Draft Final Intersection Control Evaluation (ICE) Addendum
for
Chuluota Road (CR 419)
From SR 50 to Lake Pickett Road

Prepared for

Orange County Public Works

Prepared by

March, 2025

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Intersection Control Evaluation (ICE) Addendum

FOR

Chuluota Road (CR 419)
FROM SR 50 TO LAKE PICKETT ROAD

PREPARED FOR

ORANGE COUNTY GOVERNMENT FLORIDA

ORANGE COUNTY PUBLIC WORKS

PREPARED BY

JMT

March, 2025

Orange County Project Number: Y20-830

PROFESSIONAL ENGINEER CERTIFICATION

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

REPORT: Intersection Control Evaluation (ICE) Analysis Addendum

PROJECT LOCATION: Chuluota Road From SR 50 to Lake Pickett Road

CLIENT: Orange County, Florida

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

JMT, Inc.
400 Colonial Center Parkway, Suite 100
Lake Mary, FL 32746
Florida Certificate of Authorization: 5917

This report includes a summary of data collection efforts, corridor analysis, and conceptual design analysis for Chuluota Road from SR 50 to Lake Pickett 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 judgment and experience.

Signature:

Name: Greg T. Smith, PE
FL PE 39087

Date: _____

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EXECUTIVE SUMMARY

ES.1 Introduction

Orange County prepared the Roadway Conceptual Analysis (RCA) for the Chuluota Road (CR 419) corridor from SR 50 to Lake Pickett Road in northeast Orange County which was presented to the Orange County Board of County Commissioners on March 7, 2023. At this meeting, the Board concluded that additional studies were needed to consider and investigate alternative intersection controls and configurations such as roundabouts and other options. Later in 2023, the Board authorized further investigations to more fully explore various options by conducting an Intersection Control Evaluation (ICE) process using FDOT procedures.

This addendum to the Chuluota Road RCA summarizes the ICE Study which identifies alternative intersection concepts, recommendations, and other findings from the ICE evaluation process. The preferred improvements identified in the RCA and this report will serve as the basis for the subsequent design and construction of these facilities.

ES.2 Purpose and Need for Improvement

The RCA Study established the purpose and need for this project which is based on several factors including addressing forecasted traffic demands, the need for multi-modal improvements to accommodate pedestrians and bicyclists, provisions for safety enhancements, and consistency with the County's long range transportation plans. The conclusion from the RCA was that Chuluota Road should be widened to a divided four-lane, urban roadway with sidewalks and a multi-use path to meet the above factors.

The ICE investigations provided additional evaluations of various intersection options by performing safety, operations, and cost analyses at six intersections along the Chuluota Road corridor (see Figure ES-1).

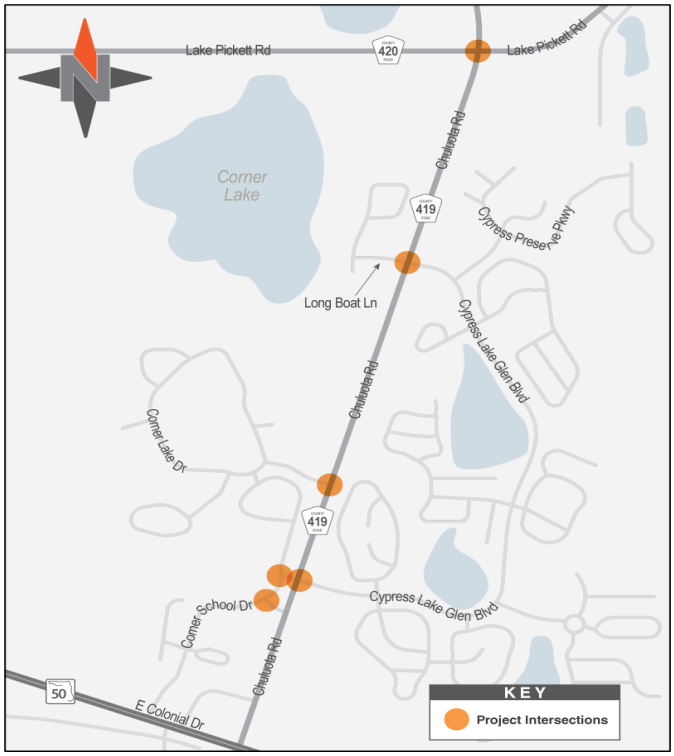


Figure ES-1 ICE Study Intersections

The conclusions reached by the ICE investigations confirmed that four-lane widening improvements are needed to meet forecasted traffic demands. Also, while the ICE Study indicated that the existing traffic controls (signals and stop signs) along Chuluota Road generally provide better Level of Service and less delay than the use of innovative intersection concepts (roundabouts or bow tie intersection concepts), when other factors are considered such as measures to reduce operating speeds, a roundabout at Long Boat Lane and Cypress Lake Glen Boulevard (North) can be a viable option at this location since it would slow southbound motorists while providing better access opportunities for the side road motorists. Consequently, the combined improvements of the RCA's four-lane widening with a roundabout option at Long Boat Lane from the ICE Study are recommended for design and construction.

ES.3 ICE Alternatives

The ICE investigations were conducted at six intersections listed below:

- Chuluota Road at Lake Pickett Road
- Chuluota Road at Long Boat Lane/Cypress Lake Glen Boulevard (North)
- Chuluota Road at Corner Lake Drive
- Chuluota Road at Cypress Lake Glen Boulevard (South)
- Corner School Drive and Schoolview Way
- Corner School Drive, Relocated Schoolview Way, Cypress Lake Glen Boulevard

These six intersections were also analyzed under two scenarios:

- Chuluota Road as a two-lane roadway which would maintain existing conditions except for the integration of various ICE intersection options.
- Chuluota Road with four-lane widening as described in the RCA with the integration of various ICE intersection options such as roundabouts.

Under the ICE investigations, various intersection concepts were considered using FDOT ICE guidelines which prescribes three stages of analyses (see report Sections 3-5 for details).

- Stage 1 ICE Evaluations were conducted which consisted of using FDOT's CAP-X and SPICE tools to analyze the intersection concepts shown on the next page. The Cap-X tool is an operational analysis tool designed to evaluate various innovative intersection designs, and the SPICE tool examines the safety performance of the intersection options. The Stage 1 analysis started with 15 intersection concepts (see Figure ES-2 on the following page) and at it's conclusion, four intersection alternatives (signals, stop signs, roundabouts, and bow tie intersection options) were advanced to Stage 2 for further study
- Stage 2 ICE Evaluations further differentiates the control strategies from Stage 1, by requiring an in-depth analysis of the proposed control strategies. Prior to conducting additional analyses, a conceptual design was developed for each viable control strategy to better determine impacts to adjacent properties and the need for additional right-of-way. At the conclusion of Stage 2 analyses, it was determined that the four intersection concepts (signals, stop signs, roundabouts, and bow tie intersection options) should receive additional analysis in Stage 3.
- Under Stage 3, further studies were prepared for the four intersection concepts (signals, stop signs, roundabouts, and bow tie intersection options) which included geometric enhancements of the intersection control options, cost analyses (both construction and right-of-way), and a corridor operational analysis which will examine the overall performance of the intersection concepts for the entire corridor. The Stage 3 activities included collection of additional data, developing more detailed designs, conducting more detailed operational analysis, additional cost estimates, and completion of the Stage 3 forms to identify the preferred control strategy.

ALTERNATIVE INTERSECTION CONTROLS CONSIDERED IN STAGE 1 ICE

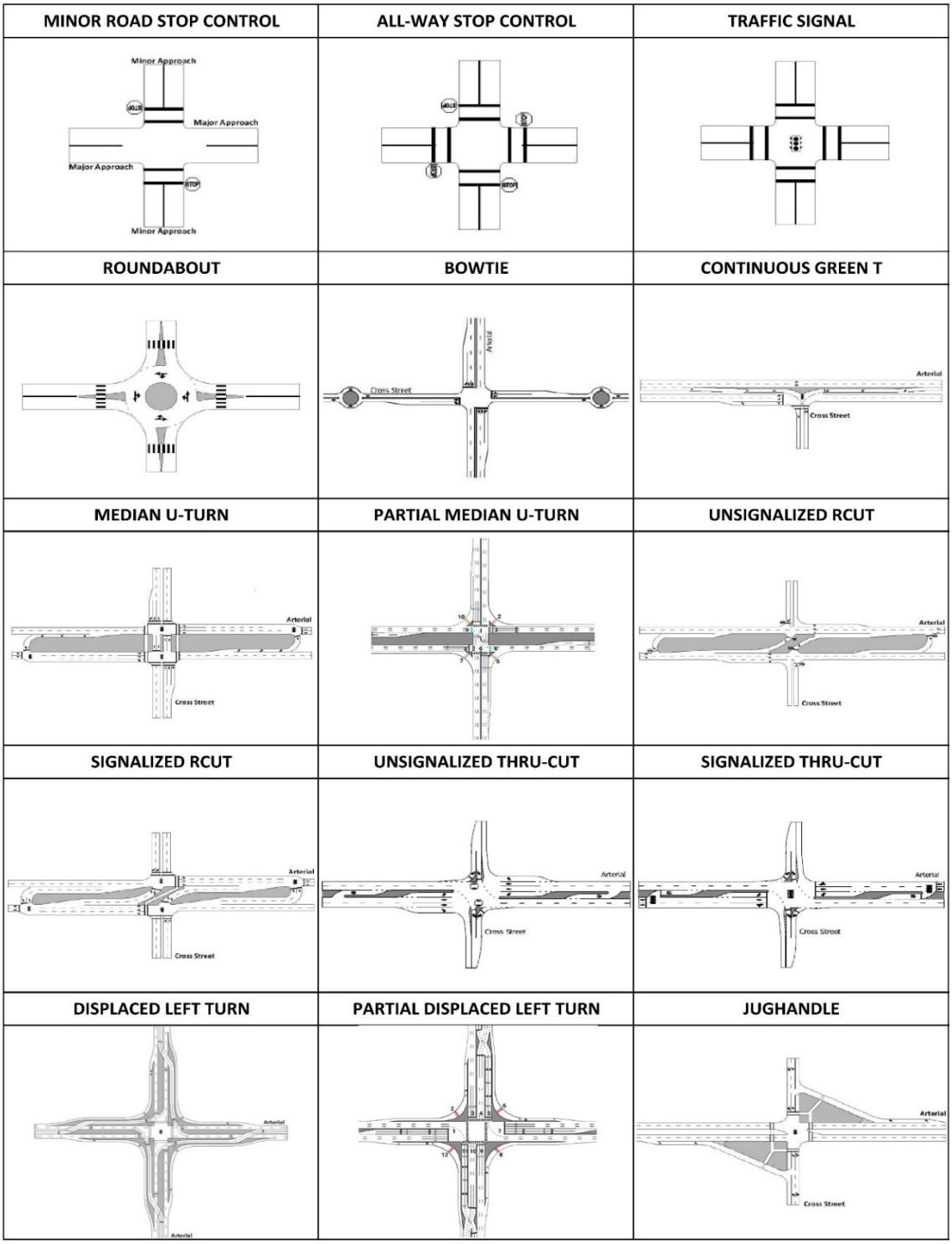


Figure ES-2 ICE Stage 1 Alternatives

ES.4 Traffic Analysis

Additional traffic counts and analyses were conducted to support the ICE investigations. A summary of these analyses is included in Section 2 with detailed traffic results provided in Appendix B, Traffic Addendum.

In addition, the ICE Stages 1, 2, and 3 analyses are summarized in this document in Sections 3, 4 and 5, respectively. The detailed results of these analyses for ICE Stages 1, 2, and 3 are contained in Appendices C-E, respectively.

ES.5 Results from the ICE Analyses

The Stage 1 analysis started with 15 intersection concepts and at it's conclusion, four intersection alternatives (signals, stop signs, roundabouts, and bow tie intersection options) were advanced to Stage 2 for further study.

The results of the Stage 2 analyses were not entirely conclusive, thus the above four intersection concepts were reviewed further in Stage 3. At the end of the Stage 3 investigations, the ICE Study arrived at the following conclusions as well as preferred intersection controls and other recommendations as follows:

- The existing two-lane Chuluota Road cannot accommodate anticipated future traffic demands. Even with the use of innovative intersection concepts such roundabouts or bow tie intersection concepts, the existing two-lane section of Chuluota Road is expected to reach capacity well before the Design Year, and continue to experience high congestion, low levels of service, and delays. Furthermore, the existing two-lane roadway will not meet other goals of the project such as providing multi-modal accommodations for pedestrians and bicyclists through the use of sidewalks and a multi-use path throughout the corridor.

- To meet forecasted traffic demands, Chuluota Road is recommended to be widened to four lanes.

- The ICE Study indicated that the existing traffic controls consisting of signals and stop signs along Chuluota Road generally provide better Level of Service and less delay than the use of innovative intersection concepts such roundabouts or bow tie intersection concepts.

  However, when other factors are considered such as measures to reduce operating speeds, a roundabout at Long Boat Lane and Cypress Lake Glen Boulevard (North) is a viable option (see Figure ES-3) at this location since it would likely slow motorists on Chuluota Road while providing improved access opportunities for motorists on the side roads. Attendees at the public meetings frequently mentioned

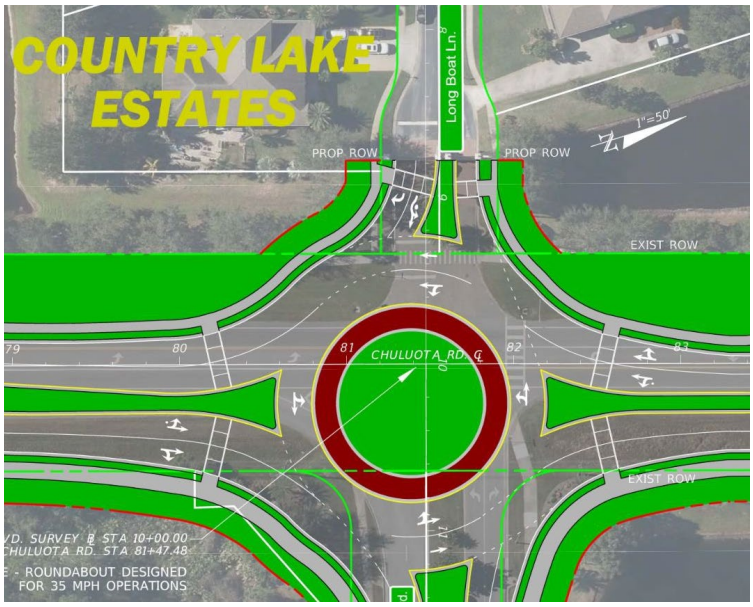


Figure ES- 3 Proposed Roundabout at Long Boat Lane and Cypress Lake Glen Boulevard (North)

these concerns and those in attendance at the second public meeting voted to provide a roundabout at this location.

The Alternatives Evaluation Matrix considered four alternatives as shown below on Table ES-1.

EVALUATION CRITERIA	Four-Lane Widening with Existing Intersection Controls (ETC)	Four-Lane Widening with Roundabout at Long Boat Lane, ETC at Other Intersections	Four-Lane Widening with Roundabouts at All Intersections	Recommended Four-Lane Widening with Bow Tie at Lake Pickett Road and Roundabouts at Other Intersections
RELOCATIONS				
Number of Residential Acquisitions	1	1	1	1
Number of Business Acquisitions	None	None	None	None
Number of Parcels Impacted	10	14	39	40
Social, Natural and Physical Impacts				
Social and Neighborhood	Low	Low	Medium	Medium
Archeological/Historic Sites	None	None	None	None
Threatened and Endangered Species	No Adverse Impacts	No Adverse Impacts	No Adverse Impacts	No Adverse Impacts
Wetland Impacts (Acres)	Low	Low	Low	Low
RHPZ Uplands Impacts (Acres)	Low	Low	Low	Low
Floodplain Impacts (Acre-Feet)	1.9	2.16	2.16	2.16
Potential High or Medium Ranked Contamination Sites	None	None	None	None
Estimated Costs (Present Day)				
Estimated Construction Costs	$ 40,968,339	$ 44,102,180	$ 48,811,549	$ 48,977,856
Estimated Design/Adm Costs (12%)	$ 4,916,201	$ 5,292,262	$ 5,857,386	$ 5,877,343
Preliminary Estimated CEI Costs (15%)	$ 6,145,251	$ 6,615,327	$ 7,321,732	$ 7,346,678
Preliminary Estimated Right-of-Way Impacts	11.864	12.453	17.466	19.115
Preliminary Estimated Right-of-Way Costs	$ 2,196,355	$ 2,305,449	$ 3,233,481	$ 3,538,760
Mitigation/RHPZ	$ 103,000	$ 103,000	$ 103,000	$ 103,000
Subtotal	$ 54,329,146	$ 58,418,218	$ 65,327,148	$ 65,843,637
Contingency (20%)	$ 10,865,829	$ 11,683,644	$ 13,065,430	$ 13,168,727
TOTAL PRELIMINARY ESTIMATED PROJECT COSTS	***$ 65,194,975***	***$ 70,101,862***	***$ 78,392,578***	***$ 79,012,364***

Table ES-1 Alternatives Evaluation Matrix

ES.6 Preferred Alternative

The preferred improvements for proposed Chuluota Road are the four-lane urban section as developed during the RCA along with a roundabout at Long Boat Lane and Cypress Lake Glen Boulevard (North). The typical section for these improvements is shown on Figure ES-4 on the next page and contains the following roadway design elements:

- An urban section with four 11-foot travel lanes and a 22-foot median
- Landscaping consisting of trees in the median
- Type E curb and gutter along the inside lanes, Type F curb and gutter along the outside lanes

- A six-foot sidewalk on the east side of Chuluota Road from SR 50 to Cypress Lake Glen Boulevard, and on the west side of Chuluota Road from Cypress Lake Glen Boulevard to Lake Pickett Road.
- A 10-path on the west side of Chuluota Road from SR 50 to Cypress Lake Glen Boulevard (S), and along the east side of Chuluota Road from Cypress Lake Glen Boulevard (S) to north of Cypress Lakes development. To the north of Cypress Lakes, a 14-foot path will be provided.

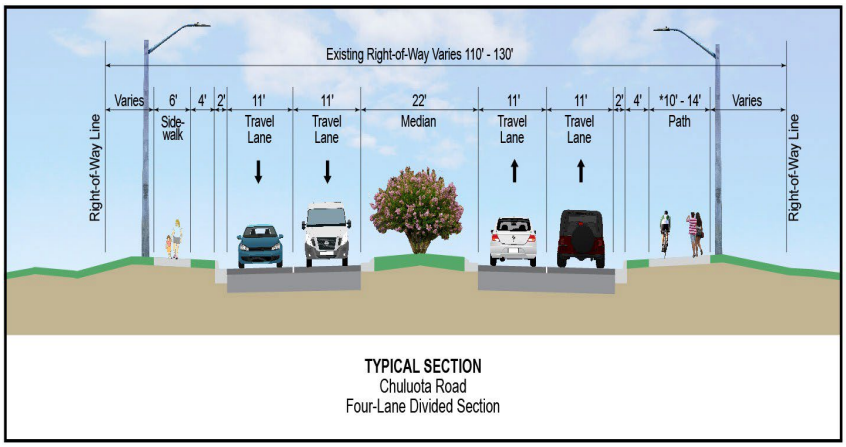


Figure ES- 4 Chuluota Road Proposed Typical Section

- Four-foot utility strips between the Type Of curb and the sidewalk or path
- A proposed right-of-way of 120 feet, most of which is existing and already available on this project.
- A two-lane roundabout at Long Boat Lane and Cypress Lake Glen Boulevard (North).

For more information on the proposed four-lane widening improvements, see the RCA document.

ES.7 Public Involvement

Critical to the success of this project is the feedback received from the local community. Two community meetings were held to present the ICE alternatives and recommendations. In addition, a public hearing will be held before the Board of County Commissioners to formally approve the ICE recommendations. Meeting summaries, along with input received regarding the project have been included with the Public Involvement Documents in Appendix G.

During the course of the ICE Study, a survey questionnaire was distributed to the public after the community meeting in September, 2024 to receive general feedback from respondents regarding safety, congestion, and their preference for improvements (see Section 8 and Appendix G).

The survey indicated that 60% of the respondents supported the proposed widening of Chuluota Road. In addition, 59% of the respondents said relieving congestion and keeping traffic moving were their top priorities. The Long Boat Lane/Cypress Glen Boulevard (North) intersection was ranked highest by 43% of the respondents as having the most urgent need for improvements. Lake Pickett Road came in second with 32% of the respondents indicating the need for improvements.

The Corner School Drive/Schoolview Way was perceived as being highly congested. The RCA proposed elimination of existing Schoolview Way and relocation of this roadway to the existing signalized at Cypress Lake Glen Boulevard (South). This change may help to improve the overall operations along Corner School Drive as well as Chuluota Road by removing the existing Schoolview Way intersections at Corner School Drive as well as at Chuluota Road, and focusing all movements at a single location.

ES.8 Conclusions and Recommendations

The objective of the Chuluota Road ICE Study is to evaluate alternative intersection control options

for Chuluota Road from north of SR 50 to Lake Pickett Road. This process is consistent with FDOT guidelines for ICE investigations and incorporates the insights from planning, engineering, and the public involvement activities to consider various alternatives, develop recommendations, and ultimately, advance a preferred alternative into the design phase.

At the conclusion of the ICE Study, the findings indicate the following:

- The ICE Study indicated that the existing traffic controls consisting of signals and stop signs along Chuluota Road generally provide better Level of Service and less delay than the use of innovative intersection concepts such roundabouts or bow tie intersection concepts. However, when other factors are considered such as measures to reduce operating speeds, a roundabout at Long Boat Lane and Cypress Lake Glen Boulevard (North) can be considered as a viable option at this location since it would slow motorists on Chuluota Road while providing better access opportunities for the side road motorists. Attendees at the public meetings frequently mentioned these concerns and those in attendance at the second public meeting voted to provide a roundabout at this location.
- For the remaining intersections at Lake Pickett Road, Corner Lake Drive, and Cypress Lake Glen Boulevard (South), the ICE Study confirmed that the existing traffic controls at these locations provide better operations and less delays than the other alternatives considered by this study, and should be retained going forward.
- The ICE Study also verified the findings of the RCA Study that there is a strong need for widening Chuluota Road to four lanes to meet future forecasted traffic volumes. These improvements are recommended and discussed further in the RCA and Section 7 of this report.

1 INTRODUCTION

1.1 Introduction and Study Area

Orange County prepared the Roadway Conceptual Analysis (RCA) for the Chuluota Road (CR 419) corridor from SR 50 to Lake Pickett Road in northeast Orange County which was presented to the Orange County Board of County Commissioners on March 7, 2023. At this meeting, the Board concluded that additional studies were needed to consider and investigate alternative intersection controls and configurations such as roundabouts and other options. Later in 2023, the Board authorized further investigations to more fully explore various options by conducting an Intersection Control Evaluation (ICE) process using FDOT procedures.

Existing Chuluota Road is a two-lane, minor arterial roadway located in a suburban area of northeast Orange County Commission District Five. The roadway alignment is generally straight and the corridor is surrounded by a mix of housing developments, wetlands, conservation areas, and some commercial development near the southern end of the project at SR 50.

Figure 1-1 Location Map

1.2 Purpose of Report

This report has been prepared as an addendum to the Chuluota Road RCA and summarizes the ICE Study investigations which identifies and evaluates alternative intersection concepts, recommendations, and other findings resulting from the ICE evaluation process.

The ICE investigations were undertaken to provide additional assessments of various intersection options by performing safety, operations, and cost analyses at six intersections along the Chuluota Road corridor (see Figure 1-2).

The ICE investigations were conducted at six intersections listed below:

- Chuluota Road at Lake Pickett Road
- Chuluota Road at Long Boat Lane/Cypress Lake Glen Boulevard (North)
- Chuluota Road at Corner Lake Drive
- Chuluota Road at Cypress Lake Glen Boulevard (South)
- Corner School Drive and Schoolview Way
- Corner School Drive, Relocated Schoolview Way, Cypress Lake Glen Boulevard

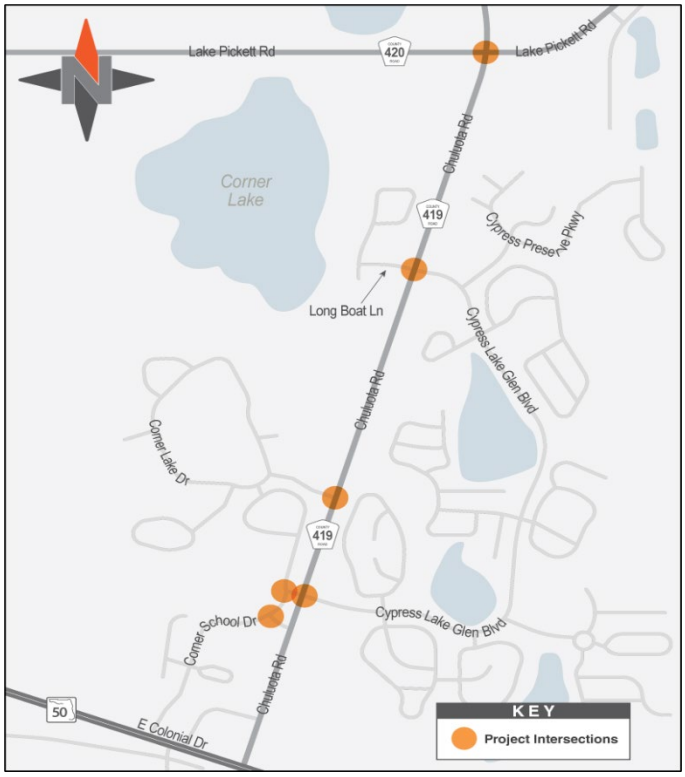


Figure 1-2 ICE Study Intersections

The findings and conclusions from this ICE Study are detailed in the following sections or this report and together with applicable recommendations from the RCA will serve as the basis for the subsequent design and construction of the proposed Chuluota Road improvements.

2 TRAFFIC

As part of the ICE Study, additional traffic analyses were undertaken to provide needed data to support the ICE traffic analyses. This section summarizes the supplemental traffic work including additional traffic counts undertaken for the ICE Study in the areas of Cypress Lake Glen Boulevard (South), Corner School Drive, and Schoolview Way. These scenarios included:

Scenario 1 Chuluota Road Build Alternative (4 Lane Section) – The RCA recommended Scenario 1 which includes the relocation of Schoolview Way to align with Cypress Lake Glen Boulevard (South) signalized intersection with Chuluota Road (assumes closure/elimination of existing Schoolview Way segment). With this relocation, Schoolview Way would serve as the west approach at this intersection and would connect with Corner School Drive.

Since this intersection configuration came about as part of the final recommendations after the traffic work on the RCA had been concluded, it was necessary to conduct additional traffic counts and analyses at this location to support the ICE investigations. The proposed RCA Build Geometrics and lane assignments are shown on Figure 2-1 on the following page.

Scenario 2 Chuluota Road Build Alternative (4 Lane) and Existing Schoolview Way (2 Lane) - Scenario 2 maintains the existing Schoolview Way alignment, intersecting at Chuluota Road with full median opening and unsignalized (minor street STOP) control. The Cypress Lake Glen Boulevard (South) intersection would remain as a T-intersection, though would reflect the four-lane widening of Chuluota Road recommended in the RCA.

Scenario 3: Chuluota Road Build Alternative (4 Lane) with New Connection to Corner School Drive Along with Maintaining Existing Schoolview Way - Scenario 3 includes modifying the Cypress Lake Glen Boulevard (South) intersection by adding a west leg that would connect Corner School Drive to Chuluota Road. In addition, existing Schoolview Way would remain in operation as well, though would only perform as right in/right out at Chuluota Road as a unsignalized (minor street STOP) control. Scenarios 1, 2 and 3 are provided in Figures 2 – 4.

Traffic Data Collection - To provide base conditions for the ICE study area (beyond the RCA study limits) for this supplemental analysis, six (6) hour weekday turning movement counts ([AM peak hour and PM peak period- 2 - 6 pm) at Corner School Drive and at Schoolview Way. These traffic volumes are included in **Appendix B**.

Design Traffic Projections - Using the adopted growth rates from the Chuluota Road RCA DTTR, the design volume forecasts for Scenarios 1, 2 and 3 were prepared and shown on the following exhibits for the Opening Year 2028, Interim Year 2038, and Design Year 2048.

Scenario 1 (RCA Recommended Build Improvements for Chuluota Road Build Alternative/4 Lane)

- **Figure 2-1** on the following page illustrates the recommended RCA Build lane assignments at all intersections along Chuluota Road including the recommended modifications to Cypress Lake Glen Boulevard (South) with the inclusion of Relocated Schoolview Way.

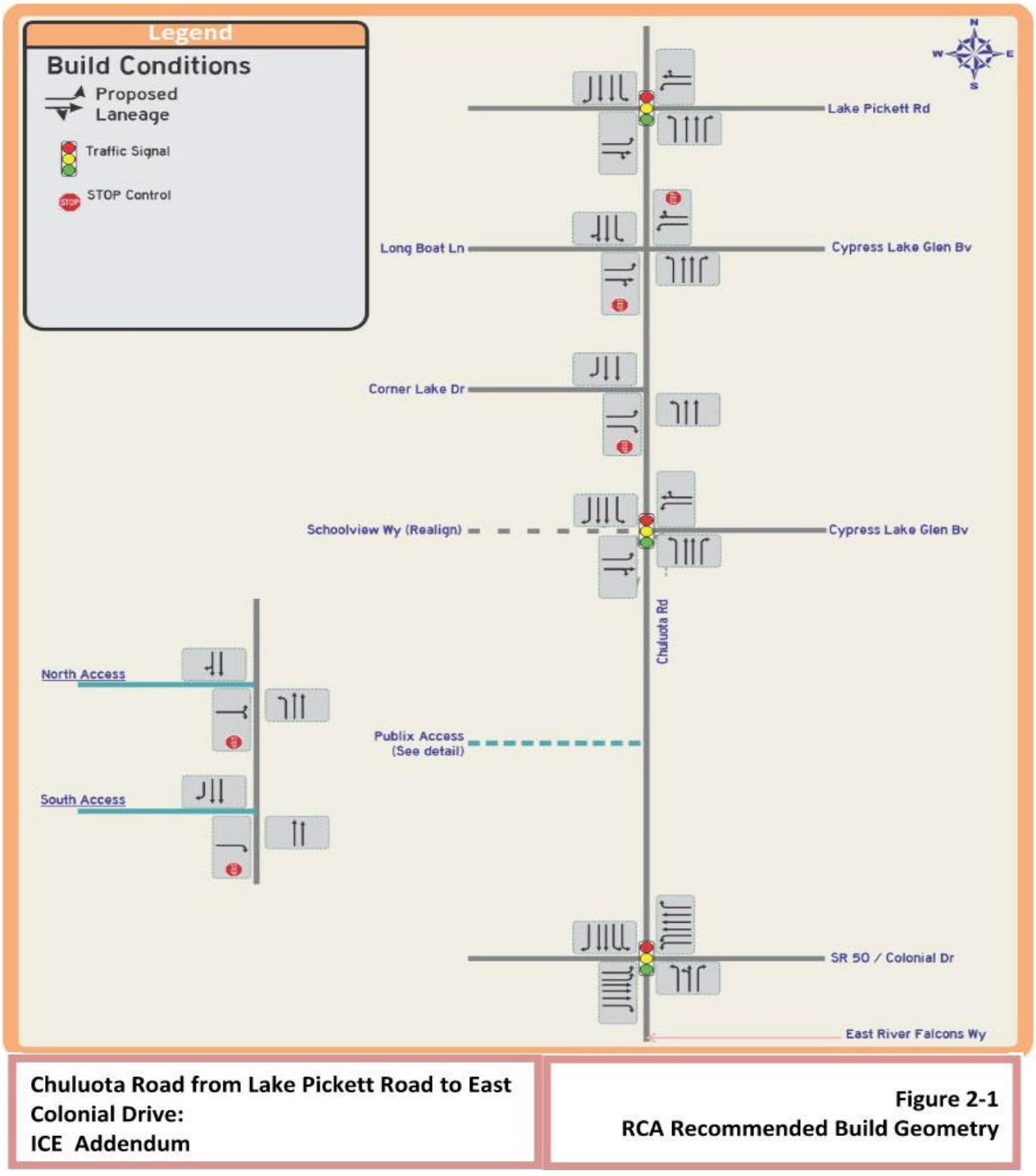


Figure 2-1 RCA Recommended Build Geometry

- **Figures 2-2, 2-3, 2-4** on the following pages, depict the weekday AM peak hour, school dismissal (afternoon) peak hour, and PM peak hour intersection volumes for Build Years 2028, 2038 and 2048 for Scenario 1.

