turn lane
Driggs Drive	- Extend the westbound left turn lane - Convert northbound shared left-through lane to left-only, and right-only to a shared through-right lane - Convert all permitted phases for the left turn movements to protected phases - LPIs and right-turn-on-red restrictions for the eastbound and westbound directions
Forsyth Road	- Add northbound exclusive right turn lane - LPIs and right-turn-on-red restrictions for the eastbound and westbound directions
Metric Drive	- Convert permitted phase to protected phase for the minor left turn movements. - LPIs and right-turn-on-red restrictions for the eastbound and westbound directions
Goldenrod Road	Add eastbound exclusive right turn lane
University Boulevard Segment	- A target speed of 40 mph - Add a midblock pedestrian crossing supplemented with a Pedestrian Hybrid Beacon (PHB) just west of Goldenrod Road near the Publix Driveway - This study recommends monitoring the area near Central Place at Winter Park Apartments for the need to install a midblock pedestrian crossing with a PHB - This study recommends a midblock pedestrian crossing along the frontage of the Full Sail University main entrance that will be designed and constructed by others. A pedestrian bridge is being proposed along with Phase 1 development of the vacant parcel (Silver City Properties) located west of Costco on the north side of University Boulevard.

6 Alternatives Analysis

6.1 Proposed Alternatives

Through the existing conditions analysis, public involvement feedback, and input from local agency stakeholders, several alternatives were identified for the corridor to improve pedestrian and bicyclist safety.

Four Build Alternatives for the corridor were developed and are discussed below in the following subsections, in addition to the No-Build Alternative.

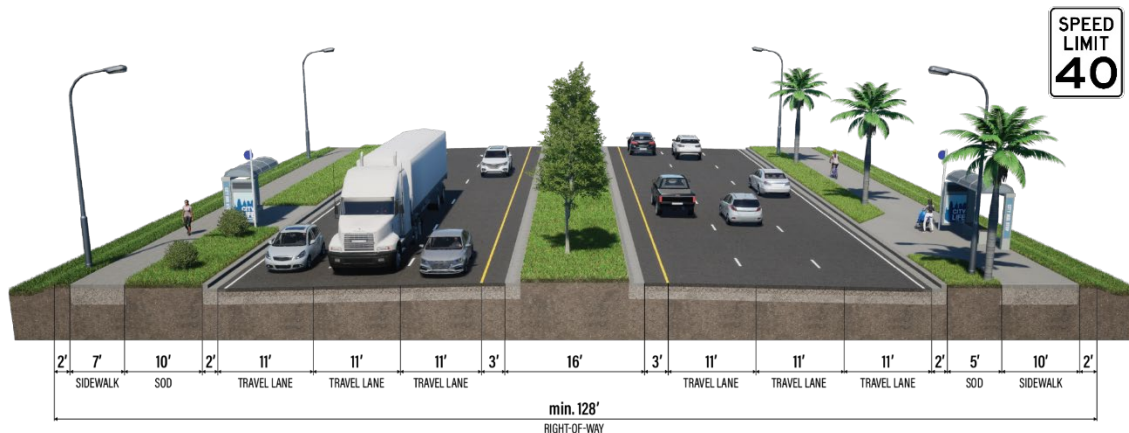
6.1.1 No-Build Alternative

The No-Build Alternative, carried as a viable option throughout the corridor study process, assumes no construction of a pedestrian or bicycle facility. The advantages of the No-Build Alternative include no additional ROW acquisition, no impacts to the environment from construction, no disruption of traffic during construction, and no project cost. The disadvantages of the No-Build Alternative are the purpose and need for the project are not satisfied: potential roadway safety enhancements are not made, potential pedestrian and bicyclist safety enhancements are not made, accessibility for all users are not improved, increased comfort and convenience for all users are not made, and transit accessibility is not enhanced.

6.1.2 Alternative 1

Alternative 1, shown in **Figure 6-1**, provides three 11-foot-wide travel lanes in each direction and maintains the existing raised median and outside curb and gutter. This alternative provides a three-foot-wide inside paved shoulder. This alternative maintains a seven-foot-wide sidewalk along the north side of the road. The sidewalk on the south side of the road is widened from the existing 5-foot width to 10 feet, to provide additional comfort for pedestrian and bicyclist users. The posted speed limit is reduced from 45 mph to 40 mph and no proposed ROW is required.

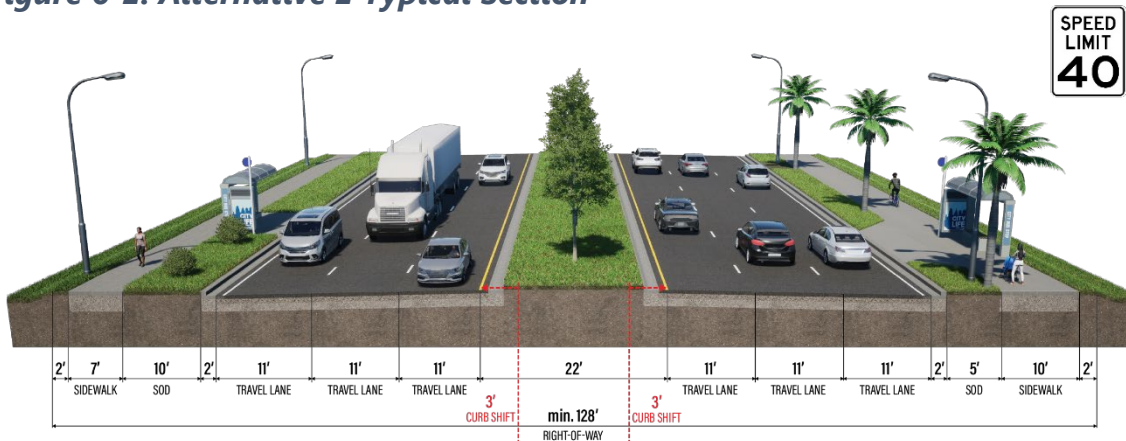
Figure 6-1: Alternative 1 Typical Section



6.1.3 Alternative 2

Alternative 2, shown in **Figure 6-2**, provides three 11-foot-wide travel lanes in each direction and widens the median to 22 feet. The inside curb and gutter are shifted by three feet to widen the median. This alternative maintains a seven-foot-wide sidewalk along the north side of the road. The sidewalk on the south side of the road is widened from the existing five-foot width to 10 feet, which provides additional comfort for pedestrians and bicyclists. The posted speed limit is reduced from 45 mph to 40 mph and no proposed ROW is required.

Figure 6-2: Alternative 2 Typical Section

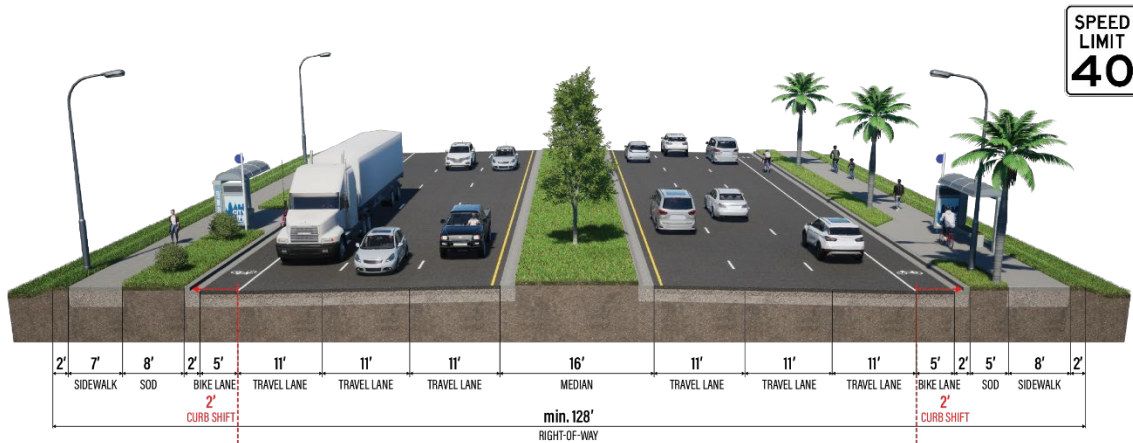


6.1.4 Alternative 3

Alternative 3, shown in **Figure 6-3**, provides three 11-foot-wide travel lanes in each direction and maintains the existing raised median. This alternative provides five-foot-wide bike lanes in both directions of travel. This requires the outside curb and gutter to be shifted out by two feet. The sidewalk on the south side of the road is widened from

the existing five-foot width to eight feet, which provides additional comfort for pedestrians. At both ends of the study corridor, the bike lanes would connect directly into the sidewalks. The posted speed limit is reduced from 45 mph to 40 mph and no proposed ROW is required.

