

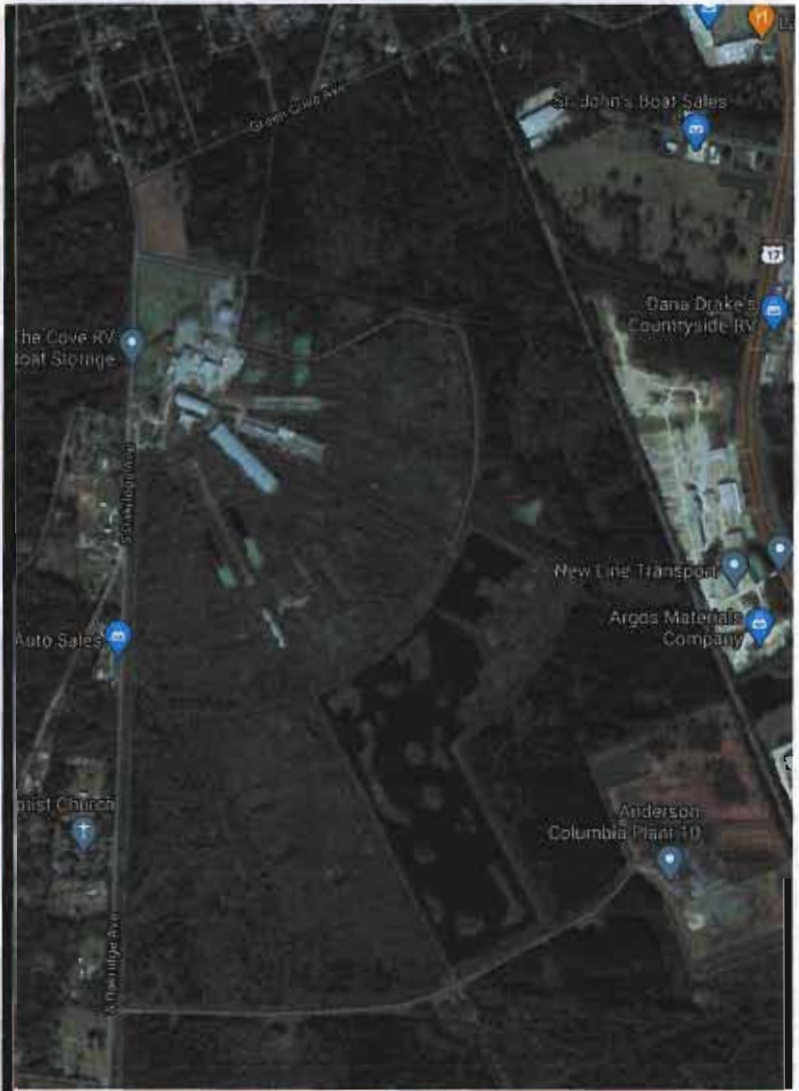
Prepared for:



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City of
Green Cove Springs
FLORIDA

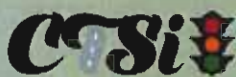


Ayrshire PUD

Comprehensive Plan Amendment Traffic Impact Study

City of Green Cove Springs, Florida

Prepared By:



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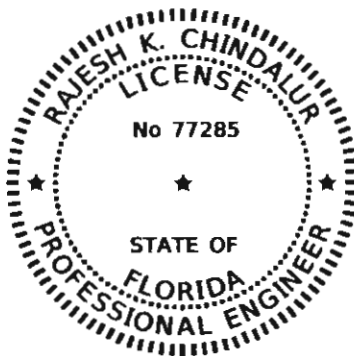
Project #: 1001-200-026
Date: Revised 03/19/2021

PROFESSIONAL ENGINEER CERTIFICATE

I, Rajesh Ramn K. Chindalur, PE #77285, certify that I currently hold an active license in the state of Florida and am competent through education or experience to provide engineering services in the civil discipline contained in this plan, print, specification, or report.

PROJECT:	Ayrshire PUD – CPA Traffic Study
LOCATION:	City of Green Cove Springs, Florida
CLIENT:	DR. Horton, Inc.