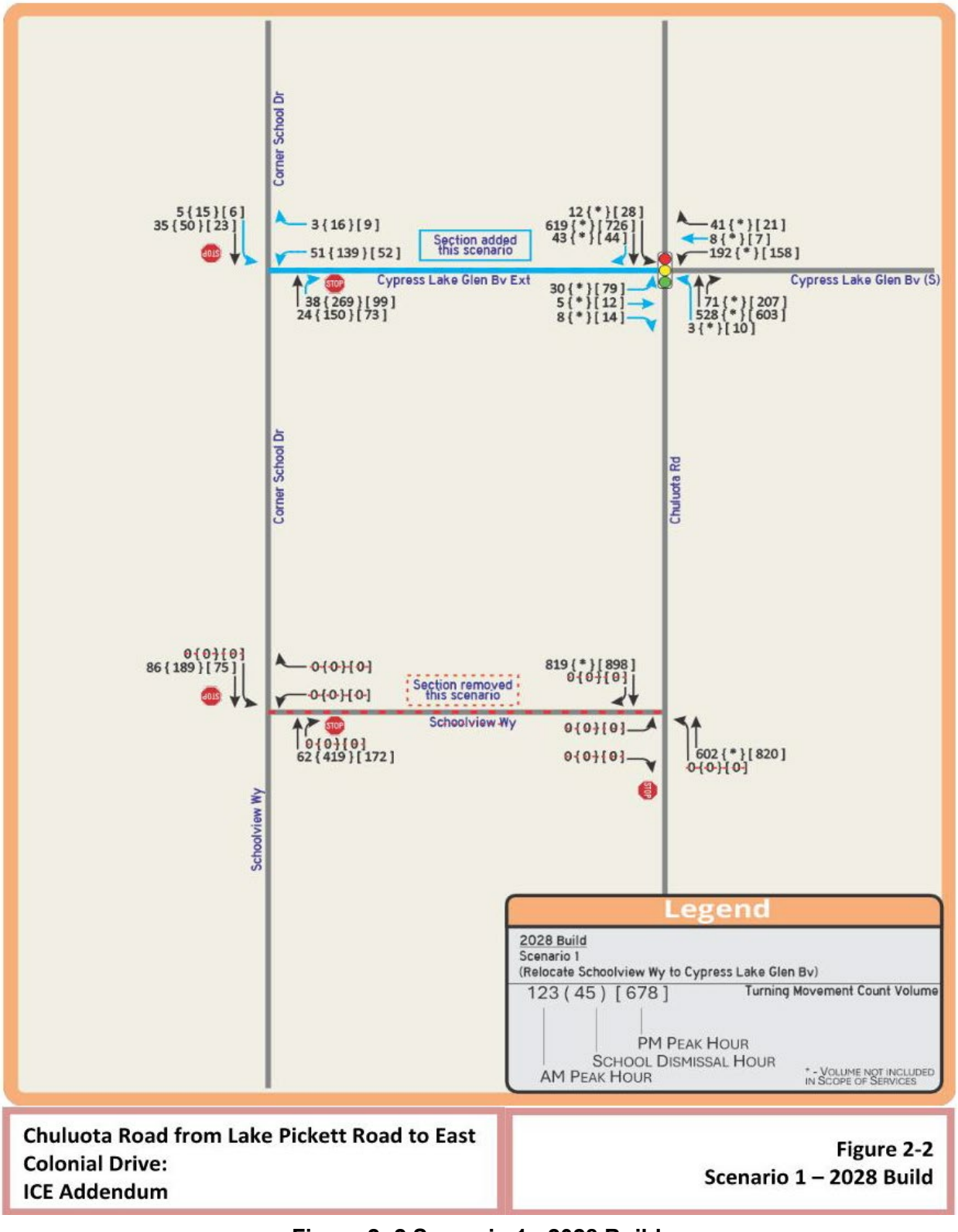


Figure 2- 2 Scenario 1 - 2028 Build

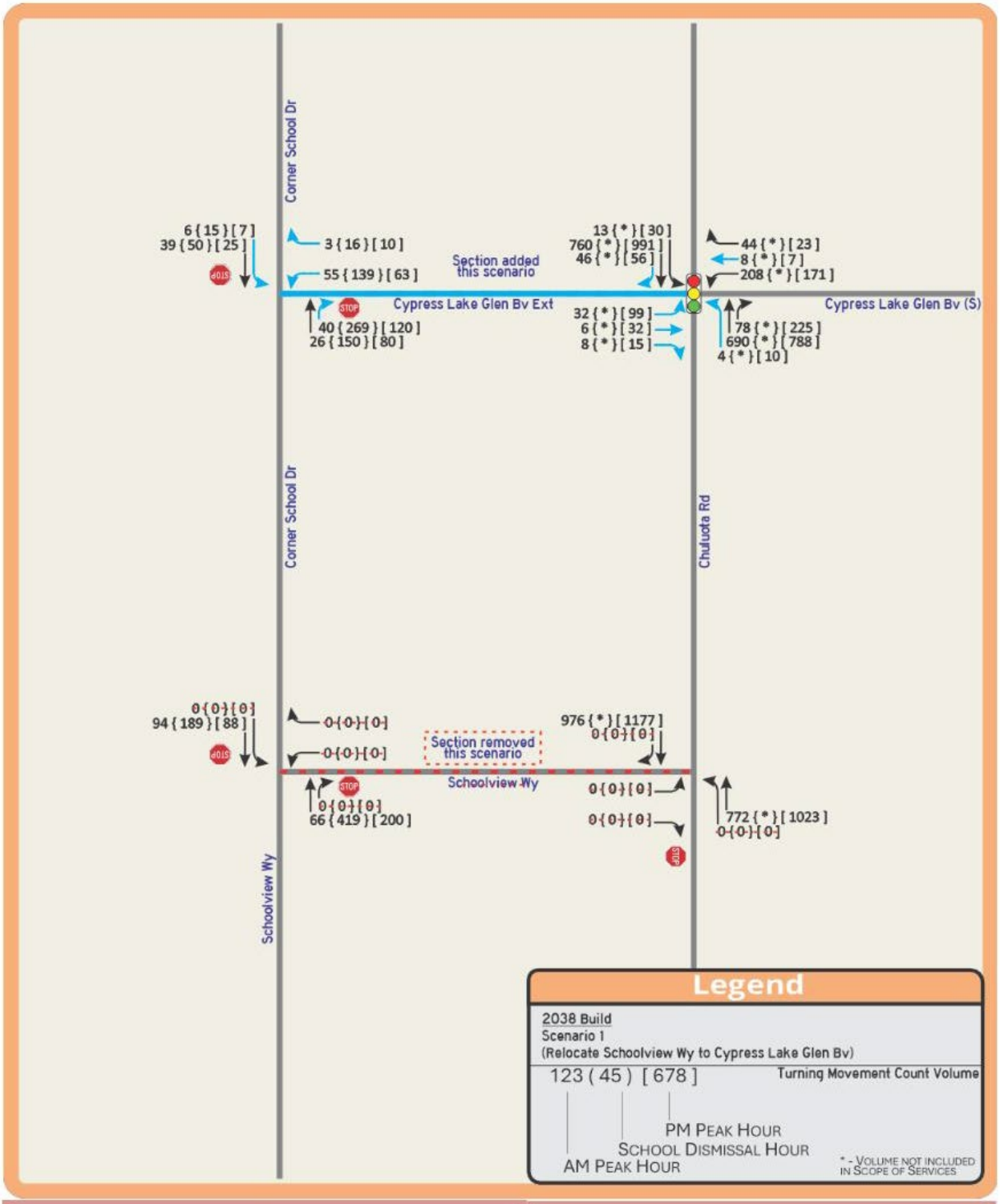


Figure 2- 3 Scenario 1 - 2038 Build

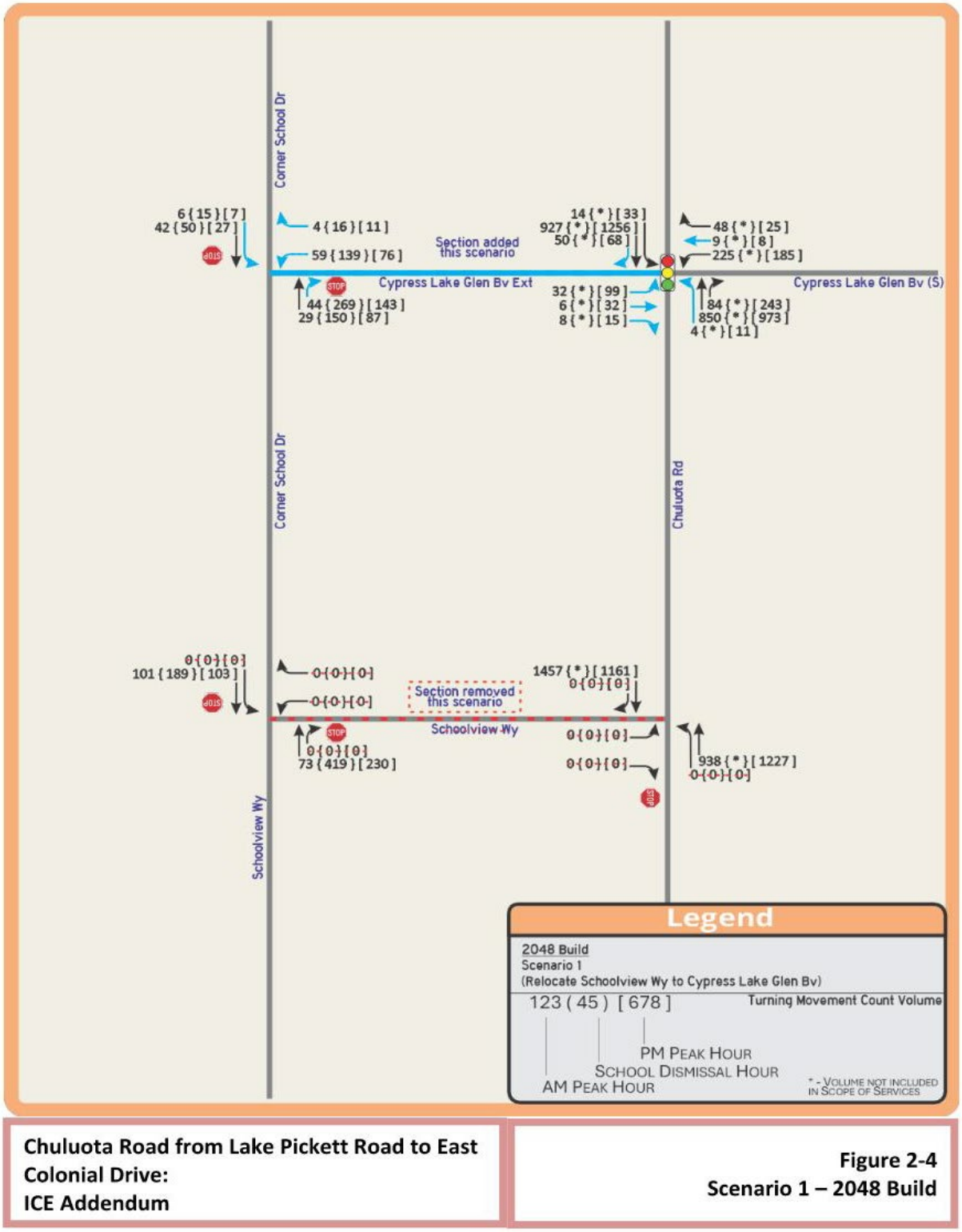


Figure 2- 4 Scenario 1 - 2048 Build

Scenario 2 (Chuluota Road Build Alternative(4 Lane), Existing Schoolview Way (Build Traffic Conditions)

- Design hour traffic volumes for Chuluota Road, Corner School Drive, and existing Schoolview Way for Opening Year 2028, Interim Year 2038, Design Year 2048 based on Build Traffic Conditions. These volumes are provided in **Figures 2-5, 2-6, 2-7**, which depict the weekday AM peak hour and PM peak hour intersection volumes for years 2028, 2038 and 2048.

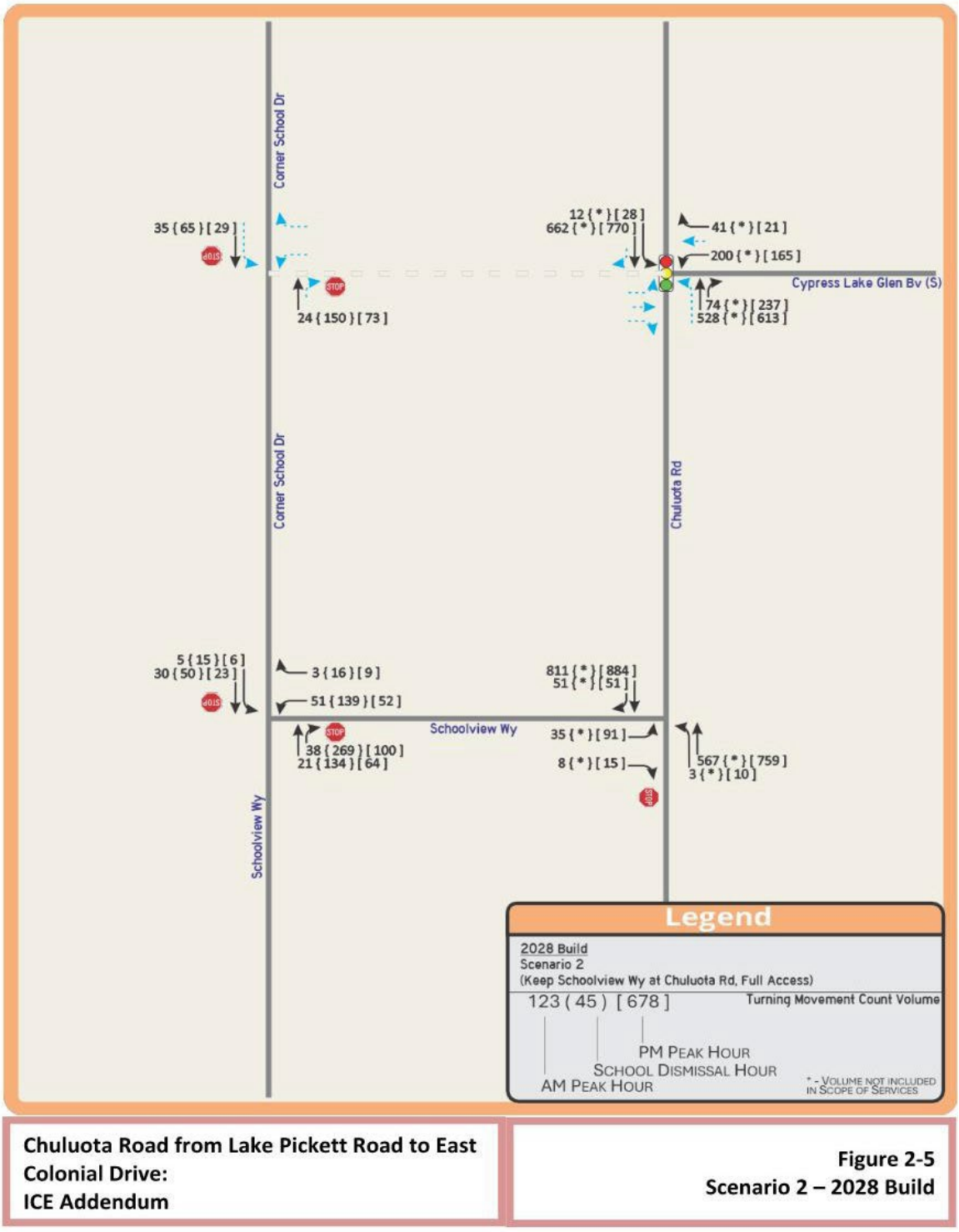


Figure 2- 5 Scenario 2 - 2028 Build

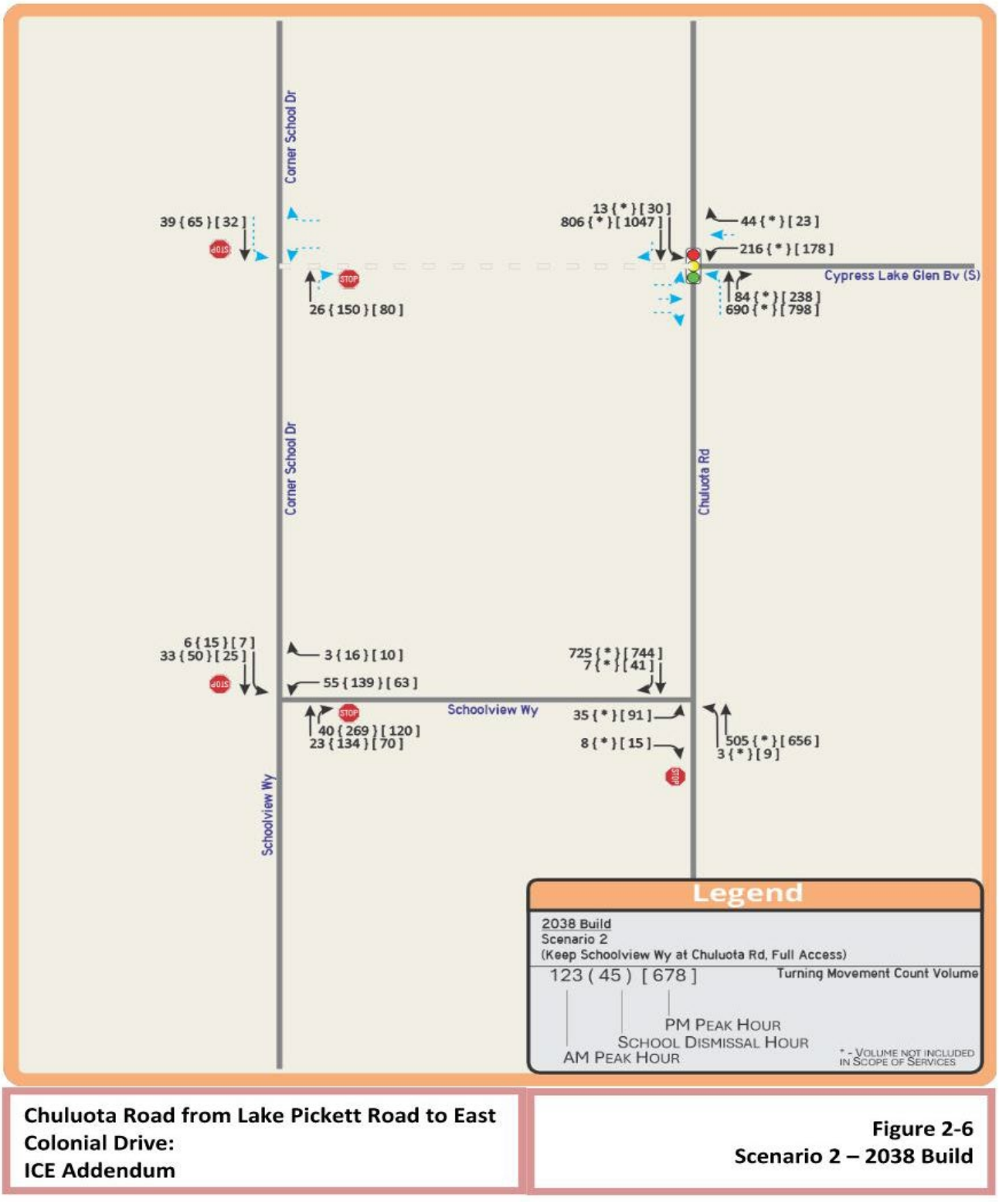


Figure 2- 6 Scenario 2 - 2038 Build

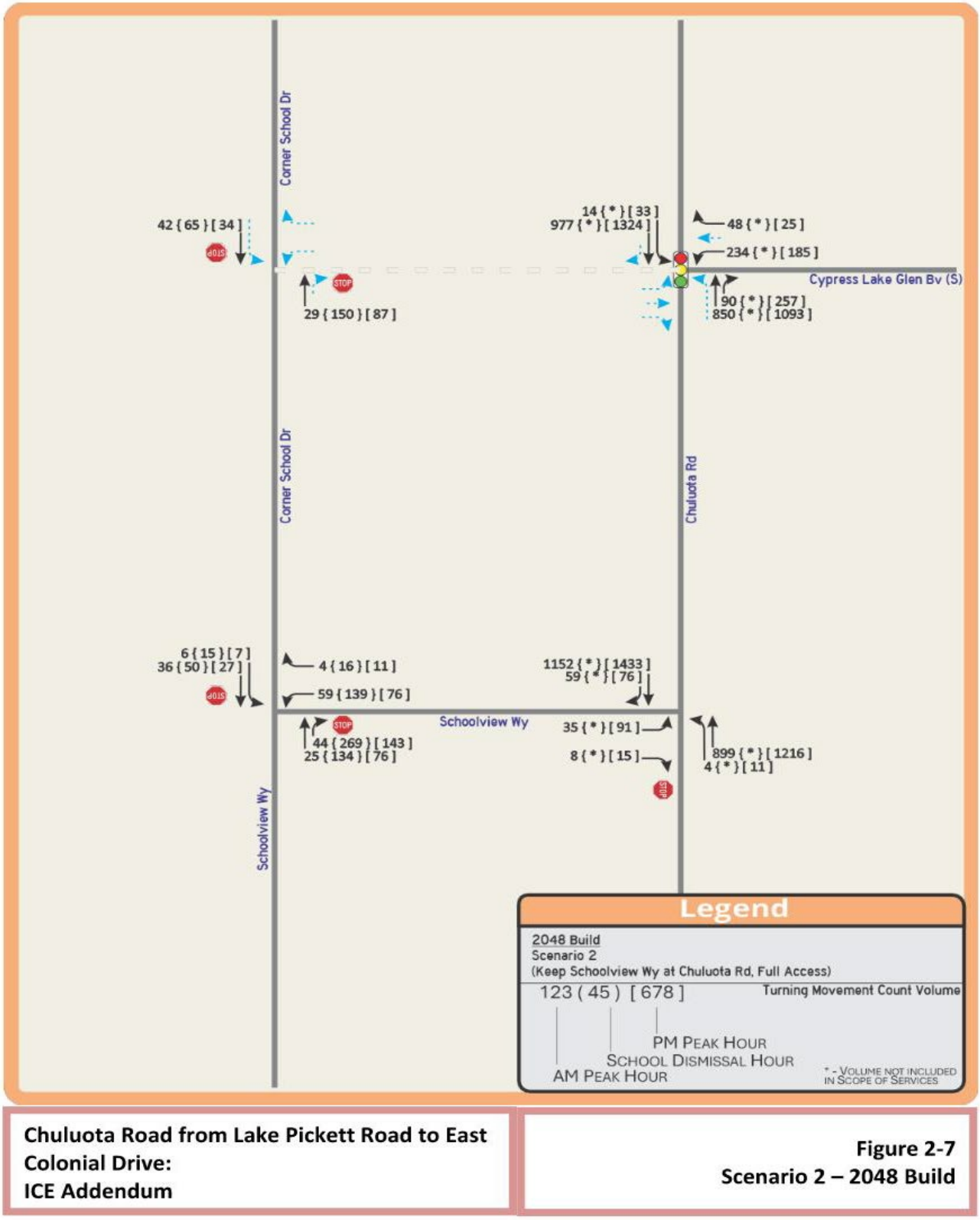


Figure 2- 7 Scenario 2 - 2048 Build

- Design hour traffic volumes were developed for Chuluota Road, Corner School Drive, and existing Schoolview Way for Opening Year 2028, Interim Year 2038, Design Year 2048 based on No Build Traffic Conditions. These volumes are provided in **Figures 2-8, 2-9, 2-10**, which depict the weekday AM peak hour and PM peak hour intersection volumes for years 2028, 2038 and 2048, respectively.

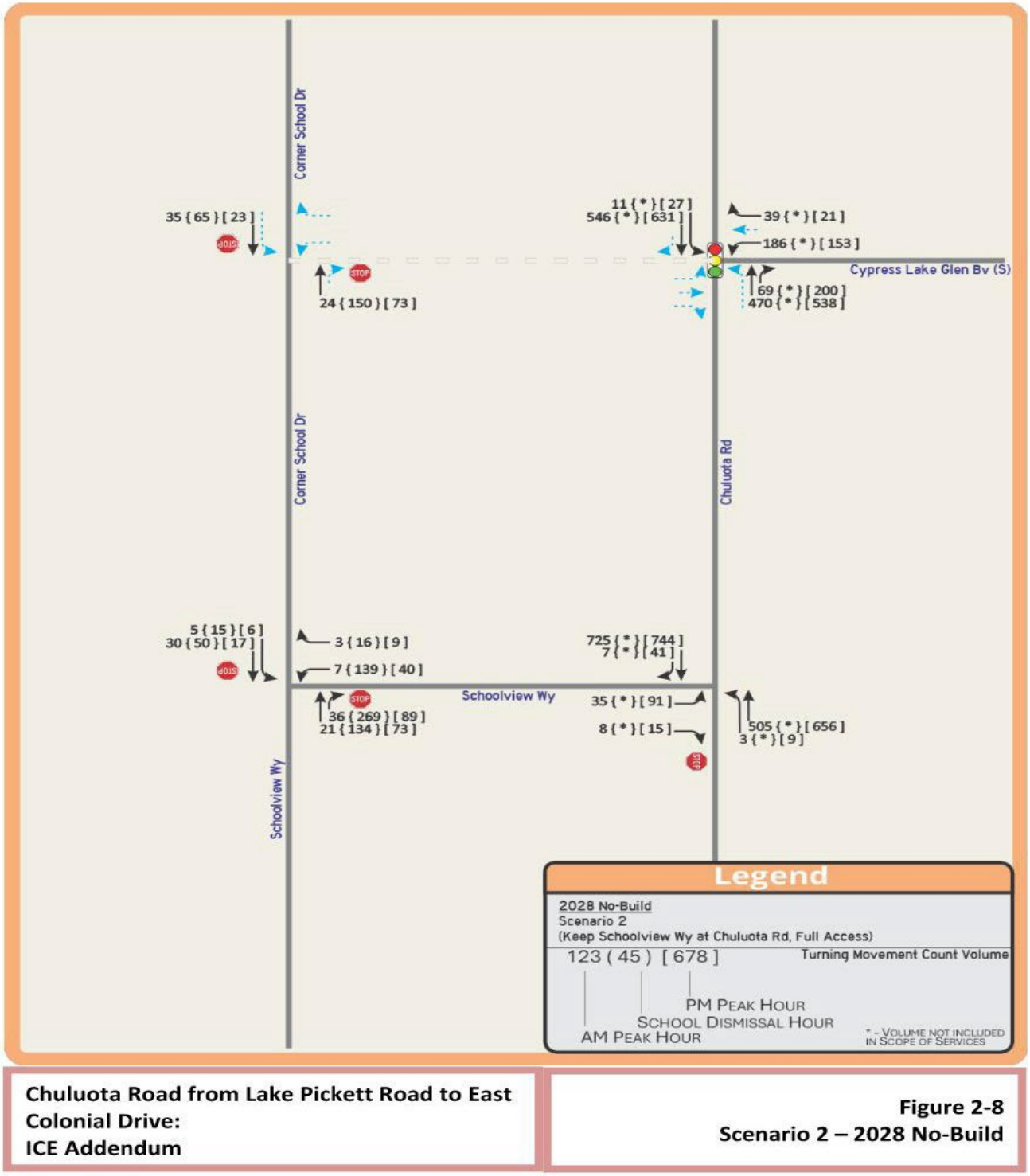


Figure 2- 8 Scenario 2 - 2028 No Build

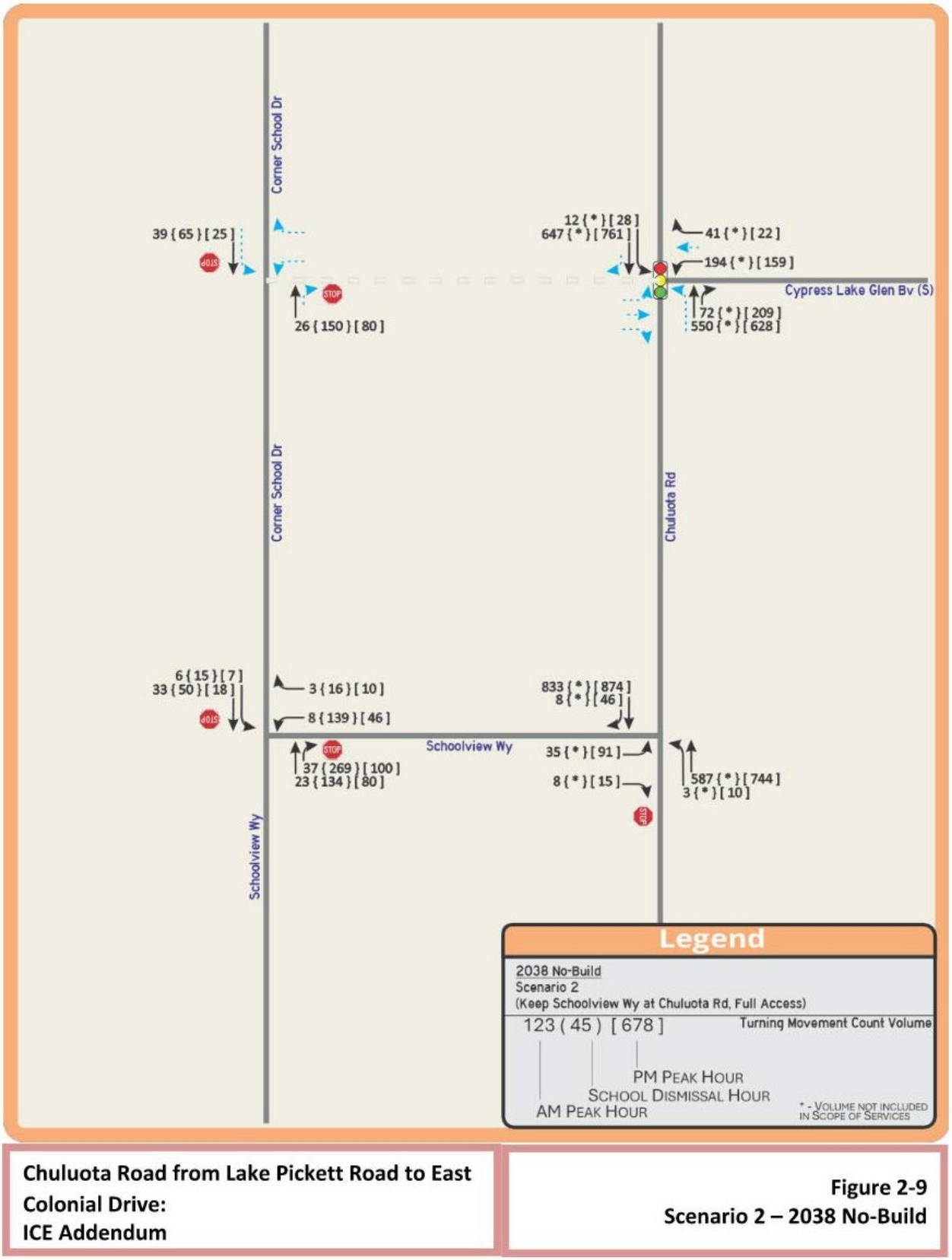
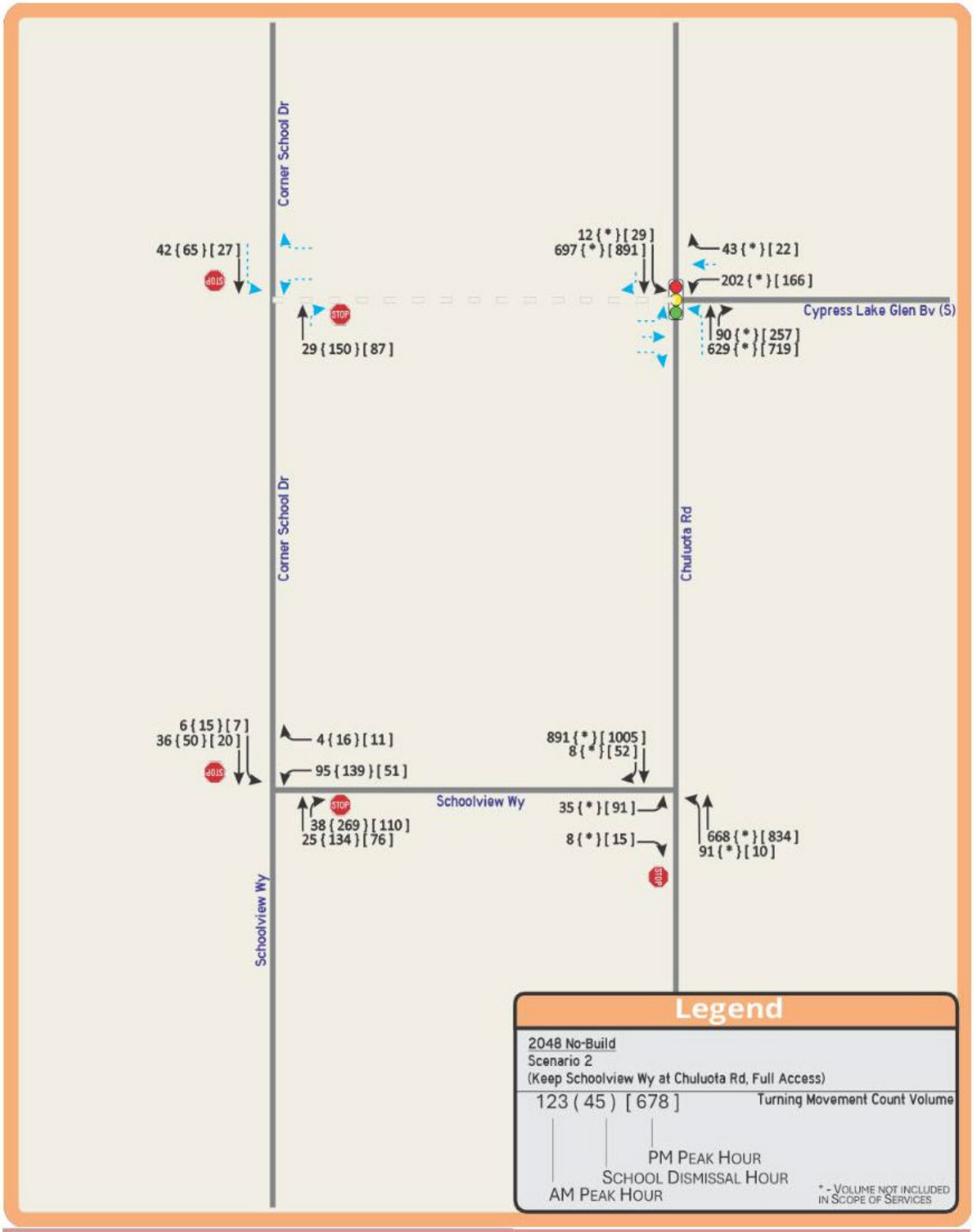


Figure 2- 9 Scenario 2 - 2038 No Build



Chuluota Road from Lake Pickett Road to East Colonial Drive: ICE Addendum

Figure 2-10 Scenario 2 – 2048 No-Build

Figure 2- 10 Scenario 2 - 2048 No Build

Scenario 3: Chuluota Road Build Alternative (4 Lane) with Connection to Corner School Drive and Maintaining Existing Schoolview Way

Design hour traffic volumes for Corner School Drive and Cypress Lake Glen Boulevard with west approach connection to Corner School Drive, and existing Corner School Drive and Schoolview Way for Opening Year 2028, Interim Year 2038, Design Year 2048 based on Build Traffic conditions. This traffic is provided in **Figures 2-11, 12, 13**, which depict the weekday AM peak hour and PM peak hour intersection volumes for years 2028, 2038 and 2048.