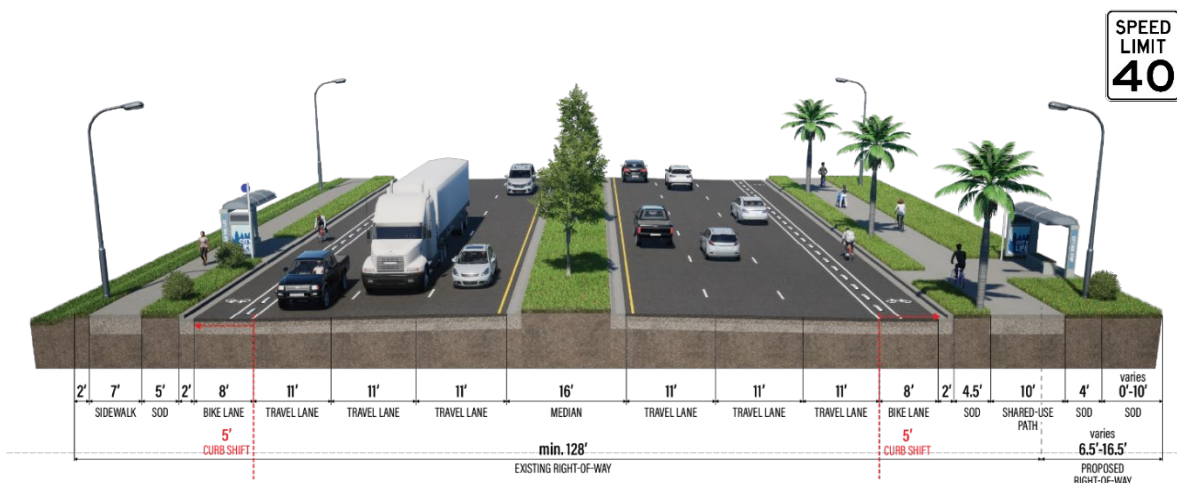
Figure 6-3: Alternative 3 Typical Section



6.1.5 Alternative 4

Alternative 4, shown in **Figure 6-4**, provides three 11-foot-wide travel lanes in each direction and maintains the existing median and curb and gutter. This alternative provides eight-foot-wide protected bike lanes in both directions of travel. This requires the outside curb and gutter to be shifted out by five feet. The sidewalk on the south side of the road is widened from the existing five-foot width to a 10-foot-wide shared-use path, which provides additional comfort for pedestrians and bicyclists. At both ends of the study corridor, the bike lanes would connect directly into the ten-foot-wide shared-use-path on the southside and seven-foot-wide sidewalk on the northside. The posted speed limit is reduced from 45 mph to 40 mph and an additional 5.5 through 15.5 feet of proposed ROW is required.

Figure 6-4: Alternative 4 Typical Section



6.2 Access Management Alternatives

To improve the access management of the study corridor, it is recommended that two changes be made to the median openings. Of the existing openings, it is recommended to modify one full opening to a dual directional opening and modify one full opening to a single-directional median to reduce the number of conflict points leading to potential reduction in crashes.

Table 6-1 shows the recommended changes to the median openings.

Table 6-1: Proposed Changes to Median Openings

#	Spacing	South Side Road/Connection	North Side Road/Connection	Existing Median Opening Type	Proposed Median Opening Type
1	-	Semoran Blvd	Semoran Blvd	Full - Signal	Full - Signal
2	900	University Park Drive	Driggs Drive	Full - Signal	Full - Signal
3	1,000	N/A	Costco Driveway	EB Directional	EB Directional
4	750	Forsyth Road	Forsyth Road	Full - Signal	Full - Signal
5	905	Winter Park Dental	Burger King	Full	Dual Directional
6	660	N/A	University Corporate Center	Full	Full
7	385	Central Place at Winter Park	N/A	Full	WB Directional
8	800	Calibre Bend Trail	Metric Drive	Full - Signal	Full - Signal
9	510	N/A	Publix Driveway	EB Directional	EB Directional
10	715	Goldenrod Road	Goldenrod Road	Full - Signal	Full - Signal

Table 6-2 shows the resultant opening spacings along the corridor as a result of the proposed changes.

Table 6-2: Proposed Median Openings

Median Opening #	Spacing	Median Opening Type	South Side Road/Connection	North Side Road/Connection
1	-	Full - Signal	Semoran Blvd	Semoran Blvd
2	900	Full - Signal	University Park Drive	Driggs Drive
3	1,000	EB Directional	N/A	Costco Driveway
4	750	Full - Signal	Forsyth Road	Forsyth Road
5	905	Dual Directional	Winter Park Dental	Burger King
6	660	Full	N/A	University Corporate Center
7	385	WB Directional	Central Place at Winter Park	N/A
8	800	Full - Signal	Calibre Bend Trail	Metric Drive
9	510	EB Directional	N/A	Publix Driveway
10	715	Full - Signal	Goldenrod Road	Goldenrod Road

6.3 Transportation Systems Management Analysis

Several Transportation System Management and Operational (TSM&O) improvements are recommended for the study corridor based on field observations, the safety audit, operational analysis, and stakeholder input. These following low-cost improvements do not typically require additional ROW and are intended to be implemented in the field within a five-year period.

- Driggs Drive and University Boulevard:
 - Extend the WB left turn storage by around 175 feet.
 - Allow protected phase only for the southbound left turn movement when pedestrians are present.
 - Recommend use of a blank out sign for no RTOR when pedestrians are present.
- Install a quick curb or flex stakes as an interim between the left turn lane and the travel lane for the directional EB left turn onto Costco Driveway to eliminate illegal NB and SB left turns onto University Boulevard from the side streets.
- Forsyth Road and University Boulevard:
 - Recommend use of a blank out sign for no RTOR when pedestrians are present.
 - To accommodate the access change to the full median opening just east of Forsyth Road (see #5 in **Table 6-1**), extend the WB left turn lane as needed.
- Metric Drive and University Boulevard:
 - Convert the existing three-section signal display to a four-section signal display for the southbound left turn movement so that permissive phase can be restricted when pedestrians are present.
 - Recommend use of a blank out sign for no RTOR when pedestrians are present.
 - To accommodate the access change to the full median opening just west of Metric Drive (see #7 in **Table 6-1**), extend the EB left turn lane as needed.
- Implement the access management recommendations included in Section 6.2.
- Install the necessary ADA Improvements along the study corridor based on the ADA compliance field review notes provided in **Appendix D**.

6.4 Alternative Drainage and Pond Concepts

University Boulevard, between Semoran Boulevard and Goldenrod Road, was permitted as phase one of a four-phase corridor extension. Per the Permit Number 19972-1, the corridor extension included ten retention/detention ponds with an underdrain system to

provide the necessary storage. Three of these ten ponds are within the study project corridor. University Boulevard from Semoran Boulevard to approximately 400 feet west of North Forsyth Road drains to Pond 1. From approximately 450 feet west of North Forsyth Road to the Crane Strand Canal drains to Pond 2, and from the Crane Strand Canal to Goldenrod Road drains to Pond 3.

These ponds generally outfall to the Crane Strand Canal, which drains to the Little Econ River. **Table 6-3** summarizes the existing ponds within the project limits. According to the County's Road and Drainage Division, there are no recorded drainage maintenance issues within the project corridor. See **Appendix E** for additional information about the existing stormwater ponds.

Table 6-3: Existing Stormwater Ponds

Pond	Location	Owner
1	1,280 feet east of the intersection of University Boulevard and S. Semoran Boulevard	University Park Assoc LLLP
2	1,500 feet west of the intersection of University Boulevard and N. Goldenrod Road	Orange County BCC
3	1,260 feet west of the intersection of University Boulevard and N. Goldenrod Road	Orange County BCC

Generally, for the University Boulevard study corridor, stormwater flows off the roadway and is collected in curb and gutter-inlets combination that discharge to the three existing stormwater ponds within the project limits as shown in **Table 6-3**.

Three drainage sub-basins have been identified along the project corridor. These basins were delineated from the Little Econ Drainage Master Plan, dated June 2001. Stormwater runoff from these basins is collected through a closed drainage system and conveyed to existing ponds for water quality treatment and peak discharge attenuation.

6.4.1 Sub-Basin 1

Identified as WP00062 in original study, is approximately 78 acres and is located within the Winter Park Basin boundary, per the Little Econ River Basin Stormwater Management Master Plan. Basin WP00062 starts at the intersection of Semoran Boulevard and University Boulevard and ends at approximately 450 feet west of the intersection of University Boulevard and North Forsyth Road. The basin extends north of the University Boulevard corridor until it is approximately 100 feet south of Cady Way Trail. The basin

also extends south of the University Boulevard corridor until it is approximately 50 feet north of the Winter Park Pines Canal.