I further certify that this plan, print, specification, or report was prepared by me or under my responsible charge as defined in Chapter 61G15-18.001 F.A.C. Moreover, if offered by a corporation, partnership, or through a fictitious name, I certify that the company offering the engineering services, Chindalur Traffic Solutions, Inc., 8833 Perimeter Park Boulevard, Suite 103, Jacksonville, Florida 32216, holds an active certificate of authorization #30806 to provide engineering service.



*THIS ITEM HAS BEEN DIGITALLY
SIGNED AND SEALED BY*

Rajesh Ramn K Chindalur
2021.03.19 16:43:02 -04'00'

ON THE DATE ADJACENT TO THE SEAL.

*PRINTED COPIES OF THIS DOCUMENT ARE
NOT CONSIDERED SIGNED AND SEALED
AND THE SIGNATURE MUST BE VERIFIED
ON ANY ELECTRONIC COPIES.*

*CHINDALUR TRAFFIC SOLUTIONS, INC.
8833 PERIMETER PARK BOULEVARD, SUITE 103
JACKSONVILLE, FL 32216
CERTIFICATE OF AUTHORIZATION #30806
RAJESH RAMN K. CHINDALUR, P.E. NO. 77285*

*THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THIS DOCUMENT IN
ACCORDANCE WITH RULE 61G15-23.004, F.A.C.*

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**Ayrshire – Annexation and Large-Scale Comprehensive Plan Amendment Traffic Study
City of Green Cove Springs, Clay County, Florida**

Introduction

This traffic impact study (TIS) was performed in support of the proposed Ayrshire/Application for Annexation and Large-Scale Comprehensive Plan Amendment. Our client, D.R. Horton, Inc. – Jacksonville, is the contract purchaser of approximately 889 acres owned by Gustafson’s Cattle, Inc. with Clay County Parcel Identification No. 38-06-26-016515-000-00.

The Property is located in unincorporated Clay County and has future land use designations of Rural Fringe and Industrial and zoning districts of Agricultural and Industrial. The Applicant desires to annex the Property (approximately 560 acres) into the City of Green Cove Springs and give the Property City future land use designations of Residential Medium Density. The applicant will file a companion application to rezone the Property to Planned Unit Development following the City Council’s transmittal of the Comprehensive Plan Amendment application to the State. The proposed development is anticipated to include a maximum of 2,100 residential single-family dwelling units. Access to the proposed development is anticipated to be provided via a roadway (bridge over the CSX railroad) connecting to US 17, via existing Jersey Avenue and an additional driveway on CR 15A (Oak Ridge Avenue).

Figure 01 shows the project location. A copy of the Generalized Site Plan (GSP) provided by Dunn and Associates, Inc. is included as **Attachment A**. The methodology used in this study is consistent with the methodology discussed with the City’s Planning and Zoning Director on October 29th, 2020.

Trip Generation

Trip generation for the proposed project was estimated using the equation provided in the *Trip Generation Manual*, 10th Edition published by Institute of Transportation Engineers (ITE). The proposed residential development is anticipated to generate a total of 17,115 Daily trips that include 1,496 AM peak hour trips and 1,889 PM peak hour trips. **Table 01** summarizes the Daily, AM peak and PM peak hour trip generation for the proposed residential development.

Study Area and Existing Conditions

As discussed with the City’s Planning and Zoning Director and the City of Green Cove Springs traffic study guidelines, the study area includes all the roadway segments that are anticipated to include project traffic of 5% of more of the roadway segment’s adopted level of service (LOS) standard maximum service volume (MSV). The existing conditions data for the study area roadway links was taken directly from the Clay County Roadway Characteristics Inventory spreadsheet, March, 2019 and FDOT D2 LOS Summary Reports. A copy of the *Clay County Roadway System Capacity Analysis Spreadsheet (Provided by Clay County Planning Department)*, is included in **Attachment B**. **Table 02** includes details of the roadway segments in Clay County. All the roadway segments IDs are shown in **Figure 02**. The maximum service volumes for the roadway segments were obtained from the *Clay County Roadway System Capacity Analysis Spreadsheet* and FDOT D2 LOS Summary Reports. The copies of the FDOT D2 LOS Summary Reports are included in **Attachment C**.