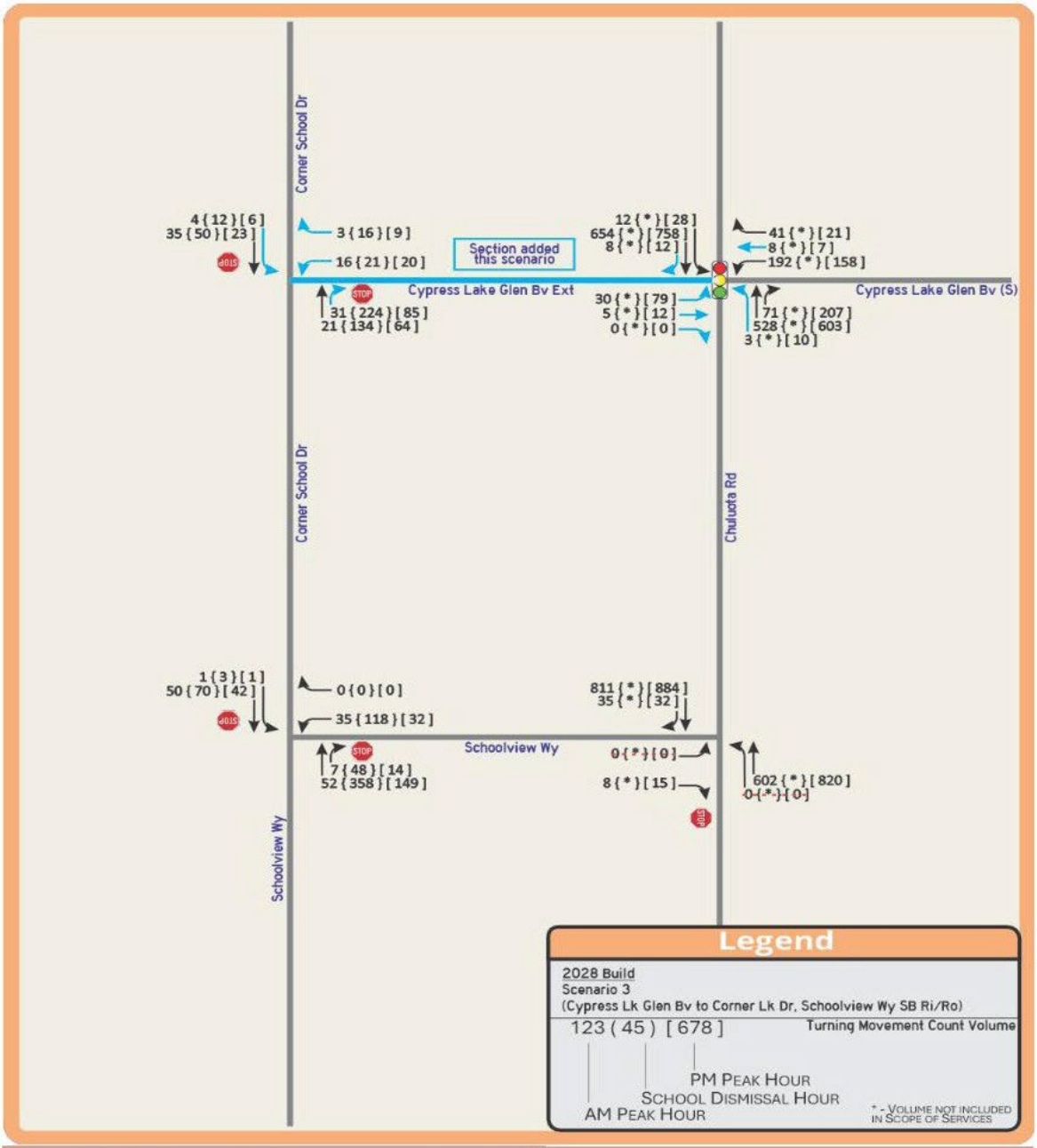


Figure 2- 11 Scenario 3 - 2028 Build

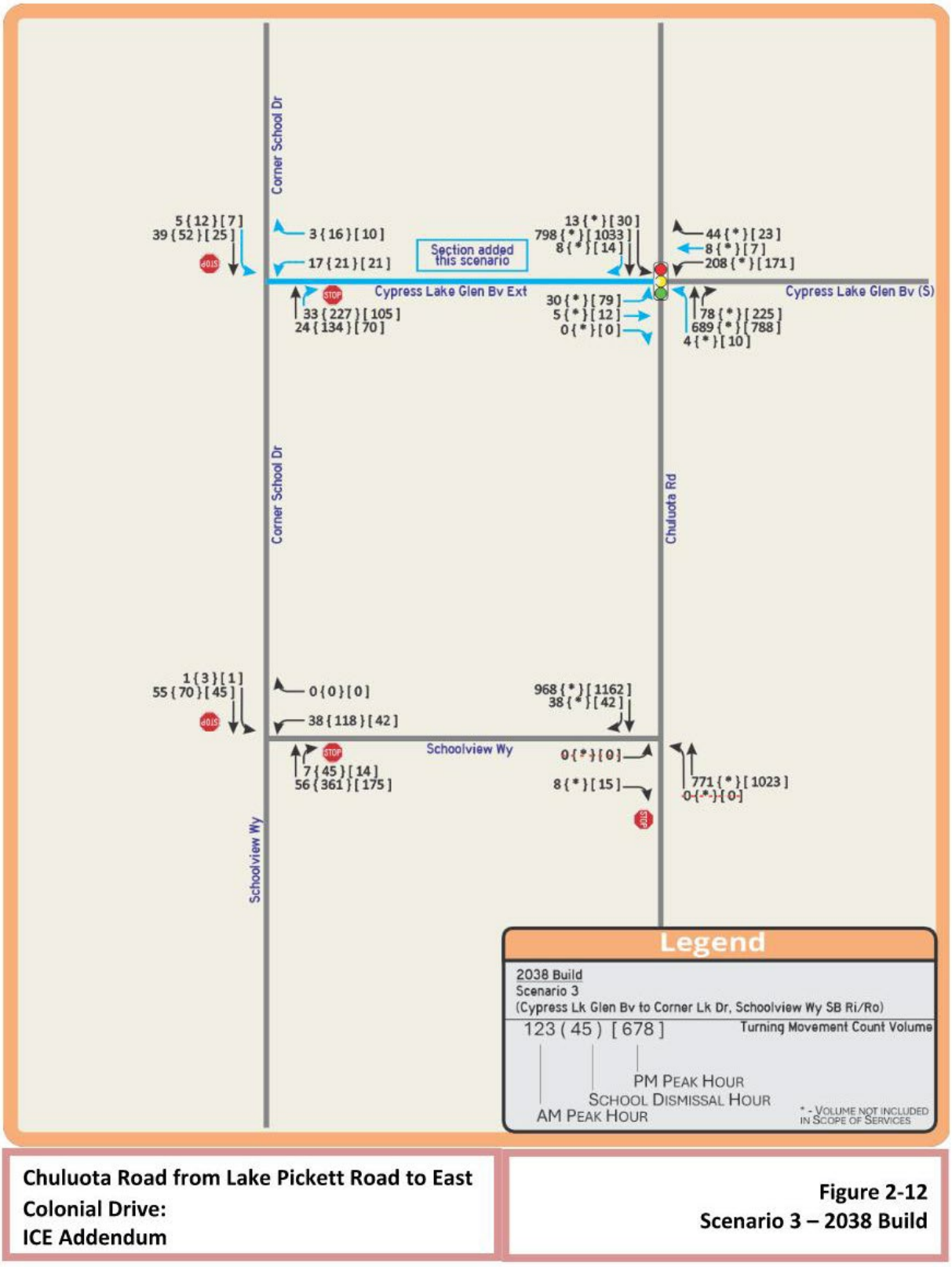


Figure 2- 12 Scenario 3 - 2038 Build

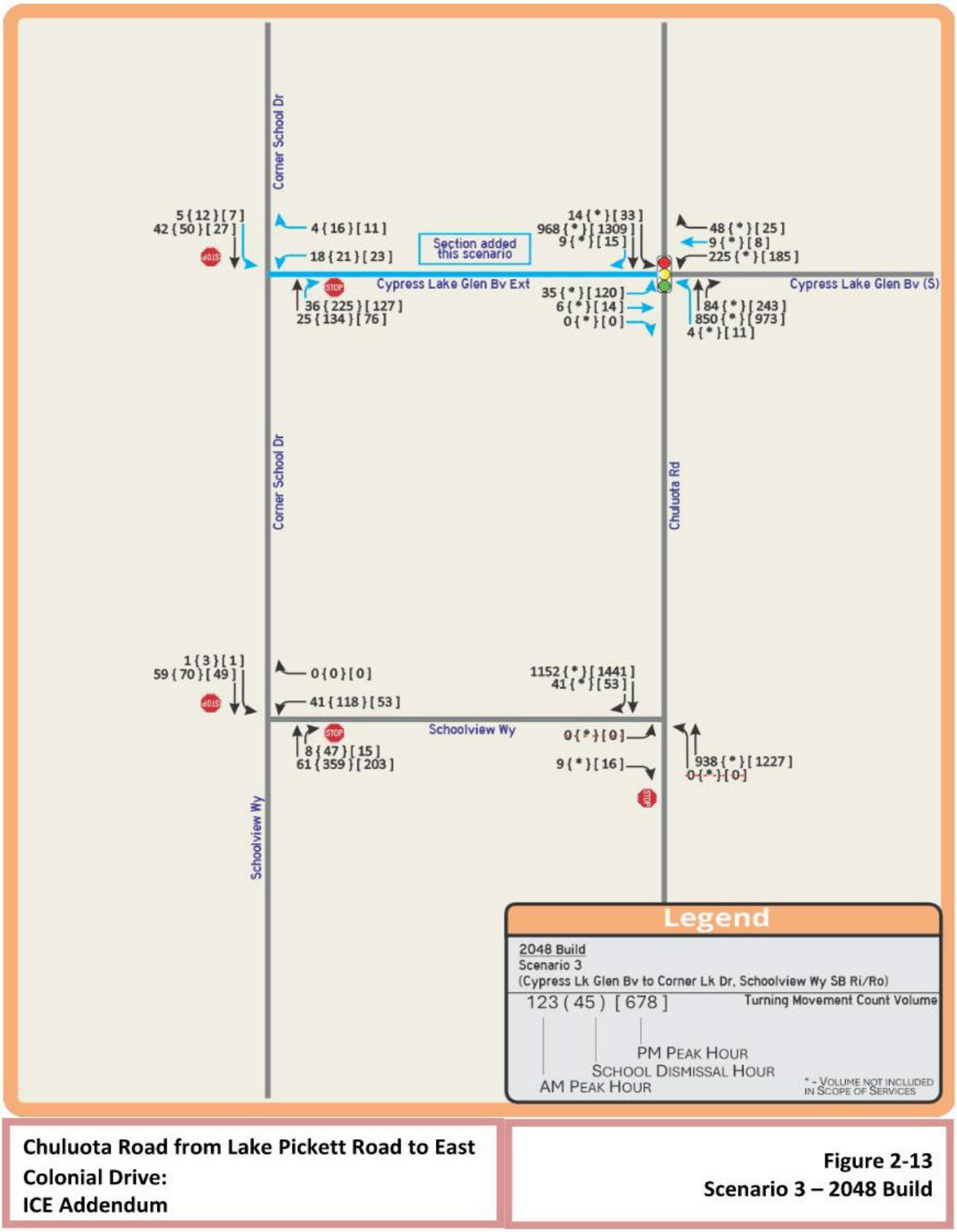


Figure 2- 13 Scenario 2 - 2048 Build

Design hour traffic volumes for Corner School Drive and Cypress Lake Glen Boulevard with west approach connection to Corner School Drive, and existing Corner School Drive and Schoolview Way for Opening Year 2028, Interim Year 2038, Design Year 2048 based on No Build Traffic conditions. This traffic is provided in **Figures 2-14, 2-15, 2-16**, below and on the following pages, which depict the weekday AM peak hour and PM peak hour intersection volumes for years 2028, 2038, and 2048.

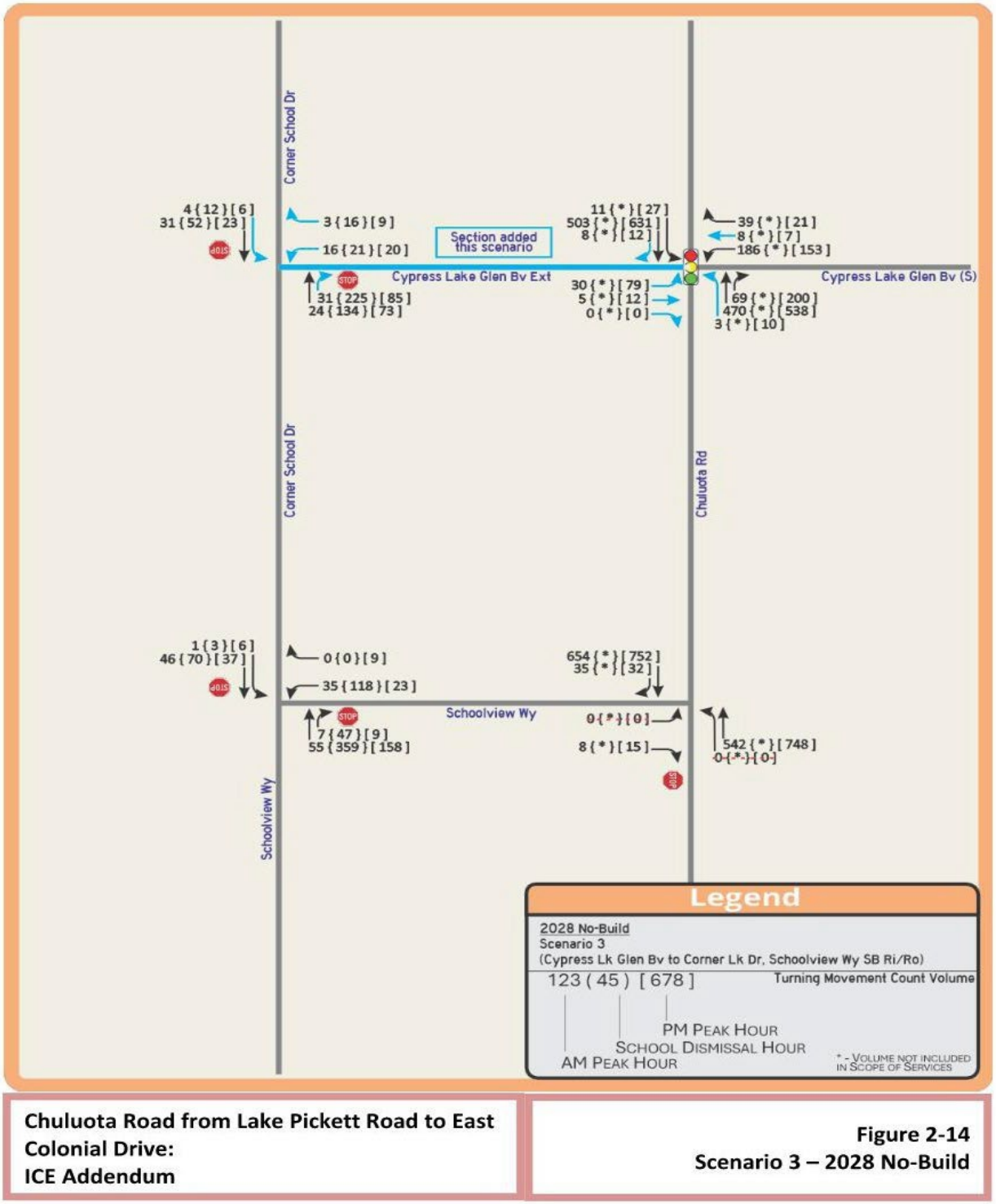


Figure 2- 14 Scenario 3 - 2028 No Build

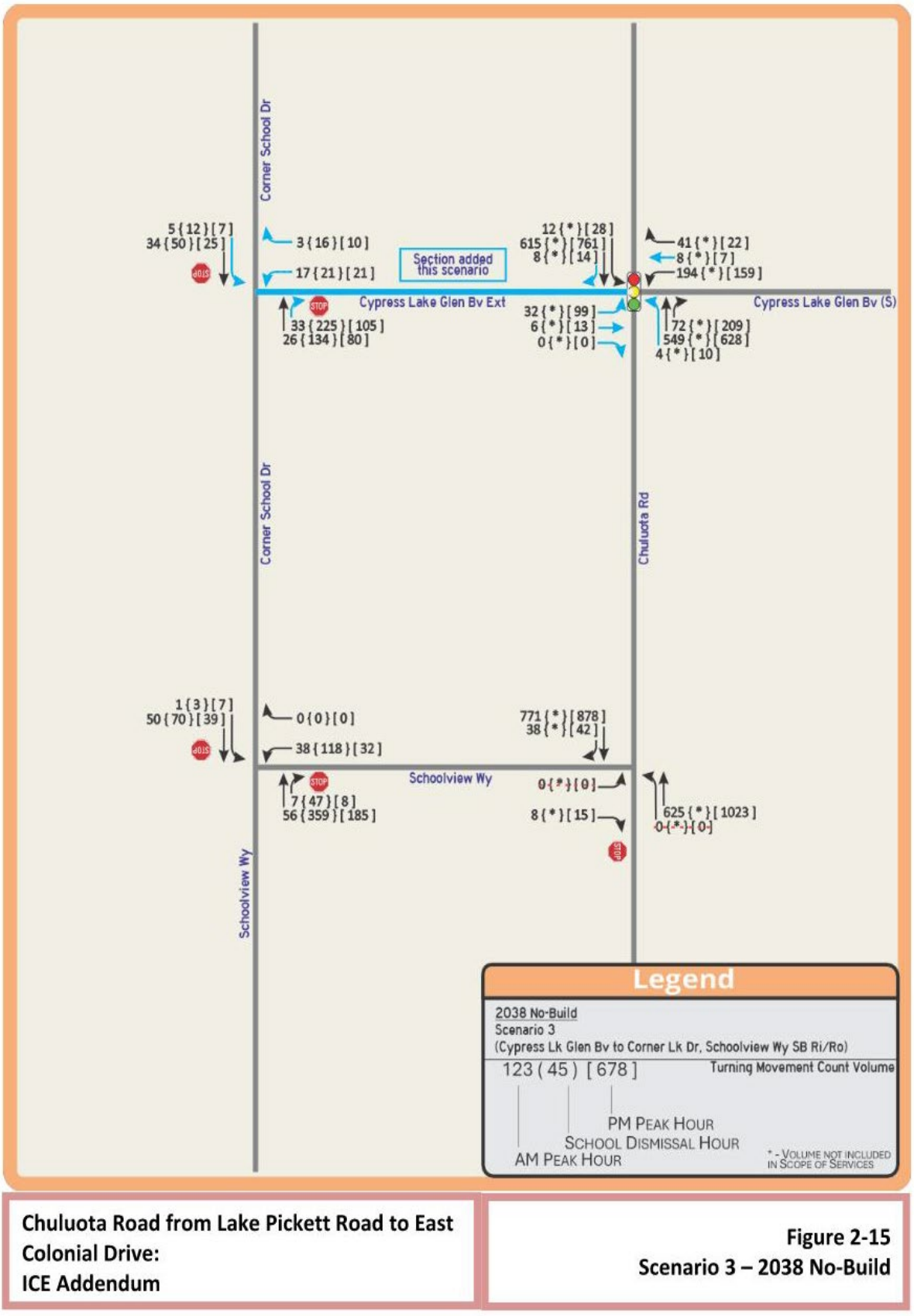
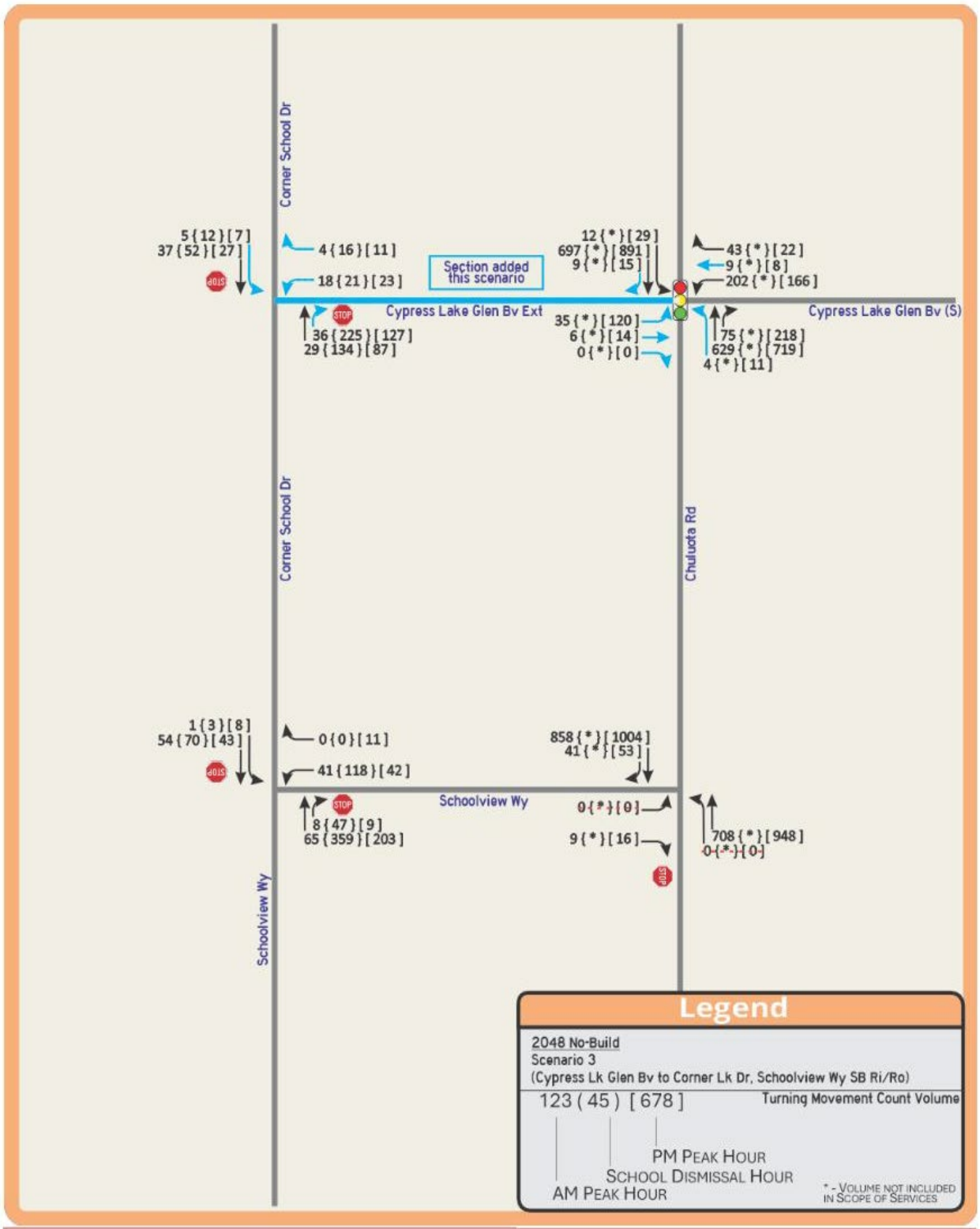


Figure 2- 15 Scenario 3 - 2038 No Build



Chuluota Road from Lake Pickett Road to East Colonial Drive: ICE Addendum	**Figure 2-16 Scenario 3 – 2048 No-Build**

Figure 2- 16 Scenario 3 - 2048 No Build

3 ICE ANALYSIS, STAGE 1

3.1 Stage 1 Methodology

The methods utilized in the Chuluota Road Stage 1 ICE analysis are described in the FDOT Manual on Intersection Control Evaluation (ICE), dated January 2024. Per page 2-6 of the FDOT Manual on ICE:

> "The purpose of Stage 1 is to screen a number of potential control strategies and identify a single preferred control strategy or, if not possible, only a few viable control strategies narrowed down from the initial consideration based on preliminary analysis of traffic operations, safety, and other related factors. However, a single control strategy may not always be found at the end of Stage 1 analysis. In this case, it is expected to narrow down the control strategies to fewer viable alternatives from the initial consideration."

A total of 15 potential intersection control strategies were considered as part of the Chuluota Road Stage 1 ICE analysis, which includes the following:

- Traffic Signal
- Two-Way Stop Control (TWSC)
- All-Way Stop Control (AWSC)
- Roundabout
- Bowtie
- Jughandle
- Continuous Green T
- Signalized Restricted Crossing U-Turn (RCUT)
- Unsignalized Restricted Crossing U-Turn (RCUT)
- Signalized Thru-Cut
- Unsignalized Thru-Cut
- Full Median U-Turn (MUT)
- Partial Median U-Turn (MUT)
- Full Displaced Left Turn (DLT)
- Partial Displaced Left Turn (DLT)

All potential Stage 1 control strategies are shown in Figure 3-1 on the next page.

ALTERNATIVE INTERSECTION CONTROLS CONSIDERED IN STAGE 1 ICE

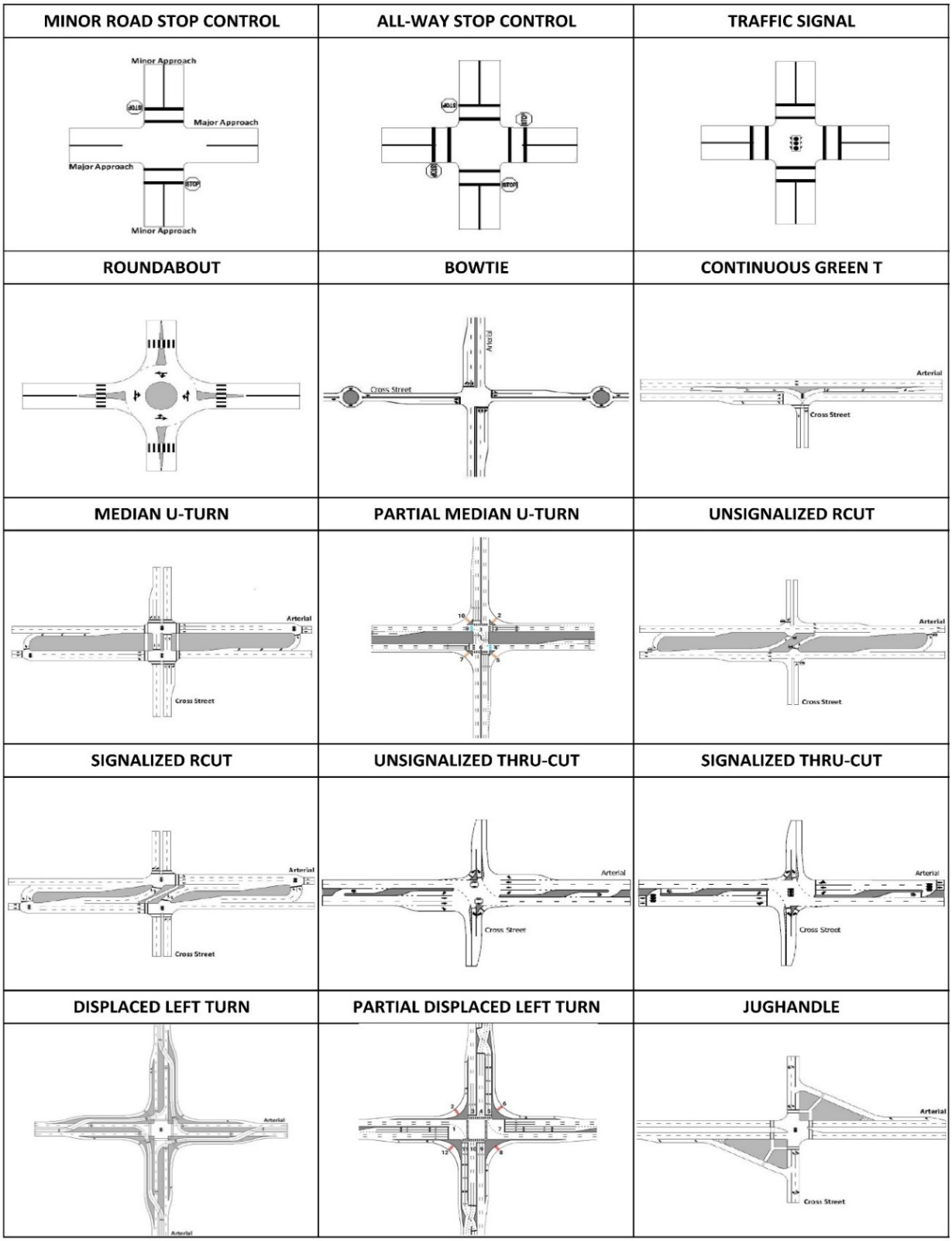


Figure 3- 1 ICE Stage 1 Alternatives

Stage 1 ICE requires the use of two analysis tools, which include the following:

- Capacity Analysis for Planning of Junctions (CAP-X) Tool
- Safety Performance for Intersection Control Evaluation (SPICE) Tool

Per page 2-7 of the FDOT Manual on ICE: "CAP-X is a macro-based Microsoft Excel spreadsheet tool, originally developed by Federal Highway Administration (FHWA), to evaluate the anticipated operational performance of intersection control strategies. The CAP-X tool uses a critical lane volume analysis to determine the volume to capacity ratio for a variety of intersection control strategies using the Highway Capacity Manual (HCM) methodologies.

FDOT has expanded this tool for use in Florida to include an enhanced evaluation for pedestrian and bicycle accommodations at intersections. Based on the input parameters, CAP-X generates a list of intersection strategies, ranked by volume to capacity ratio and given pedestrian and bicycle accommodation score"

The CAP-X analysis was performed for the following six intersections:

- Lake Pickett Road at Chuluota Road
- Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road
- Corner Lake Drive at Chuluota Road
- Cypress Lake Glen Boulevard (S) at Chuluota Road
- Corner School Drive at Schoolview Way
- Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road

Sections 3.2 through 3.7 provide a summary of the results of the CAP-X analyses at each intersection. Table 3-1 shows the parameters used for all CAP-X analyses.

Analysis Years	Opening (2028), Interim (2038), Design (2048)
Peak Hours	AM and PM
Heavy Vehicles	3.48%
Volume Growth	0.00%
Truck to PCE Factor	2.00
Left Turn Adjustment Factor	0.95
Right Turn Adjustment Factor	0.85

Table 3- 1 CAP-X Analysis Parameters

Per page 2-7 of the FDOT Manual on ICE: "SPICE is another macro-based Microsoft Excel spreadsheet tool, originally developed by FHWA, for safety analysis based on crash predictions. The FDOT SPICE tool is an expanded version of the original tool, which includes two complimentary approaches to safety analysis: (1) Crash prediction method, and (2) Safe Systems for Intersections (SSI) method."

Both SPICE methods were utilized to provide a comprehensive safety analysis at each of the following six intersections:

- Lake Pickett Road at Chuluota Road
- Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road
- Corner Lake Drive at Chuluota Road
- Cypress Lake Glen Boulevard (S) at Chuluota Road
- Corner School Drive at Schoolview Way
- Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road

Sections 3.2 through 3.7 provide a discussion and summary of the results of the SPICE analyses at each intersection.

3.2 Lake Pickett Road at Chuluota Road

CAP-X analyses were performed at the intersection of Lake Pickett Road at Chuluota Road for the AM and PM peak hours of the opening year (2038), interim year (2038), and design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 12 analysis permutations.

A summary of the results of the CAP-X analyses at the intersection of Lake Pickett Road at Chuluota Road are shown in Figure 3-2. The ten highest ranked intersection control strategies by volume to capacity (V/C) ratio are shown for each analysis permutation with the following color coding:

- The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way impacts, excessive cost, or other factors.
- The green cells indicate that the intersection control strategy results in a V/C ratio less than 0.750.
- The yellow cells indicate that the intersection control strategy results in a V/C ratio between 0.750 and 0.875.
- The orange cells indicate that the intersection control strategy results in a V/C ratio between 0.875 and 1.00.
- The red cells indicate that the intersection control strategy results in a V/C ratio greater than or equal to 1.00.

The summary of the CAP-X analyses results indicate that, for both the no-build and build scenarios, the bowtie configuration is the prevailing feasible intersection control strategy in terms of V/C ratio, followed by the traffic signal, roundabout, and AWSC configurations. The results also indicate that the roundabout configuration is expected to exceed a V/C ratio of 1.00 during the no-build 2048 PM, build 2038 PM, and build 2048 PM analysis permutations.

SPICE analyses using the crash prediction method were performed at the intersection of Lake Pickett Road at Chuluota Road for the opening year (2028), interim year (2038), and design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 6 analysis permutations.

A summary of the results of the SPICE analyses using the crash prediction method at the intersection of Lake Pickett Road at Chuluota Road are shown in Figure 3-3. The ten highest ranked intersection control strategies by predicted fatal and serious injury crashes are shown for each analysis permutation. The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.

The summary of the SPICE analyses results using the crash prediction method indicate that, for the no-build scenario, the roundabout configuration is the prevailing feasible intersection control strategy in terms of predicted fatal and serious injury crashes, followed by the AWSC, traffic signal, and TWSC configurations. For the build scenario, the traffic signal configuration is the prevailing feasible intersection control strategy in terms of predicted fatal and serious injury crashes, followed by the AWSC, roundabout, and TWSC configurations.

It should be noted that, due to the absence of adequate safety performance functions (SPFs), the crash prediction method could not be applied to the following intersection control strategies considered in the Stage 1 analysis:

- Bowtie
- Signalized RCUT
- Unsignalized RCUT

SPICE analyses using the SSI method were performed at the intersection of Lake Pickett Road at Chuluota Road for the opening year (2028), interim year (2038), and design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (four-lane widening configuration along Chuluota Road), amounting to six analysis permutations.

A summary of the results of the SPICE analyses using the SSI method at the intersection of Lake Pickett Road at Chuluota Road are shown in Figure 3-4. The ten highest ranked intersection control strategies by SSI score are shown for each analysis permutation with the following color coding:

- The grey cells indicate that the intersection control strategy is likely not feasible due to excessive right-of-way impacts, cost, or other factors.
- The green cells indicate that the intersection control strategy results in a SSI score between 90 and 100.
- The yellow cells indicate that the intersection control strategy results in a SSI score between 80 and 89.
- The orange cells indicate that the intersection control strategy results in a SSI score between 70 and 79.
- The red cells indicate that the intersection control strategy results in a SSI score less than 70.

The summary of the SPICE analyses results using the SSI method indicate that, for both the no-build and build scenarios, the roundabout configuration is the prevailing feasible intersection control strategy in terms of SSI score, followed by the AWSC, bowtie, and traffic signal configurations.