6.4.2 Sub-Basin 2

Identified as CS00170 in original study, is approximately 38 acres and is located within the Crane Strand Basin boundary, per the Little Econ River Basin Stormwater Management Master Plan. Basin CS00170 starts at approximately 450 west of the intersection of University Boulevard and North Forsyth Road and ends at the intersection of University Boulevard and Goldenrod Road. The basin extends approximately 750 feet south of the University Boulevard and Goldenrod Road intersection.

6.4.3 Sub-Basin 3

Identified as CS00175 in original study, is approximately 34 acres and is located within the Crane Strand Basin Boundary, per the Little Econ River Basin Stormwater Management Master Plan. Basin CS00175 starts east of Crane Strand Canal and ends at the intersection of University Boulevard and Goldenrod Road. The basin extends approximately 1,000 feet south of the University Boulevard and Goldenrod Road intersection. The basin does not include the existing Target shopping center.

The proposed alternatives are expected to maintain the existing drainage pattern of the corridor. The changes to the existing drainage system are as follows:

1. Alternative 1 proposes no changes to the drainage system, keeping the curb and gutter and inlet structures in the same location.
2. Alternative 2 proposes widening the median to 22 feet which will require the inside curb and gutter and inlet structures to be shifted by 3 feet.
3. Alternative 3 maintains the existing median and inside curb and gutter and provides five-foot-wide bike lanes in both directions of travel which will require the curb and gutter and inlet structures to be shifted out by two feet.
4. Alternative 4 maintains the existing median and inside curb and gutter and provides eight-foot-wide protected bike lanes in both directions of travel which will require the curb and gutter and inlet structures to be shifted out by five feet.

7 Analysis and Comparison of Alternatives

7.1 Community Impacts

The No-Build Alternative maintains current conditions without impacts to existing community resources. However, it does not enhance safety, accessibility, and transit convenience.

Alternatives 1, 2, 3, and 4 provide enhancements in pedestrian and bicyclist safety, accessibility, comfort and convenience for all users, and transit accessibility.

The corridor is primarily comprised of Commercial, Industrial, and Residential land uses. In addition, Full Sail University is located at the southeast corner of the intersection of University Boulevard and Semoran Boulevard, at the western limit of the study corridor. Given the predominance of commercial and industrial land uses within the study corridor, Alternatives 1, 2, 3, and 4 are anticipated to have low impacts on the surrounding community. Enhancing connectivity through bicycle and pedestrian features will contribute positively to the community. Further, enhancing connectivity and accessibility around Full Sail University would support safer and more efficient transportation options for university staff and students.

7.1.1 Right-of-Way Impacts

Alternatives 1, 2, and 3 are not anticipated to have any ROW impacts. However, Alternative 4 is anticipated to require 0.79 acres of proposed ROW spanning across 22 parcels.

7.1.2 Existing Landscaping Impacts

Each build alternative will cause impacts to the existing trees within the corridor. Alternatives 1 and 2 are anticipated to cause impacts to 43 existing trees within the corridor. Alternatives 3 and 4 are anticipated to impact 59 and 65 existing trees, respectively. During the design phase, the existing trees should be evaluated for transplanting to minimize impacts and to provide shading. Existing trees will be preserved to the extent possible. Any trees removed shall have new trees installed in the original or a new location within the project's limits as allowed in the updated Orange County code during the design phase. Alternative sidewalk material use can also be used to help mitigate tree impacts as a substitute method.

7.1.3 Utility Impacts

Based on the safety improvements proposed for each of the Alternatives 1 through 4 evaluated, minimal impacts to existing utilities are anticipated. Potential impacts to underground utilities will likely only occur where we have underground construction

activities including signalization improvements, new ped pole locations, and new mid-block crossings. In addition, Occupational Safety and Health Administration (OSHA) separation requirements from overhead electric lines will need to be reviewed for all overhead work.

Other special considerations would be the City of Winter Park water and wastewater facilities. The City maintains a 16-inch and 12-inch water main running line along the south side of University Boulevard and an 8-inch force main that runs along the north side of University Boulevard. Segments of both the City's water and wastewater facilities are asbestos cement material. Impacts to the City's asbestos cement facilities would require costly relocations and include hazardous waste removal coordination. Subsurface Utility Engineering (SUE) should be performed during the design phase to ensure there are no impacts to the City's facilities.

To minimize existing utilities impacts to the fullest extent possible, mitigation measures would be taken during the project's design phase. If impacts are unavoidable, design alternatives would be reviewed to allow for impacted facilities relocation in a manner minimizing cost to the UAO and minimizing customer disruption.

7.1.4 Drainage Impacts

Alternative 1 is not expected to have any impact on the existing drainage system. However, Alternatives 2 through 4 are anticipated to affect the placement of the curb and gutter as well as the location of the inlet structures, which may be positioned either inside the median or on the sidewalk side. Specifically, Alternative 2 will require shifting the inside curb and gutter and inlet structures by three feet; Alternatives 3 and 4 will necessitate shifting the curb and gutter and inlet structures outward by two and five feet, respectively.

7.2 Environmental Impacts

Alternatives 1, 2, and 3 will all impact 0.01 acres of previously permitted surface waters. Alternative 4 however, will impact 0.04 acres of previously permitted surface waters. Given that all impacts would occur to permitted surface waters, no mitigation is anticipated for any of the alternatives.

7.3 Cost Estimate

A preliminary evaluation of the Build alternatives was performed to determine the estimated cost of each alternative. The breakdown of the cost of each alternative are provided in **Table 7-1**. A detailed version of each alternative's cost estimate is provided in **Appendix B**.

Table 7-1: Cost Estimate

Evaluation Criteria	No-Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Estimated Construction Cost (millions)	\$0	\$5.31	\$5.66	\$11.18	\$11.99
Estimated Design Cost (15% of Construction Cost) (millions)	\$0	\$0.76	\$0.81	\$1.61	\$1.72
Estimated Right-of-Way Cost (millions)	None	None	None	None	\$6.40
CEI (15% of Construction Cost) (millions)	\$0	\$0.80	\$0.85	\$1.68	\$1.80
Estimated Total Cost including Right-of-Way (millions)	\$0	\$6.87	\$7.32	\$14.47	\$21.91

7.4 Evaluation Matrix

A preliminary evaluation of the Build alternatives was performed to evaluate the study objectives, potential community impacts, potential environmental impacts, as well as estimated project cost for comparison. An evaluation matrix, provided in **Table 7-2**, was prepared for a side-by-side assessment of each alternative and its estimated impacts. Each topic within the evaluation matrix is described further in the sections below.

Table 7-2: Alternatives Evaluation Matrix

Evaluation Criteria	No-Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Study Objectives					
Potentially Enhances Roadway Safety	No	Yes	Yes	Yes	Yes
Potentially Enhances Pedestrian and Bicyclist Safety	No	Yes	Yes	Yes	Yes
Improves Accessibility for All Users	No	Yes	Yes	Yes	Yes
Provides Comfort and Convenience for All Users	No	Yes	Yes	Yes	Yes
Enhances Transit Accessibility	No	Yes	Yes	Yes	Yes
Potential Community Impacts					
Right-of-Way Potentially Needed (acres)	0.00	0.00	0.00	0.00	0.79

Evaluation Criteria	No-Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Total Potential Parcels Impacted (#)	0	0	0	0	22
Impact to Existing Trees (#)	0	43	43	59	65
Existing Bus Stop Shelter Impacts (#)	0	5	5	5	5
Community (Social-Economic) Impact Analysis – Environmental Justice (Low/Med/High)	None	Low	Low	Low	Low
Potential Archaeological & Historical Impacts (Low/Med/High)	None	Low	Low	Low	Low
Potential Roadway Utility Impacts (Low/Med/High)	None	Medium	Medium	High	High
Potential Roadway Drainage Impacts (Low/Med/High)	None	Low	Low	High	High
Potential Environmental Impacts					
Potential Wetlands Impacts (acres)	None	None	None	None	None
Potential Floodplain Impacts (acres)	None	None	None	None	None
Potential Contamination Sites Impacts (# of Medium/High Sites)	None	4	4	4	4
Potential Threatened & Endangered Species Impacts (Low/Med/High)	None	Low	Low	Low	Low
Critical and Strategic Habitat Impact (Low/Med/High)	None	Low	Low	Low	Low
Wildlife Corridor Impact (Low/Med/High)	None	Low	Low	Low	Low
Estimated Project Cost					
Estimated Total Cost including Right-of-Way (millions)	\$0	\$6.87	\$7.32	\$14.47	\$21.91

7.5 Selection of the Preferred Alternative

After developing the four alternatives, analyzing the impacts of each alternative, and gathering public feedback, a preferred alternative was chosen by the County. The preferred Build Alternative, along with the reasons used for the selection, is described below.