Planned and Programmed Improvements

All of the planned and programmed improvements within the transportation study area identified from the FDOT Five (5) year work program, FDOT Long Range Plan and Clay County

**Ayrshire – Annexation and Large-Scale Comprehensive Plan Amendment Traffic Study
City of Green Cove Springs, Clay County, Florida**

Capital Improvement Plan document were included in the model and the segment analysis. The following planned and programmed improvements were included in the analysis. Details of these projects are included in **Attachment D**.

- CR 218 (Middleburg): Cosmos Avenue to Pine Tree Lane (Widening 2.7 miles from 2 to 4 lanes)
- CR 209 (Lake Asbury): CR 315B to US 17 (Widening 0.8 miles from 2 to 4 lanes)
- CR 209 (Lake Asbury): Sandridge Road to CR 315B (Widening 2.6 miles from 2 to 3 lanes)
- Sandridge Road (Lake Asbury): Henley Road to CR 209 (Widening 3.75 miles from 2 to 3 lanes)
- CR 220: Baxley Road to Henley Road (Widening 1.6 miles from 2 to 4 lanes)
- First Coast Connector: US 17 to CR 315 (Widening 1.6 miles from 2 to 4 lanes)
- First Coast Connector (Green Cove Springs): First Coast Expressway to CR 315 (Construct 2.9 miles of 2-lane divided road)
- First Coast Expressway: I-10 to N. Of Argyle Forest Boulevard
- First Coast Expressway: N. of Argyle Forest Boulevard to Blanding Boulevard (SR 21)
- First Coast Expressway: Blanding Boulevard (SR 21) to North of SR 16
- First Coast Expressway: North of SR 16 to East of CR 209
- First Coast Expressway (New St. Johns River Bridge) : SR 16 to CR 16A (St. Johns County)
- First Coast Expressway (St. Johns County): CR 16A to I-95
- SR 21 (Blanding Boulevard): Allie Murray Road to Long Bay Road (CR 220A) (Widening from 4 to 6 lanes)
- SR 21 (Blanding Boulevard): CR 218 and Black Creek (Widening from 4 to 6 lanes)

Trip Distribution and Assignment

The interim year 2030 model set of the Northeast Regional Planning Activity Based Model (NERPM_AB3v1) travel demand forecasting model, provided by the North Florida Transportation Planning Organization (NFTPO), which was prepared as part of the TPO's 2040 Long Range Transportation Plan update, was used to develop project traffic distribution for the proposed Ayrshire PUD project. Upon construction of the First Coast Expressway, a majority of the project traffic is anticipated to use the First Coast Expressway (to and from St. Johns County and Duval County). Additionally, about 11% of project traffic was assigned to Oak Ridge Boulevard as access to the Phase 01 development is anticipated to be provided via Oak Ridge Boulevard. Hence, this distribution was further adjusted based on the future FDOT projections on US 17 and First Coast Expressway in the vicinity of the proposed development. The future FDOT projections were obtained from the FDOT traffic counts online portal. Following is a summary of the project traffic distribution percentages in the vicinity of the proposed development.

- Oak Ridge Avenue – SR 16 to Project Entrance: 6.7%
- Oak Ridge Avenue – Project Entrance to US 17: 4.32%
- US 17 – Project Entrance to First Coast Expressway: 48.63%
- US 17 – SR 16 East to Project Entrance: 40.35%

Table 03 shows the adjusted project traffic distribution on the roadway segments in Clay County. **Figure 03** shows the proposed project traffic distribution percentages on the roadway segments. **Attachment E** includes the travel demand model plots showing the project traffic distributions

(unadjusted distributions). **Figure 04** shows the project traffic assignment on the roadway segments in Clay County. **Attachment F** includes a figure depicting the adjusted project traffic distribution percentages in the vicinity of the proposed development.

Impacted Roadway Segments

As discussed with the City of Green Cove Springs’s Planning and Zoning Director on October 29th, 2020, a roadway segment is considered impacted if the project assigns traffic equal to or greater than 5% of the roadway segments adopted LOS standard maximum service volume. Previously stated, **Table 03** shows the roadway segments impact analysis. As shown in this table, the following roadway segments are anticipated to be impacted (with project traffic equal to or greater than 5% of the roadway segment’s adopted LOS maximum service volume). **Figure 05** shows the roadway segments on which project traffic is anticipated to be greater than 5% of the roadway segment’s maximum service volumes.