Build Type	Year	Peak Hour	Intersection Control Rank 1 (V/C Ratio)	Intersection Control Rank 2 (V/C Ratio)	Intersection Control Rank 3 (V/C Ratio)	Intersection Control Rank 4 (V/C Ratio)	Intersection Control Rank 5 (V/C Ratio)	Intersection Control Rank 6 (V/C Ratio)	Intersection Control Rank 7 (V/C Ratio)	Intersection Control Rank 8 (V/C Ratio)	Intersection Control Rank 9 (V/C Ratio)	Intersection Control Rank 10 (V/C Ratio)
No-Build (2-lane)	2028	AM	DLT (0.33)	Unsignalized RCUT N-S (0.37)	Signalized ThruCut N-S (0.37)	Partial DLT N-S (0.40)	Signalized RCUT N-S (0.42)	Bowtie N-S (0.42)	MUT N-S (0.46)	Partial MUT N-S (0.48)	1 X 1 Roundabout (0.54)	Traffic Signal (0.57)
	2038		DLT (0.40)	Signalized ThruCut N-S (0.45)	Partial DLT N-S (0.49)	Unsignalized RCUT N-S (0.49)	Signalized RCUT N-S (0.50)	Bowtie N-S (0.50)	MUT N-S (0.56)	Partial MUT N-S (0.56)	Traffic Signal (0.69)	1 X 1 Roundabout (0.71)
	2048		DLT (0.47)	Signalized ThruCut N-S (0.54)	Bowtie N-S (0.57)	Partial DLT N-S (0.58)	Signalized RCUT N-S (0.60)	Unsignalized RCUT N-S (0.64)	Partial MUT N-S (0.65)	MUT N-S (0.66)	Traffic Signal (0.81)	1 X 1 Roundabout (0.91)
	2028	PM	DLT (0.32)	Bowtie N-S (0.41)	Partial DLT N-S (0.47)	Signalized ThruCut N-S (0.48)	Partial MUT N-S (0.51)	MUT N-S (0.52)	Signalized RCUT N-S (0.59)	Traffic Signal (0.61)	1 X 1 Roundabout (0.62)	Unsignalized RCUT N-S (0.86)
	2038		DLT (0.39)	Bowtie N-S (0.50)	Partial DLT N-S (0.56)	Signalized ThruCut N-S (0.58)	Partial MUT N-S (0.61)	MUT N-S (0.62)	Signalized RCUT N-S (0.71)	Traffic Signal (0.74)	1 X 1 Roundabout (0.80)	AWSC (1.15)
	2048		DLT (0.46)	Bowtie N-S (0.59)	Partial DLT N-S (0.66)	Signalized ThruCut N-S (0.68)	Partial MUT N-S (0.71)	MUT N-S (0.72)	Signalized RCUT N-S (0.83)	Traffic Signal (0.86)	1 X 1 Roundabout (1.03)	AWSC (1.35)
Build (4-lane)	2028	AM	DLT (0.25)	Partial DLT N-S (0.30)	Signalized ThruCut N-S (0.33)	2NS X 1EW Roundabout (0.33)	Signalized RCUT N-S (0.34)	MUT N-S (0.42)	Partial MUT N-S (0.42)	Bowtie N-S (0.43)	Traffic Signal (0.49)	Unsignalized RCUT N-S (0.50)
	2038		DLT (0.34)	Partial DLT N-S (0.40)	Signalized RCUT N-S (0.45)	Signalized ThruCut N-S (0.45)	2NS X 1EW Roundabout (0.52)	MUT N-S (0.55)	Partial MUT N-S (0.56)	Bowtie N-S (0.56)	Traffic Signal (0.66)	Unsignalized RCUT N-S (0.89)
	2048		DLT (0.44)	Partial DLT N-S (0.51)	Signalized RCUT N-S (0.56)	Signalized ThruCut N-S (0.56)	MUT N-S (0.68)	Partial MUT N-S (0.69)	Bowtie N-S (0.69)	2NS X 1EW Roundabout (0.76)	Traffic Signal (0.83)	Unsignalized RCUT N-S (1.51)
	2028	PM	DLT (0.24)	Bowtie N-S (0.37)	Partial DLT N-S (0.40)	Signalized RCUT N-S (0.41)	Partial MUT N-S (0.42)	Signalized ThruCut N-S (0.42)	MUT N-S (0.45)	Traffic Signal (0.53)	2NS X 1EW Roundabout (0.69)	AWSC (1.10)
	2038		DLT (0.32)	Bowtie N-S (0.48)	Partial DLT N-S (0.54)	Signalized RCUT N-S (0.54)	Signalized ThruCut N-S (0.56)	Partial MUT N-S (0.57)	MUT N-S (0.59)	Traffic Signal (0.71)	2NS X 1EW Roundabout (1.10)	AWSC (1.49)
	2048		DLT (0.41)	Bowtie N-S (0.59)	Partial DLT N-S (0.68)	Signalized RCUT N-S (0.68)	Signalized ThruCut N-S (0.70)	Partial MUT N-S (0.71)	MUT N-S (0.74)	Traffic Signal (0.89)	2NS X 1EW Roundabout (1.64)	AWSC (1.88)

*Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors

V/C Ratio Legend	
	< 0.750
	0.750 - 0.875
	0.875 - 1.00
	≥ 1.00

Table 3- 2 Summary of CAP-X Results at the Intersection of Lake Pickett Road and Chuluota Road

Build Type	Year	Intersection Control Rank 1 (Fatal & Injury Crashes)	Intersection Control Rank 2 (Fatal & Injury Crashes)	Intersection Control Rank 3 (Fatal & Injury Crashes)	Intersection Control Rank 4 (Fatal & Injury Crashes)	Intersection Control Rank 5 (Fatal & Injury Crashes)	Intersection Control Rank 6 (Fatal & Injury Crashes)	Intersection Control Rank 7 (Fatal & Injury Crashes)	Intersection Control Rank 8 (Fatal & Injury Crashes)	Intersection Control Rank 9 (Fatal & Injury Crashes)	Intersection Control Rank 10 (Fatal & Injury Crashes)
No-Build (2-lane)	2028	1 Lane Roundabout (0.35)	Signalized RCUT N-S (0.66)	Unsignalized RCUT N-S (0.71)	Jughandle (0.79)	MUT N-S (0.82)	AWSC (0.91)	DLT (0.94)	Traffic Signal (1.07)	TWSC (1.39)	Bowtie N-S (No SPF)
	2038	1 Lane Roundabout (0.40)	Unsignalized RCUT N-S (0.80)	Signalized RCUT N-S (0.86)	Jughandle (0.87)	MUT N-S (0.89)	DLT (1.04)	AWSC (1.09)	Traffic Signal (1.18)	TWSC (1.69)	Bowtie N-S (No SPF)
	2048	1 Lane Roundabout (0.45)	Unsignalized RCUT N-S (0.89)	Jughandle (0.94)	MUT N-S (0.96)	Signalized RCUT N-S (1.08)	DLT (1.12)	AWSC (1.26)	Traffic Signal (1.27)	TWSC (2.00)	Bowtie N-S (No SPF)
Build (4-lane)	2028	Unsignalized RCUT N-S (0.80)	Signalized RCUT N-S (0.84)	Jughandle (0.87)	MUT N-S (0.89)	DLT (1.03)	AWSC (1.07)	2 Lane Roundabout (1.10)	Traffic Signal (1.17)	TWSC (1.65)	Bowtie N-S (No SPF)
	2038	Unsignalized RCUT N-S (0.98)	Jughandle (1.01)	MUT N-S (1.03)	DLT (1.20)	Signalized RCUT N-S (1.32)	Traffic Signal (1.36)	AWSC (1.46)	2 Lane Roundabout (1.56)	TWSC (2.30)	Bowtie N-S (No SPF)
	2048	Jughandle (1.12)	Unsignalized RCUT N-S (1.15)	MUT N-S (1.15)	DLT (1.33)	Traffic Signal (1.52)	AWSC (1.85)	Signalized RCUT N-S (1.88)	2 Lane Roundabout (2.05)	TWSC (2.97)	Bowtie N-S (No SPF)

*Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors

Predicted Crashes Legend		
	0.00 - 0.50	Above Average Safety
	0.50 - 1.00	Acceptable Safety
	1.00 - 1.50	Below Average Safety
	≥ 1.50	Poor Safety

Table 3- 3 Summary of SPICE Crash Prediction Method Results at the Intersection of Lake Pickett and Chuluota Road

Build Type	Year	Intersection Control Rank 1 (SSI Score)	Intersection Control Rank 2 (SSI Score)	Intersection Control Rank 3 (SSI Score)	Intersection Control Rank 4 (SSI Score)	Intersection Control Rank 5 (SSI Score)	Intersection Control Rank 6 (SSI Score)	Intersection Control Rank 7 (SSI Score)	Intersection Control Rank 8 (SSI Score)	Intersection Control Rank 9 (SSI Score)	Intersection Control Rank 10 (SSI Score)
No-Build	2028	1 Lane Roundabout (100)	AWSC (99)	MUT N-S (98)	Signalized RCUT N-S (97)	Signalized ThruCut N-S (97)	Unsignalized RCUT N-S (96)	Unsignalized ThruCut N-S (95)	Bowtie N-S (95)	Traffic Signal (94)	DLT (94)
	2038	1 Lane Roundabout (100)	AWSC (98)	MUT N-S (97)	Signalized RCUT N-S (96)	Signalized ThruCut N-S (95)	Unsignalized RCUT N-S (95)	Unsignalized ThruCut N-S (94)	Bowtie N-S (93)	Traffic Signal (92)	DLT (92)
	2048	1 Lane Roundabout (99)	AWSC (98)	MUT N-S (96)	Signalized RCUT N-S (95)	Signalized ThruCut N-S (94)	Unsignalized RCUT N-S (94)	Unsignalized ThruCut N-S (92)	Bowtie N-S (91)	Traffic Signal (90)	DLT (90)
Build	2028	2 Lane Roundabout (99)	AWSC (98)	MUT N-S (95)	Signalized RCUT N-S (94)	Unsignalized RCUT N-S (92)	Signalized ThruCut N-S (92)	Unsignalized ThruCut N-S (89)	Bowtie N-S (88)	DLT (88)	Traffic Signal (87)
	2038	2 Lane Roundabout (99)	AWSC (96)	MUT N-S (91)	Signalized RCUT N-S (91)	Unsignalized RCUT N-S (87)	Signalized ThruCut N-S (87)	Unsignalized ThruCut N-S (82)	Bowtie N-S (80)	DLT (80)	Traffic Signal (80)
	2048	2 Lane Roundabout (98)	AWSC (94)	MUT N-S (87)	Signalized RCUT N-S (86)	Unsignalized RCUT N-S (81)	Signalized ThruCut N-S (81)	Unsignalized ThruCut N-S (74)	DLT (71)	Bowtie N-S (71)	Traffic Signal (70)

*Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors

SSI Legend	
	90-100
	80-89
	70-79
	< 70

Table 3- 2 Summary of SPICE SSI Method Results at the Intersection of Lake Pickett Road and Chuluota Road

3.3 Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road

CAP-X analyses were performed at the intersection of Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road for the AM and PM peak hours of the opening year (2038), interim year (2038), and design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 12 analysis permutations.

A summary of the results of the CAP-X analyses at the intersection of Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road are shown in Figure 3-5. The ten highest ranked intersection control strategies by volume to capacity (V/C) ratio are shown for each analysis permutation with the following color coding:

- The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.
- The green cells indicate that the intersection control strategy results in a V/C ratio less than 0.750.
- The yellow cells indicate that the intersection control strategy results in a V/C ratio between 0.750 and 0.875.
- The orange cells indicate that the intersection control strategy results in a V/C ratio between 0.875 and 1.00.
- The red cells indicate that the intersection control strategy results in a V/C ratio greater than or equal to 1.00.

The summary of the CAP-X analyses indicate that, for both the no-build and build scenarios, the bowtie configuration is the prevailing feasible intersection control strategy in terms of V/C ratio, followed by the traffic signal, roundabout, and TWSC configurations.

SPICE analyses using the crash prediction method were performed at the intersection of Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road for the opening year (2028), interim year (2038), and design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 6 analysis permutations.

A summary of the results of the SPICE analyses using the crash prediction method at the intersection of Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road are shown in Figure 3-6. The ten highest ranked intersection control strategies by predicted fatal and serious injury crashes are shown for each analysis permutation. The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.

The summary of the SPICE analyses results using the crash prediction method indicate that, for the no-build scenario, the roundabout configuration is the prevailing feasible intersection control strategy in terms of predicted fatal and serious injury crashes, followed by the TWSC, AWSC, and traffic signal configurations. For the build scenario, the TWSC configuration is the prevailing feasible intersection control strategy in terms of predicted fatal and serious injury crashes, followed by the AWSC, roundabout, and traffic signal configurations.

It should be noted that, due to the absence of adequate safety performance functions (SPFs), the crash prediction method could not be applied to the following intersection control strategies considered in the Stage 1 analysis:

- Bowtie
- Signalized RCUT
- Unsignalized RCUT

SPICE analyses using the SSI method were performed at the intersection of Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road for the opening year (2028), interim year (2038), and design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 6 analysis permutations.

A summary of the results of the SPICE analyses using the SSI method at the intersection of Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road are shown in Figure 3-7. The ten highest ranked intersection control strategies by SSI score are shown for each analysis permutation with the following color coding:

- The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.
- The green cells indicate that the intersection control strategy results in a SSI score between 90 and 100.
- The yellow cells indicate that the intersection control strategy results in a SSI score between 80 and 89.
- The orange cells indicate that the intersection control strategy results in a SSI score between 70 and 79.
- The red cells indicate that the intersection control strategy results in a SSI score less than 70.

The summary of the SPICE analyses results using the SSI method indicate that, for both the no-build and build scenarios, the roundabout configuration is the prevailing feasible intersection control strategy in terms of SSI score, followed by the AWSC, traffic signal, TWSC, and bowtie configurations.

Build Type	Year	Peak Hour	Intersection Control Rank 1 (V/C Ratio)	Intersection Control Rank 2 (V/C Ratio)	Intersection Control Rank 3 (V/C Ratio)	Intersection Control Rank 4 (V/C Ratio)	Intersection Control Rank 5 (V/C Ratio)	Intersection Control Rank 6 (V/C Ratio)	Intersection Control Rank 7 (V/C Ratio)	Intersection Control Rank 8 (V/C Ratio)	Intersection Control Rank 9 (V/C Ratio)	Intersection Control Rank 10 (V/C Ratio)
No-Build (2-lane)	2028	AM	DLT (0.33)	Partial DLT N-S (0.34)	Bowtie N-S (0.36)	Partial MUT N-S (0.38)	Signalized ThruCut N-S (0.38)	Traffic Signal (0.39)	Unsignalized RCUT N-S (0.41)	Signalized RCUT N-S (0.42)	MUT N-S (0.43)	1 X 1 Roundabout (0.45)
	2038		DLT (0.38)	Partial DLT N-S (0.39)	Bowtie N-S (0.41)	Signalized ThruCut N-S (0.44)	Traffic Signal (0.45)	Partial MUT N-S (0.45)	Unsignalized RCUT N-S (0.48)	Signalized RCUT N-S (0.48)	MUT N-S (0.50)	1 X 1 Roundabout (0.53)
	2048		DLT (0.43)	Partial DLT N-S (0.44)	Bowtie N-S (0.47)	Signalized ThruCut N-S (0.49)	Traffic Signal (0.50)	Partial MUT N-S (0.52)	Signalized RCUT N-S (0.53)	Unsignalized RCUT N-S (0.56)	MUT N-S (0.57)	1 X 1 Roundabout (0.61)
	2028	PM	Unsignalized RCUT N-S (0.24)	DLT (0.37)	Partial DLT N-S (0.38)	Bowtie N-S (0.38)	Signalized ThruCut N-S (0.39)	Traffic Signal (0.40)	Signalized RCUT N-S (0.42)	Partial MUT N-S (0.43)	TWSC (0.44)	MUT N-S (0.46)
	2038		Unsignalized RCUT N-S (0.28)	DLT (0.45)	Bowtie N-S (0.45)	Partial DLT N-S (0.46)	Signalized ThruCut N-S (0.46)	Traffic Signal (0.48)	Signalized RCUT N-S (0.50)	Partial MUT N-S (0.51)	MUT N-S (0.54)	1 X 1 Roundabout (0.64)
	2048		Unsignalized RCUT N-S (0.33)	DLT (0.52)	Partial DLT N-S (0.53)	Bowtie N-S (0.53)	Signalized ThruCut N-S (0.54)	Traffic Signal (0.55)	Signalized RCUT N-S (0.57)	Partial MUT N-S (0.58)	MUT N-S (0.61)	1 X 1 Roundabout (0.74)
Build (4-lane)	2028	AM	DLT (0.21)	Partial DLT N-S (0.22)	Signalized RCUT N-S (0.24)	Bowtie N-S (0.24)	Partial MUT N-S (0.26)	Traffic Signal (0.27)	Signalized ThruCut N-S (0.27)	2NS X 1EW Roundabout (0.29)	MUT N-S (0.32)	Unsignalized RCUT N-S (0.51)
	2038		DLT (0.27)	Partial DLT N-S (0.28)	Signalized RCUT N-S (0.31)	Bowtie N-S (0.31)	Traffic Signal (0.33)	Signalized ThruCut N-S (0.33)	Partial MUT N-S (0.34)	2NS X 1EW Roundabout (0.37)	MUT N-S (0.40)	Unsignalized RCUT N-S (0.73)
	2048		DLT (0.34)	Partial DLT N-S (0.35)	Signalized RCUT N-S (0.38)	Signalized ThruCut N-S (0.38)	Bowtie N-S (0.38)	Traffic Signal (0.39)	Partial MUT N-S (0.41)	2NS X 1EW Roundabout (0.46)	MUT N-S (0.48)	Unsignalized RCUT N-S (1.03)
	2028	PM	DLT (0.23)	Partial DLT N-S (0.24)	Bowtie N-S (0.24)	Signalized ThruCut N-S (0.25)	Traffic Signal (0.26)	Signalized RCUT N-S (0.26)	Partial MUT N-S (0.27)	Unsignalized RCUT N-S (0.30)	MUT N-S (0.30)	2NS X 1EW Roundabout (0.32)
	2038		DLT (0.31)	Partial DLT N-S (0.32)	Signalized ThruCut N-S (0.32)	Bowtie N-S (0.32)	Traffic Signal (0.33)	Signalized RCUT N-S (0.34)	Partial MUT N-S (0.34)	MUT N-S (0.38)	2NS X 1EW Roundabout (0.44)	Unsignalized RCUT N-S (0.44)
	2048		DLT (0.38)	Partial DLT N-S (0.39)	Bowtie N-S (0.39)	Signalized ThruCut N-S (0.40)	Traffic Signal (0.41)	Signalized RCUT N-S (0.42)	Partial MUT N-S (0.42)	MUT N-S (0.46)	2NS X 1EW Roundabout (0.55)	Unsignalized RCUT N-S (0.65)

*Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors

V/C Ratio Legend	
	< 0.750
	0.750 - 0.875
	0.875 - 1.00
	≥ 1.00

Table 3- 3 Summary of CAP-X Results at the Intersection of Long Boat Lane/Cypress Lake Glen Boulevard (N) and Chuluota Road

Build Type	Year	Intersection Control Rank 1 (Fatal & Injury Crashes)	Intersection Control Rank 2 (Fatal & Injury Crashes)	Intersection Control Rank 3 (Fatal & Injury Crashes)	Intersection Control Rank 4 (Fatal & Injury Crashes)	Intersection Control Rank 5 (Fatal & Injury Crashes)	Intersection Control Rank 6 (Fatal & Injury Crashes)	Intersection Control Rank 7 (Fatal & Injury Crashes)	Intersection Control Rank 8 (Fatal & Injury Crashes)	Intersection Control Rank 9 (Fatal & Injury Crashes)	Intersection Control Rank 10 (Fatal & Injury Crashes)
No-Build (2-lane)	2028	1 Lane Roundabout (0.36)	Signalized RCUT N-S (0.69)	Unsignalized RCUT N-S (0.74)	TWSC (0.86)	AWSC (0.95)	Jughandle (1.03)	MUT N-S (1.06)	DLT (1.22)	Traffic Signal (1.39)	Bowtie N-S (No SPF)
	2038	1 Lane Roundabout (0.41)	Unsignalized RCUT N-S (0.83)	Signalized RCUT N-S (0.87)	TWSC (0.94)	AWSC (1.11)	Jughandle (1.15)	MUT N-S (1.19)	DLT (1.37)	Traffic Signal (1.56)	Bowtie N-S (No SPF)
	2048	1 Lane Roundabout (0.45)	Unsignalized RCUT N-S (0.90)	TWSC (1.00)	Signalized RCUT N-S (1.04)	AWSC (1.26)	Jughandle (1.27)	MUT N-S (1.30)	DLT (1.51)	Traffic Signal (1.71)	Bowtie N-S (No SPF)
Build (4-lane)	2028	Unsignalized RCUT N-S (0.81)	Signalized RCUT N-S (0.82)	TWSC (0.91)	AWSC (1.08)	2 Lane Roundabout (1.11)	Jughandle (1.13)	MUT N-S (1.17)	DLT (1.35)	Traffic Signal (1.53)	Bowtie N-S (No SPF)
	2038	Unsignalized RCUT N-S (0.97)	TWSC (1.02)	Signalized RCUT N-S (1.16)	Jughandle (1.36)	AWSC (1.39)	MUT N-S (1.40)	2 Lane Roundabout (1.49)	DLT (1.62)	Traffic Signal (1.84)	Bowtie N-S (No SPF)
	2048	TWSC (1.10)	Unsignalized RCUT N-S (1.12)	Signalized RCUT N-S (1.51)	Jughandle (1.57)	MUT N-S (1.61)	AWSC (1.71)	DLT (1.86)	2 Lane Roundabout (1.88)	Traffic Signal (2.12)	Bowtie N-S (No SPF)

*Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors

Predicted Crashes Legend		
	0.00 - 0.50	Above Average Safety
	0.50 - 1.00	Acceptable Safety
	1.00 - 1.50	Below Average Safety
	≥ 1.50	Poor Safety

Table 3- 4 Summary of SPICE Crash Prediction Method Results at the Intersection of Long Boat Lane/Cypress Lake Glen Boulevard (N) and Chuluota Road

Build Type	Year	Intersection Control Rank 1 (SSI Score)	Intersection Control Rank 2 (SSI Score)	Intersection Control Rank 3 (SSI Score)	Intersection Control Rank 4 (SSI Score)	Intersection Control Rank 5 (SSI Score)	Intersection Control Rank 6 (SSI Score)	Intersection Control Rank 7 (SSI Score)	Intersection Control Rank 8 (SSI Score)	Intersection Control Rank 9 (SSI Score)	Intersection Control Rank 10 (SSI Score)
No-Build (2-lane)	2028	1 Lane Roundabout (100)	AWSC (99)	MUT N-S (98)	Signalized RCUT N-S (98)	Unsignalized RCUT N-S (97)	Traffic Signal (96)	Jughandle (96)	Signalized ThruCut N-S (96)	TWSC (95)	Bowtie N-S (94)
	2038	1 Lane Roundabout (100)	AWSC (99)	MUT N-S (97)	Signalized RCUT N-S (97)	Unsignalized RCUT N-S (96)	Traffic Signal (95)	Jughandle (95)	Signalized ThruCut N-S (95)	TWSC (93)	Bowtie N-S (93)
	2048	1 Lane Roundabout (100)	AWSC (99)	MUT N-S (97)	Signalized RCUT N-S (96)	Unsignalized RCUT N-S (95)	Traffic Signal (94)	Jughandle (94)	Signalized ThruCut N-S (94)	TWSC (92)	Bowtie N-S (91)
Build (4-lane)	2028	2 Lane Roundabout (99)	AWSC (98)	MUT N-S (96)	Signalized RCUT N-S (95)	Unsignalized RCUT N-S (93)	Traffic Signal (92)	Signalized ThruCut N-S (92)	Jughandle (91)	TWSC (89)	Unsignalized ThruCut N-S (88)
	2038	2 Lane Roundabout (99)	AWSC (98)	MUT N-S (94)	Signalized RCUT N-S (94)	Unsignalized RCUT N-S (91)	Traffic Signal (89)	Jughandle (88)	Signalized ThruCut N-S (88)	TWSC (85)	Unsignalized ThruCut N-S (83)
	2048	2 Lane Roundabout (99)	AWSC (97)	MUT N-S (93)	Signalized RCUT N-S (92)	Unsignalized RCUT N-S (88)	Traffic Signal (85)	Jughandle (84)	Signalized ThruCut N-S (84)	TWSC (80)	Unsignalized ThruCut N-S (78)

*Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors

SSI Legend	
	90-100
	80-89
	70-79
	< 70

Table 3- 5 Summary of SPICE SSI Method Results at the Intersection of Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road

3.4 Corner Lake Drive at Chuluota Road

CAP-X analyses were performed at the intersection of Corner Lake Drive at Chuluota Road for the AM and PM peak hours of the opening year (2038), interim year (2038), and design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 12 analysis permutations.

A summary of the results of the CAP-X analyses at the intersection of Corner Lake Drive at Chuluota Road are shown in Figure 3-8. The ten highest ranked intersection control strategies by volume to capacity (V/C) ratio are shown for each analysis permutation with the following color coding:

- The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.
- The green cells indicate that the intersection control strategy results in a V/C ratio less than 0.750.
- The yellow cells indicate that the intersection control strategy results in a V/C ratio between 0.750 and 0.875.
- The orange cells indicate that the intersection control strategy results in a V/C ratio between 0.875 and 1.00.
- The red cells indicate that the intersection control strategy results in a V/C ratio greater than or equal to 1.00.

The summary of the CAP-X analyses indicate that, for the no-build scenario, the TWSC configuration is the prevailing feasible intersection control strategy in terms of V/C ratio, followed by the bowtie, traffic signal, and roundabout configurations. For the build scenario, the bowtie configuration is the prevailing feasible intersection control strategy in terms of V/C ratio, followed by the TWSC, traffic signal, and roundabout configurations.

SPICE analyses using the crash prediction method were performed at the intersection of Corner Lake Drive at Chuluota Road for the opening year (2028), interim year (2038), and design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 6 analysis permutations.

A summary of the results of the SPICE analyses using the crash prediction method at the intersection of Corner Lake Drive at Chuluota Road are shown in Figure 3-9. The ten highest ranked intersection control strategies by predicted fatal and serious injury crashes are shown for each analysis permutation. The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.

The summary of the SPICE analyses results using the crash prediction method indicate that, for the no-build scenario, the roundabout configuration is the prevailing feasible intersection control strategy in terms of predicted fatal and serious injury crashes, followed by the TWSC and traffic signal configurations. For the build scenario, the TWSC configuration is the prevailing feasible intersection control strategy in terms of predicted fatal and serious injury crashes, followed by the traffic signal and roundabout configurations.

It should be noted that, due to the absence of adequate safety performance functions (SPFs), the crash prediction method could not be applied to the following intersection control strategies considered in the

Stage 1 analysis:

- Bowtie
- Signalized RCUT
- Unsignalized RCUT

SPICE analyses using the SSI method were performed at the intersection of Corner Lake Drive at Chuluota Road for the opening year (2028), interim year (2038), and design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 6 analysis permutations.

A summary of the results of the SPICE analyses using the SSI method at the intersection of Corner Lake Drive at Chuluota Road are shown in Figure 3-10. The ten highest ranked intersection control strategies by SSI score are shown for each analysis permutation with the following color coding:

- The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.
- The green cells indicate that the intersection control strategy results in a SSI score between 90 and 100.
- The yellow cells indicate that the intersection control strategy results in a SSI score between 80 and 89.
- The orange cells indicate that the intersection control strategy results in a SSI score between 70 and 79.
- The red cells indicate that the intersection control strategy results in a SSI score less than 70.

The summary of the SPICE analyses results using the SSI method indicate that, for both the no-build and build scenarios, the roundabout configuration is the prevailing feasible intersection control strategy in terms of SSI score, followed by the AWSC, traffic signal, TWSC, and bowtie configurations.

Build Type	Year	Peak Hour	Intersection Control Rank 1 (V/C Ratio)	Intersection Control Rank 2 (V/C Ratio)	Intersection Control Rank 3 (V/C Ratio)	Intersection Control Rank 4 (V/C Ratio)	Intersection Control Rank 5 (V/C Ratio)	Intersection Control Rank 6 (V/C Ratio)	Intersection Control Rank 7 (V/C Ratio)	Intersection Control Rank 8 (V/C Ratio)	Intersection Control Rank 9 (V/C Ratio)	Intersection Control Rank 10 (V/C Ratio)
No-Build (2-lane)	2028	AM	Unsignalized RCUT N-S (0.18)	TWSC (0.30)	Unsignalized ThruCut N-S (0.30)	Bowtie N-S (0.33)	Partial MUT N-S (0.34)	Traffic Signal (0.35)	Continuous Green T (0.35)	Signalized ThruCut N-S (0.35)	Signalized RCUT N-S (0.36)	MUT N-S (0.36)
	2038		Unsignalized RCUT N-S (0.22)	TWSC (0.36)	Unsignalized ThruCut N-S (0.36)	Bowtie N-S (0.39)	Partial MUT N-S (0.40)	Traffic Signal (0.41)	Continuous Green T (0.41)	Signalized ThruCut N-S (0.41)	Signalized RCUT N-S (0.43)	MUT N-S (0.43)
	2048		Unsignalized RCUT N-S (0.27)	TWSC (0.43)	Unsignalized ThruCut N-S (0.43)	Bowtie N-S (0.46)	Partial MUT N-S (0.47)	Traffic Signal (0.48)	Continuous Green T (0.48)	Signalized ThruCut N-S (0.48)	Signalized RCUT N-S (0.49)	MUT N-S (0.49)
	2028	PM	Unsignalized RCUT N-S (0.14)	TWSC (0.35)	Unsignalized ThruCut N-S (0.35)	Bowtie N-S (0.38)	Traffic Signal (0.39)	Continuous Green T (0.39)	Signalized RCUT N-S (0.39)	MUT N-S (0.39)	Partial MUT N-S (0.39)	Signalized ThruCut N-S (0.39)
	2038		Unsignalized RCUT N-S (0.17)	TWSC (0.42)	Unsignalized ThruCut N-S (0.42)	Bowtie N-S (0.45)	Traffic Signal (0.46)	Continuous Green T (0.46)	Partial MUT N-S (0.46)	Signalized ThruCut N-S (0.46)	Signalized RCUT N-S (0.47)	MUT N-S (0.47)
	2048		Unsignalized RCUT N-S (0.21)	TWSC (0.49)	Unsignalized ThruCut N-S (0.49)	Bowtie N-S (0.52)	Traffic Signal (0.54)	Continuous Green T (0.54)	Signalized RCUT N-S (0.54)	MUT N-S (0.54)	Partial MUT N-S (0.54)	Signalized ThruCut N-S (0.54)
Build (4-lane)	2028	AM	Bowtie N-S (0.20)	Signalized RCUT N-S (0.21)	TWSC (0.21)	Partial MUT N-S (0.21)	Traffic Signal (0.22)	Continuous Green T (0.22)	Signalized ThruCut N-S (0.22)	Unsignalized RCUT N-S (0.24)	MUT N-S (0.24)	2NS X 1EW Roundabout (0.25)
	2038		Signalized RCUT N-S (0.27)	Bowtie N-S (0.27)	Partial MUT N-S (0.28)	Traffic Signal (0.29)	Continuous Green T (0.29)	Signalized ThruCut N-S (0.29)	MUT N-S (0.31)	2NS X 1EW Roundabout (0.34)	Unsignalized RCUT N-S (0.37)	TWSC (0.38)
	2048		Signalized RCUT N-S (0.34)	Bowtie N-S (0.34)	Continuous Green T (0.35)	Partial MUT N-S (0.35)	Signalized ThruCut N-S (0.35)	Traffic Signal (0.36)	MUT N-S (0.38)	2NS X 1EW Roundabout (0.43)	Unsignalized RCUT N-S (0.56)	TWSC (0.66)
	2028	PM	Unsignalized RCUT N-S (0.19)	TWSC (0.20)	Unsignalized ThruCut N-S (0.20)	Signalized RCUT N-S (0.22)	Bowtie N-S (0.23)	Traffic Signal (0.24)	Continuous Green T (0.24)	Partial MUT N-S (0.24)	Signalized ThruCut N-S (0.24)	MUT N-S (0.25)
	2038		TWSC (0.27)	Signalized RCUT N-S (0.30)	Unsignalized ThruCut N-S (0.30)	Bowtie N-S (0.30)	Traffic Signal (0.31)	Continuous Green T (0.31)	Partial MUT N-S (0.31)	Signalized ThruCut N-S (0.31)	MUT N-S (0.32)	2NS X 1EW Roundabout (0.40)
	2048		Signalized RCUT N-S (0.37)	Bowtie N-S (0.38)	Traffic Signal (0.39)	Continuous Green T (0.39)	Partial MUT N-S (0.39)	Signalized ThruCut N-S (0.39)	MUT N-S (0.40)	TWSC (0.45)	Unsignalized RCUT N-S (0.49)	2NS X 1EW Roundabout (0.51)

*Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors

V/C Ratio Legend	
	< 0.750
	0.750 - 0.875
	0.875 - 1.00
	≥ 1.00

Table 3- 7 Summary of CAP-X Results at the Intersection of Corner Lake Drive and Chuluota Road

Build Type	Year	Intersection Control Rank 1 (Fatal & Injury Crashes)	Intersection Control Rank 2 (Fatal & Injury Crashes)	Intersection Control Rank 3 (Fatal & Injury Crashes)	Intersection Control Rank 4 (Fatal & Injury Crashes)	Intersection Control Rank 5 (Fatal & Injury Crashes)	Intersection Control Rank 6 (Fatal & Injury Crashes)	Intersection Control Rank 7 (Fatal & Injury Crashes)	Intersection Control Rank 8 (Fatal & Injury Crashes)	Intersection Control Rank 9 (Fatal & Injury Crashes)	Intersection Control Rank 10 (Fatal & Injury Crashes)
No-Build (2-lane)	2028	1 Lane Roundabout (0.19)	Signalized RCUT N-S (0.35)	Jughandle (0.44)	Continuous Green T (0.50)	TWSC (0.53)	Traffic Signal (0.59)	Unsignalized RCUT N-S (0.63)	Bowtie N-S (No SPF)	Signalized ThruCut N-S (No SPF)	Unsignalized ThruCut N-S (No SPF)
	2038	1 Lane Roundabout (0.23)	Signalized RCUT N-S (0.44)	Jughandle (0.49)	Continuous Green T (0.56)	TWSC (0.57)	Traffic Signal (0.66)	Unsignalized RCUT N-S (0.70)	Bowtie N-S (No SPF)	Signalized ThruCut N-S (No SPF)	Unsignalized ThruCut N-S (No SPF)
	2048	1 Lane Roundabout (0.26)	Signalized RCUT N-S (0.52)	Jughandle (0.53)	TWSC (0.60)	Continuous Green T (0.61)	Traffic Signal (0.72)	Unsignalized RCUT N-S (0.77)	Bowtie N-S (No SPF)	Signalized ThruCut N-S (No SPF)	Unsignalized ThruCut N-S (No SPF)
Build (4-lane)	2028	Signalized RCUT N-S (0.40)	Jughandle (0.47)	Continuous Green T (0.54)	TWSC (0.55)	Traffic Signal (0.63)	2 Lane Roundabout (0.66)	Unsignalized RCUT N-S (0.68)	Bowtie N-S (No SPF)	Signalized ThruCut N-S (No SPF)	Unsignalized ThruCut N-S (No SPF)
	2038	Jughandle (0.55)	Signalized RCUT N-S (0.56)	TWSC (0.61)	Continuous Green T (0.63)	Traffic Signal (0.74)	Unsignalized RCUT N-S (0.80)	2 Lane Roundabout (0.92)	Bowtie N-S (No SPF)	Signalized ThruCut N-S (No SPF)	Unsignalized ThruCut N-S (No SPF)
	2048	Jughandle (0.63)	TWSC (0.66)	Continuous Green T (0.72)	Signalized RCUT N-S (0.72)	Traffic Signal (0.85)	Unsignalized RCUT N-S (0.92)	2 Lane Roundabout (1.20)	Bowtie N-S (No SPF)	Signalized ThruCut N-S (No SPF)	Unsignalized ThruCut N-S (No SPF)

*Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors

Predicted Crashes Legend		
	0.00 - 0.50	Above Average Safety
	0.50 - 1.00	Acceptable Safety
	1.00 - 1.50	Below Average Safety
	≥ 1.50	Poor Safety

Table 3- 6 Summary of SPICE Crash Prediction Method Results at the Intersection of Corner Lake Drive and Chuluota Road

Build Type	Year	Intersection Control Rank 1 (SSI Score)	Intersection Control Rank 2 (SSI Score)	Intersection Control Rank 3 (SSI Score)	Intersection Control Rank 4 (SSI Score)	Intersection Control Rank 5 (SSI Score)	Intersection Control Rank 6 (SSI Score)	Intersection Control Rank 7 (SSI Score)	Intersection Control Rank 8 (SSI Score)	Intersection Control Rank 9 (SSI Score)	Intersection Control Rank 10 (SSI Score)
No-Build (2-lane)	2028	1 Lane Roundabout (100)	AWSC (100)	Signalized RCUT N-S (100)	Continuous Green T (99)	Unsignalized RCUT N-S (99)	Traffic Signal (99)	TWSC (98)	Bowtie N-S (N/A)	Unsignalized ThruCut N-S (N/A)	Jughandle (N/A)
	2038	1 Lane Roundabout (100)	AWSC (100)	Signalized RCUT N-S (99)	Continuous Green T (99)	Unsignalized RCUT N-S (99)	Traffic Signal (99)	TWSC (98)	Bowtie N-S (N/A)	Unsignalized ThruCut N-S (N/A)	Jughandle (N/A)
	2048	1 Lane Roundabout (100)	AWSC (100)	Signalized RCUT N-S (99)	Continuous Green T (99)	Unsignalized RCUT N-S (99)	Traffic Signal (99)	TWSC (97)	Bowtie N-S (N/A)	Unsignalized ThruCut N-S (N/A)	Jughandle (N/A)
Build (4-lane)	2028	2 Lane Roundabout (100)	AWSC (100)	Continuous Green T (99)	Signalized RCUT N-S (99)	Unsignalized RCUT N-S (99)	Traffic Signal (98)	TWSC (96)	Bowtie N-S (N/A)	Unsignalized ThruCut N-S (N/A)	Jughandle (N/A)
	2038	2 Lane Roundabout (100)	AWSC (99)	Continuous Green T (99)	Signalized RCUT N-S (99)	Unsignalized RCUT N-S (98)	Traffic Signal (97)	TWSC (95)	Bowtie N-S (N/A)	Unsignalized ThruCut N-S (N/A)	Jughandle (N/A)
	2048	2 Lane Roundabout (99)	AWSC (99)	Continuous Green T (99)	Signalized RCUT N-S (98)	Unsignalized RCUT N-S (98)	Traffic Signal (97)	TWSC (94)	Bowtie N-S (N/A)	Unsignalized ThruCut N-S (N/A)	Jughandle (N/A)

*Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors

SSI Legend	
	90-100
	80-89
	70-79
	< 70

Table 3- 8 Summary of SPICE SSI Method Results at the Intersection of Corner Lake and

3.5 Cypress Lake Glen Boulevard (S) at Chuluota Road

CAP-X analyses were performed at the intersection of Cypress Lake Glen Boulevard (S) at Chuluota Road for the AM and PM peak hours of the opening year (2038), interim year (2038), and design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 12 analysis permutations.