The Preferred Alternative is Alternative 1. Alternative 1 provides three 11-foot-wide travel lanes in each direction and maintains the existing median and curb and gutter. This alternative provides a three-foot-wide inside paved shoulder. This alternative maintains a seven-foot-wide sidewalk along the north side of the road. The sidewalk on the south side of the road is widened from the existing five-foot width to 10 feet, which provides additional comfort for pedestrians and bicyclists. The posted speed limit is reduced from 45 mph to 40 mph and the proposed improvements can be constructed within the existing ROW.

Alternative 1 was chosen as the preferred alternative as it meets the study objectives and has minimal community and environmental impacts, and total project costs.

8 Preferred Alternative

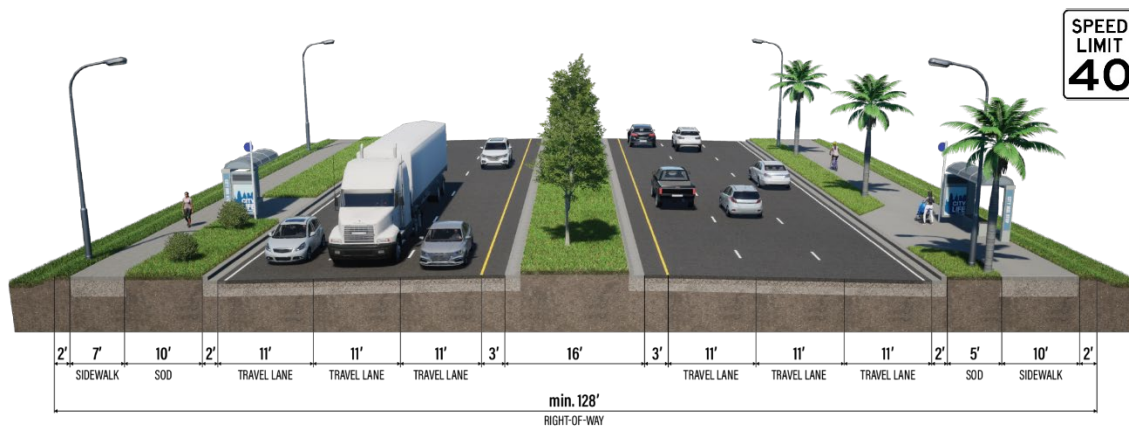
8.1 Typical Section

The Preferred Alternative, as shown in **Figure 8-1**, provides three 11-foot-wide travel lanes in each direction, and maintains the existing 16-foot-wide median and curb and gutter. This alternative provides a three-foot-wide inside paved shoulder. The sidewalk on the south side of the road is widened from the existing five-foot width to 10 feet, which provides additional comfort for pedestrians. The existing seven-foot-wide sidewalk on the north side of the road is maintained. The posted speed limit is reduced from 45 mph to 40 mph and no proposed ROW is required.

The preferred typical section, as shown in **Figure 8-1**, contains the following design elements:

- Six 11-foot travel lanes
- A 7-foot sidewalk located along the north side of the roadway
- A 10-foot sidewalk located along the south side of the roadway
- Type E curb and gutter along the inside lanes
- Type F curb and gutter along the outside lanes
- A 3-foot paved shoulder along the inside lanes
- A 16-foot raised median
- A 5-foot utility strip between the Type F curb and gutter and 10-foot sidewalk, and a 10-foot utility strip between the Type F curb and gutter and 7-foot sidewalk
- The existing ROW varies, but is typically 128 feet

Figure 8-1: Preferred Alternative Typical Section



8.2 Intersection Concepts and Signal Analysis

Within the project limits, there are no new traffic signals proposed. The existing signals are at Semoran Boulevard, Driggs Drive/University Park Drive, Forsyth Road, Metric Drive, and Goldenrod Road.

8.3 Right-of-Way Needs

The Preferred Alternative can be constructed within the existing ROW; therefore, no proposed ROW is anticipated for this project. For all alternatives, temporary construction easements will be required on driveways to restripe the existing stopbars located outside of the existing ROW.

8.4 Drainage

8.4.1 Preliminary Design Analysis

Alternative 1 was selected as the preferred alternative. Alternative 1 proposes no changes to the drainage system, keeping the curb and gutter and inlet structures in the same location. Therefore, the preferred alternative will not alter the existing drainage pattern. The road drainage will continue to runoff through the existing curb and gutter-inlet combination to the existing pipe system and ponds.

8.4.2 Stormwater Management Facilities

Technical Staff Report from ERP 19972-1 from the original construction of the road in 1983, shows the required attenuation storage for the 10-yr/24-hr storm as 7.86 acre-foot (ac-ft). The report indicates that the ten retention/detention ponds along the University Boulevard corridor provide 14.11 ac-ft of storage, 44% more than what is required for attenuation. The report does not provide details on the specific storage for each of the ten ponds. See **Appendix E** for ERP 19972-1 Technical Staff Report.

The preferred alternative involves adding five feet to the existing five-foot sidewalk along the entire south side of the study corridor. For a 10-year/24-hour storm, this addition corresponds to an estimated runoff volume of approximately 0.35 ac-ft for the added impervious area. The existing ponds, with an additional storage capacity of 14.11 ac-ft, should be sufficient to manage the 0.35 ac-ft of excess runoff generated by the project.

8.4.3 Cross Drains

There is an existing skewed 12-foot by 8-foot concrete box culvert located roughly 1,500 feet west of the intersection of University Boulevard and Goldenrod Road at the Crane Strand Canal. The culvert measures 242 feet in length, with its headwalls situated at the existing ROW line.

The proposed improvement to the corridor is not anticipated to impact the existing cross drain.

8.4.4 Floodplain and Floodways

FEMA Flood Map 12095C0260F (effective September 25, 2009) shows the Crane Strand Canal and triple box culverts within the 100-yr floodplain, in Zone AE with Base Flood Elevation (BFE) of 76 feet North American Vertical Datum (NAVD).

The proposed improvements are not expected to impact the triple box culverts, and no extension of the existing drainage culvert will be required. Consequently, no adverse effects on the flood plain area are anticipated.

8.4.5 Stormwater Permits

The project might qualify for an exemption from permitting from SJRWMD, as it meets F.A.C. 62-330.051 criteria for exempt activities as follows:

- (4)(d) Resurfacing and Repair of Existing Paved Roads, and Grading of Existing Unpaved Roads, provided:
 1. Travel lanes are not paved that are not already paved;
 2. No substantive changes occur to existing road surface elevations, grades, or profiles; and
 3. All work is conducted in compliance with subsection 62-330.050(9), F.A.C.
- (10) The construction, alteration, maintenance, removal or abandonment of recreational paths for pedestrians, bicycles, and golf carts, provided:
 - (a) There is no work in, on, or over wetlands or other surface waters other than those in drainage ditches constructed in uplands;
 - (b) There is no reduction in the capacity of existing swales, ditches, or other stormwater management systems legally in existence under chapter 403 or part IV of chapter 373, F.S.;
 - (c) The paths have a width of 8 feet or less for pedestrian paths, and 14 feet or less for multi-use recreational paths;
 - (d) The paths are not intended for use by motorized vehicles powered by internal combustion engines or electric-powered roadway vehicles, except when needed for maintenance or emergency purposes; and
 - (e) The paths comply with the limitations and restrictions in subsection 62-330.050(9), F.A.C.

8.5 Displacements

The preferred alternative has no business or residential displacements resulting from the project.

8.6 Estimated Project Costs

The estimated project costs for the preferred alternative are summarized in **Table 8-1**.

Table 8-1: Total Estimated Project Costs

Project Item	Cost
Estimated Construction Cost (millions)	\$5.31
Estimated Design Cost (15% of Construction Cost) (millions)	\$0.76
Estimated Right-of-Way Cost (millions)	None
CEI (15% of Construction Cost) (millions)	\$0.80
Estimated Total Cost including Right-of-Way (millions)	\$6.87

Notes:

1. Project Costs are in 2024 dollars
2. Construction Costs based on Preferred Alternative concept plans
3. Design Phase cost is estimated at 15% for this project
4. CEI is assumed at 15% for this project

The full detailed cost estimates are included in **Appendix B**.

8.6.1 Estimated Interim Measures Costs

The estimated interim measures costs for the preferred alternative are summarized in **Table 8-2**.

Table 8-2: Total Estimated Interim Measures Costs

Project Item	Cost
Estimated Construction Cost (millions)	\$0.239
Estimated Design Cost (15% of Construction Cost) (millions)	\$0.034
Estimated Right-of-Way Cost (millions)	None
CEI (15% of Construction Cost) (millions)	\$0.036
Estimated Total Cost including Right-of-Way (millions)	\$0.309

Notes:

5. Project Costs are in 2024 dollars
6. Construction Costs based on Preferred Alternative concept plans

7. Design Phase cost is estimated at 15% for this project
8. CEI is assumed at 15% for this project

The full detailed interim measures cost estimates are included in **Appendix B**.