- US 17: Kingsley Ave. to Dr. Inlet Bridge
- US 17: Dr. Inlet Bridge to Raggedy Point Dr.
- US 17: Raggedy Point Dr. to CR 220
- US 17: CR 220 to Water Oak Lane
- US 17: Water Oak Lane to Black Creek Bridge
- US 17: Black Creek Bridge to CR 209
- US 17: CR 209 to Green Cove Springs
- US 17: Green Cove Springs to SR 16 West
- US 17: SR 16 East to SR 16 West
- US 17: SR 16 East to CR 209 (First Coast Expressway)
- First Coast Expressway: US 17 to St. Johns County Line
- Oak Ridge Avenue: SR 16 to Green Cove Avenue
- Oak Ridge Avenue: Green Cove Avenue to Project Entrance
- Oak Ridge Avenue: Project Entrance to US 17
- Green Cove Avenue: US 17 to Oak Ridge Avenue

Year 2030 Background Conditions Projections

The year 2030 Future conditions traffic volumes for the above stated impacted FDOT roadway segments were obtained from the FDOT D2 LOS Summary Reports (Included in previously stated **Attachment C**). Future conditions traffic volumes for Oak Ridge Avenue were estimated by applying a growth rate of 2% per year to the year 2020 existing traffic volumes.

Table 04 shows the year 2030 background traffic volumes on the impacted roadway segments. As shown in this table, the year 2030 background traffic volumes are anticipated to be greater than the roadway segment’s maximum service volume on the following segments.

- US 17: Wells Rd. to Kingsley Ave.
- US 17: Kingsley Ave. to Dr. Inlet Bridge
- US 17: Dr. Inlet Bridge to Raggedy Point Dr.
- US 17: Raggedy Point Dr. to CR 220

- US 17: Green Cove Springs to SR 16 West

Build-Out Conditions Roadway Segment Analysis

Build-Out Conditions traffic volumes include the year 2030 background conditions traffic volumes and the project traffic assignment. Previously stated **Table 04** shows the year 2030 build-out conditions roadway segment analysis. As shown in this table, the year 2030 build-out traffic volumes are anticipated to be greater than the roadway segment's maximum service volume on the following segments.

- US 17: Wells Rd. to Kingsley Ave.
- US 17: Kingsley Ave. to Dr. Inlet Bridge
- US 17: Dr. Inlet Bridge to Raggedy Point Dr.
- US 17: Raggedy Point Dr. to CR 220
- US 17: Green Cove Springs to SR 16 West

However, it should be noted that all the adversely impacted roadway segments are anticipated to be deficient (peak hour traffic exceeds 100% of the maximum service volume of the adopted level of service standard) under background (no-build) traffic. Per Florida Statutes (FS) 163.3180 these roadway segments are considered deficient without the project traffic under review. None of the impacted roadway segments are anticipated to be adversely impacted due to the proposed development.

Project Related Proportionate Share

Project related proportionate share will be estimated only for the study area roadway segments that are anticipated to be adversely impacted by the traffic from the proposed development. Upon transmittal of the Comprehensive Plan Amendment application, the applicant will submit a Concurrency Application. The applicant will further comply with concurrency requirements as mandated by Section 163.3180, Florida Statutes, including any provisions of the Green Cove Springs Land Development Code consistent therewith to mitigate Ayrshire PUD Residential Development related transportation adverse impacts.

Intersection Capacity Analysis

Any required study intersection capacity analysis including access intersection capacity analysis and FDOT ICE Analysis for US 17 and Project Entrance will be provided as part of the Concurrency application submittal.

Summary and Conclusions

This traffic impact study (TIS) was performed in support of the proposed Ayrshire/Application for Annexation and Large-Scale Comprehensive Plan Amendment. The proposed development is anticipated to include a maximum of 2,100 residential units. Access to the proposed development is anticipated to be provided via a roadway (bridge over the CSX railroad) connecting to US 17, via existing Jersey Avenue and an additional driveway on CR 15A (Oak Ridge Avenue).