A summary of the results of the CAP-X analyses at the intersection of Cypress Lake Glen Boulevard (S) at Chuluota Road are shown in Figure 3-11. The ten highest ranked intersection control strategies by volume to capacity (V/C) ratio are shown for each analysis permutation with the following color coding:

- The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.
- The green cells indicate that the intersection control strategy results in a V/C ratio less than 0.750.
- The yellow cells indicate that the intersection control strategy results in a V/C ratio between 0.750 and 0.875.
- The orange cells indicate that the intersection control strategy results in a V/C ratio between 0.875 and 1.00.
- The red cells indicate that the intersection control strategy results in a V/C ratio greater than or equal to 1.00.

The summary of the CAP-X analyses indicate that, for both the no-build and build scenarios, the bowtie configuration is the prevailing feasible intersection control strategy in terms of V/C ratio, followed by the traffic signal, roundabout, and TWSC configurations.

SPICE analyses using the crash prediction method were performed at the intersection of Cypress Lake Glen Boulevard (S) at Chuluota Road for the opening year (2028), interim year (2038), and design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 6 analysis permutations.

A summary of the results of the SPICE analyses using the crash prediction method at the intersection of Cypress Lake Glen Boulevard (S) at Chuluota Road are shown in Figure 3-12. The ten highest ranked intersection control strategies by predicted fatal and serious injury crashes are shown for each analysis permutation. The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.

The summary of the SPICE analyses results using the crash prediction method indicate that, for both the no-build and build scenarios, the roundabout configuration is the prevailing feasible intersection control strategy in terms of predicted fatal and serious injury crashes, followed by the traffic signal and TWSC configurations.

It should be noted that, due to the absence of adequate safety performance functions (SPFs), the crash prediction method could not be applied to the following intersection control strategies considered in the

Stage 1 analysis:

- Bowtie
- Signalized RCUT
- Unsignalized RCUT

SPICE analyses using the SSI method were performed at the intersection of Cypress Lake Glen Boulevard (S) at Chuluota Road for the opening year (2028), interim year (2038), and design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 6 analysis permutations.

A summary of the results of the SPICE analyses using the SSI method at the intersection of Cypress Lake Glen Boulevard (S) at Chuluota Road are shown in Figure 3-13. The ten highest ranked intersection control strategies by SSI score are shown for each analysis permutation with the following color coding:

- The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.
- The green cells indicate that the intersection control strategy results in a SSI score between 90 and 100.
- The yellow cells indicate that the intersection control strategy results in a SSI score between 80 and 89.
- The orange cells indicate that the intersection control strategy results in a SSI score between 70 and 79.
- The red cells indicate that the intersection control strategy results in a SSI score less than 70.

The summary of the SPICE analyses results using the SSI method indicate that, for both the no-build and build scenarios, the roundabout configuration is the prevailing feasible intersection control strategy in terms of SSI score, followed by the AWSC, traffic signal, TWSC, and bowtie configurations.

Build Type	Year	Peak Hour	Intersection Control Rank 1 (V/C Ratio)	Intersection Control Rank 2 (V/C Ratio)	Intersection Control Rank 3 (V/C Ratio)	Intersection Control Rank 4 (V/C Ratio)	Intersection Control Rank 5 (V/C Ratio)	Intersection Control Rank 6 (V/C Ratio)	Intersection Control Rank 7 (V/C Ratio)	Intersection Control Rank 8 (V/C Ratio)	Intersection Control Rank 9 (V/C Ratio)	Intersection Control Rank 10 (V/C Ratio)
No-Build (2-lane)	2028	AM	Bowtie N-S (0.34)	Continuous Green T (0.40)	Unsignalized RCUT N-S (0.40)	Traffic Signal (0.44)	Partial MUT N-S (0.44)	Signalized ThruCut N-S (0.44)	Signalized RCUT N-S (0.45)	MUT N-S (0.47)	1 X 1 Roundabout (0.51)	75 ICD Mini-Roundabout (0.67)
	2038		Bowtie N-S (0.40)	Continuous Green T (0.45)	Unsignalized RCUT N-S (0.47)	Traffic Signal (0.50)	Signalized ThruCut N-S (0.50)	Partial MUT N-S (0.51)	Signalized RCUT N-S (0.52)	MUT N-S (0.54)	1 X 1 Roundabout (0.61)	75 ICD Mini-Roundabout (0.81)
	2048		Bowtie N-S (0.46)	Continuous Green T (0.50)	Unsignalized RCUT N-S (0.54)	Traffic Signal (0.57)	Partial MUT N-S (0.57)	Signalized ThruCut N-S (0.57)	Signalized RCUT N-S (0.58)	MUT N-S (0.60)	1 X 1 Roundabout (0.71)	75 ICD Mini-Roundabout (0.94)
	2028	PM	Unsignalized RCUT N-S (0.34)	Bowtie N-S (0.38)	Continuous Green T (0.43)	Traffic Signal (0.47)	Signalized ThruCut N-S (0.47)	Partial MUT N-S (0.48)	Signalized RCUT N-S (0.49)	MUT N-S (0.50)	1 X 1 Roundabout (0.59)	75 ICD Mini-Roundabout (0.77)
	2038		Unsignalized RCUT N-S (0.40)	Bowtie N-S (0.45)	Continuous Green T (0.49)	Traffic Signal (0.55)	Signalized ThruCut N-S (0.55)	Signalized RCUT N-S (0.57)	Partial MUT N-S (0.57)	MUT N-S (0.58)	1 X 1 Roundabout (0.71)	75 ICD Mini-Roundabout (0.93)
	2048		Unsignalized RCUT N-S (0.47)	Bowtie N-S (0.53)	Continuous Green T (0.55)	Traffic Signal (0.63)	Signalized ThruCut N-S (0.63)	Signalized RCUT N-S (0.65)	Partial MUT N-S (0.65)	MUT N-S (0.66)	1 X 1 Roundabout (0.83)	75 ICD Mini-Roundabout (1.09)
Build (4-lane)	2028	AM	Bowtie N-S (0.21)	Continuous Green T (0.28)	2NS X 1EW Roundabout (0.30)	Traffic Signal (0.30)	Signalized ThruCut N-S (0.30)	Partial MUT N-S (0.31)	Signalized RCUT N-S (0.32)	MUT N-S (0.34)	Unsignalized RCUT N-S (0.50)	TWSC (0.76)
	2038		Bowtie N-S (0.27)	Continuous Green T (0.34)	Traffic Signal (0.37)	Signalized ThruCut N-S (0.37)	Partial MUT N-S (0.38)	Signalized RCUT N-S (0.39)	2NS X 1EW Roundabout (0.40)	MUT N-S (0.41)	Unsignalized RCUT N-S (0.70)	75 ICD Mini-Roundabout (1.04)
	2048		Bowtie N-S (0.33)	Continuous Green T (0.40)	Traffic Signal (0.44)	Signalized ThruCut N-S (0.44)	Partial MUT N-S (0.45)	Signalized RCUT N-S (0.46)	MUT N-S (0.48)	2NS X 1EW Roundabout (0.51)	Unsignalized RCUT N-S (0.99)	75 ICD Mini-Roundabout (1.32)
	2028	PM	Bowtie N-S (0.22)	Continuous Green T (0.29)	Traffic Signal (0.31)	Signalized ThruCut N-S (0.31)	Partial MUT N-S (0.32)	Signalized RCUT N-S (0.33)	MUT N-S (0.34)	2NS X 1EW Roundabout (0.34)	Unsignalized RCUT N-S (0.44)	75 ICD Mini-Roundabout (0.89)
	2038		Bowtie N-S (0.30)	Continuous Green T (0.36)	Traffic Signal (0.40)	Signalized ThruCut N-S (0.40)	Partial MUT N-S (0.41)	Signalized RCUT N-S (0.42)	MUT N-S (0.42)	2NS X 1EW Roundabout (0.47)	Unsignalized RCUT N-S (0.63)	75 ICD Mini-Roundabout (1.22)
	2048		Bowtie N-S (0.38)	Continuous Green T (0.42)	Traffic Signal (0.49)	Signalized ThruCut N-S (0.49)	Signalized RCUT N-S (0.50)	Partial MUT N-S (0.50)	MUT N-S (0.51)	2NS X 1EW Roundabout (0.60)	Unsignalized RCUT N-S (0.92)	50 ICD Mini-Roundabout (1.60)

Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors

V/C Ratio Legend	
	< 0.750
	0.750 - 0.875
	0.875 - 1.00
	≥ 1.00

Table 3- 11 Summary of CAP-X Results at the Intersection of Cypress Lake Glen Boulevard (S) and Chuluota Road

Build Type	Year	Intersection Control Rank 1 (Fatal & Injury Crashes)	Intersection Control Rank 2 (Fatal & Injury Crashes)	Intersection Control Rank 3 (Fatal & Injury Crashes)	Intersection Control Rank 4 (Fatal & Injury Crashes)	Intersection Control Rank 5 (Fatal & Injury Crashes)	Intersection Control Rank 6 (Fatal & Injury Crashes)	Intersection Control Rank 7 (Fatal & Injury Crashes)	Intersection Control Rank 8 (Fatal & Injury Crashes)	Intersection Control Rank 9 (Fatal & Injury Crashes)	Intersection Control Rank 10 (Fatal & Injury Crashes)
No-Build (2-lane)	2028	1 Lane Roundabout (0.25)	Signalized RCUT N-S (0.66)	Unsignalized RCUT N-S (0.77)	Jughandle (0.84)	MUT N-S (0.86)	Continuous Green T (0.97)	Traffic Signal (1.14)	TWSC (1.37)	Bowtie N-S (No SPF)	Signalized ThruCut N-S (No SPF)
	2038	1 Lane Roundabout (0.29)	Signalized RCUT N-S (0.81)	Unsignalized RCUT N-S (0.86)	Jughandle (0.89)	MUT N-S (0.92)	Continuous Green T (1.03)	Traffic Signal (1.21)	TWSC (1.62)	Bowtie N-S (No SPF)	Signalized ThruCut N-S (No SPF)
	2048	1 Lane Roundabout (0.33)	Unsignalized RCUT N-S (0.94)	Jughandle (0.94)	MUT N-S (0.97)	Signalized RCUT N-S (0.97)	Continuous Green T (1.08)	Traffic Signal (1.27)	TWSC (1.85)	Bowtie N-S (No SPF)	Signalized ThruCut N-S (No SPF)
Build (4-lane)	2028	Signalized RCUT N-S (0.74)	Unsignalized RCUT N-S (0.83)	Jughandle (0.87)	2 Lane Roundabout (0.88)	MUT N-S (0.90)	Continuous Green T (1.00)	Traffic Signal (1.18)	TWSC (1.51)	Bowtie N-S (No SPF)	Signalized ThruCut N-S (No SPF)
	2038	Jughandle (0.96)	Unsignalized RCUT N-S (0.98)	MUT N-S (0.99)	Signalized RCUT N-S (1.04)	Continuous Green T (1.10)	2 Lane Roundabout (1.20)	Traffic Signal (1.30)	TWSC (1.94)	Bowtie N-S (No SPF)	Signalized ThruCut N-S (No SPF)
	2048	Jughandle (1.03)	MUT N-S (1.06)	Unsignalized RCUT N-S (1.13)	Continuous Green T (1.18)	Signalized RCUT N-S (1.35)	Traffic Signal (1.39)	2 Lane Roundabout (1.54)	TWSC (2.36)	Bowtie N-S (No SPF)	Signalized ThruCut N-S (No SPF)

Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors

Predicted Crashes Legend		
	0.00 - 0.50	Above Average Safety
	0.50 - 1.00	Acceptable Safety
	1.00 - 1.50	Below Average Safety
	≥ 1.50	Poor Safety

Table 3- 12 Summary of SPICE Crash Prediction Method Results at the Intersection of Cypress Lake Glen Boulevard (S) and Chuluota Road

Build Type	Year	Intersection Control Rank 1 (SSI Score)	Intersection Control Rank 2 (SSI Score)	Intersection Control Rank 3 (SSI Score)	Intersection Control Rank 4 (SSI Score)	Intersection Control Rank 5 (SSI Score)	Intersection Control Rank 6 (SSI Score)	Intersection Control Rank 7 (SSI Score)	Intersection Control Rank 8 (SSI Score)	Intersection Control Rank 9 (SSI Score)	Intersection Control Rank 10 (SSI Score)
No-Build (2-lane)	2028	1 Lane Roundabout (100)	AWSC (100)	Signalized RCUT N-S (99)	Unsignalized RCUT N-S (99)	Continuous Green T (99)	Traffic Signal (98)	TWSC (95)	Bowtie N-S (N/A)	Unsignalized ThruCut N-S (N/A)	Jughandle (N/A)
	2038	1 Lane Roundabout (100)	AWSC (99)	Signalized RCUT N-S (99)	Unsignalized RCUT N-S (98)	Continuous Green T (98)	Traffic Signal (97)	TWSC (93)	Bowtie N-S (N/A)	Unsignalized ThruCut N-S (N/A)	Jughandle (N/A)
	2048	1 Lane Roundabout (100)	AWSC (99)	Signalized RCUT N-S (99)	Unsignalized RCUT N-S (98)	Continuous Green T (98)	Traffic Signal (97)	TWSC (92)	Bowtie N-S (N/A)	Unsignalized ThruCut N-S (N/A)	Jughandle (N/A)
Build (4-lane)	2028	2 Lane Roundabout (99)	AWSC (99)	Continuous Green T (98)	Signalized RCUT N-S (98)	Unsignalized RCUT N-S (98)	Traffic Signal (96)	TWSC (90)	Bowtie N-S (N/A)	Unsignalized ThruCut N-S (N/A)	Jughandle (N/A)
	2038	2 Lane Roundabout (99)	AWSC (99)	Continuous Green T (98)	Signalized RCUT N-S (97)	Unsignalized RCUT N-S (97)	Traffic Signal (94)	TWSC (85)	Bowtie N-S (N/A)	Unsignalized ThruCut N-S (N/A)	Jughandle (N/A)
	2048	2 Lane Roundabout (99)	AWSC (98)	Continuous Green T (97)	Signalized RCUT N-S (97)	Unsignalized RCUT N-S (96)	Traffic Signal (92)	TWSC (81)	Bowtie N-S (N/A)	Unsignalized ThruCut N-S (N/A)	Jughandle (N/A)

**Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors*

SSI Legend	
	90-100
	80-89
	70-79
	< 70

Table 3- 9 Summary of SPICE SSI Method Results at the Intersection of Cypress Lake Glen Boulevard (S) and Chuluota Road

3.6 Corner School Drive at Schoolview Way

CAP-X analyses were performed at the intersection of Corner School Drive at Schoolview Way for the AM and PM peak hours of the opening year (2038), interim year (2038), and design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 12 analysis permutations.

A summary of the results of the CAP-X analyses at the intersection of Corner School Drive at Schoolview Way are shown in Figure 3-14. The ten highest ranked intersection control strategies by volume to capacity (V/C) ratio are shown for each analysis permutation with the following color coding:

- The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.
- The green cells indicate that the intersection control strategy results in a V/C ratio less than 0.750.
- The yellow cells indicate that the intersection control strategy results in a V/C ratio between 0.750 and 0.875.
- The orange cells indicate that the intersection control strategy results in a V/C ratio between 0.875 and 1.00.
- The red cells indicate that the intersection control strategy results in a V/C ratio greater than or equal to 1.00.

The summary of the CAP-X analyses indicate that, for both the no-build and build scenarios, the TWSC configuration is the prevailing feasible intersection control strategy in terms of V/C ratio, followed by the roundabout and AWSC configurations.

SPICE analyses using the crash prediction method were performed at the intersection of Corner School Drive at Schoolview Way for the opening year (2028), interim year (2038), and design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 6 analysis permutations.

A summary of the results of the SPICE analyses using the crash prediction method at the intersection of Corner School Drive at Schoolview Way are shown in Figure 3-15. The ten highest ranked intersection control strategies by predicted fatal and serious injury crashes are shown for each analysis permutation. The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.

The summary of the SPICE analyses results using the crash prediction method indicate that, for both the no-build and build scenarios, the roundabout configuration is the prevailing feasible intersection control strategy in terms of predicted fatal and serious injury crashes, followed by the TWSC and AWSC configurations.

It should be noted that, due to the absence of adequate safety performance functions (SPFs), the crash prediction method could not be applied to the following intersection control strategies considered in the Stage 1 analysis:

- Bowtie

- Signalized RCUT
- Unsignalized RCUT

SPICE analyses using the SSI method were performed at the intersection of Corner School Drive at Schoolview Way for the opening year (2028), interim year (2038), and design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 6 analysis permutations.

A summary of the results of the SPICE analyses using the SSI method at the intersection of Corner School Drive at Schoolview Way are shown in Figure 3-16. The ten highest ranked intersection control strategies by SSI score are shown for each analysis permutation with the following color coding:

- The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.
- The green cells indicate that the intersection control strategy results in a SSI score between 90 and 100.
- The yellow cells indicate that the intersection control strategy results in a SSI score between 80 and 89.
- The orange cells indicate that the intersection control strategy results in a SSI score between 70 and 79.
- The red cells indicate that the intersection control strategy results in a SSI score less than 70.

The summary of the SPICE analyses results using the SSI method indicate that, for both the no-build and build scenarios, the AWSC, roundabout, and TWSC configurations all received a SSI score of 100.

Build Type	Year	Peak Hour	Intersection Control Rank 1 (V/C Ratio)	Intersection Control Rank 2 (V/C Ratio)	Intersection Control Rank 3 (V/C Ratio)	Intersection Control Rank 4 (V/C Ratio)	Intersection Control Rank 5 (V/C Ratio)	Intersection Control Rank 6 (V/C Ratio)	Intersection Control Rank 7 (V/C Ratio)	Intersection Control Rank 8 (V/C Ratio)	Intersection Control Rank 9 (V/C Ratio)	Intersection Control Rank 10 (V/C Ratio)
No-Build (2-lane)	2028	AM	Unsignalized RCUT N-S (0.01)	Continuous Green T (0.02)	TWSC (0.03)	Unsignalized ThruCut N-S (0.03)	Traffic Signal (0.04)	Signalized RCUT N-S (0.04)	1 X 1 Roundabout (0.04)	MUT N-S (0.04)	Partial MUT N-S (0.04)	Signalized ThruCut N-S (0.04)
	2038		Unsignalized RCUT N-S (0.01)	Continuous Green T (0.02)	TWSC (0.03)	Unsignalized ThruCut N-S (0.03)	Traffic Signal (0.04)	Signalized RCUT N-S (0.04)	MUT N-S (0.04)	Partial MUT N-S (0.04)	Signalized ThruCut N-S (0.04)	1 X 1 Roundabout (0.05)
	2048		Unsignalized RCUT N-S (0.01)	Continuous Green T (0.02)	TWSC (0.04)	Unsignalized ThruCut N-S (0.04)	Traffic Signal (0.04)	Signalized RCUT N-S (0.04)	Partial MUT N-S (0.04)	1 X 1 Roundabout (0.05)	MUT N-S (0.05)	Signalized ThruCut N-S (0.05)
	2028	PM	Unsignalized RCUT N-S (0.05)	Continuous Green T (0.05)	TWSC (0.09)	Unsignalized ThruCut N-S (0.09)	Traffic Signal (0.12)	Signalized RCUT N-S (0.12)	Partial MUT N-S (0.12)	1 X 1 Roundabout (0.13)	MUT N-S (0.13)	Signalized ThruCut N-S (0.13)
	2038		Continuous Green T (0.05)	Unsignalized RCUT N-S (0.05)	TWSC (0.10)	Unsignalized ThruCut N-S (0.10)	Traffic Signal (0.14)	Signalized RCUT N-S (0.14)	MUT N-S (0.14)	Partial MUT N-S (0.14)	1 X 1 Roundabout (0.14)	Bowtie N-S (0.14)
	2048		Continuous Green T (0.05)	Unsignalized RCUT N-S (0.06)	TWSC (0.11)	Unsignalized ThruCut N-S (0.11)	Traffic Signal (0.14)	Signalized RCUT N-S (0.14)	Partial MUT N-S (0.14)	MUT N-S (0.15)	1 X 1 Roundabout (0.15)	Signalized ThruCut N-S (0.15)
Build (4-lane)	2028	AM	Continuous Green T (0.02)	1 X 1 Roundabout (0.05)	Unsignalized RCUT N-S (0.05)	TWSC (0.06)	Unsignalized ThruCut N-S (0.06)	50 ICD Mini-Roundabout (0.06)	75 ICD Mini-Roundabout (0.07)	Traffic Signal (0.07)	Bowtie N-S (0.07)	Signalized RCUT N-S (0.07)
	2038		Continuous Green T (0.02)	1 X 1 Roundabout (0.05)	Unsignalized RCUT N-S (0.06)	TWSC (0.06)	Unsignalized ThruCut N-S (0.06)	50 ICD Mini-Roundabout (0.07)	Traffic Signal (0.07)	75 ICD Mini-Roundabout (0.07)	Partial MUT N-S (0.07)	Signalized RCUT N-S (0.08)
	2048		Continuous Green T (0.02)	1 X 1 Roundabout (0.06)	Unsignalized RCUT N-S (0.06)	TWSC (0.07)	Unsignalized ThruCut N-S (0.07)	50 ICD Mini-Roundabout (0.07)	75 ICD Mini-Roundabout (0.08)	Traffic Signal (0.08)	Bowtie N-S (0.08)	Signalized RCUT N-S (0.08)
	2028	PM	Continuous Green T (0.04)	Unsignalized RCUT N-S (0.06)	TWSC (0.09)	Unsignalized ThruCut N-S (0.09)	Traffic Signal (0.13)	1 X 1 Roundabout (0.13)	Signalized RCUT N-S (0.13)	Partial MUT N-S (0.13)	MUT N-S (0.14)	Signalized ThruCut N-S (0.14)
	2038		Continuous Green T (0.05)	Unsignalized RCUT N-S (0.07)	TWSC (0.11)	Unsignalized ThruCut N-S (0.11)	Traffic Signal (0.15)	Signalized RCUT N-S (0.15)	Partial MUT N-S (0.15)	1 X 1 Roundabout (0.15)	MUT N-S (0.16)	Signalized ThruCut N-S (0.16)
	2048		Continuous Green T (0.05)	Unsignalized RCUT N-S (0.09)	TWSC (0.13)	Unsignalized ThruCut N-S (0.13)	Traffic Signal (0.18)	1 X 1 Roundabout (0.18)	Signalized RCUT N-S (0.18)	Partial MUT N-S (0.18)	MUT N-S (0.19)	Signalized ThruCut N-S (0.19)

*Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors

V/C Ratio Legend	
	< 0.750
	0.750 - 0.875
	0.875 - 1.00
	≥ 1.00

Table 3- 14 Summary of CAP-X Results at the Intersection of Corner School Drive and Schoolview Way

Build Type	Year	Intersection Control Rank 1 (Fatal & Injury Crashes)	Intersection Control Rank 2 (Fatal & Injury Crashes)	Intersection Control Rank 3 (Fatal & Injury Crashes)	Intersection Control Rank 4 (Fatal & Injury Crashes)	Intersection Control Rank 5 (Fatal & Injury Crashes)	Intersection Control Rank 6 (Fatal & Injury Crashes)	Intersection Control Rank 7 (Fatal & Injury Crashes)	Intersection Control Rank 8 (Fatal & Injury Crashes)	Intersection Control Rank 9 (Fatal & Injury Crashes)	Intersection Control Rank 10 (Fatal & Injury Crashes)
No-Build (2-lane)	2028	Signalized RCUT N-S (0.02)	1 Lane Roundabout (0.03)	Jughandle (0.15)	MUT N-S (0.15)	Unsignalized RCUT N-S (0.17)	Continuous Green T (0.17)	Traffic Signal (0.20)	TWSC (0.22)	AWSC (No SPF)	Bowtie N-S (No SPF)
	2038	Signalized RCUT N-S (0.03)	1 Lane Roundabout (0.03)	Jughandle (0.16)	MUT N-S (0.17)	Unsignalized RCUT N-S (0.18)	Continuous Green T (0.19)	Traffic Signal (0.22)	TWSC (0.26)	AWSC (No SPF)	Bowtie N-S (No SPF)
	2048	Signalized RCUT N-S (0.03)	1 Lane Roundabout (0.03)	Jughandle (0.17)	MUT N-S (0.18)	Unsignalized RCUT N-S (0.19)	Continuous Green T (0.20)	Traffic Signal (0.23)	TWSC (0.28)	AWSC (No SPF)	Bowtie N-S (No SPF)
Build (4-lane)	2028	Signalized RCUT N-S (0.03)	1 Lane Roundabout (0.03)	Jughandle (0.16)	MUT N-S (0.17)	Unsignalized RCUT N-S (0.18)	Continuous Green T (0.19)	Traffic Signal (0.22)	TWSC (0.26)	AWSC (No SPF)	Bowtie N-S (No SPF)
	2038	1 Lane Roundabout (0.04)	Signalized RCUT N-S (0.04)	Jughandle (0.18)	MUT N-S (0.19)	Unsignalized RCUT N-S (0.20)	Continuous Green T (0.21)	Traffic Signal (0.25)	TWSC (0.32)	AWSC (No SPF)	Bowtie N-S (No SPF)
	2048	1 Lane Roundabout (0.04)	Signalized RCUT N-S (0.05)	Jughandle (0.20)	MUT N-S (0.21)	Unsignalized RCUT N-S (0.22)	Continuous Green T (0.23)	Traffic Signal (0.27)	TWSC (0.38)	AWSC (No SPF)	Bowtie N-S (No SPF)

*Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors

Predicted Crashes Legend		
	0.00 - 0.50	Above Average Safety
	0.50 - 1.00	Acceptable Safety
	1.00 - 1.50	Below Average Safety
	≥ 1.50	Poor Safety

Table 3- 105 Summary of SPICE Crash Prediction Method Results at the Intersection of Corner School Drive and Schoolview Way

Build Type	Year	Intersection Control Rank 1 (SSI Score)	Intersection Control Rank 2 (SSI Score)	Intersection Control Rank 3 (SSI Score)	Intersection Control Rank 4 (SSI Score)	Intersection Control Rank 5 (SSI Score)	Intersection Control Rank 6 (SSI Score)	Intersection Control Rank 7 (SSI Score)	Intersection Control Rank 8 (SSI Score)	Intersection Control Rank 9 (SSI Score)	Intersection Control Rank 10 (SSI Score)
No-Build (2-lane)	2028	Continuous Green T (100)	Signalized RCUT N-S (100)	Unsignalized RCUT N-S (100)	Traffic Signal (100)	AWSC (100)	1 Lane Roundabout (100)	TWSC (100)	MUT N-S (N/A)	Bowtie N-S (N/A)	Jughandle (N/A)
	2038	Continuous Green T (100)	Signalized RCUT N-S (100)	Unsignalized RCUT N-S (100)	Traffic Signal (100)	AWSC (100)	1 Lane Roundabout (100)	TWSC (100)	MUT N-S (N/A)	Bowtie N-S (N/A)	Jughandle (N/A)
	2048	Continuous Green T (100)	Signalized RCUT N-S (100)	Unsignalized RCUT N-S (100)	Traffic Signal (100)	AWSC (100)	1 Lane Roundabout (100)	TWSC (100)	MUT N-S (N/A)	Bowtie N-S (N/A)	Jughandle (N/A)
Build (4-lane)	2028	Continuous Green T (100)	Signalized RCUT N-S (100)	Unsignalized RCUT N-S (100)	Traffic Signal (100)	AWSC (100)	1 Lane Roundabout (100)	TWSC (100)	MUT N-S (N/A)	Bowtie N-S (N/A)	Jughandle (N/A)
	2038	Continuous Green T (100)	Signalized RCUT N-S (100)	Unsignalized RCUT N-S (100)	Traffic Signal (100)	AWSC (100)	1 Lane Roundabout (100)	TWSC (100)	MUT N-S (N/A)	Bowtie N-S (N/A)	Jughandle (N/A)
	2048	Continuous Green T (100)	Signalized RCUT N-S (100)	Unsignalized RCUT N-S (100)	Traffic Signal (100)	AWSC (100)	1 Lane Roundabout (100)	TWSC (100)	MUT N-S (N/A)	Bowtie N-S (N/A)	Jughandle (N/A)

**Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors*

SSI Legend	
	90-100
	80-89
	70-79
	< 70

Table 3- 11 Summary of CAP-X Results at the Intersection of Corner School Drive and Schoolview Way

3.7 Relocated Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road

CAP-X analyses were performed at the intersection of Relocated Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road for the AM and PM peak hours of the opening year (2038), interim year (2038), and design year (2048) under the build A scenario (Four-lane widening configuration along Chuluota Road and relocated Schoolview Way connection) and the build B scenario (Four-lane widening configuration along Chuluota Road and convert Schoolview Way connection to right-in right-out), amounting to 12 analysis permutations.

A summary of the results of the CAP-X analyses at the intersection of Relocated Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road are shown in Figure 3-17. The ten highest ranked intersection control strategies by volume to capacity (V/C) ratio are shown for each analysis permutation with the following color coding:

- The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.
- The green cells indicate that the intersection control strategy results in a V/C ratio less than 0.750.
- The yellow cells indicate that the intersection control strategy results in a V/C ratio between 0.750 and 0.875.
- The orange cells indicate that the intersection control strategy results in a V/C ratio between 0.875 and 1.00.
- The red cells indicate that the intersection control strategy results in a V/C ratio greater than or equal to 1.00.

The summary of the CAP-X analyses results indicate that, for both the build A and build B scenarios, the bowtie configuration is the prevailing feasible intersection control strategy in terms of V/C ratio, followed by the traffic signal and roundabout configurations.

SPICE analyses using the crash prediction method were performed at the intersection of Relocated Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road for the opening year (2028), interim year (2038), and design year (2048) under the build A scenario (Four-lane widening configuration along Chuluota Road and close Schoolview Way connection) and the build B scenario (Four-lane widening configuration along Chuluota Road and convert Schoolview Way connection to right-in right-out), amounting to 6 analysis permutations.

A summary of the results of the SPICE analyses using the crash prediction method at the intersection of Relocated Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road are shown in Figure 3-18. The ten highest ranked intersection control strategies by predicted fatal and serious injury crashes are shown for each analysis permutation. The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.

The summary of the SPICE analyses results using the crash prediction method indicate that, for both the build A and build B scenarios, the TWSC configuration is the prevailing feasible intersection control strategy in terms of predicted fatal and serious injury crashes, followed by the traffic signal, AWSC, and roundabout configurations.

It should be noted that, due to the absence of adequate safety performance functions (SPFs), the crash prediction method could not be applied to the following intersection control strategies considered in the Stage 1 analysis:

- Bowtie
- Signalized RCUT
- Unsignalized RCUT

SPICE analyses using the SSI method were performed at the intersection of Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road for the opening year (2028), interim year (2038), and design year (2048) under the build A scenario (Four-lane widening configuration along Chuluota Road and close Schoolview Way connection) and the build B scenario (Four-lane widening configuration along Chuluota Road and convert Schoolview Way connection to right-in right-out), amounting to 6 analysis permutations.