8.7 User Benefits

Highway user costs are defined by the American Association of State Highway and Transportation Officials (AASHTO)'s A Manual on User Benefit Analysis of Highway and Bus-Transit Improvements, 1977, as a 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 users through the use of a particular transportation facility as compared with the user 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 by providing additional comfort for pedestrian and bicyclist users due to the widened sidewalk along the south side of University Boulevard. Pedestrian and bicyclist travel times can be reduced due to the addition of two new midblock crossings (the study recommends monitoring for the need at one of the two locations). Additionally, the improved access management provided with the project should reduce the occurrence rate of many crash types on the roadway.

8.8 Pedestrian and Bicycle Facilities

A continuous, 10-foot-wide sidewalk will be provided on the south side of University Boulevard, and the existing seven-foot-wide sidewalk will remain along the north side of University Boulevard. The sidewalks will be separated from the roadway by curb and gutter and a variable width grass/utility strip. Pedestrian features, including crosswalks and pedestrian signals, will be provided at each signalized intersection. The pedestrian and bicycle facilities will comply with ADA.

Two midblock crossings are proposed across University Boulevard. The first midblock crossing with a PHB is located west of the intersection of University Boulevard and Goldenrod Road near the Publix Driveway. The study recommends monitoring the area near Central Place at Winter Park Apartments west of the intersection of University Boulevard and Metric Drive for the need to install a second midblock pedestrian crossing with a PHB (when warranted). In addition to the midblock crossings, an elevated pedestrian bridge is in the design phase and would cross University Boulevard between Full Sail University and the planned student housing development (Silver City Properties (parcel ID 03-22-30-0000-00-029)) located west of Costco on the north side of University Boulevard.

Two proposed shaded areas are proposed along the study corridor. The first location is on the south side of the roadway approximately 500 feet west of Forsyth Road behind the sidewalk. The second location is on the south side of the roadway approximately 450 feet east of Calibre Bend Trail behind the sidewalk. These locations were chosen due to the additional existing ROW. These shaded areas consist of a bench, canopy, and trash can, and are meant to provide pedestrians and cyclists with a location to rest. The typical size of a shaded area is 10 feet wide by 15 feet long. However, the exact dimensions and locations of these shaded areas will be determined during the design phase.

8.9 Transit Facilities

LYNX provided information regarding the bus stop locations outlining the proposed modifications. These proposed changes were incorporated into the corridor concept plans. In addition, based on subsequent coordination with LYNX, the existing bus stops, south and north of University Boulevard, across from the Central Place at Winter Park Apartments are moved closer to the proposed mid-block crosswalk. There will be no change to the original proposed location of the eastbound bus stop on the far side of Calibre Bend Trail. The following list illustrates the final bus stop locations along the study corridor:

- EB University Boulevard and Driggs Drive far side: No change
- EB University Boulevard and Full Sail University main entrance: Remove stop
- EB University Boulevard and Forsyth Road far side: No change
- EB University Boulevard and Central Place at Winter Park Apartments first entrance: Remove stop
- EB University and Central Place at Winter Park Apartments second entrance: Move to be closer to the proposed mid-block crosswalk
- EB University Boulevard and Calibre Bend Trail far side: No Change
- WB University Boulevard and Goldenrod Road far side: Add stop
- WB University Boulevard and Metric Drive nearside: Move stop to far side
- WB University Boulevard and University Corporate Center first entrance: Remove stop
- WB University Boulevard and University Corporate Center second entrance: Move to be closer to the proposed mid-block crosswalk
- WB University Boulevard and Forsyth Road: Move near side stop to far side
- WB University Boulevard and Costco entrance: Remove stop
- WB University Boulevard and Driggs Drive: Move near side stop to far side

8.10 Environmental Impacts

The preferred alternative is anticipated to impact 0.01 acres of previously permitted surface waters. Because of this, no mitigation is anticipated.

8.10.1 Land Use

As with all of the corridor improvement alternatives, Alternative 1, the preferred alternative, can be constructed entirely within County ROW, minimizing impacts to land uses along the project corridor.

With no ROW acquisition, perhaps the largest impacts to adjacent land uses are related to vehicular access modifications and improved pedestrian and bicycle access. These proposed improvements benefit adjacent land uses by enhancing safety and mobility for all road users to access nearby businesses and residential uses.

There are two vehicular access modifications proposed for Alternative 1:

1. The existing full median opening providing access to the University Corporate Center on the north side and Winter Park Dental on the south side will be modified to a dual-directional median opening with the preferred alternative. In addition, a new WB left turn lane will be provided at this opening. Drivers exiting both properties and desiring to turn left or cross University Boulevard will be required to turn right and U-turn downstream where left turn storage will be increased to provide for the additional U-turning vehicles. Drivers exiting the University Corporate Center will U-turn at the Forsyth Road signalized intersection. Drivers exiting from Winter Park Dental will U-turn at the full median opening approximately 650 feet east.
2. The existing full median opening west of Metric Drive providing access to the Central Place at Winter Park Apartments will be modified to a WB directional left turn opening. Drivers exiting the apartment complex and desiring to turn left or cross University Boulevard will be required to turn right and U-turn at the Metric Drive traffic signal, where left turn storage will be increased to provide for the additional U-turning vehicles.

Pedestrian and bicycle access and mobility will be improved by adding safer opportunities to cross University Boulevard at three locations:

1. Full Sail University has plans to construct student housing on the north side of University Boulevard in the vacant parcel (parcel ID 03-22-30-0000-00-029) east of Driggs Drive. Once constructed, this development will generate a high volume of

pedestrians crossing to and from Full Sail University on the south side of University Boulevard. To facilitate these movements, Full Sail University is planning to construct a pedestrian bridge spanning University Boulevard near the western parcel boundary of the proposed student housing.

2. A midblock crosswalk with PHB is planned west of Goldenrod Road (near Publix driveway) to facilitate pedestrian and bicycle mobility to and from area businesses. Businesses benefiting from this improvement include the University Plaza shopping center that includes Publix and outparcels on the north side, and the Fifth Third Bank, Starbucks, and MD Now Urgent Care on the south side of University Boulevard.

Additionally, when warranted, a second midblock crosswalk with PHB is proposed to provide a safe crossing location between Forsyth Road and Metric Drive. This improvement will benefit businesses on both sides of University Boulevard between these two signalized intersections, including the University Corporate Center and Central Place at Winter Park Apartments.

8.10.2 Community Cohesion

The project does not bifurcate any neighborhoods or developments.

8.10.3 Cultural Impacts

No cultural impacts are anticipated from the construction of the preferred alternative.

8.10.4 Wetlands

There are no natural wetlands surrounding the preferred alternative. Impacts would occur to previously permitted surface waters.

8.10.5 Wildlife and Habitat

The proposed project was evaluated to determine the impacts to wildlife and habitat as a result of the Preferred Alternative. Based on existing information and data collected during the field review, the Preferred Alternative will not jeopardize the continued existence of a protected species and/or result in the destruction or adverse modification of Critical Habitat.

USFWS Consultation Areas

The study area is located within the USFWS Consultation Area (CA) of the Everglade snail kite and Florida scrub-jay. A consultation area is intended to identify the geographic landscape where each federally listed species is likely to occur. The study area also falls within two wood stork Core Foraging Areas (CFA), which include suitable foraging areas

important to the reproductive success of known wood stork nesting colonies. The following details these species including other federal and state listed species with the potential to occur within the project area. **Table 8-3** identifies listed species evaluated in this document, their regulatory status, and the effect determination under the Preferred Alternative.

Federally Protected Species

Eastern Indigo Snake

The eastern indigo snake is listed by the USFWS as threatened due to over-collecting for the pet trade as well as habitat loss and fragmentation and is widely distributed throughout central and south Florida. They occur in a broad range of habitats, from scrub and sandhill to wet prairies and mangrove swamps. Indigo snakes are most closely associated with habitats occupied by gopher tortoises whose burrows provide refugia from cold or desiccating conditions.

As a habitat generalist, the eastern indigo snake has the potential to occur throughout the project study area, including developed areas. However, there are no eastern indigo snakes documented in the resources reviewed within the project study area. No indigo snakes were observed during the field review. Suitable habitat for the gopher tortoise is present within the ROW of University Boulevard, however, no gopher tortoise burrows were observed. A 100% gopher tortoise survey was not conducted. To address any potential effects to the eastern indigo snake, all potentially occupied gopher tortoise burrows within the limits of construction will be excavated and the Standard Protection Measures for the Indigo Snake will be implemented during construction activities. The Preferred Alternative “may affect and is not likely to adversely affect” the eastern indigo snake.