The Property is located in unincorporated Clay County and has future land use designations of Rural Fringe and Industrial and zoning districts of Agricultural and Industrial. The Applicant desires to annex the Property (approximately 560 acres) into the City of Green Cove Springs and give the Property City future land use designations of Residential Medium Density.

The proposed residential development is anticipated to generate a total of 17,115 Daily trips that include 1,496 AM peak hour trips and 1,889 PM peak hour trips.

The interim year 2030 model set of the Northeast Regional Planning Activity Based Model (NERPM_AB3v1) travel demand forecasting model, provided by the North Florida Transportation Planning Organization (NFTPO), which was prepared as part of the TPO's 2040 Long Range Transportation Plan update, was used to develop project traffic distribution for the proposed Ayrshire PUD project. Upon construction of the First Coast Expressway, a majority of the project traffic is anticipated to use the First Coast Expressway (to and from St. Johns County and Duval County). Hence, this distribution was further adjusted based on the future FDOT projections on US 17 and First Coast Expressway in the vicinity of the proposed development. The future FDOT projections were obtained from the FDOT traffic counts online portal. Following is a summary of the project traffic distribution percentages in the vicinity of the proposed development.

- Oak Ridge Avenue – SR 16 to Project Entrance: 6.7%
- Oak Ridge Avenue – Project Entrance to US 17: 4.32%
- US 17 – Project Entrance to First Coast Expressway: 48.63%
- US 17 – SR 16 East to Project Entrance: 40.35%

The following roadway segments are anticipated to be impacted (with project traffic equal to or greater than 5% of the roadway segment's adopted LOS maximum service volume).

- US 17: Kingsley Ave. to Dr. Inlet Bridge
- US 17: Dr. Inlet Bridge to Raggedy Point Dr.
- US 17: Raggedy Point Dr. to CR 220
- US 17: CR 220 to Water Oak Lane
- US 17: Water Oak Lane to Black Creek Bridge
- US 17: Black Creek Bridge to CR 209
- US 17: CR 209 to Green Cove Springs
- US 17: Green Cove Springs to SR 16 West

**Ayrshire – Annexation and Large-Scale Comprehensive Plan Amendment Traffic Study
City of Green Cove Springs, Clay County, Florida**

- US 17: SR 16 East to SR 16 West
- US 17: SR 16 East to CR 209 (First Coast Expressway)
- First Coast Expressway: US 17 to St. Johns County Line
- Oak Ridge Avenue: SR 16 to Green Cove Avenue
- Oak Ridge Avenue: Green Cove Avenue to Project Entrance
- Oak Ridge Avenue: Project Entrance to US 17
- Green Cove Avenue: US 17 to Oak Ridge Avenue

The year 2030 build-out traffic volumes are anticipated to be greater than the roadway segment's maximum service volume on the following segments.

- US 17: Wells Rd. to Kingsley Ave.
- US 17: Kingsley Ave. to Dr. Inlet Bridge
- US 17: Dr. Inlet Bridge to Raggedy Point Dr.
- US 17: Raggedy Point Dr. to CR 220
- US 17: Green Cove Springs to SR 16 West

However, it should be noted that all the adversely impacted roadway segments are anticipated to be deficient (existing peak hour traffic exceeds 100% of the maximum service volume of the adopted level of service standard) under background (no-build) traffic conditions. Per Florida Statutes (FS) 163.3180 these roadway segments are considered deficient without the project traffic under review. The roadway segment of US 17 between SR 16 West and SR 16 East is the only roadway segment that is anticipated to be adversely impacted by the proposed development.

Project related proportionate share will be estimated only for the study area roadway segments that are anticipated to be adversely impacted by the traffic from the proposed development. Upon transmittal of the Comprehensive Plan Amendment application, the applicant will submit a Concurrency Application. The applicant will further comply with concurrency requirements as mandated by Section 163.3180, Florida Statutes, including any provisions of the Green Cove Springs Land Development Code consistent therewith to mitigate Ayrshire PUD Residential Development related transportation adverse impacts.