A summary of the results of the SPICE analyses using the SSI method at the intersection of Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road are shown in Figure 3-19. The ten highest ranked intersection control strategies by SSI score are shown for each analysis permutation with the following color coding:

- The grey cells indicate that the intersection control strategy is likely not feasible due to right-of-way, cost, or other factors.
- The green cells indicate that the intersection control strategy results in a SSI score between 90 and 100.
- The yellow cells indicate that the intersection control strategy results in a SSI score between 80 and 89.
- The orange cells indicate that the intersection control strategy results in a SSI score between 70 and 79.
- The red cells indicate that the intersection control strategy results in a SSI score less than 70.

The summary of the SPICE analyses results using the SSI method indicate that, for both the build A and build B scenarios, the roundabout configuration is the prevailing feasible intersection control strategy in terms of SSI score, followed by the AWSC, traffic signal, TWSC, and bowtie configurations.

Build Type	Year	Peak Hour	Intersection Control Rank 1 (V/C Ratio)	Intersection Control Rank 2 (V/C Ratio)	Intersection Control Rank 3 (V/C Ratio)	Intersection Control Rank 4 (V/C Ratio)	Intersection Control Rank 5 (V/C Ratio)	Intersection Control Rank 6 (V/C Ratio)	Intersection Control Rank 7 (V/C Ratio)	Intersection Control Rank 8 (V/C Ratio)	Intersection Control Rank 9 (V/C Ratio)	Intersection Control Rank 10 (V/C Ratio)
Build A (Leg Removal)	2028	AM	Signalized RCUT N-S (0.27)	DLT (0.29)	Partial DLT N-S (0.31)	Partial MUT N-S (0.31)	Signalized ThruCut N-S (0.31)	Bowtie N-S (0.31)	Traffic Signal (0.32)	2NS X 1EW Roundabout (0.33)	MUT N-S (0.34)	Unsignalized RCUT N-S (0.55)
	2038		Signalized RCUT N-S (0.31)	DLT (0.34)	Partial DLT N-S (0.36)	Signalized ThruCut N-S (0.36)	Bowtie N-S (0.36)	Partial MUT N-S (0.37)	Traffic Signal (0.38)	MUT N-S (0.39)	2NS X 1EW Roundabout (0.40)	Unsignalized RCUT N-S (0.76)
	2048		Signalized RCUT N-S (0.37)	DLT (0.40)	Partial DLT N-S (0.42)	Partial MUT N-S (0.43)	Signalized ThruCut N-S (0.43)	Bowtie N-S (0.43)	Traffic Signal (0.44)	MUT N-S (0.46)	2NS X 1EW Roundabout (0.50)	Unsignalized RCUT N-S (1.07)
	2028	PM	Signalized RCUT N-S (0.29)	DLT (0.30)	Bowtie N-S (0.32)	Partial DLT N-S (0.33)	Signalized ThruCut N-S (0.33)	Traffic Signal (0.34)	Partial MUT N-S (0.34)	MUT N-S (0.35)	2NS X 1EW Roundabout (0.38)	Unsignalized RCUT N-S (0.51)
	2038		Signalized RCUT N-S (0.38)	DLT (0.39)	Bowtie N-S (0.41)	Partial DLT N-S (0.42)	Partial MUT N-S (0.42)	Signalized ThruCut N-S (0.42)	Traffic Signal (0.43)	MUT N-S (0.44)	2NS X 1EW Roundabout (0.52)	Unsignalized RCUT N-S (0.77)
	2048		Signalized RCUT N-S (0.46)	DLT (0.47)	Partial DLT N-S (0.50)	Bowtie N-S (0.50)	Partial MUT N-S (0.51)	Signalized ThruCut N-S (0.51)	Traffic Signal (0.53)	MUT N-S (0.53)	2NS X 1EW Roundabout (0.66)	Unsignalized RCUT N-S (1.40)
Build B (Leg RI-RO)	2028	AM	Signalized RCUT N-S (0.27)	DLT (0.30)	Partial DLT N-S (0.32)	Partial MUT N-S (0.32)	Signalized ThruCut N-S (0.32)	Bowtie N-S (0.32)	2NS X 1EW Roundabout (0.33)	Traffic Signal (0.33)	MUT N-S (0.35)	Unsignalized RCUT N-S (0.55)
	2038		Signalized RCUT N-S (0.31)	DLT (0.36)	Partial DLT N-S (0.37)	Partial MUT N-S (0.37)	Signalized ThruCut N-S (0.37)	Bowtie N-S (0.37)	Traffic Signal (0.38)	MUT N-S (0.40)	2NS X 1EW Roundabout (0.40)	Unsignalized RCUT N-S (0.76)
	2048		Signalized RCUT N-S (0.37)	DLT (0.41)	Partial DLT N-S (0.43)	Partial MUT N-S (0.43)	Signalized ThruCut N-S (0.43)	Bowtie N-S (0.43)	Traffic Signal (0.45)	MUT N-S (0.47)	2NS X 1EW Roundabout (0.50)	Unsignalized RCUT N-S (1.07)
	2028	PM	Signalized RCUT N-S (0.29)	DLT (0.31)	Bowtie N-S (0.32)	Partial DLT N-S (0.33)	Signalized ThruCut N-S (0.33)	Partial MUT N-S (0.34)	Traffic Signal (0.35)	MUT N-S (0.35)	2NS X 1EW Roundabout (0.38)	Unsignalized RCUT N-S (0.51)
	2038		Signalized RCUT N-S (0.38)	DLT (0.40)	Bowtie N-S (0.41)	Partial DLT N-S (0.42)	Signalized ThruCut N-S (0.42)	Partial MUT N-S (0.43)	Traffic Signal (0.44)	MUT N-S (0.44)	2NS X 1EW Roundabout (0.52)	Unsignalized RCUT N-S (0.77)
	2048		Signalized RCUT N-S (0.47)	DLT (0.49)	Bowtie N-S (0.50)	Partial DLT N-S (0.51)	Signalized ThruCut N-S (0.51)	Partial MUT N-S (0.52)	Traffic Signal (0.53)	MUT N-S (0.53)	2NS X 1EW Roundabout (0.66)	Unsignalized RCUT N-S (1.36)

*Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors

V/C Ratio Legend	
	< 0.750
	0.750 - 0.875
	0.875 - 1.00
	≥ 1.00

Table 3- 17 Summary of CAP-X Results at the Intersection of Schoolview Way/Cypress Lake Glen Boulevard (s) and Chuluota Road

Build Type	Year	Intersection Control Rank 1 (Fatal & Injury Crashes)	Intersection Control Rank 2 (Fatal & Injury Crashes)	Intersection Control Rank 3 (Fatal & Injury Crashes)	Intersection Control Rank 4 (Fatal & Injury Crashes)	Intersection Control Rank 5 (Fatal & Injury Crashes)	Intersection Control Rank 6 (Fatal & Injury Crashes)	Intersection Control Rank 7 (Fatal & Injury Crashes)	Intersection Control Rank 8 (Fatal & Injury Crashes)	Intersection Control Rank 9 (Fatal & Injury Crashes)	Intersection Control Rank 10 (Fatal & Injury Crashes)
Build A (Leg Removal)	2028	Signalized RCUT N-S (0.70)	Unsignalized RCUT N-S (0.82)	Jughandle (1.04)	TWSC (1.05)	MUT N-S (1.07)	AWSC (1.09)	2 Lane Roundabout (1.12)	DLT (1.24)	Traffic Signal (1.41)	Bowtie N-S (No SPF)
	2038	Unsignalized RCUT N-S (0.97)	Signalized RCUT N-S (1.00)	Jughandle (1.13)	MUT N-S (1.16)	TWSC (1.33)	DLT (1.34)	AWSC (1.42)	2 Lane Roundabout (1.52)	Traffic Signal (1.52)	Bowtie N-S (No SPF)
	2048	Unsignalized RCUT N-S (1.12)	Jughandle (1.20)	MUT N-S (1.23)	Signalized RCUT N-S (1.33)	DLT (1.42)	TWSC (1.61)	Traffic Signal (1.62)	AWSC (1.77)	2 Lane Roundabout (1.95)	Bowtie N-S (No SPF)
Build B (Leg RI-RO)	2028	Signalized RCUT N-S (0.68)	Unsignalized RCUT N-S (0.81)	TWSC (1.02)	Jughandle (1.04)	MUT N-S (1.06)	AWSC (1.08)	2 Lane Roundabout (1.11)	DLT (1.23)	Traffic Signal (1.40)	Bowtie N-S (No SPF)
	2038	Unsignalized RCUT N-S (0.97)	Signalized RCUT N-S (0.97)	Jughandle (1.12)	MUT N-S (1.15)	TWSC (1.29)	DLT (1.34)	AWSC (1.41)	2 Lane Roundabout (1.51)	Traffic Signal (1.52)	Bowtie N-S (No SPF)
	2048	Unsignalized RCUT N-S (1.11)	Jughandle (1.19)	MUT N-S (1.23)	Signalized RCUT N-S (1.30)	DLT (1.42)	TWSC (1.57)	Traffic Signal (1.61)	AWSC (1.76)	2 Lane Roundabout (1.94)	Bowtie N-S (No SPF)

*Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors

Predicted Crashes Legend		
	0.00 - 0.50	Above Average Safety
	0.50 - 1.00	Acceptable Safety
	1.00 - 1.50	Below Average Safety
	≥ 1.50	Poor Safety

Table 3- 18 Summary of SPICE Crash Prediction Results at the Intersection of Schoolview Way/Cypress Lake Glen Boulevard (S) and Chuluota Road

Build Type	Year	Intersection Control Rank 1 (SSI Score)	Intersection Control Rank 2 (SSI Score)	Intersection Control Rank 3 (SSI Score)	Intersection Control Rank 4 (SSI Score)	Intersection Control Rank 5 (SSI Score)	Intersection Control Rank 6 (SSI Score)	Intersection Control Rank 7 (SSI Score)	Intersection Control Rank 8 (SSI Score)	Intersection Control Rank 9 (SSI Score)	Intersection Control Rank 10 (SSI Score)
Build A (Leg Removal)	2028	2 Lane Roundabout (99)	AWSC (99)	MUT N-S (99)	Signalized RCUT N-S (97)	Traffic Signal (97)	Jughandle (96)	Unsignalized RCUT N-S (96)	TWSC (95)	Signalized ThruCut N-S (93)	Bowtie N-S (92)
	2038	2 Lane Roundabout (99)	AWSC (99)	MUT N-S (98)	Signalized RCUT N-S (96)	Traffic Signal (95)	Jughandle (95)	Unsignalized RCUT N-S (94)	TWSC (93)	Signalized ThruCut N-S (89)	Bowtie N-S (88)
	2048	2 Lane Roundabout (99)	AWSC (99)	MUT N-S (97)	Signalized RCUT N-S (94)	Traffic Signal (93)	Jughandle (93)	Unsignalized RCUT N-S (92)	TWSC (91)	Signalized ThruCut N-S (85)	Bowtie N-S (84)
Build B (Leg RI-RO)	2028	2 Lane Roundabout (100)	AWSC (99)	MUT N-S (99)	Traffic Signal (98)	Jughandle (97)	Signalized RCUT N-S (97)	TWSC (97)	Unsignalized RCUT N-S (96)	Signalized ThruCut N-S (93)	Bowtie N-S (93)
	2038	2 Lane Roundabout (99)	AWSC (99)	MUT N-S (99)	Traffic Signal (97)	Jughandle (96)	Signalized RCUT N-S (96)	TWSC (95)	Unsignalized RCUT N-S (94)	Signalized ThruCut N-S (89)	Bowtie N-S (89)
	2048	2 Lane Roundabout (99)	AWSC (99)	MUT N-S (99)	Traffic Signal (96)	Jughandle (95)	Signalized RCUT N-S (95)	TWSC (94)	Unsignalized RCUT N-S (93)	Bowtie N-S (86)	Signalized ThruCut N-S (85)

**Greyed out cells indicate that the intersection control type may not be viable due to right-of-way, cost, or other factors*

SSI Legend	
	90-100
	80-89
	70-79
	< 70

Table 3- 12 Summary of SPICE Crash Prediction Method Results at the Intersection of Schoolview Way/Cypress Lake Glen Boulevard (S) and Chuluota Road

3.8 Recommendations

This section of the report documents the recommendations of intersection control strategies to advance to ICE Stage 2 at each intersection.

Lake Pickett Road at Chuluota Road

Based on the results of the CAP-X and SPICE analyses, the following intersection control strategies are recommended to advance to ICE Stage 2 at the intersection of Lake Pickett Road at Chuluota Road:

- Traffic Signal
- Roundabout
- Bowtie

The remaining intersection control strategies are not recommended to advance to ICE Stage 2 due to poor operational performance, poor safety performance, or lack of feasibility based on excessive cost, constructability, and right-of-way acquisition.

Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road

Based on the results of the CAP-X and SPICE analyses, the following intersection control strategies are recommended to advance to ICE Stage 2 at the intersection of Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road:

- TWSC
- Roundabout

The remaining intersection control strategies are not recommended to advance to ICE Stage 2 due to poor operational performance, poor safety performance, or lack of feasibility based on cost, constructability, and right-of-way acquisition.

Corner Lake Drive at Chuluota Road

Based on the results of the CAP-X and SPICE analyses, the following intersection control strategies were recommended to advance to ICE Stage 2 at the intersection of Corner Lake Drive at Chuluota Road:

- TWSC
- Roundabout

The remaining intersection control strategies were not recommended to advance to ICE Stage 2 due to poor operational performance, poor safety performance, or lack of feasibility based on cost, constructability, and right-of-way acquisition.

Cypress Lake Glen Boulevard (S) at Chuluota Road

Based on the results of the CAP-X and SPICE analyses, the following intersection control strategies are recommended to advance to ICE Stage 2 at the intersection of Cypress Lake Glen Boulevard (S) at Chuluota Road:

- Traffic Signal
- Roundabout

The remaining intersection control strategies are not recommended to advance to ICE Stage 2 due to poor operational performance, poor safety performance, or lack of feasibility based on cost, constructability, and right-of-way acquisition.

Corner School Drive at Schoolview Way

Based on the results of the CAP-X and SPICE analyses, the following intersection control strategies are recommended to advance to ICE Stage 2 at the intersection of Corner School Drive at Schoolview Way:

- AWSC
- TWSC
- Roundabout

The remaining intersection control strategies are not recommended to advance to ICE Stage 2 due to poor operational performance, poor safety performance, or lack of feasibility based on cost, constructability, and right-of-way acquisition.

Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road

Based on the results of the CAP-X and SPICE analyses, the following intersection control strategies are recommended to advance to ICE Stage 2 at the intersection of Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road:

- Traffic Signal
- Roundabout

The remaining intersection control strategies are not recommended to advance to ICE Stage 2 due to poor operational performance, poor safety performance, or lack of feasibility based on cost, constructability, and right-of-way acquisition.

Table 3-20 on the following page provides a summary of the intersection control strategies recommended to advance to Stage 2 for each intersection.

Intersection	Recommended Intersection Control Strategies
Lake Pickett Road at Chuluota Road	Traffic Signal Roundabout Bowtie
Long Boat Lane/Cypress Lake Glen Boulevard (S) at Chuluota Road	TWSC Roundabout
Corner Lake Drive at Chuluota Road	TWSC Roundabout
Cypress Lake Glen Boulevard (S) at Chuluota Road	Traffic Signal Roundabout
Corner School Drive at Schoolview Way	AWSC TWSC Roundabout
Relocated Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road	Traffic Signal Roundabout

Table 3- 13 Chuluota Road Intersection Control Strategies Recommended to Advance to Stage 2

4 ICE ANALYSIS, STAGE 2

4.1 Stage 2 Methodology

The methods utilized in the Chuluota Road Stage 2 ICE analysis are described in the FDOT Manual on ICE, dated January 2024. Per pages 2-13 through 2-15 of the FDOT Manual on ICE, the procedure of Stage 2 involves developing conceptual designs for each intersection control strategy that was advanced from Stage 1, as well as evaluating each intersection control strategy based on design year operations, safety performance, environmental, utility, and right-of-way impacts, multimodal accommodations, public input, and other appropriate factors.

The following traffic simulation software packages were applied to evaluate the design year operations for the intersection control strategies at each intersection:

- SYNCHRO
- SIDRA

During our analysis, we found that SIDRA appeared to understate the delays (lower than expected) for the roundabouts, thus SYNCHRO was used instead to provide a more accurate understanding and conservative picture of the operations. Also, since SYNCHRO was being used for all of the other intersection control analyses, its use for all control options including roundabouts would better facilitate the comparison of results between the options by using the same program.

4.2 Lake Pickett Road at Chuluota Road

SYNCHRO analyses were performed at the intersection of Lake Pickett Road at Chuluota Road for the AM and PM peak hours of the design year (2048) under the no build scenario (existing conditions with two-lane configuration along Chuluota Road) and the build scenario (four-lane widening configuration along Chuluota Road). The intersection control strategies that were evaluated were traffic signal, roundabout, and bowtie configurations. Although SIDRA analyses were performed for the roundabout configuration, SYNCHRO was also used as noted above to better provide for comparative assessments between options.

A summary of the operational analysis results at the intersection of Lake Pickett Road at Chuluota Road are shown in Table 4-1. It lists the delay and the LOS letter grade for each intersection approach as well as the overall intersection. The delay and level of service are color coded to illustrate better operational performance as increasingly green and worse operational performance as increasingly red.

When considering the overall intersection delay, the summary results indicate that all three intersection control strategies perform at LOS D or better for both the no-build and the build scenarios. The summary results also indicate that, when considering the individual approach delays, the following scenarios perform at LOS E: No-build AM traffic signal southbound, no-build PM traffic signal eastbound and southbound, no-build AM roundabout southbound, build PM roundabout eastbound, build AM bowtie northbound, and build PM bowtie northbound.

It should be noted that the ICE Stage 2 operational analysis evaluated the intersection of Lake Pickett Road at Chuluota Road as an isolated intersection. Therefore, the results mentioned in this section must be combined with the corridor-wide analysis that is presented in Section 5 of this report to provide a complete assessment of the intersection's operations.

Chuluota Road at Lake Pickett Road Design Year 2048 Operational Analysis Results													
	Build Configuration	No-Build (2-lane)						Build (4-lane)					
	Peak Time	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
	Intersection Control Type	Traffic Signal	Traffic Signal	1x1 Roundabout	1x1 Roundabout	Bowtie N-S	Bowtie N-S	Traffic Signal	Traffic Signal	2x1 Roundabout	2x1 Roundabout	Bowtie N-S	Bowtie N-S
	Measure of Effectiveness	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)
Approach	Eastbound	32.9 (C)	64.3 (E)	7.9 (A)	15.1 (C)	16.2 (B)	21.9 (C)	18.7 (B)	26.6 (C)	13.2 (B)	50.0 (E)	14.9 (B)	25.3 (C)
	Westbound	47.7 (D)	48.7 (D)	15.9 (C)	11.3 (B)	25.4 (C)	16.7 (B)	36.1 (D)	33.9 (C)	30.9 (D)	16.8 (C)	35.9 (D)	14.7 (B)
	Northbound	26.5 (C)	29.3 (C)	11.5 (B)	18.6 (C)	17.6 (B)	18.0 (B)	17.6 (B)	25.0 (C)	9.3 (A)	18.3 (C)	58.5 (E)	69.7 (E)
	Southbound	60.9 (E)	61.1 (E)	48.4 (E)	19.5 (C)	16.3 (B)	20.7 (C)	26.1 (C)	33.6 (C)	24.0 (C)	12.3 (B)	16.9 (B)	16.7 (B)
	Intersection	41.7 (D)	50.6 (D)	23.9 (C)	17.4 (C)	18.8 (B)	19.6 (B)	23.0 (C)	28.8 (C)	17.7 (C)	25.2 (D)	34.1 (C)	33.7 (C)

LOS Legend	
	LOS A
	LOS B
	LOS C
	LOS D
	LOS E
	LOS F

Table 4- 1 Summary of Operational Analysis Results at the Intersection of Lake Pickett Road at Chuluota Road

Renderings of the roundabouts and bow tie configurations for both the no build scenario (two-lane existing section for Chuluota Road) and the build scenarios (four-lane widening section for Chuluota Road) are shown on Figures 4-1 thru 4-4 on the next pages.

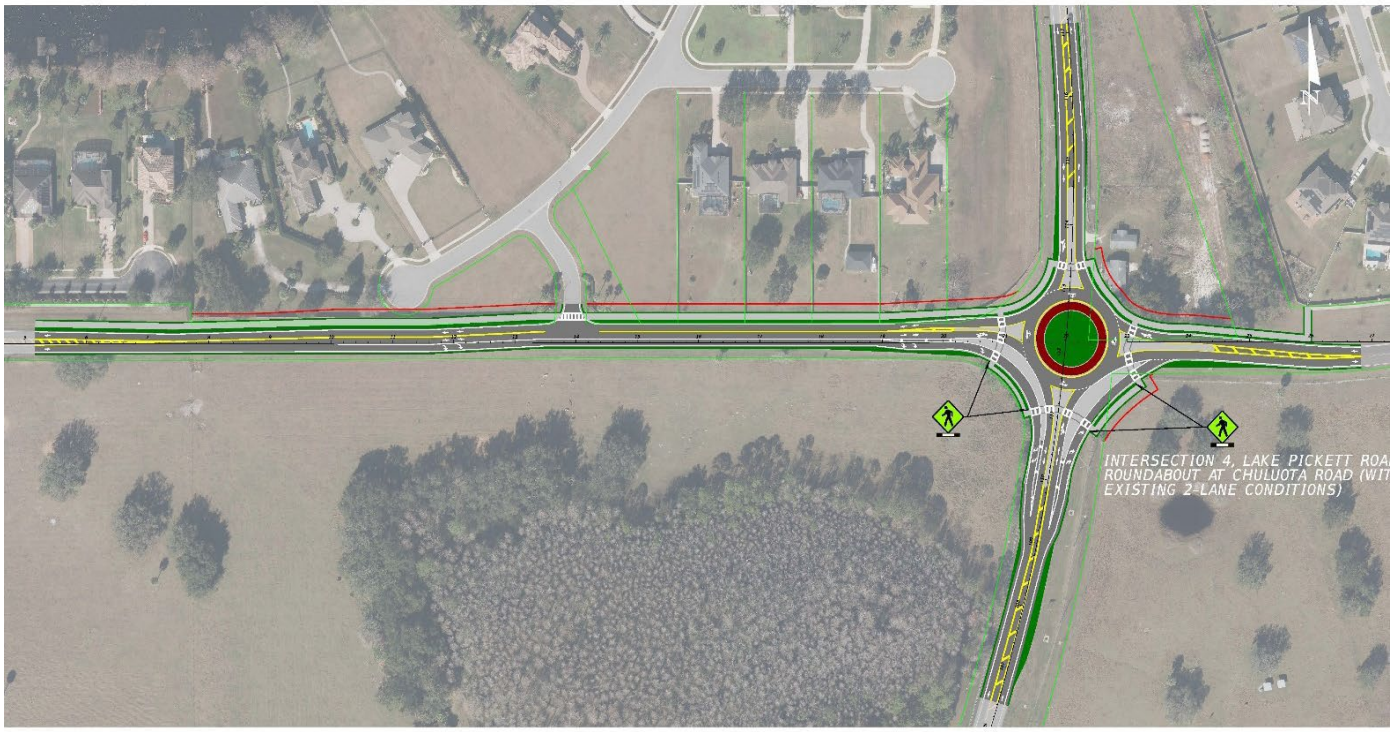


Figure 4- 1 Roundabout Control Option at Lake Pickett Road Under No Build Conditions (Two-Lane Existing Section on Chuluota Road)

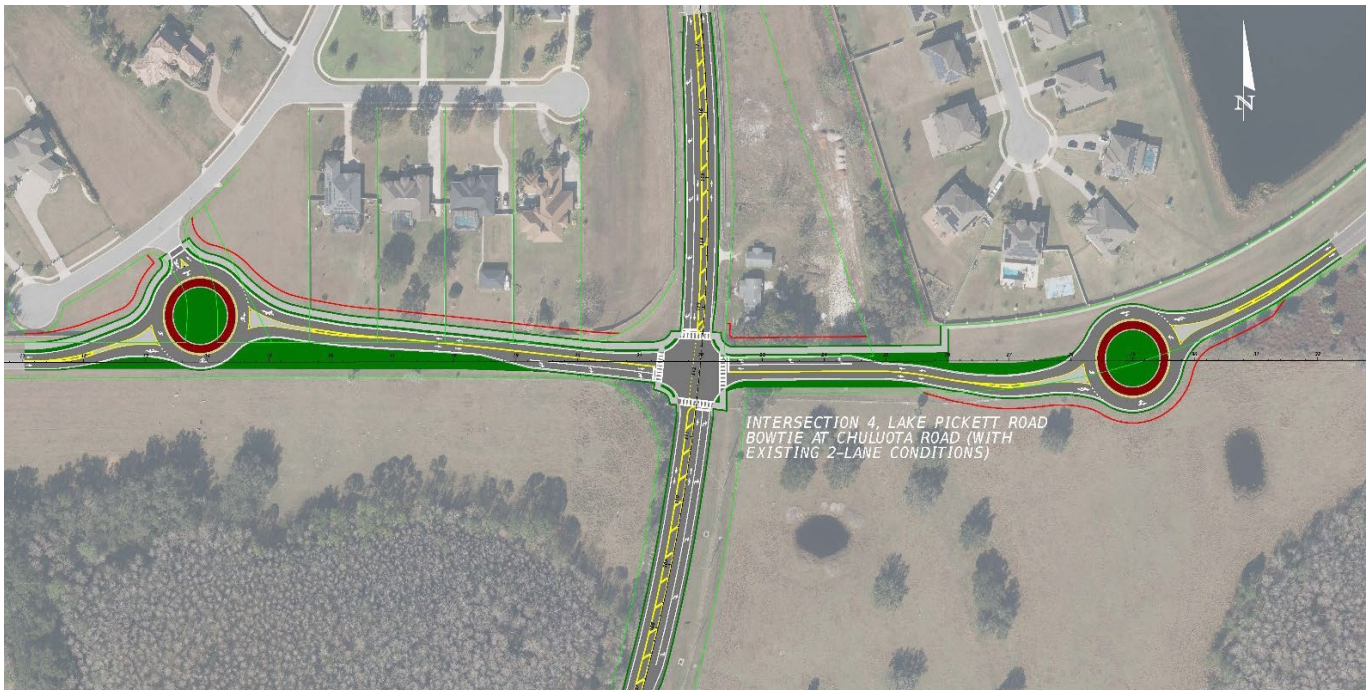


Figure 4- 2 Bow Tie Control Option at Lake Pickett Road Under No Build Conditions (Two-Lane Existing Section on Chuluota Road)

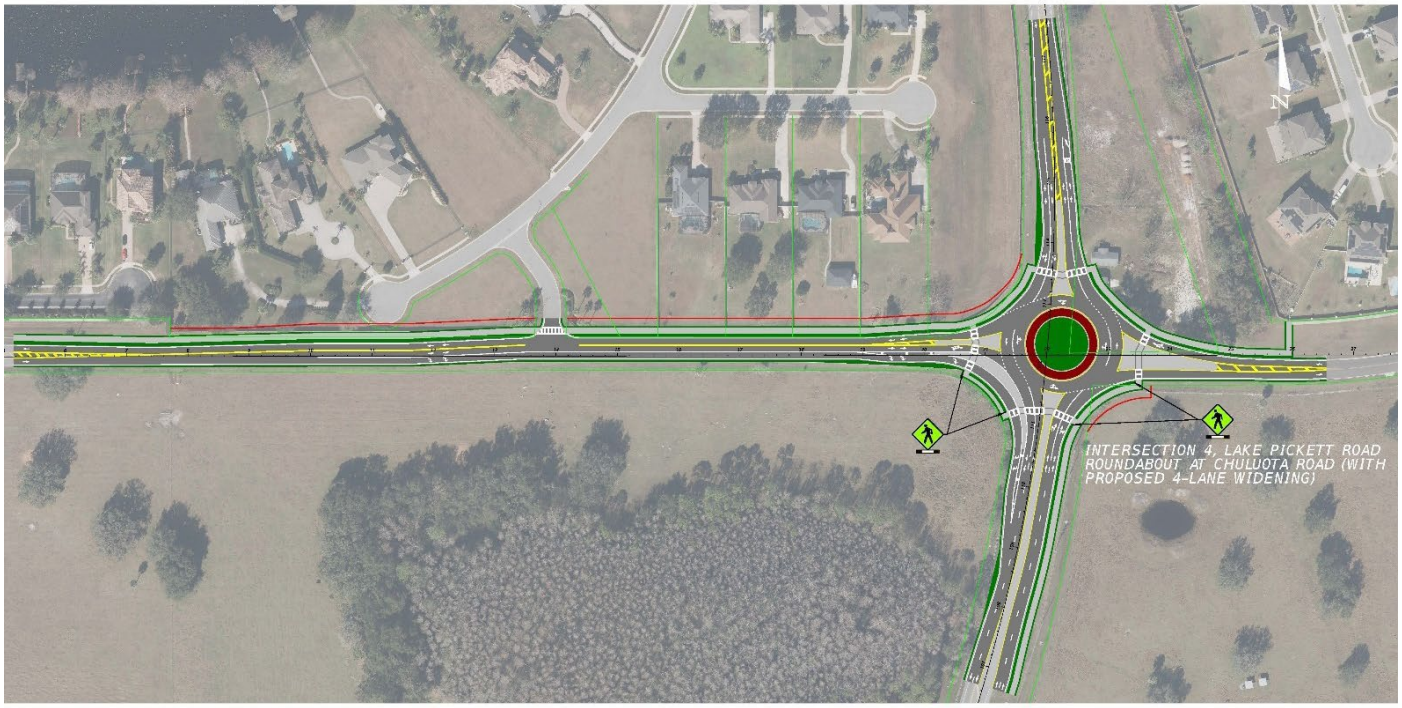


Figure 4- 3 Roundabout Control Option at Lake Pickett Road Under Build Conditions (Four-Lane Widening Section on Chuluota Road)

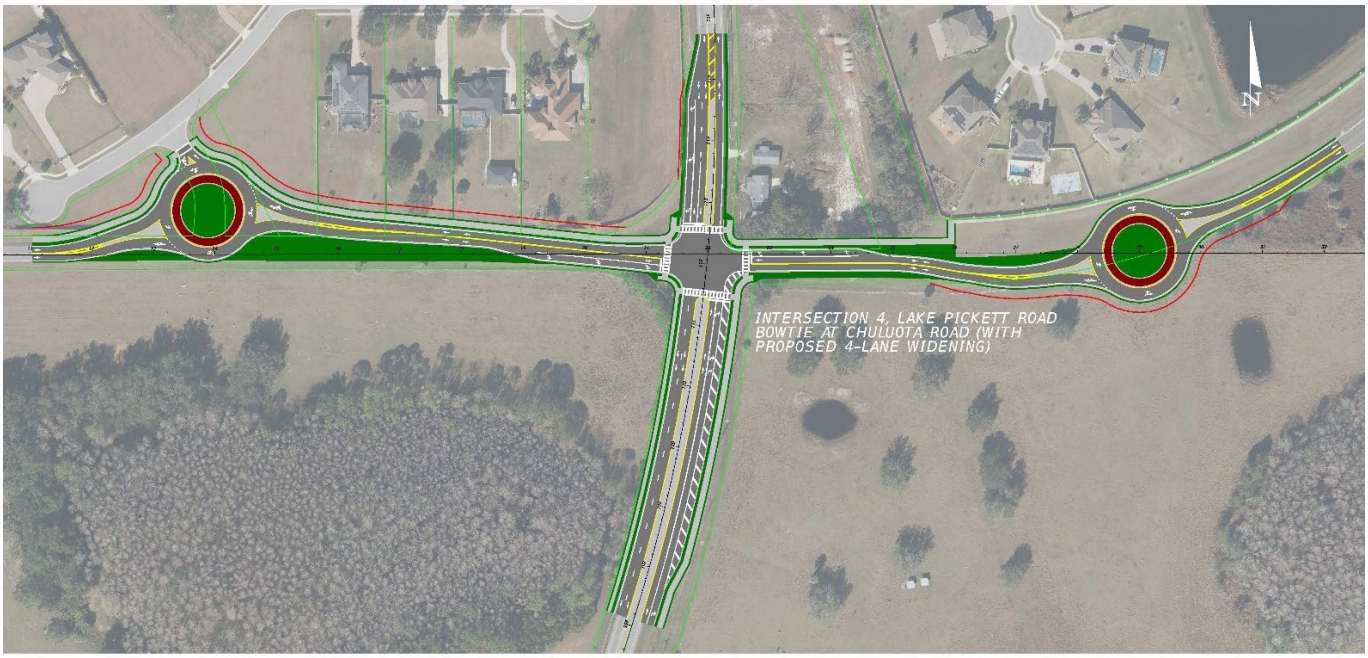


Figure 4- 4 Bow Tie Control Option at Lake Pickett Road Under Build Conditions (Four-Lane Widening Section on Chuluota Road)

4.3 Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road

SYNCHRO analyses were performed at the intersection of Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road for the AM and PM peak hours of the design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 4 analysis permutations per intersection control strategy. The intersection control strategies that were evaluated were TWSC and roundabout configurations. Although SIDRA analyses were performed for the roundabout configuration, SYNCHRO was also used as noted above to better provide for comparative assessments between options.

A summary of the operational analysis results at the intersection of Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road are shown in Figure 4-2. It lists the delay and the LOS letter grade for each intersection approach as well as the overall intersection. The delay and level of service are color coded to illustrate better operational performance as increasingly green and worse operational performance as increasingly red.

When considering the overall intersection delay, the summary results indicate that both intersection control strategies perform at LOS C or better for both the no-build and the build scenarios, with the single exception being the build AM TWSC scenario performing at LOS E. The summary results also indicate that, when considering the individual approach delays, the following scenarios perform at LOS F: No-build AM TWSC westbound, no-build PM TWSC eastbound and westbound, build AM TWSC eastbound and westbound, and build PM TWSC eastbound and westbound.

It should be noted that the ICE Stage 2 operational analysis evaluated the intersection of Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road as an isolated intersection. Therefore, the results mentioned in this section must be combined with the corridor-wide analysis that is presented in Section 5 of this report to provide a complete assessment of the intersection's operations.