Everglade Snail Kite

USFWS Everglade snail kite CA is located over the entire project study area. The Everglade snail kite is classified as endangered due to a very small population and increasingly limited amount of fresh marsh with sufficient water to ensure an adequate supply of snails. The USFWS has designated critical habitat for snail kites, which consists mostly of marshes near south Florida. No critical habitat for the snail kite occurs within the project corridor. The Everglade snail kite is a non-migratory subspecies only found in Florida, particularly near large watersheds (e.g., Everglades, Lake Okeechobee) and the shallow vegetated edges of lakes that support apple snails, the primary component of the snail kite’s diet. The project study area lacks the marshes and large waterbodies suited for snails and snail kites. No suitable habitat nor individuals were observed. No suitable habitat for the snail

kite will be impacted; and therefore, the Preferred Alternative will have “no effect” on the Everglade snail kite.

Wood Stork

The wood stork is listed by the USFWS as threatened. Wood storks are associated with freshwater and estuarine wetlands that are used for nesting, roosting, and foraging. Nesting typically occurs in medium to tall trees that occur in stands located in swamps or islands surrounded by open water. Preferred foraging habitat includes wetlands with a mosaic of submerged and/or emergent aquatic vegetation, and shallow open-water areas. Particularly attractive feeding sites are depressions in marshes or swamps where fish become concentrated during periods of receding water levels. According to the USFWS’s North Florida Ecological Service Office, the habitats within 15 miles of a wood stork breeding colony are considered to be wood stork CFAs. The project study area falls within the CFA of two wood stork breeding colonies: Eagle Nest Park and Lawne Lake. Suitable Foraging Habitat (SFH) for wood storks is located along the banks of the existing canal and areas within stormwater management facility locations. Impacts to these surface waters will not be impacted; therefore, there will be no impacts to SFH. The Preferred Alternative will have “no effect” on the wood stork.

Federally Protected Plants

According to the FNAI and USFWS, six federally protected plants have the potential to occur within the study area. The species listed as endangered include beautiful pawpaw, clasping warea, Carter’s warea, and sandlace. Beautiful pawpaw occurs in slash pine woods on sandy substrates in Charlotte, Lee, and Orange counties. Clasping warea is found in sunny openings with exposed sand in longleaf pine/turkey oak/wiregrass sandhills. Carter’s warea and sandlace inhabits sandhill, scrub, and scrubby flatwoods. The species listed as threatened include papery Whitlow-wort and pigeon winds occurs in scrub habitats. The FNAI database listed no Elemental Occurrences of protected plants within the study area. Due to the development within and adjacent to the study area, these species are unlikely to occur within the project area. No suitable habitat was observed within the project limits. Ecologists did not observe federally protected plants during the field survey. The Preferred Alternative will have “no effect” on federally listed plant species.

State Protected SpeciesFlorida Burrowing Owl

The FWC listed the Florida burrowing owl as threatened due to loss of native habitat, dependence on altered habitat, and lack of regulatory protections. The burrowing owl is a non-migratory, year-round breeding resident of Florida, and maintains home ranges and territories while nesting. Burrowing owls inhabit upland areas that are sparsely vegetated. Natural habitats include dry prairie and sandhill, but they will make use of ruderal areas such as pastures, airports, parks, and road ROW because much of their native habitat has been altered or converted to other uses.

Suitable habitat within the study area is limited to the mowed and maintained ROW of University Boulevard. No burrowing owls were observed during general wildlife surveys or species-specific surveys. Burrowing owls usually dig their own burrows but are known to utilize gopher tortoise burrows and armadillo burrows as well. No gopher tortoise burrows or mammal burrows were observed within the study area. No suitable habitat will be impacted as a result of the Preferred Alternative; therefore, "no effect is anticipated" for the burrowing owl.

Florida Sandhill Crane

The FWC listed the Florida sandhill crane as threatened due to the loss and degradation of nesting and foraging habitat from development and hydrologic alteration to their potential nesting habitat. The Florida sandhill crane is a heavy-bodied gray bird, with a long neck and long legs. It is widely distributed throughout most of peninsular Florida. Sandhill cranes rely on shallow marshes for roosting and nesting and open upland and wetland habitats for foraging.

No sandhill cranes were observed during field surveys. SFH was observed; however, no nesting habitat was observed within the study area. Sandhill cranes have not been documented within the study area.

Gopher Tortoise

The gopher tortoise is listed as threatened by the FWC. They occur in the southeastern Coastal Plain from Louisiana to South Carolina; the largest portion of the population is located in Florida. Gopher tortoises require well-drained, sandy soils for burrowing and nest construction, with a generally open canopy and an abundance of herbaceous groundcover, particularly broadleaf grasses, wiregrass (*Aristida stricta*), legumes and fruits for foraging. Gopher tortoises can be found in most types of upland communities including disturbed areas and pastures.

An undeveloped upland parcel is present adjacent to the project limits that provides suitable habitat for tortoises. Additionally, the mowed and maintained ROW of University Boulevard could provide suitable habitat. No gopher tortoises or gopher tortoise burrows were observed during the field survey. A 100% gopher tortoise survey was not conducted, but a survey will need to be performed prior to construction. A permit may be necessary from the FWC if tortoises are present within any permanent or temporary construction area. Therefore, "no adverse effect is anticipated" for the gopher tortoise resulting from the Preferred Alternative.

Imperiled Wading Birds

Three wading birds have the potential to occur in the study area. These species are the little blue heron, roseate spoonbill, and tricolored heron. All are listed by the FWC as threatened due to the loss and degradation of habitat, particularly from hydrologic alterations to their essential foraging areas. Little blue herons, roseate spoonbills, and tricolored herons are widely distributed throughout peninsular Florida. Wading birds depend on healthy wetlands and vegetated areas suitable for resting and breeding which are near foraging areas. They forage in freshwater, brackish water, and saltwater habitats. They tend to nest in multi-species colonies of a variety of woody vegetation types including cypress, willow, maple, black mangrove, and cabbage palm.

No listed wading bird species were observed during the field review. No suitable nesting habitat for wading birds was observed within or adjacent to the project. Foraging habitat is limited and includes the canal that intersects University Boulevard west of Metric Drive/Calibre Bend Trail. No nesting activity was observed within the project area, and there is no evidence that nesting occurs within 330 feet of the project. According to the FWC Wading Bird Rookery Data, the nearest rookery is approximately 3.9 miles southeast of the project site. "No effect is anticipated" for wading birds as a result of the Preferred Alternative.

Striped Newt

The striped newt is listed by the FWC as threatened due to habitat loss and alteration, destruction of breeding habitat from the use of off-road vehicles, changes in water retention periods, climate change, and diseases. They are found in southern Georgia and northern Florida with populations occurring in the Panhandle and Peninsula. Terrestrial adults inhabit dry upland habitats, including sandhill, scrub, scrubby flatwoods, and mesic flatwoods. Breeding habitat for the striped newt includes temporary or semipermanent depression marshes, dome swamps, sinkhole ponds, and borrow pits that lack predatory fish species.

No striped newts were observed during the field review. The study area does contain some undeveloped upland habitat; however, it lacks the temporary/semipermanent pools required to support striped newt breeding. Therefore, “no effect is anticipated” for the striped newt as a result of the Preferred Alternative.

State Listed Plants

Through regulation by the Florida Department of Agriculture and Consumer Services (FDACS) Division of Plant Industry, Florida protects plant species native to the state that are endangered, threatened, or commercially exploited. The Florida Regulated Plant Index includes all plants listed as endangered, threatened, or commercially exploited as defined in Chapter 5B-40.0055, F.A.C. According to the FNAI and FDACS, 12 state protected plant species have the potential to occur in Orange County. State threatened plant species include the many-flowered grass-pink, Chapman’s sedge, hartwrightia, nodding pinweed, Florida beargrass, and giant orchid. Endangered plants with potential to occur in Orange County include sand butterfly pea, cutthroatgrass, star anise, Florida spiny-pod, celestial lily, and Florida willow. However, the FNAI database listed no Elemental Occurrences of protected plants within the study area. Habitat for these state-listed plant species does not occur within the limits of the Preferred Alternative. Ecologists did not observe state listed plants during the field survey. Therefore, “no adverse effect is anticipated” for state-listed plants as a result of the Preferred Alternative.

Other Protected or Managed Species

Bald Eagle

The bald eagle was removed from the ESA in 2007 and Florida’s Endangered and Threatened Species list in 2008; however, it remains protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The bald eagle is a member of the Accipitridae family. Bald eagles tend to nest in the tops of very tall trees that provide unobstructed lines of sight to nearby habitats, particularly lakes and other open waters. Because eagles are piscivorous (fish-eating) raptors, nearly all eagles’ nests occur within 1.8 miles of water.