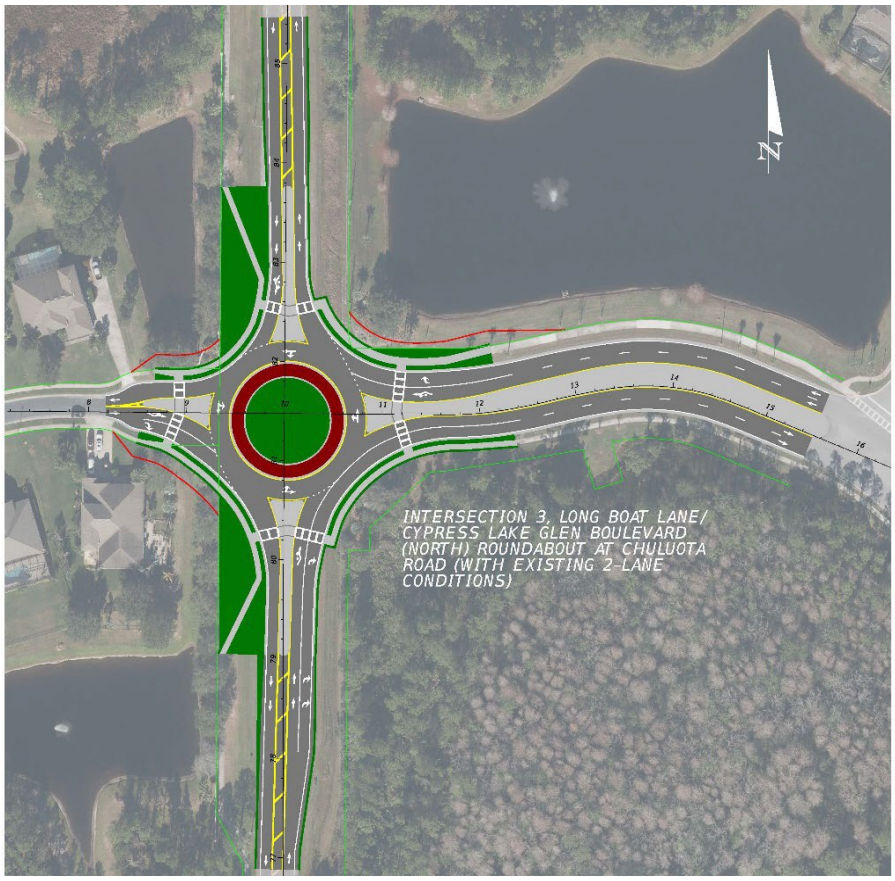
Chuluota Road at Cypress Lake Glen Boulevard N/Long Boat Lane Design Year 2048 Operational Analysis Results									
	Build Configuration	No-Build (2-lane)				Build (4-lane)			
	Peak Time	AM	PM	AM	PM	AM	PM	AM	PM
	Intersection Control Type	Two-Way Stop Control	Two-Way Stop Control	1x1 Roundabout	1x1 Roundabout	Two-Way Stop Control	Two-Way Stop Control	2x1 Roundabout	2x1 Roundabout
	Measure of Effectiveness	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)
Approach	Eastbound	34.8 (D)	59.3 (F)	6.4 (A)	7.6 (A)	52.0 (F)	96.8 (F)	8.4 (A)	9.5 (A)
	Westbound	123.2 (F)	169.6 (F)	7.8 (A)	6.9 (A)	277.8 (F)	346.8 (F)	10.4 (B)	8.9 (A)
	Northbound	0.0 (A)	0.1 (A)	7.8 (A)	8.5 (A)	0.1 (A)	0.1 (A)	7.0 (A)	7.4 (A)
	Southbound	0.9 (A)	0.8 (A)	11.3 (B)	15.8 (C)	0.8 (A)	0.8 (A)	7.7 (A)	8.9 (A)
	Intersection	19.7 (C)	14.7 (B)	9.3 (A)	12.1 (B)	36.1 (E)	24.3 (C)	7.7 (A)	8.2 (A)

LOS Legend	
	LOS A
	LOS B
	LOS C
	LOS D
	LOS E
	LOS F

Table 4- 2 Summary of Operational Analysis Results at the Intersection of Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road

Renderings of the roundabout configurations for both the no build scenario (two-lane existing section for Chuluota Road) and the build scenario (four-lane widening section for Chuluota Road) are shown on Figures 4-5 and 4-6.

Figure 4- 5 Roundabout Control Option at Long Boat Lane/Cypress Lake Glen Boulevard (N) Under No Build Conditions (Two- Lane Existing Section on Chuluota Road)



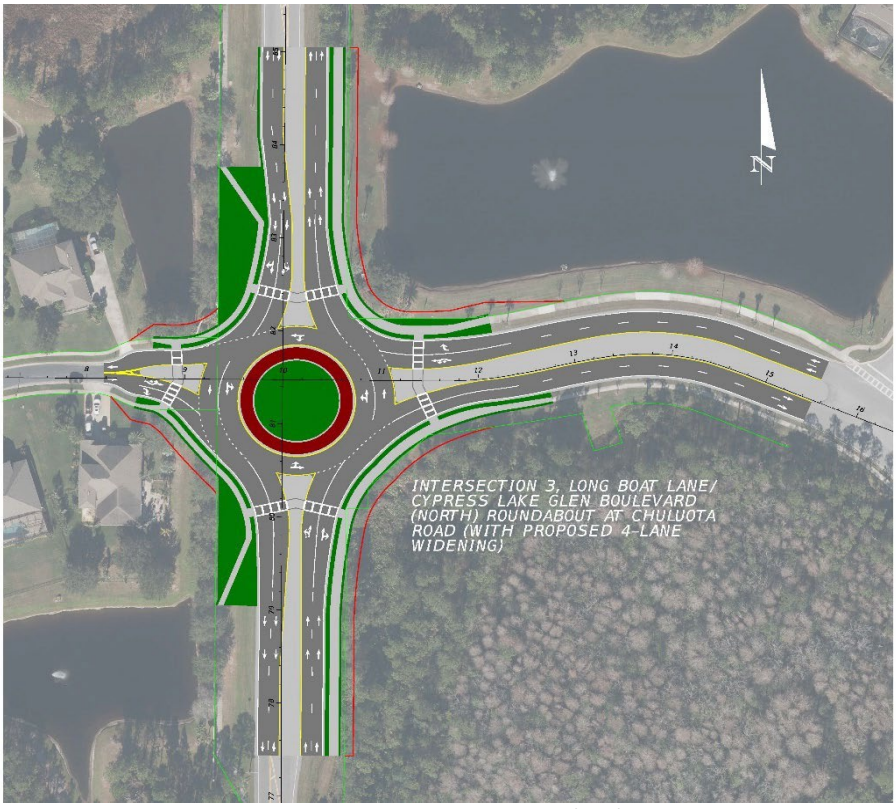


Figure 4- 6 Roundabout Control Option at Long Boat Lane/Cypress Lake Glen Boulevard (N) Under Build Conditions (Four-Lane Widening Section on Chuluota Road)

4.4 Corner Lake Drive at Chuluota Road

SYNCHRO analyses were performed at the intersection of Corner Lake Drive at Chuluota Road for the AM and PM peak hours of the design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 4 analysis permutations per intersection control strategy. The intersection control strategies that were evaluated were TWSC and roundabout configurations. Although SIDRA analyses were performed for the roundabout configuration, SYNCHRO was also used as noted above to better provide for comparative assessments between options.

A summary of the operational analysis results at the intersection of Corner Lake Drive at Chuluota Road are shown in Table 4-3. It lists the delay and the LOS letter grade for each intersection approach as well as the overall intersection. The delay and level of service are color coded to illustrate better operational performance as increasingly green and worse operational performance as increasingly red.

When considering the overall intersection delay, the summary results indicate that both intersection control strategies perform at LOS B or better for both the no-build and the build scenarios. The summary results also indicate that, when considering the individual approach delays, the following scenarios perform at LOS E: No-build AM TWSC eastbound and build PM TWSC eastbound. Additionally, the build AM TWSC scenario performs at LOS F for the eastbound direction.

It should be noted that the ICE Stage 2 operational analysis evaluated the intersection of Corner Lake Drive at Chuluota Road as an isolated intersection. Therefore, the results mentioned in this section must be combined with the corridor-wide analysis that is presented in Section 5 of this report to provide a complete assessment of the intersection's operations.

Chuluota Road at Corner Lake Drive Design Year 2048 Operational Analysis Results									
	Build Configuration	No-Build (2-lane)				Build (4-lane)			
	Peak Time	AM	PM	AM	PM	AM	PM	AM	PM
	Intersection Control Type	Two-Way Stop Control	Two-Way Stop Control	1x1 Roundabout	1x1 Roundabout	Two-Way Stop Control	Two-Way Stop Control	2x1 Roundabout	2x1 Roundabout
	Measure of Effectiveness	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)
Approach	Eastbound	35.3 (E)	31.5 (D)	7.2 (A)	7.9 (A)	62.1 (F)	47.7 (E)	9.4 (A)	11.2 (B)
	Northbound	0.2 (A)	0.3 (A)	9.5 (A)	9.9 (A)	0.2 (A)	0.3 (A)	6.6 (A)	6.7 (A)
	Southbound	0.0 (A)	0.0 (A)	9.2 (A)	11.6 (B)	0.0 (A)	0.0 (A)	6.8 (A)	7.9 (A)
	Intersection	2.4 (A)	1.4 (A)	9.2 (A)	10.7 (B)	3.4 (A)	1.7 (A)	6.8 (A)	7.5 (A)

LOS Legend	
	LOS A
	LOS B
	LOS C
	LOS D
	LOS E
	LOS F

Table 4- 3 Summary of Operational Analysis Results at the Intersection of Corner Lake Drive at Chuluota Road

Renderings of the roundabout configurations for both the no build scenario (two-lane existing section for Chuluota Road) and the build scenario (four-lane widening section for Chuluota Road) are shown on Figures 4-7 and 4-8 on the next page.

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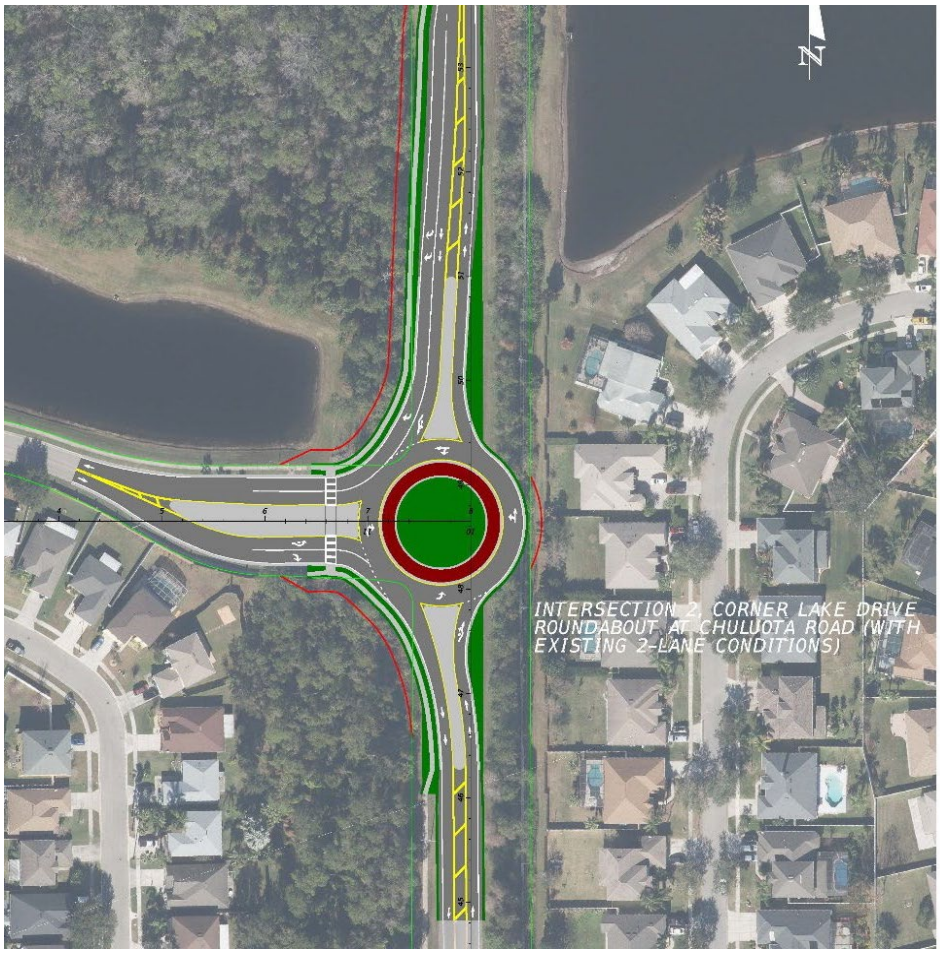


Figure 4- 7 Roundabout Control Option at Corner Lake Drive Under No Build Conditions (Two-Lane Existing Section on Chuluota Road)

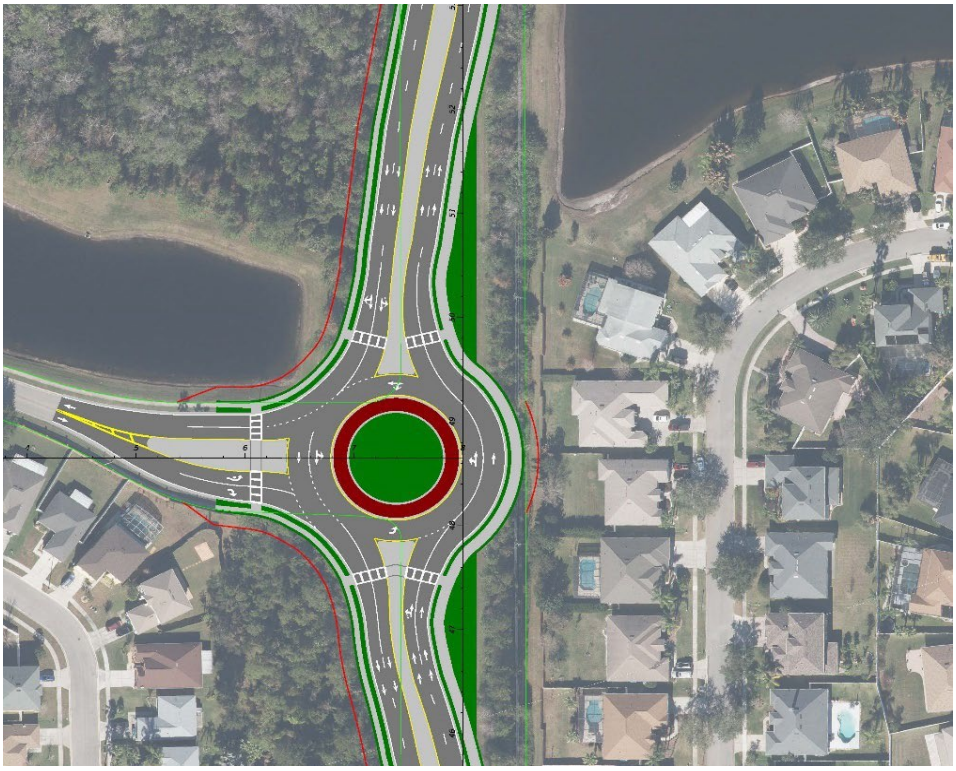


Figure 4- 8 Roundabout Control Option at Corner Lake Drive Under Build Conditions (Four- Lane Widening Section on Chuluota Road)

4.5 Cypress Lake Glen Boulevard (S) at Chuluota Road

SYNCHRO analyses were performed at the intersection of Cypress Lake Glen Boulevard (S) at Chuluota Road for the AM and PM peak hours of the design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road), amounting to 4 analysis permutations per intersection control strategy. The intersection control strategies that were evaluated were traffic signal and roundabout configurations. Although SIDRA analyses were performed for the roundabout configuration, SYNCHRO was also used as noted above to better provide for comparative assessments between options.

A summary of the operational analysis results at the intersection of Cypress Lake Glen Boulevard (S) at Chuluota Road are shown in Table 4-4. It lists the delay and the LOS letter grade for each intersection approach as well as the overall intersection. The delay and level of service are color coded to illustrate better operational performance as increasingly green and worse operational performance as increasingly red.

The summary results indicate that, when considering the overall intersection delays as well as the individual approach delays, both intersection control strategies perform at LOS C or better for both the no- build and the build scenarios.

It should be noted that the ICE Stage 2 operational analysis evaluated the intersection of Cypress Lake Glen Boulevard (S) at Chuluota Road as an isolated intersection. Therefore, the results mentioned in this section must be combined with the corridor-wide analysis that is presented in Section 5 of this report to provide a complete assessment of the intersection's operations.

Chuluota Road at Cypress Lake Glen Boulevard S Design Year 2048 Operational Analysis Results									
	Build Configuration	No-Build (2-lane)				Build (4-lane)			
	Peak Time	AM	PM	AM	PM	AM	PM	AM	PM
	Intersection Control Type	Traffic Signal	Traffic Signal	1x1 Roundabout	1x1 Roundabout	Traffic Signal	Traffic Signal	2x1 Roundabout	2x1 Roundabout
	Measure of Effectiveness	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)
Approach	Westbound	23.5 (C)	28.8 (C)	8.9 (A)	9.4 (A)	21.0 (C)	25.9 (C)	10.5 (B)	11.2 (B)
	Northbound	17.0 (B)	17.4 (B)	7.1 (A)	7.3 (A)	12.3 (B)	12.4 (B)	6.2 (A)	7.9 (A)
	Southbound	17.3 (B)	17.9 (B)	16.2 (C)	24.3 (C)	11.3 (B)	11.1 (B)	9.2 (A)	10.9 (B)
	Intersection	18.1 (B)	18.7 (B)	11.4 (B)	15.1 (C)	12.9 (B)	12.8 (B)	8.1 (A)	9.6 (A)

LOS Legend	
	LOS A
	LOS B
	LOS C
	LOS D
	LOS E
	LOS F

Table 4- 4 Summary of Operational Analysis Results at the Intersection of Cypress Lake Glen Boulevard (S) at Chuluota Road

The rendering of the roundabout configuration for the no build scenario (two-lane existing section for Chuluota Road) is shown on Figure 4-9.

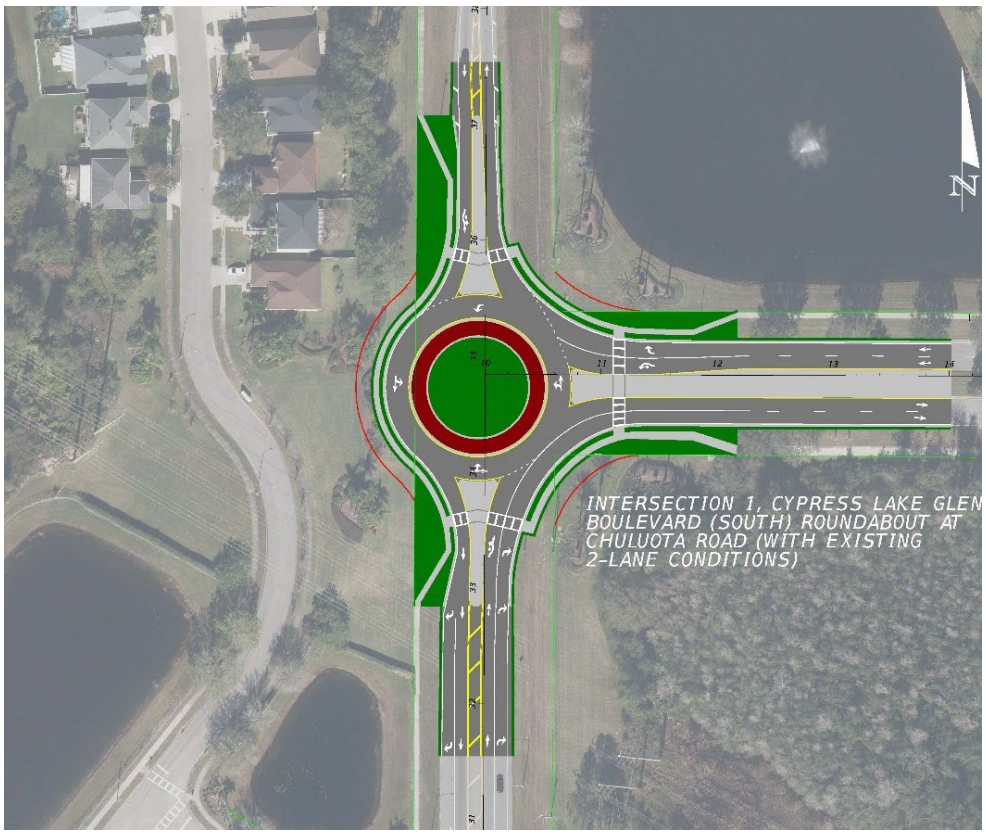


Figure 4- 9 Roundabout Control Option at Cypress Lake Glen Boulevard (S) Under No Build Conditions (Two-Lane Existing Section on Chuluota Road)

4.6 Corner School Drive at Schoolview Way

SYNCHRO analyses were performed at the intersection of Corner School Drive at Schoolview Way for the AM and PM peak hours of the design year (2048) under the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (four-lane widening configuration along Chuluota Road), amounting to four analysis permutations per intersection control strategy. The intersection control strategies that were evaluated were AWSC, TWSC, and roundabout configurations. Although SIDRA analyses were performed for the roundabout configuration, SYNCHRO was also used as noted above to better provide for comparative assessments between options.

A summary of the operational analysis results at the intersection of Corner School Drive at Schoolview Way are shown in Table 4-5. It lists the delay and the LOS letter grade for each intersection approach as well as the overall intersection. The delay and level of service are color coded to illustrate better operational performance as increasingly green and worse operational performance as increasingly red.

The summary results indicate that, when considering the overall intersection delays as well as the individual approach delays, all of the intersection control strategies performed equally well at LOS B or better for both the no-build and the build scenarios. However, based on the RCA Study recommendations, Schoolview Way will be relocated to the Cypress Lake Glen Boulevard intersection which is expected to improve overall operations in the Chuluota Road corridor by eliminating an intersection and associated potential conflicts. Consequently, existing Schoolview Way will be closed.

Corner School Drive at Schoolview Way Design Year 2048 Operational Analysis Results													
	Build Configuration	No-Build (2-lane)						Build (4-lane)					
	Peak Time	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
	Intersection Control Type	All-Way Stop Control	All-Way Stop Control	Two-Way Stop Control	Two-Way Stop Control	1x1 Roundabout	1x1 Roundabout	All-Way Stop Control	All-Way Stop Control	Two-Way Stop Control	Two-Way Stop Control	1x1 Roundabout	1x1 Roundabout
	Measure of Effectiveness	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)
Approach	Westbound	8.8 (A)	8.4 (A)	9.5 (A)	9.6 (A)	3.4 (A)	3.4 (A)	8.4 (A)	8.9 (A)	9.3 (A)	10.0 (B)	3.2 (A)	3.5 (A)
	Northbound	7.2 (A)	7.8 (A)	0.0 (A)	0.0 (A)	3.1 (A)	3.9 (A)	7.1 (A)	8.1 (A)	0.0 (A)	0.0 (A)	3.1 (A)	4.1 (A)
	Southbound	7.6 (A)	7.5 (A)	1.1 (A)	2.0 (A)	3.3 (A)	3.0 (A)	7.5 (A)	7.7 (A)	1.1 (A)	1.6 (A)	3.1 (A)	3.1 (A)
	Intersection	8.1 (A)	7.9 (A)	4.8 (A)	2.4 (A)	3.3 (A)	3.7 (A)	7.7 (A)	8.3 (A)	3.6 (A)	2.7 (A)	3.1 (A)	3.9 (A)

LOS Legend	
	LOS A
	LOS B
	LOS C
	LOS D
	LOS E
	LOS F

Table 4- 5 Summary of Operational Analysis Results at the Intersection of Corner School Drive at Schoolview Way

4.7 Relocated Schoolview Way/Cypress Lake Glen Boulevard (S)

SYNCHRO analyses were performed at the intersection of Cypress Lake Glen Boulevard (S) at Chuluota Road for the AM and PM peak hours of the design year (2048) under two scenarios. Under Build A scenario (four-lane widening configuration along Chuluota Road) Schoolview Way would be relocated to connect with Cypress Lake Glen Boulevard (S) thus allowing existing Schoolview Way to be eliminated. Under Build B scenario (four-lane widening configuration along Chuluota Road), the Build A concept would be retained with existing Schoolview Way being left in place at its current location, though with right-in right-out operations only at Chuluota Road.

The traffic signal and roundabout configurations were further evaluated for the Relocated Schoolview Way/Cypress Lake Glen Boulevard (S) intersection. Although SIDRA analyses were performed for the roundabout configuration, SYNCHRO was also used as noted above to better provide for comparative assessments between options.

A summary of the operational analysis results at the intersection of Relocated Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road are shown in Table 4-6. It lists the delay and the LOS letter grade for each intersection approach as well as the overall intersection. The delay and level of service are color coded to illustrate better operational performance as increasingly green and worse operational performance as increasingly red.

The summary results indicate that, when considering the overall intersection delays as well as the individual approach delays, both intersection control strategies perform at LOS D or better for both the

Build A and the Build B scenarios. However, the Build A scenario has the advantages of focusing all movements at one intersection, and thus is the recommended treatment.

It should be noted that the ICE Stage 2 operational analysis evaluated the intersection of Relocated Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road as an isolated intersection. Therefore, the results mentioned in this section must be combined with the corridor-wide analysis that is presented in Section 5 of this report to provide a complete assessment of the intersection's operations.

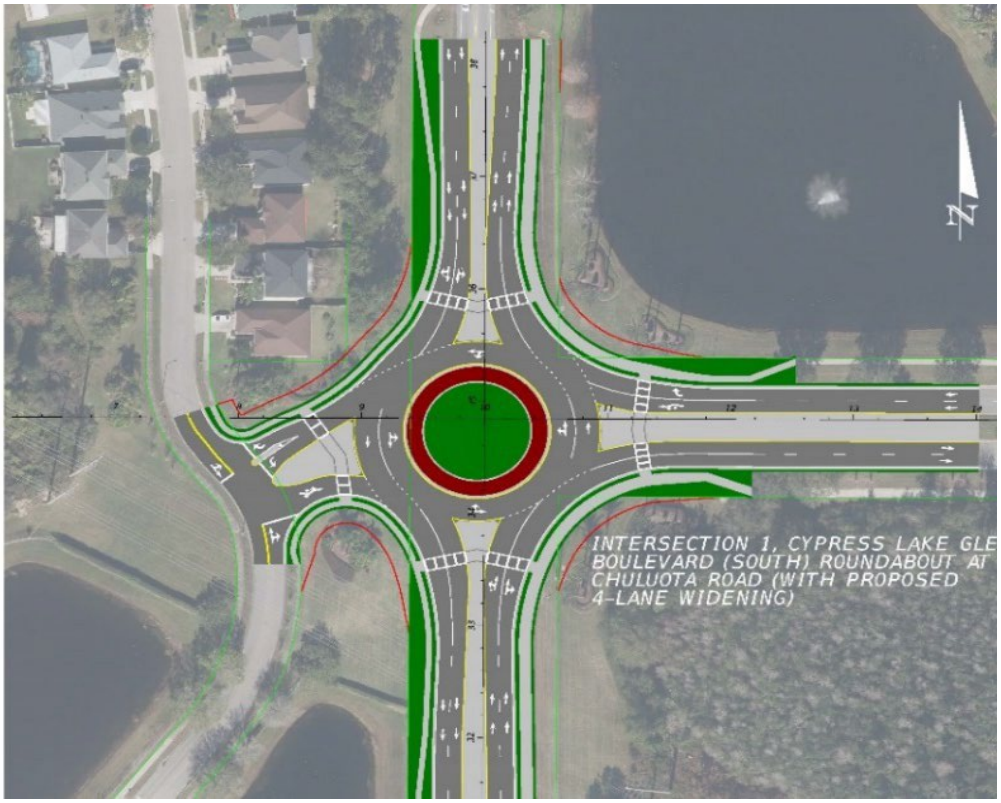
Chuluota Road at Schoolview Way Relocation/Cypress Lake Glen Boulevard S Design Year 2048 Operational Analysis Results									
	Build Configuration	Build A (Close Schoolview)				Build B (Schoolview RI-RO)			
	Peak Time	AM	PM	AM	PM	AM	PM	AM	PM
	Intersection Control Type	Traffic Signal	Traffic Signal	2x1 Roundabout	2x1 Roundabout	Traffic Signal	Traffic Signal	2x1 Roundabout	2x1 Roundabout
	Measure of Effectiveness	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)	Delay (s/veh) (LOS)
Approach	Eastbound	20.3 (C)	24.5 (C)	9.1 (A)	20.4 (C)	21.9 (C)	31.6 (C)	9.2 (A)	20.2 (C)
	Westbound	22.6 (C)	36.0 (D)	11.3 (B)	13.7 (B)	22.9 (C)	34.5 (C)	11.3 (B)	13.7 (B)
	Northbound	11.8 (B)	11.9 (B)	6.5 (A)	10.0 (A)	11.8 (B)	11.4 (B)	6.5 (A)	10.0 (A)
	Southbound	11.7 (B)	12.0 (B)	9.0 (A)	12.3 (B)	12.4 (B)	12.3 (B)	8.9 (A)	12.2 (B)
	Intersection	13.3 (B)	14.4 (B)	8.2 (A)	11.8 (B)	13.6 (B)	14.5 (B)	8.2 (A)	11.8 (B)

LOS Legend	
	LOS A
	LOS B
	LOS C
	LOS D
	LOS E
	LOS F

Table 4- 6 Summary of Operational Analysis Results at the Intersection of Relocated Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road

The rendering of the roundabout configuration for the build scenario (four- lane widening existing section for Chuluota Road) is shown on Figure 4-10.

Figure 4- 10 Roundabout Control Option at Relocated Schoolview Way/Cypress Lake Glen Boulevard (S) Under Build Conditions (Four-Lane Widening Section on Chuluota Road



4.8 Recommendations

This section of the report documents the recommendation of intersection control strategies to advance to ICE Stage 3 at each intersection.

Lake Pickett Road at Chuluota Road

Based on the results of the operational analyses, conceptual designs, and right-of-way impacts, the following intersection control strategies were recommended to advance to ICE Stage 3 at the intersection of Lake Pickett Road at Chuluota Road:

- Traffic Signal
- Roundabout

According to the SYNCHRO analyses, the bowtie configuration results in the lowest delays in the no-build scenario, and the roundabout configuration results in the lowest delays in the build scenario. However, the roundabout configuration will require significant right-of-way impacts. It is therefore necessary to advance both configurations to ICE Stage 3 to determine the preferred intersection control strategy. The bowtie configuration was not recommended to advance to ICE Stage 3 due to excessive right-of-way acquisition, overall cost, and concerns that drivers may not be familiar with the bow tie operations.

Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road

Based on the results of the operational analyses, conceptual designs, and right-of-way impacts, the following intersection control strategies were recommended to advance to ICE Stage 3 at the intersection of Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road:

- TWSC
- Roundabout

According to the SYNCHRO analyses, the roundabout configuration results in lower delays than the TWSC configuration. However, the roundabout configuration will require significant right-of-way impacts. It is therefore necessary to advance both configurations to ICE Stage 3 to determine the preferred intersection control strategy.

Corner Lake Drive at Chuluota Road

Based on the results of the operational analyses, conceptual designs, and right-of-way impacts, the following intersection control strategies were recommended to advance to ICE Stage 3 at the intersection of Corner Lake Drive at Chuluota Road:

- TWSC
- Roundabout

According to the SYNCHRO analyses, while the TWSC configuration produces lower intersection delays than the roundabout configuration, the TWSC configuration fails in the eastbound approach. Also, the roundabout configuration will require significant right-of-way impacts. It is therefore necessary to advance both configurations to ICE Stage 3 to determine the preferred intersection control strategy.

Corner School Drive at Schoolview Way

Based on the results of the operational analyses, the AWSC, TWSC, and roundabout configurations all produced comparable operational results. However, the roundabout configuration would necessitate substantial right-of-way impacts that the AWSC and TWSC configurations would not require.

Based on the previous RCA Study recommendations, Schoolview Way will be relocated to the Cypress Lake Glen Boulevard intersection which is expected to improve overall operations along the Chuluota Road corridor by eliminating an intersection and associated potential conflicts. Consequently, existing Schoolview Way will be closed. See the next paragraph for further discussion on relocated Schoolview Way.

Relocated Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road

Based on the results of the operational analyses, conceptual designs, and right-of-way impacts, the following intersection control strategies are recommended to advance to ICE Stage 3 at the intersection of Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road:

- Traffic Signal
- Roundabout

According to the SYNCHRO analyses, the roundabout configuration produces lower delays than

the traffic signal configuration. However, the roundabout configuration will require significant right-of-way impacts and a nearby homeowner has expressed concern over the close proximity of the roundabout. It is therefore necessary to advance both configurations to ICE Stage 3 to determine the preferred intersection control strategy. Table 4-7 below provides a summary of the intersection control strategies recommended to advance to ICE Stage 3 for each intersection.

Intersection	Recommended Intersection Control Strategies
Lake Pickett Road at Chuluota Road	Traffic Signal Roundabout
Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road	TWSC Roundabout
Corner Lake Drive at Chuluota Road	TWSC Roundabout
Cypress Lake Glen Boulevard (S) at Chuluota Road	Traffic Signal Roundabout
Corner School Drive at Schoolview Way	Schoolview Way Is Recommended to Be Relocated to the Cypress Lake Glen Boulevard (S) In Order to Improve Chuluota Road Operations
Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road	Traffic Signal Roundabout

Table 4- 7 Chuluota Road Intersection Control Strategies Recommended to Advance to ICE Stage 3

5 ICE ANALYSIS, STAGE 3

5.1 Stage 3 Methodology

The methods utilized in the Chuluota Road Stage 3 ICE analysis are described in the FDOT Manual on ICE, dated January 2024. Per page 2-18 of the FDOT Manual on ICE, the procedure of Stage 3 involves conducting a more detailed analysis of the remaining intersection control strategies in order to determine the preferred intersection control strategy. This process includes additional traffic analysis, public engagement, assessment of right-of-way need, and cost.

SimTraffic, a microsimulation software package within SYNCHRO, was used to model the Chuluota Road corridor from south of Cypress Lake Glen Boulevard (S) to north of Lake Pickett Road for the design year (2048) PM peak hour for the no-build scenario (existing two-lane configuration along Chuluota Road) and the build scenario (Four-lane widening configuration along Chuluota Road). The following three corridor traffic control alternatives were considered in the analysis:

- Existing traffic controls (ETC) at all intersections
    - Traffic signal at Lake Pickett Road, TWSC at Long Boat Lane/Cypress Lake Glen Boulevard (N), TWSC at Corner Lake Drive, and traffic signal at Cypress Lake Glen Boulevard (S)
- Roundabouts at all intersections
- Existing traffic controls (ETC) and roundabouts mixture
    - Traffic signal at Lake Pickett Road, roundabout at Long Boat Lane/Cypress Lake Glen Boulevard (N), roundabout at Corner Lake Drive, and traffic signal at Relocated Schoolview Way and Cypress Lake Glen Boulevard (S)

Due to the significant impact that calibration can have on microsimulation, it is vital to provide a summary of the calibration parameters that were used in the microsimulation analyses, which can be found in Table 5-1 below.

Left Turn Speed	15 MPH
Right Turn Speed	12 MPH
Link Speed	5 MPH above the posted speed
Seeding Duration	15 minutes
Period 1 Duration	15 minutes
Period 2 Duration	45 minutes
PHF Adjustment	Seeding and Period 1
Anti-PHF Adjustment	Period 2
Growth Factor Adjustment	None
Number of Runs per Scenario	10

Table 5- 1 SimTraffic Calibration Parameters

5.2 Existing Two-Lane (No-Build) Section

SimTraffic microsimulation analyses were performed for the existing two-lane (no-build) corridor of Chuluota Road from south of Cypress Lake Glen Boulevard (S) to north of Lake Pickett Road for the PM peak hour of the design year (2048) for the following corridor traffic control alternatives: existing traffic controls (ETC) at all intersections, roundabouts at all intersections, and existing traffic controls (ETC) and roundabouts mixture.

A summary of the SimTraffic corridor analysis results for the existing two-lane (no-build) section is shown in Figure 5-1. It lists the delay in seconds per vehicle, the arterial speed in miles per hour, and the associated arterial level of service (LOS) letter grade for both corridor travel directions and for each corridor traffic control alternative. The delay, arterial speed, and arterial LOS are color coded to illustrate better operational performance as increasingly green and worse operational performance as increasingly red.

The summary results indicate that the existing traffic controls (ETC) at all intersections alternative produces the lowest delay and the highest arterial speed in both the northbound and southbound directions compared to the other two alternatives. The results also indicate that the corridor fails in the northbound direction at a LOS E for the roundabouts at all intersections alternative.

The corridor also fails in the southbound direction at a LOS E for the existing traffic controls (ETC) at all intersections. The corridor also fails in the southbound direction at a LOS F for the roundabouts at all intersections as well as the existing traffic controls (ETC) and roundabouts mixture alternatives. Lastly, the results indicate that the northbound direction has lower delays and higher arterial speeds than the southbound direction, regardless of the corridor traffic control alternative used.

The following is a list of observations made during the no-build SimTraffic runs:

- The 95th percentile queue for the EB direction at the intersection of Lake Pickett Road at Chuluota Road was approximately 2,700 feet for the existing traffic controls (ETC) at all intersections alternative. This was likely caused by significant right turning volumes and a lack of an exclusive eastbound right turn lane.
- The 95th percentile queue for the SB direction at the intersection of Lake Pickett Road at Chuluota Road was approximately 2,100 feet for the existing traffic controls (ETC) at all intersections alternative. This was likely caused by significant through volumes and a lack of an exclusive southbound right turn lane.
- The 95th percentile queue for the SB direction at the intersection of Lake Pickett Road at Chuluota Road was approximately 1,600 feet for the roundabout at all intersections alternative. This was likely caused by significant through volumes and a lack of an exclusive southbound right turn slip lane.
- The 95th percentile queue for the SB direction at the intersection of Cypress Lake Glen Boulevard (S) at Chuluota Road was approximately 1,350 feet for the roundabout at all intersections alternative. Due to the link distance being only 1,200 feet, this caused vehicle spillback into the roundabout upstream at the intersection of Corner Lake Drive at Chuluota Road.

Chuluota Road Existing 2-Lane Section With Alternative Intersection Concepts							
	Corridor Traffic Control Type	Existing Traffic Controls (ETC)		Roundabouts at All Intersections		ETC & Roundabouts Mixture (1)	
	Measure of Effectiveness (MOE)	Delay (s/veh)	Arterial Speed (LOS)	Delay (s/veh)	Arterial Speed (LOS)	Delay (s/veh)	Arterial Speed (LOS)
Corridor Travel Direction	Northbound	66.3	34 (C)	167.9	21 (E)	98.4	27 (D)
	Southbound	239.1	19 (E)	343.8	15 (F)	268.1	16 (F)

(1) TRAFFIC SIGNALS AT LAKE PICKETT ROAD AND CYPRESS LAKE GLEN BLVD (SOUTH), ROUNDABOUTS AT LONG BOAT LANE AND AT CORNER LAKE DRIVE

LOS Legend	
	LOS A
	LOS B
	LOS C
	LOS D
	LOS E
	LOS F

Table 5- 2 Summary of Chuluota Road SimTraffic Corridor Analysis Results for the Existing Two-Lane (No-Build) Section

5.3 Four-Lane Widening (Build) Section

SimTraffic microsimulation analyses were performed for the four-lane widening (build) corridor of Chuluota Road from south of Cypress Lake Glen Boulevard (S) to north of Lake Pickett Road for the PM peak hour of the design year (2048) for the following corridor traffic control alternatives: existing traffic controls (ETC) at all intersections, roundabouts at all intersections, and existing traffic controls (ETC) and roundabouts mixture.

A summary of the SimTraffic corridor analysis results for the four-lane widening (build) section is shown in Figure 5-2. It lists the delay in seconds per vehicle, the arterial speed in miles per hour, and the associated arterial level of service (LOS) letter grade for both corridor travel directions and for each corridor traffic control alternative. The delay, arterial speed, and arterial LOS are color coded to illustrate better operational performance as increasingly green and worse operational performance as increasingly red.

The summary results indicate that the existing traffic controls (ETC) at all intersections alternative produces the lowest delay and the highest arterial speed in the northbound direction compared to the two other alternatives, and the existing traffic controls (ETC) at all intersections alternative produces similar delay and arterial speed when compared to the roundabouts at all intersections alternative. The results also indicate that the corridor performs at LOS C or better in both directions, regardless of the traffic control alternative used. Lastly, the results indicate that the delay and arterial speeds are comparable between the northbound and southbound directions for all alternatives except the roundabouts at all intersections alternative, where the southbound direction produces lower delay and higher arterial speed than the northbound direction.

The following is a list of observations made during the build SimTraffic runs:

- The 95th percentile queue for the EB direction at the intersection of Lake Pickett Road at Chuluota Road was approximately 5,700 feet for the roundabouts at all intersections alternative. This was likely caused by significant eastbound left turning volumes and significant stop delays due to yielding to two circulating lanes of heavy traffic volumes traveling southbound through the roundabout.

Chuluota Road 4-Lane Widening Section With Alternative Intersection Concepts							
	Corridor Traffic Control Type	Existing Traffic Controls (ETC)		Roundabouts at All Intersections		ETC & Roundabouts Mixture (1)	
	Measure of Effectiveness (MOE)	Delay (s/veh)	Arterial Speed (LOS)	Delay (s/veh)	Arterial Speed (LOS)	Delay (s/veh)	Arterial Speed (LOS)
Corridor Travel Direction	Northbound	52.5	35 (B)	86.4	28 (C)	71.9	31 (C)
	Southbound	57.0	35 (B)	50.3	35 (B)	77.3	31 (C)

(1) TRAFFIC SIGNALS AT LAKE PICKETT ROAD AND CYPRESS LAKE GLEN BLVD (SOUTH), ROUNDABOUTS AT LONG BOAT LANE AND AT CORNER LAKE DRIVE

LOS Legend	
	LOS A
	LOS B
	LOS C
	LOS D
	LOS E
	LOS F

Table 5- 3 Summary of Chuluota Road SimTraffic Corridor Analysis Results for the Four-lane Widening (Build) Section

5.4 Recommendations

This section documents the preferred intersection control strategy for each intersection, as well as the preferred typical section for Chuluota Road. Table 5-2 on the following page summarizes the preferred intersection control strategies for each intersection as well as the preferred typical section for Chuluota Road.

Lake Pickett Road at Chuluota Road

Based on the results of the detailed traffic analyses, right-of-way impacts, and public input, it was determined that the preferred intersection control strategy at the intersection of Lake Pickett Road at Chuluota Road is the traffic signal configuration.

Long Boat Lane/Cypress Lake Glen Boulevard (N) at Chuluota Road

While the Stage 3 results indicated that the existing intersection controls provided slightly better operations along with no right-of-way impacts, a roundabout did receive support from attendees at the second public meeting since this option would likely slow travel speeds along Chuluota Road as well as provide for better access opportunities to/from the sideroads. Accordingly, the roundabout is the preferred alternative concept at this location.

Corner Lake Drive at Chuluota Road

Based on the results of the detailed traffic analyses, right-of-way impacts, and public input, it was determined that the preferred intersection control strategy at the intersection of Corner Lake Drive

at Chuluota Road is the TWSC configuration.

Relocated Schoolview Way/Cypress Lake Glen Boulevard (S) at Chuluota Road

Based on the results of the detailed traffic analyses, right-of-way impacts, and public input, it was determined that the preferred intersection control strategy at the intersection of Relocated Schoolview Way/Cypress Lake Glen Boulevard (S) is the traffic signal configuration.

Chuluota Road Typical Section

Based on the results of the detailed traffic analyses, right-of-way impacts, and public input, the preferred typical section for the study corridor of Chuluota Road from south of Cypress Lake Glen Boulevard (S) to north of Lake Pickett Road is the four-lane widening (build) section. Based on the SimTraffic, it is unlikely that the existing two-lane (no-build) section can support the design year (2048) forecasted traffic volumes.

Intersection	Recommended Intersection Control Strategies
Lake Pickett Road at Chuluota Road	Traffic Signal
Long Boat Lane/Cypress Lake Glen Boulevard (S) at Chuluota Road	Roundabout
Corner Lake Drive at Chuluota Road	TWSC
Cypress Lake Glen Boulevard (S) at Chuluota Road	Traffic Signal
Preferred Typical Section on Chuluota Road	Four-Lane Widening (Build) Section

Table 5- 4 Chuluota Road Preferred Intersection Control Strategies and Typical Section

6 DRAINAGE AND COST ANALYSES

This section summarizes the needed drainage improvements required for the ICE alternatives. Also included in this section are cost analyses of the ICE alternatives.

6.1 Drainage Analyses

A supplemental drainage analysis was conducted to determine potential changes to the proposed Chuluota Road drainage system (as described in the RCA Pond Siting Report (PSR)) that would result if the preferred ICE alternatives are implemented (see Appendix A for the ICE Alternatives).

The roadway project limits have been divided into nine drainage sub-basins. The water quality and attenuation for two of the sub-basins will be provided in existing runoff attenuation systems, while seven of the sub-basins will be provided for in proposed pond sites or expansions of existing ponds.

This drainage section evaluated the adequacy of the pond sites to accommodate the ICE alternatives using a volumetric analysis, which accounts for the water quality treatment and water quantity attenuation for runoff. Since the previous drainage analysis relies on preliminary data, pond sizes and configurations may change during the final design as refinements to the roadway design are made, and detailed topographic survey is obtained.

This report is focused only on potential changes to the RCA stormwater ponds and floodplain compensation ponds if the preferred ICE alternatives are authorized and implemented. All other ramifications such as impacts to wetlands, listed species impacts, contamination, or other environmental impacts are outside the scope of this study.

6.1.1 Project Description

The Chuluota Road project area is located within the Big Econlockhatchee River Basin within the jurisdiction of the St. Johns River Water Management District (SJRWMD). The Econlockhatchee River System is considered an Outstanding Florida Waters (OFW). Refer to **Appendix A** for the project location map and USGS quadrangle map.

Orange County is proposing to widen Chuluota Road from East Colonial Drive to Lake Pickett Road to improve roadway capacity. The total project length is approximately 1.93 miles of roadway. The improvements include the widening of Chuluota Road with the construction of four eleven-foot travel lanes, a 10-14 foot multiuse path/trail, and one 6-foot sidewalk. The lengths of existing turn lanes are anticipated to remain. The roadway corridor spans a mix of commercial, residential, institutional, and pastureland uses.

The project vertical datum is the North American Vertical Datum of 1988 (NAVD88), and all elevations contained in this document and the plans reference this datum unless otherwise noted. Conversion from NGVD29 to NAVD88 is -1.1 feet.

In this ICE report, two drainage alternatives have been developed with first option consisting of roundabouts at all intersections as noted below:

- Two-lane roundabout at Cypress Lake Glen Boulevard (South)
- Two-lane roundabout at Corner Lake Drive
- Two-lane roundabout at Long Boat Lane / Cypress Lake Glen Boulevard (North)
- Two-lane roundabout at Lake Pickett Road

The second drainage alternative would include the same two-lane roundabouts at Cypress Lake Glen Boulevard, Corner Lake Drive, and Long Boat Lane / Cypress Lake Glen Boulevard (North). However, instead of a roundabout at Lake Pickett Road, the bow tie configuration for Lake Pickett Road would be considered along with the three roundabouts to the south.

6.1.2 Data Collection, Design Criteria, and Existing/Proposed Conditions

The RCA PSR includes the background data used for this analysis. For the ICE drainage analysis, the ICE Conceptual Plans in Appendix A were used to assess changes in stormwater attenuation, water quality, and floodplain compensation requirements which would result if the ICE alternatives are implemented. The RCA PSR includes the design criteria used for this analysis.

The existing and proposed basins are described in the RCA PCR. For this ICE analysis, it is assumed the proposed pavement associated with intersection improvements adjacent to these basins will drain to each adjacent basin in final design conditions.

6.1.3 Floodplain Information

Based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM's) dated September 25, 2009, portions of the study area are located within Zone A (100 Year) floodplain. There are no Zone AE floodplains within the study area. The Zone A floodplains occur:

- East of Chuluota Road across from Corner Lake Middle School. This Zone A floodplain is isolated.
- North and South of Cypress Lake Glen Boulevard and across Chuluota Road at the intersection. This Zone A floodplain ultimately drains to Lake Pickett.

Appendix F contains depictions of the floodplains in the study area. There are no floodways within the project limits. There will be floodplain impacts within the project corridor that will be mitigated by providing compensatory volume in proposed floodplain compensation ponds.

The Zone A floodplains have no designated elevation, though the floodplain limits within Chuluota Road for the Zone A floodplain north of Corner Lake Drive are associated with elevations varying between 69.8 and 70.8 ft NAVD88 as estimated from LiDAR data. Therefore, potentially raising the road profile to elevation 70.0 ft NAVD88 and widening the road would constitute floodplain fill. Note that no survey is available nor is a proposed roadway profile, so the amount of floodplain compensation required is preliminary.

Under the non-roundabout alternative, there is 0.03 ac-ft of floodplain impact between STA 22+00 and 26+00, and there is 1.87 ac-ft of floodplain impacts between 73+00 and 90+00. With the ICE alternatives, there is an estimated total of 2.13 ac-ft of floodplain impacts between STA 73+00 and 90+00. The same estimated floodplain impact volume (2.13 ac-ft) is anticipated for each ICE alternative.

Net Fill Summary				
Station to Station			Updated PSR Volume (Ac-Ft)	ICE Alternatives Volume (Ac-Ft)
22+00.00	TO	26+00.00	0.03	0.03
73+00.00	TO	90+00.00	1.87	2.13
Total			1.90	2.16

Table 6- 1 Floodplain Compensation Requirements for the ICE Alternatives

Calculations supporting the floodplain compensatory volume required and those provided are included in Appendix C. A floodplain compensatory pond (FC-1) is proposed across from Corner Lake Middle School. No changes to the size of this floodplain compensatory pond will be necessary with roundabouts. A second floodplain compensatory pond (FC-2) is proposed adjacent to wetlands south of Lake Pickett Road and east of Chuluota Road. The footprint of this pond without roundabouts was 1.87 acres. **With the ICE Alternatives, the size of FC-2 will need to be increased to 2.13 acres.**

6.1.4 Stormwater Ponds

In the PCA PSR, dated October 2022, the proposed four-lane widening would be accommodated by recommended Pond 3C to provide attenuation and water quality for Drainage Basins 1, 2, and 3, and for recommended Pond 4C to provide attenuation and water quality for Drainage Basin 4. See Appendix D for the following pond sizing calculations.

Pond 3C - The parcel size for Pond 3C is 40.22 acres and was previously owned by Cross Life Church. The pond footprint with tie-downs is approximately 7.14 acres for the non-roundabout option and 8.17 acres for the ICE alternatives. The proposed pond site is along the west side of Chuluota Road. The outfall from the proposed pond is conveyed west to the existing wetland and eventually to Corner Lake. There are no wetlands within the proposed footprint of this pond site location.

The seasonal high-water table is 67.0 ft NAVD88 based on a combination of LiDAR and wetland delineation. A wet detention pond is proposed at this location due to the high-water table. Preliminary pond sizing calculations indicate that Drainage Basins 1, 2, and 3 require a total of 5.56 ac-ft of treatment and attenuation volume to accommodate the proposed roadway configuration and pond footprint without roundabouts.

With the ICE alternatives, 6.10 ac-ft of treatment and attenuation volume is required. Pond sizing calculations were also completed to provide the required volume at one foot below the inside maintenance berm. The ability to convey runoff from Basin 1 north may require Chuluota Road to be raised in the vicinity of the SR50 intersection. Alternatively, a portion of Basin 1 can continue to drain to the FDOT drainage systems on SR50 such that peak discharges into FDOT right-of-way is maintained or reduced, and the remainder of Basin 1 can be conveyed to Pond 3C.

Pond 3C assumes that the crown of Chuluota Road can be raised to elevation 70 ft NAVD88 in the vicinity of Pond 3C. If the Chuluota Road profile can be raised, then the footprint for Pond 3C can be reduced in size, although the floodplain compensation requirements may need to increase in size.

Pond 4C - The parcel size for Pond 4C is 2.046 acres and is located on the northeast corner of Chuluota Road and Lake Pickett Road, and the estimated pond footprint is approximately 1.22 acres which can accommodate either the roundabout option at Lake Pickett Road or the bowtie option. The pond footprint is approximately the same size without the roundabouts or bowties.

This parcel will require acquisition of a residential parcel to accommodate the future widening of Chuluota Road. This parcel is recommended to be joined with a portion of the adjacent parcel to the east which is owned by the County (old CR 15), to maximize the overall size of Pond 4C, while leaving an adequate remainder for the proposed East Orange Trail.

The outfall from the proposed pond is conveyed south to Lake Picket Road. There are no wetlands in this pond site location. The measured seasonal high-water table is 4.9 feet below existing ground. Pond 4C is proposed as a wet detention pond. Preliminary pond sizing calculations indicate that Basin 4 requires a total of 1.58 ac-ft of treatment and attenuation volume to accommodate the proposed roadway configuration and pond footprint. Pond sizing calculations were also completed to provide the required volume at one foot below the inside maintenance berm.

6.1.5 Drainage Results and Conclusions

Pond 3C and 4C are the recommended stormwater treatment ponds for the Chuluota Road widening improvements, with Drainage Basins 1, 2, and 3 assigned to Pond 3C. This pond site is expected to require a full acquisition of the parcel previously owned by Cross Life Church. The parcel size is listed at 40.22 acres and the proposed pond 3C footprint is approximately 8.17 acres with the remainder of the parcel being mostly wetlands.

Pond 4C has been assigned for Drainage Basin 4 which is located at the northeast corner of Chuluota Road and Lake Pickett Road and will require acquisition to accommodate the future widening of Chuluota Road as well as stormwater and water quality needs for Chuluota Road Basin 4. The parcel size is listed at 2.046 acres, and the proposed Pond 4C footprint is 1.22 acres. This parcel is recommended to be joined with a portion of the adjacent parcel to the east which is owned by the County (old CR 15), to maximize the overall size of Pond 4C, while leaving an adequate remainder for the proposed East Orange Trail.

A floodplain compensatory pond (FC-1) is proposed across from Corner Lake Middle School. No changes to the size of this floodplain compensatory pond will be necessary with roundabouts. A second floodplain compensatory pond (FC-2) is proposed adjacent to wetlands south of Lake Pickett Road and east of Chuluota Road. The footprint of this pond without the ICE alternatives is 1.87 acres. With the ICE alternatives, FC-2 will need to be increased to 2.13 acres. Note that no survey is available nor is a proposed roadway profile, so the amount of floodplain compensation required is preliminary.

For Basins 1, 2, and 3, Pond 3C is recommended due to the lower cost estimation compared to the other options. Additionally, the pond may be sited such that there are no wetland impacts. The pond sizing assumes that Chuluota Road can be raised to at least elevation 70 NAVD88. If it can be raised higher, the Pond 3C footprint can likely be reduced, though the floodplain compensation pond FC-2 will need to increase in size.

For Basin 4, the preferred pond site is Pond 4C due to its low footprint and potential lower cost, which would be sited on a residential parcel in the NE corner of the Chuluota Road/Lake Pickett Road intersection. This parcel is recommended to be joined with a portion of the parcel to the east which is owned by the County (old CR 15), to maximize the overall size of Pond 4C, while leaving an adequate remainder for the proposed East Orange Trail.

A summary of the stormwater and floodplain compensation impacts resulting from the potential implementation of the ICE alternatives is shown on Table 2 on the next page. If all of the ICE alternatives are implemented, an additional 1.04 acres of right-of-way would be needed for the stormwater ponds (Ponds 3C and 4C) and an additional 0.27 acres of floodplain compensation would be needed as well, which would likely be accommodated by FC-2. In addition to the RCA right-of-way requirements, another 1.31 acres would be needed if all ICE alternatives were implemented.

Configuration	Pond 3C		Pond 4C*		FC1**		FC2		Total ROW needed (ac) ***
	Pond ROW (ac)	Pond Capacity (ac-ft)	Pond ROW (ac)	Pond Capacity (ac-ft)	Pond ROW (ac)	Pond Capacity (ac-ft)	Pond ROW (ac)	Pond Capacity (ac-ft)	
PSR Submittal	7.14	5.56	1.22	1.58	0.05	0.03	1.93	1.87	10.34
Full ICE Alternatives	8.18	6.11					2.2	2.13	11.65
ICE Alternative at Cypress Lake Glen Blvd (S)/Relocated Schoolview Way	7.41	5.43					1.93	1.87	10.61
ICE Alternative at Corner Lake Dr	7.9	5.87					1.93	1.87	11.1
ICE Alternative at Long Boat Ln/Cypress Lake Glen Blvd (N)	7.68	5.68					2.2	2.13	11.15
ICE Alternative at Lake Pickett Rd *	7.14	5.56					1.93	1.87	10.34

* All Lake Pickett alternatives; PSR submittal, round-a-bout, and bow-tie configuration result in similar Pond 4C requirements
** FC1 is not impacted by the ICE alternatives
*** ROW is calculated as the estimated pond footprint for an idealized square pond and does not include access or other drainage considerations

Table 6- 2 Stormwater and Floodplain Compensation Requirements for the ICE Alternatives

6.2 Cost Evaluations of the ICE Alternatives

An evaluation of alternatives was developed for four scenarios as illustrated in Table 6-3 below. ***Note, all construction cost estimate updated with current unit cost prices.*** The column labeled as *Recommended Four-Lane Widening with Existing* Controls reflects the proposed four-lane widening improvements as developed by the RCA Study. For this scenario, the existing intersection controls consisting of signals and stop signs have been applied.

The next column labeled as *Four-Lane Widening with Roundabout at Long Boat Lane, ETC at Other Intersections* provides a similar analysis, except a roundabout has been applied at the Long Boat Lane/Cypress Lake Glen Boulevard intersection with existing traffic control measures at the remaining intersections. The next column labeled *Four-Lane Widening with Roundabouts at All Intersections* provides a similar analysis, except roundabouts have been applied at all intersections instead of the current intersection controls. The last scenario labeled as *Four-Lane Widening with a Bow Tie at Lake Picket Road and Roundabouts at Other Intersections* reflects roundabouts at all intersections except Lake Pickett Road where a Bow-Tie configuration has been applied instead of the roundabout option.

EVALUATION CRITERIA	Four-Lane Widening with Existing Intersection Controls (ETC)	Four-Lane Widening with Roundabout at Long Boat Lane, ETC at Other Intersections	Four-Lane Widening with Roundabouts at All Intersections	Recommended Four-Lane Widening with Bow Tie at Lake Pickett Road and Roundabouts at Other Intersections
RELOCATIONS				
Number of Residential Acquisitions	1	1	1	1
Number of Business Acquisitions	None	None	None	None
Number of Parcels Impacted	10	14	39	40
Social, Natural and Physical Impacts				
Social and Neighborhood	Low	Low	Medium	Medium
Archeological/Historic Sites	None	None	None	None
Threatened and Endangered Species	No Adverse Impacts	No Adverse Impacts	No Adverse Impacts	No Adverse Impacts
Wetland Impacts (Acres)	Low	Low	Low	Low
RHPZ Uplands Impacts (Acres)	Low	Low	Low	Low
Floodplain Impacts (Acre-Feet)	1.9	2.16	2.16	2.16
Potential High or Medium Ranked Contamination Sites	None	None	None	None
Estimated Costs (Present Day)				
Estimated Construction Costs	$ 40,968,339	$ 44,102,180	$ 48,811,549	$ 48,977,856
Estimated Design/Adm Costs (12%)	$ 4,916,201	$ 5,292,262	$ 5,857,386	$ 5,877,343
Preliminary Estimated CEI Costs (15%)	$ 6,145,251	$ 6,615,327	$ 7,321,732	$ 7,346,678
Preliminary Estimated Right-of-Way Impacts	11.864	12.453	17.466	19.115
Preliminary Estimated Right-of-Way Costs	$ 2,196,355	$ 2,305,449	$ 3,233,481	$ 3,538,760
Mitigation/RHPZ	$ 103,000	$ 103,000	$ 103,000	$ 103,000
Subtotal	$ 54,329,146	$ 58,418,218	$ 65,327,148	$ 65,843,637
Contingency (20%)	$ 10,865,829	$ 11,683,644	$ 13,065,430	$ 13,168,727
TOTAL PRELIMINARY ESTIMATED PROJECT COSTS	***$ 65,194,975***	***$ 70,101,862***	***$ 78,392,578***	***$ 79,012,364***

Table 6-3 Alternatives Evaluation Matrix

6.3 Recommendations

The above analyses indicate the following conclusions:

- The existing two-lane Chuluota Road cannot accommodate anticipated future traffic demands. Even with the use of innovative intersection concepts such roundabouts or bow tie intersection concepts, the existing two-lane section of Chuluota Road is expected to reach capacity well before the Design Year, and continue to experience high congestion, low levels of service, and lengthy delays. Furthermore, the existing two-lane roadway will not meet other goals of the project such as providing multi-modal accommodations for pedestrians and bicyclists through the use of sidewalks and a multi-use path throughout the corridor.

- To meet forecasted traffic demands, Chuluota Road is recommended to be widened to four lanes.

- The ICE Study indicated that the existing traffic controls consisting of signals and stop signs along Chuluota Road generally provide better Level of Service and less delay than the use of innovative intersection concepts such roundabouts or bow tie intersection concepts. However, when other factors are considered such as measures to reduce operating speeds, a roundabout at Long Boat Lane and Cypress Lake Glen Boulevard (North) may be considered as a viable option at this location since it would slow motorists on Chuluota Road while providing improved access opportunities for motorists on the side roads. Attendees at the public meetings frequently mentioned these concerns and those in attendance at the second public meeting voted to provide a roundabout at this location.

7 PREFERRED ALTERNATIVE

Based on the results of the detailed traffic analyses including an ICE evaluation, right-of-way impacts, and public input, the preferred typical section for the study corridor of Chuluota Road from south of Cypress Lake Glen Boulevard (S) to north of Lake Pickett Road is the four-lane widening (build) section using existing controls consisting of signals and stop signs except at Long Boat Lane and Cypress Lake Glen Boulevard (North) where a roundabout should be considered. It is clear from the SimTraffic results that the existing two-lane (no-build) section cannot support the forecasted design year (2048) traffic volumes.

7.1 Design Traffic Volumes

The Chuluota Road Roadway Conceptual Analysis Design Traffic Technical Memorandum (DTTM) conducted in the RCA Study documents the existing traffic conditions and the analysis of the No-Build and Build scenarios. With the proposed four-lane widening improvements, all roadway segments and intersections will operate at an acceptable level of service in the design year of 2048 except for the SR 50 and also, the Long Boat Lane/Cypress Lake Glen Boulevard intersections, the latter only during certain hours of the day. Without the proposed widening (build scenario), portions of Chuluota Road will reach capacity by opening year, and all of Chuluota Road will be at LOS F by the year 2038.

7.2 Typical Sections

The proposed typical section as developed during the RCA Study is shown on Figure 7-1. The roadway design elements incorporated into the preferred alternative include the following:

- Four 11-foot travel lanes
- A six-foot sidewalk located on one side of the roadway and 10-foot to 14-foot path on the other side
- A 22-foot raised median with Type E curb and gutter to include street trees
- Type F curb and gutter along the outside lanes with four-foot utility strips between the back of curb and the sidewalk or path
- A grass strip between the path or sidewalk with the right-of-way line of varying width
- A proposed right-of-way width of 120 feet (note, much of the existing right-of-way is already 120-feet wide thus minimizing the right-of-way impacts for this project
- A roundabout at Long Boat Lane and Cypress Lake Glen Boulevard (North).

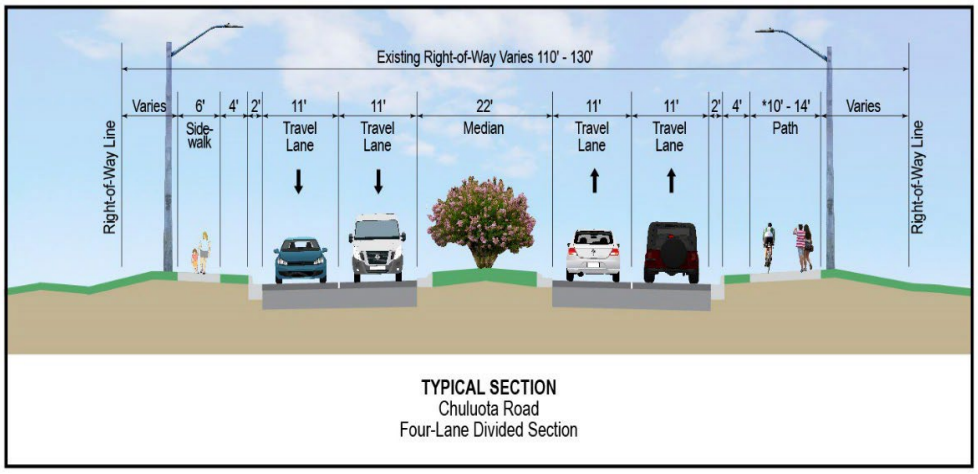


Figure 7- 1 Chuluota Road Typical Section

8 PUBLIC INVOLVEMENT

8.1 Public Involvement Plan

In 2021, a Public Involvement Plan (PIP) was created for the Chuluota Road public involvement approach and activities. The PIP identifies key local and state agency, elected, and appointed officials; and property owners and tenants for the study area, in addition to outlining public outreach strategies. This PIP also governed the public involvement activities throughout the ICE Study.

Specific strategies established in the PIP included project newsletter mailouts, contacts with the media, community and small group stakeholder meetings, two community public meetings, and presentations to the Orange County Board of County Commissioners.

All public involvement documents conducted thus far for the ICE Study can be found in Appendix G.

8.2 Public Information Distribution

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

- Newsletters were mailed to property owners, tenants, and other interested persons. Spanish version of the newsletters were also available to the public on request.
- Public meeting advertisements (both in English as well as Spanish) were placed in *The Orlando Sentinel*.
- A project website has been created which contains information such as the project study area map, project schedule, meeting notices, newsletters, and other study documents.
- During the ICE Study, a community survey was undertaken with the following results (see following section).

8.3 Community Survey

In addition to an alternatives workshop held on September 16, 2024, Orange County conducted a survey to better understand the community's priorities and preferences. The survey included seven questions and was mailed to property owners along with the notification for the recommendations meeting. It was also placed on the project website. A total of 45 surveys were returned, mostly online. The results are summarized below.

From the survey, several conclusions can be drawn. More than 60% of the respondents supported the proposed widening of Chuluota Road. In addition, 59% of the respondents said relieving congestion and keeping traffic moving was their top priority.

Traffic signals were the preferred control option at most of the intersections along Chuluota Road, though at Corner Lake Drive, a roundabout did receive more support by respondents rather than the use of traffic signals. Note, the survey also included stop signs as a possible control option, though this option was not as favored as signals or roundabouts.

The Long Boat Lane/Cypress Glen Boulevard (North) was the highest ranked intersection by 43%

of the respondents as having the most urgent need for improvements. Lake Pickett Road came in second with 32% of the respondents indicating the need for improvements.

The Corner School Drive/Schoolview Way was perceived as being highly congested. The RCA has proposed the elimination/closure of existing Schoolview Way and relocating this roadway further north to provide a new, west connection at the signalized Cypress Lake Glen Boulevard (South) intersection. This change is expected to improve the overall operations along both Corner School Drive and also, Chuluota Road, by removing the existing Schoolview Way intersection.

The Long Boat Lane/Cypress Glen Boulevard (North) intersection received the highest concerns by respondents about driving through this intersection as being unsafe (11%) or highly unsafe (32%). The proposed roundabout at this location is expected to slow speeds and thereby improve the safety of this intersection.

The Lake Pickett intersection received also received high concerns by respondents regarding pedestrian and bicycle crossings at this intersection as being unsafe (11%) or highly unsafe (27%). Additional information regarding the survey responses are located in Appendix G.

8.4 Public Meetings

The first ICE community public meeting was held on September 16, 2024 with the second meeting being held on November 20, 2024. The meeting formats consisted of an open house that allowed for informal discussions between the project team and the public, followed by a presentation and an open question and answer forum. Meeting summaries from each event including supporting materials are located in Appendix G.

8.5 Orange County Board of County Commissioners (BCC)

The BCC Public Hearing is currently scheduled for February 25, 2025.

9 CONCLUSIONS AND RECOMMENDATIONS

The objective of the Chuluota Road RCA is to develop and evaluate alternatives for improvements to Chuluota Road from SR 50 to Lake Pickett Road in order to meet current and future transportation, multi-modal, and drainage needs along the corridor. As an addendum to the RCA, an ICE Study was prepared to further investigate various intersection control alternatives to determine if these options could better serve the Chuluota Road corridor under No Build and Build conditions.

The ICE Study confirmed that four-lane widening improvements are needed to address the forecasted traffic volumes. Furthermore, the proposed urban widening of Chuluota Road will also include various multi-modal improvements such as sidewalks and a ped/bike path as well as improving drainage treatment through the use of ponds instead of open ditches.

The ICE Study found that the existing traffic controls consisting of signals and stop signs along Chuluota Road generally provide better Level of Service and less delay than the use of innovative intersection concepts such roundabouts or bow tie intersection concepts. However, when other factors are considered such as measures to reduce operating speeds, a roundabout at Long Boat Lane and Cypress Lake Glen Boulevard (North) can be considered as a viable option at this location since it would slow motorists on Chuluota Road while providing improved access opportunities for motorists on the side roads. Attendees at the public meetings frequently mentioned these concerns and those in attendance at the second public meeting voted to provide a roundabout at this location.

The preferred widening improvements as identified in the RCA Study and confirmed during the course of this ICE Study will serve as the basis for the subsequent design of the roadway improvements. The development of the proposed improvements 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 alternative as detailed in Section 7 of this report be advanced to the design phase.