According to FWC’s Eagle Nest locator and the Audubon Florida EagleWatch Nest website (EagleWatch), no bald eagle nests have been identified within the study area. The nearest eagle nest is located approximately 1.6 miles northeast of the project area. No bald eagle nests were observed during the field survey. The project is not within the 660-foot buffer of any bald eagle nests. No impacts to the bald eagle are anticipated as a result of the Preferred Alternative.

Florida Black Bear

The Florida black bear was removed from Florida's Endangered and Threatened Species list in 2012; however, it remains protected under Chapter 68A-4.009 F.A.C., the Florida Black Bear Conservation Plan. The project area is within the abundant range of the Central Bear Management Unit (BMU). The black bear requires large amounts of space for its home range and a variety of forested habitats, including flatwoods, swamps, scrub oak ridges, bayheads, and hammocks. Self-sustaining populations of bears are generally found on large tracts of contiguous forests with understories of berry producing shrubs or trees.

According to the most recent FWC data, no recent bear telemetry, bear related calls, or bear mortality locations occur within the study area. The project area is highly developed and does not provide suitable habitat or connectivity to suitable habitat. No impacts to the Florida black bear are anticipated as a result of the Preferred Alternative.

Table 8-3: Effect Determinations for Listed Species

Scientific Name	Common Name	FWS Status	FWC Status	FDACS Status	Effect Determination
Amphibian					
<i>Notophthalmus perstriatus</i>	Striped newt		T		NEA
Avian					
<i>Athene cunicularia</i>	Florida burrowing owl		T		NEA
<i>Egretta caerulea</i>	Little blue heron		T		NEA
<i>Egretta tricolor</i>	Tricolored heron		T		NEA
<i>Grus canadensis</i>	Florida sandhill crane		T		NEA
<i>Haliaeetus leucocephalus</i>	Bald eagle	BGEPA/MBTA			N/A
<i>Mycteria americana</i>	Wood stork	T			NO EFFECT
<i>Platalea ajaja</i>	Roseate spoonbill		T		NEA
<i>Rostrhamus sociabilis plumbeus</i>	Everglade snail kite	E			NO EFFECT
Mammal					
<i>Ursus americanus floridanus</i>	Florida black bear		M		N/A
Reptile					
<i>Drymarchon couperi</i>	Eastern indigo snake	T			MANLAA
<i>Gopherus polyphemus</i>	Gopher tortoise		T		NAEA
Plants					
<i>Calopogon multiflorus</i>	Many-flowered grass-pink			T	NEA
<i>Carex chapmannii</i>	Chapman's sedge			T	NEA
<i>Centrosema arenicola</i>	Sand butterfly pea			E	NEA
<i>Clitoria frangrans</i>	Pigeon wings		T		NO EFFECT
<i>Coleataenia abscissa</i>	Cutthroatgrass			E	NEA
<i>Deeringothamnus pulchellus</i>	Beautiful pawpaw		E		NO EFFECT
<i>Hartwrightia floridana</i>	Hartwrightia			T	NEA
<i>Illicium parviflorum</i>	Star anise			E	NEA
<i>Lechea cernua</i>	Nodding pinweed			T	NEA
<i>Matelea floridana</i>	Florida spiny-pod			E	NEA
<i>Nemastylis floridana</i>	Celestial lily			E	NEA
<i>Nolina atopocarpa</i>	Florida beargrass			T	NEA
<i>Paronchia chartacea</i>	Papery Whitlow-wort		T		NO EFFECT
<i>Polygonella myriophylla</i>	Sandlace		E		NO EFFECT
<i>Pteroglossaspis ecristata</i>	Giant orchid			T	NEA
<i>Salix floridana</i>	Florida willow			E	NEA
<i>Warea amplexifolia</i>	Clasping warea		E		NO EFFECT
<i>Warea carteri</i>	Carter's warea		E		NO EFFECT
E = Endangered T = Threatened C = Candidate M = Managed NEA = No Effect Anticipated NAEA = No Adverse Effect Anticipated FDACS = Florida Department of Agriculture and Consumer Services FWC = Florida Fish and Wildlife Conservation Commission USFWS = United States Fish and Wildlife Service					

Critical and Strategic Habitats

Critical Habitat

No Critical Habitat designated for listed species occurs within the project area. No destruction or adverse modification of USFWS designated Critical Habitat will occur.

Strategic Habitat Conservation Areas

No SHCA occurs within the study area.

Wildlife Corridors

Roads can have an adverse effect on wildlife, most notably through habitat fragmentation and genetic isolation. Vehicle traffic on roads can lead to wildlife-vehicle collisions and roadkill, which may imperil local wildlife populations.

The study area is highly developed with very limited natural areas that are not contiguous with other habitats, therefore wildlife mobility is limited within the corridor in the existing condition. The project would not increase traffic capacity on University Boulevard, except for at intersections. Safety improvements resulting from the proposed project are unlikely to adversely impact wildlife mobility within the corridor.

8.11 Utility Impacts

Based on the safety improvements proposed for the preferred Alternative 1, minimal impacts to existing utilities are anticipated. Potential impacts to underground utilities will likely only occur where we have underground construction activities including signalization improvements, new ped pole locations, and new mid-block crossings. In addition, OSHA separation requirements from overhead electric lines will need to be reviewed for all overhead work.

Other special considerations would be the City of Winter Park water and wastewater facilities. The City maintains a 16-inch and 12-inch water main running line along the south side of University Boulevard and an 8-inch force main that runs along the north side of University Boulevard. Segments of both the City's water and wastewater facilities are asbestos cement material. Impacts to the City's asbestos cement facilities would require costly relocations and include hazardous waste removal coordination. SUE should be performed during the design phase to ensure there are no impacts to the City's facilities.

To minimize existing utilities impacts to the fullest extent possible, mitigation measures would be taken during the project's design phase. If impacts are unavoidable, design alternatives would be reviewed to allow for impacted facilities relocation in a manner minimizing cost to the UAO and minimizing customer disruption.

8.12 Traffic Control Plan

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

8.13 Design and Construction Schedule

Currently, there are no future phases scheduled for funding. The University Boulevard Pedestrian/Cyclist Safety Study is expected to be completed by July 2025.

8.14 Special Features

Several unique design features are anticipated to be incorporated into this project and are described below.

8.14.1 Pedestrian Fencing

Pedestrian channelization fencing is proposed in the median of University Boulevard along the corridor. The purpose of the fencing is to prevent pedestrians from crossing University Boulevard at locations outside of crosswalks. Pedestrian fencing in the median is proposed only at approximately 1,900' of corridor length. This is due to lateral offset design standard requirements, which limits the placement of the pedestrian fencing to areas where the median is wide enough to accommodate the fencing.

While there was a desire to have pedestrian fencing on both sides of the road, Developmental Standard Plans Index D550-804 states that steel pedestrian channelization fences used adjacent to a sidewalk can only be used with a maximum design speed of 35 mph, which is lower than the proposed 40 mph design speed along University Boulevard. In contrast, steel pedestrian channelization fencing used in the median can be used for a maximum design speed of 45 mph.

8.14.2 Access Management

The access management plan for University Boulevard is generally based on FDOT Access Class 5 criteria. The median opening spacing distances for the Class 5 criteria are as follows:

- Directional median opening spacing – 660 feet
- Full median opening spacing criteria – 1,320 feet

The access management plan for University Boulevard is shown on the concept plans contained in **Appendix A**.

8.14.3 Street Lighting

It is the County's policy to provide street lighting along the corridor. Lighting analysis is recommended to be conducted during final design for the corridor and signalized

intersections to determine the number of additional luminaires/light poles required to meet intersection and corridor lighting criteria since most of the corridor and intersections currently do not meet FDM lighting criteria.

9 Public Involvement

9.1 Public Involvement Plan

Public involvement includes communicating to, and receiving information from, all interested persons, groups, and government organizations regarding the development of a project. At the start of the study, a Public Involvement Plan (PIP) was developed to outline the processes taken to ensure the appropriate level of public involvement is fostered for this study. The PIP (in **Appendix C**) is maintained as a living document, being updated throughout the study process, and summarizes the outreach events.

The following sections summarize the University Boulevard Pedestrian/Cyclist Safety Study public outreach efforts.

9.2 Public Information Distribution

Public information distribution is the process of ensuring that all project information shared with the public is accurate, transparent, and delivered in a timely manner. Under this study, information was distributed to the public in several ways, including the following:

1. Study Website – A dedicated project website¹ was created and linked to the Orange County Website². The website includes project details, documents, schedule, and an online tool to provide feedback on the project.
2. Newsletters – Newsletters were mailed out to all residents and business owners within the project study area prior to Public Community Meeting No. 1, Public Community Meeting No. 2, the Local Planning Agency (LPA) Hearing, and the Orange County Board of County Commissioners (BCC) Hearing. The newsletters include information about the project (location, study area and purpose) and information about how the public could participate in the study and provide input.
3. Advertisements – Advertisements were posted in the Orlando Sentinel two Sundays prior to Public Community Meeting No. 1, Public Community Meeting No. 2, and the LPA and BCC Hearings. The advertisements include information about

¹ www.universityboulevardpedestriancyclistsafetystudy.com

² <https://www.orangecountyfl.net/TrafficTransportation/TransportationProjects/UniversityBoulevard.aspx>

the project (location, study area and purpose) and information about how the public could participate in the study and provide input.

4. Coordination and Small Group Meetings were conducted throughout the study process to obtain feedback from local, regional and state (as applicable) agencies on the study, as well as with any group interested in meeting separately with the study team.

9.3 Coordination and Small Group Meetings

Coordination and Small Group Meetings were conducted throughout the study process to obtain feedback from local, regional and state agencies (as applicable) on the study, as well as with any group interested in meeting separately with the study team. To date, the study team has held meetings with the following agencies/groups:

- Full Sail University meeting on 01/08/2024.
 - This meeting was followed by a survey for Full Sail University faculty, staff and students. The survey included 17 questions related to how faculty, staff and students travel along the University Boulevard corridor, and improvements they would like to see implemented. The survey and a summary of the responses are included in **Appendix C**.
- FDOT, LYNX, Bike/Walk Central Florida (BWCF) combined meeting (Stakeholder meeting #1) on 01/08/2024.
- Orange County Parks and Recreation Department meeting on 02/09/2024.
- Orange County Sheriff's Office meeting on 02/15/2024.
- Aloma Elementary School meeting on 02/23/2024.
- Orange County Environmental Protection Division meeting on 02/23/2024.
- Orange County Public Schools (OCPS) meeting on 03/07/2024.
- Full Sail University and LYNX combined meeting on 03/19/2024.
- Full Sail University and Orange County Parks and Recreation Department combined meeting on 03/19/2024.
- University Corporate Center/Denholtz Properties meeting on 09/17/2024.
- Business Owner's meeting 10/14/2024 – invitations were extended to the following; however, only Denholtz Properties joined the call:
 - University Corporate Center/Denholtz Properties (6903 University Boulevard, Winter Park, FL 32792)
 - Zaxby's (6503 University Blvd, Winter Park, FL 32792)
 - Dunkin' (6627 University Blvd, Winter Park, FL 32792)
 - Winter Park Dental (6504 University Blvd, Winter Park, FL 32792)
 - Old Burger King/ARCTRUST (6709 University Blvd, Winter Park, FL 32792)

- Central Place at Winter Park/Robbins Property Associates (7000 University Blvd, Winter Park, FL 32792)
- University Business Park/The Bywater Company (1331 Green Forest Ct, Winter Garden, FL 34787)
- FDOT, Orange County (various departments), Full Sail University, Orlando YIMBY, BWCF combined meeting (Stakeholder meeting # 2) on 10/18/2024.

All coordination and small group meeting summaries are included in **Appendix C**.

Additionally, a walking audit of the corridor was conducted on April 18, 2024. The audit was initiated to gain a better understanding of the challenges non-motorists face while traveling along the University Boulevard corridor, and to help identify potential alternatives/improvements to move forward for further analysis. The audit included over 25 representatives from Orange County, BWCF, FDOT, MetroPlan Orlando, and the study team. A memo summarizing the walking audit is included in **Appendix C**.

9.4 Public Community Meetings

As part of this study, two public community meetings were held:

- Public Community Meeting No. 1 – the purpose of this meeting was to present the data collection findings, alternative concepts for safety improvements, and to obtain public feedback on transportation issues important to the community.
- Public Community Meeting No. 2 – the purpose of this meeting was to present the findings and recommendations of the proposed alternative(s).

9.4.1 Public Community Meeting No. 1

Public Community Meeting No. 1 was held on Monday, October 21, 2024, at the Aloma Elementary School Cafeteria (2949 Scarlet Road, Winter Park, FL 32792).

The purpose of this first meeting was to present the data collection findings, alternative concepts for safety improvements, and to obtain public feedback on transportation issues important to the community. The meeting began at 6:00 pm. Between 6:00 to 6:30 pm, members of the public were free to review poster boards with information on the proposed corridor alternatives, as well as ask questions to members of the project team. The open discussion was followed by a presentation at 6:30 pm, which included an overview of the project, a summary of existing conditions along the corridor, review of the proposed alternatives, outreach conducted to date, and the project schedule. At the end of the presentation, the public was invited to ask questions. The Public Community Meeting No. 1 summary memo is included in **Appendix C**.

9.4.1.1 Public Meeting #1 Survey

As part of the public meeting presentation, the public was provided a link to a survey to understand travel patterns along the University Boulevard corridor, and to obtain feedback on the proposed improvement alternatives.

9.4.2 Public Community Meeting No. 2

Public Community Meeting No. 2 was held on Thursday, April 3, 2025, at the Aloma Elementary School Cafeteria (2949 Scarlet Road, Winter Park, FL 32792).

The purpose of the meeting was to present the preferred study recommendations for public review and to allow the public to ask questions or provide feedback to members of the project team. The meeting began at 6:00 pm. Between 6:00 to 6:30 pm, members of the public were free to review poster boards with information on the preferred study recommendations, as well as ask questions to members of the project team. The open discussion was followed by a presentation at 6:30 pm, which included an overview of the project, a summary of existing conditions along the study corridor, review of the proposed improvements, outreach conducted to date, and the project schedule. At the end of the presentation, the public was invited to ask questions. The Public Community Meeting No. 2 summary memo along with the survey and the responses is included in **Appendix C**.

9.5 Local Planning Agency and Board of County Commissioners

As part of this study's outreach requirements, the draft study recommendations were presented to the Orange County Planning and Zoning Commission (PZC), also referred to as the Local Planning Agency (LPA) and the Orange County Board of County Commissioners (BCC) as two separate hearings.

9.5.1 LPA Public Hearing

The LPA Hearing was held in person on Thursday, August 21, 2025, at the Orange County Commission Chambers, located at 201 S. Rosalind Ave., Orlando, FL 32801.

The draft study recommendations were presented to the LPA as a public hearing agenda item on Thursday, August 21, 2025. The presentation provided highlights of the study and its findings, followed by input from Commission members. The LPA approved a motion to carry the study recommendations forward with interim measures, design, and construction to the Orange County BCC. The LPA Hearing agenda, presentation, and summary is included in **Appendix C**.

9.5.2 BCC Public Hearing

The BCC Hearing was held in person on Tuesday, August 26, 2025, at the Orange County Commission Chambers, located at 201 S. Rosalind Ave., Orlando, FL 32801.

The draft study recommendations were also presented to the BCC as a public hearing agenda item on Tuesday, August 26, 2025. The presentation provided highlights of the study findings and the LPA recommendations, followed by input from Commission members.

The BCC found the University Boulevard Pedestrian/Cyclist Safety Study consistent with the Orange County Comprehensive Plan, and approved the study, directing staff to move forward with interim measures, design, and construction. The BCC Hearing agenda, presentation, and summary is included in **Appendix C**.

10 Conclusion and Recommendations

The objective of the University Boulevard Pedestrian/Cyclist Safety Study is to develop and evaluate alternatives for improvements to University Boulevard between Semoran Boulevard and Goldenrod Road to improve the safety of pedestrians, cyclists, transit patrons, motorists and freight handlers of all ages and abilities, and 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 corridor improvements. It is recommended that the preferred alternative detailed in Section 8 of this report be advanced to the design phase.

10.1 Interim Measures

This study also included interim measures that can be constructed prior to design/construction of the preferred alternative improvements. These interim measures are selected for their lack of design and maintenance of traffic requirements, as well as their low cost, providing safety enhancements until the final improvements are implemented along the study corridor.

- Driggs Drive and University Boulevard:
 - Allow protected phase only for the southbound left turn movement when pedestrians are present.
 - Recommend use of a blank out sign for no RTOR when pedestrians are present.

- Install a quick curb or flex stakes as an interim between the left turn lane and the travel lane for the directional EB left turn onto Costco Driveway to eliminate illegal NB and SB left turns onto University Boulevard from the side streets.
- Forsyth Road and University Boulevard:
 - Recommend use of a blank out sign for no RTOR when pedestrians are present.
- Metric Drive and University Boulevard:
 - Convert the existing three-section signal display to a four-section signal display for the southbound left turn movement so that permissive phase can be restricted when pedestrians are present.
 - Recommend use of a blank out sign for no RTOR when pedestrians are present.
- University Boulevard Study Corridor:
 - Refresh/install high emphasis crosswalks at driveways.

University Boulevard Pedestrian/Cyclist Safety Study

Semoran Boulevard to Goldenrod Road

